Ground-Based Midcourse Defense (GMD)
Extended Test Range (ETR)

Final Environmental Impact Statement

Volume 1 of 3: Chapters 1-4

July 2003

U.S. Army Space and Missile Defense Command
P.O. Box 1500
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Ground-Based Midcourse Defense (GMD)
Extended Test Range (ETR)
Final Environmental Impact Statement

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Missile Defense Agency
a. Lead Agency: Missile Defense Organization

b. Preparing Agency: U.S. Army Space and Missile Defense Command

c. Cooperating Agencies: Federal Aviation Administration, Office of the Associate Administrator for Commercial Space Transportation

d. Proposed Action: Provide operationally realistic testing for GMD ETR.

e. Affected Jurisdictions: Kodiak Launch Complex, Kodiak Island Borough, Alaska; Vandenberg Air Force Base (AFB), Santa Barbara County, California; Reagan Test Site, United States Army Kwajalein Atoll; Pacific Missile Range Facility, Barking Sands, Kauai, Hawaii; Eareckson Air Station, Shemya Island, Alaska; Midway Atoll; King Salmon, Bristol Bay Borough, Alaska; Cordova, Valdez-Cordova Census Area, Alaska; Pillar Mountain, Kodiak Island Borough, Alaska; Pashagshak Point, Kodiak Island Borough, Alaska; Homer, Kenai Peninsula Borough, Alaska; Adak, Adak Island, Alaska; Pillar Point, San Mateo County, California; Wake Island, Oceania Atoll; Bremerton, Kitsap County, Washington; Pearl Harbor, Honolulu County, Hawaii; Port Hueneme/San Nicolas Island, Ventura County, California; Naval Station Everett, Snohomish County, Washington; Valdez, Valdez-Cordova Census Area, Alaska; Beale Air Force Base, Yuba County, California; Clear Air Force Station, Denali Borough, Alaska

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i. Abstract: The Missile Defense Agency is proposing to develop the capability to conduct more realistic interceptor flight tests in support of GMD. The extension of the existing GMD test range would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, and speeds of target and interceptors that closely resemble those in which an operational system would be required to provide an effective defense. Extended range testing would include pre-launch activities, launch of targets and Ground-Based Interceptors from a number of widely separated locations, and missile intercepts over the Pacific Ocean. Target missiles would be launched from Vandenberg AFB, Kodiak Launch Complex, Pacific Missile Range Facility, Reagan Test Site (RTS), or from mobile platforms in the western Pacific Ocean. Interceptor missiles would be launched from Vandenberg AFB, Kodiak Launch Complex, or RTS. Dual target and interceptor missile launches would occur in some scenarios. Existing, modified, or new launch facilities and infrastructure would support these launch activities at the various locations.

Missile acquisition and tracking would be provided by existing test range sensors, ship-borne sensors, a Sea-Based Test X-Band Radar, and a mobile sensor (TPS-X) positioned at Vandenberg AFB, Kodiak Launch Complex, or RTS; and existing/upgraded radars at Beale AFB, California, Clear Air Force Station, and Eareckson Air Station, Alaska. In-Flight Interceptor Communications Data Terminals would be constructed near the proposed Ground-Based Interceptor launch sites. Commercial satellite communications terminals would be constructed at launch locations that do not have fiber optic communications links.
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EXECUTIVE SUMMARY

ES1.1 INTRODUCTION

This Executive Summary includes Background, Purpose and Need for the Proposed Action, Proposed Action, Proposed Alternatives, Decision to be Made, Methodology of the Environmental Impact Statement (EIS), and Summary of Environmental Impacts. Tables ES-1 through ES-12 include an Impacts and Mitigations Summary for each location and for the No Action Alternative at all locations.

ES1.2 BACKGROUND

The National Environmental Policy Act (NEPA) of 1969 as amended (42 U.S. Code [USC] 4321, et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense (DoD) Instruction 4715.9, Environmental Planning and Analysis, and the applicable Service environmental regulations that implement these laws and regulations, direct DoD officials to consider environmental consequences when authorizing and approving federal actions. Accordingly, this EIS examines the potential for impacts to the environment as a result of the proposed construction, operation, and test activities associated with the proposed Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR). Under this Proposed Action, additional test facilities, including the Sea-Based Test X-Band Radar (SBX), test equipment, infrastructure, and communications links would be constructed and operated for the purpose of providing more realistic GMD flight testing in the North Pacific Region. Existing range facilities would be enhanced, and additional launch and support sites would be established to support more robust missile flight tests.

Within the DoD, the Missile Defense Agency (MDA) (formerly the Ballistic Missile Defense Organization) is responsible for developing and testing a conceptual Ballistic Missile Defense System (BMDS). There are three segments that make up the BMDS, Boost Phase Defense, Midcourse Defense, and Terminal Defense. Each segment of the BMDS is being developed to destroy an attacking missile in the corresponding boost, midcourse, or terminal phase of its flight. The boost phase is the portion of a missile’s flight in which it produces thrust to gain altitude and acceleration. This phase usually lasts between 3 to 5 minutes. The midcourse phase occurs outside much of the Earth’s atmosphere and the missile coasts in a ballistic trajectory. This phase can last as long as 20 minutes in the case of intercontinental ballistic missiles. During the terminal phase, the missile enters the lower atmosphere and continues on to its target. This phase lasts approximately 30 seconds. Each segment of the BMDS is composed of one or more elements, each of which consists of an integrated set of technology components, such as interceptors, radars, and communication links. GMD is one such element.
The GMD Joint Program Office, within the MDA, is responsible for overseeing the development of the GMD element. An operational GMD element architecture would include the five key components listed below and shown in figure ES-1.

- Ground-Based Interceptors (GBIs)
- X-Band Radar
- GMD Battle Management Command, Control, and Communications facilities and links
- Upgraded Early Warning Radars
- Space-Based Detection Capability

In July 2000, the MDA completed the National Missile Defense (NMD) Deployment EIS to support decisions concerning deployment of a GMD (formerly NMD) element. At the direction of the Secretary of Defense, however, the MDA re-focused the GMD element on operationally realistic testing under the concept of the GMD ETR. This EIS serves to analyze the proposed GMD ETR actions and alternatives for potential impacts on the environment.

On 17 December 2002, President George W. Bush announced plans to begin deployment of an initial set of missile defense capabilities by the year 2004. The deployment capability would be used in a defensive mode. This decision, however, is outside the scope of this document. Furthermore, the full scope and location of those assets are not yet ripe for NEPA analysis and will be the subject of future NEPA documentation, as appropriate. It is possible that some of those assets could share assets in common with some of those of the GMD ETR. Where further NEPA documentation is required, the limited deployment decision would examine any environmental impacts in its cumulative effects section, as applicable.

**ES1.3 PURPOSE AND NEED FOR THE PROPOSED ACTION**

The proliferation of weapons of mass destruction and long-range ballistic missile technology is increasing the threat to our national security. The GMD element would defend all 50 states against limited ballistic missile attack. The Secretary of Defense has identified the need to gain a higher level of confidence in the capability of the GMD to defend the United States through more robust interceptor flight tests under more realistic conditions.

The purpose of the Proposed Action is to provide for more realistic flight tests in support of development of the GMD element. The ETR would achieve this by providing additional target and interceptor launch locations, and sensors, in a wider range of intercept engagements and under more stressing conditions.

More realistic testing using trajectories and distances that closely resemble those required of an operational element is needed to ensure the GMD element being developed has the capability to defend the United States against limited missile attacks. To meet this need, the MDA proposes to gain a higher level of confidence in GMD’s capabilities to defend the United States through more robust system testing under more realistic conditions.
Ground-Based Interceptor

Upgraded Early Warning Radar

Sea-Based Test X-Band Radar

Defense Support Program or Space-Based Infrared System

GMD Fire Control/Communication

In-Flight Interceptor Communications System

Communication Link


EXPLANATION
Note: Locations in this figure are for illustrative purposes only and are notional.

GMD Element Architecture

Not to Scale

Figure ES-1
Currently, the existing test ranges located in the Pacific Region and elsewhere are limited in their capabilities to provide for a geographically dispersed operational environment, suitable for GMD types of testing. As a result, current GMD element testing is constrained by how missile flight tests can be conducted, and in opportunities for multiple engagement scenarios.

**ES1.4 PROPOSED ACTION**

The Proposed Action is to construct and operate additional launch and test facilities including the SBX in the Pacific Region, and to conduct more realistic interceptor flight tests in support of GMD development. The extension of existing U.S. test ranges would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, and speeds of targets and interceptors that more closely resemble those for which an operational system would provide an effective defense. The GMD ETR testing would include pre-launch activities, launch of targets and GBIs from a number of widely separated locations, and missile intercepts over the Pacific Ocean. Potential GMD ETR test and test support locations are shown in figure ES-2.

For the purpose of this EIS, a flight test or test event represents a target missile flight, an interceptor missile flight, an intercept of a target missile, or a test of a sensor(s) independent of a missile flight test. Most tests would include the launch of a target missile; tracking by range and other land-based, sea-based, airborne, and space-based sensors; launch of an interceptor missile; target intercept; and debris impacting into broad open areas of the Pacific Ocean. Some test events proposed for later in the program would require multiple target and/or interceptor missile flights to validate GMD system performance. A total of approximately 10 launches per year is anticipated for the entire GMD ETR test program. For each of the alternatives, the proposed GMD ETR activities could include up to five missile launches (interceptors and/or targets) from a specific launch facility per year. The GMD ETR testing activities would likely occur over a period of approximately 10 years following a decision to proceed.

**ES1.5 PROPOSED ALTERNATIVES**

The alternatives for implementing the Proposed Action represent architectures for achieving more realistic interceptor flight tests in the Pacific Region. These architectures are organized around potential additional GBI missile launch sites, with other new and existing test components being located to provide maximum test effectiveness. For analysis purposes in this EIS, three alternative test architectures have been identified based on developing additional missile launch capability at (1) Kodiak Launch Complex (KLC), Alaska; (2) Vandenberg Air Force Base (AFB), California; and (3) both KLC and Vandenberg AFB. Target missiles launched as a part of this ETR program would originate from KLC; Vandenberg AFB; Pacific Missile Range Facility (PMRF), Hawaii; Reagan Test Site, Kwajalein Atoll; or from a mobile air or sea launch platform in the Pacific region. All missile intercepts would occur over the Pacific Ocean. Each alternative would include common GMD test components consisting of GBIs, target missiles, In-Flight Interceptor Communication System Data Terminals (IDT), the SBX, and other sensors and instrumentation.
Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

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**Potential GMD ETR Test and Test Support Locations**

**Pacific Ocean**

**Figure ES-2**
ES1.6 **NO ACTION ALTERNATIVE**

Under the MDA No Action Alternative, the GMD ETR would not be established, and additional facilities and components to be used in ETR operations would not be built. Existing launch sites and test range activities, however, would continue at the various locations, including support of ongoing GMD test activities. The Federal Aviation Administration (FAA) also has a No Action Alternative related to this EIS, as described below.

ES1.7 **DECISION TO BE MADE**

The initial decision to be made by the MDA is whether to implement the Proposed Action to construct and operate additional GMD test facilities, infrastructure, and communication links to enable the MDA to conduct enhanced GBI flight testing; or to choose the No Action Alternative. If the MDA selects the Proposed Action, then a second decision would be made as to which of the three alternative interceptor launch scenarios and locations would most effectively meet the objectives of the enhanced test program.

The FAA, which is a cooperating agency for this EIS, will also rely on this analysis to make its licensing decisions for the KLC. The FAA, Office of the Associate Administrator for Commercial Space Transportation, is a cooperating agency because of its regulatory authority in licensing the operation of KLC, as defined in 49 USC Subtitle IX—Commercial Space Launch Activities, 49 USC 70101-70121 and supporting regulations. The FAA has special expertise and legal responsibility related to the licensing of commercial launch facilities. The FAA is responsible for providing oversight and coordination for licensed launches and protecting the public health and safety, safety of property, and national security and foreign policy interests of the United States. Licensing of launches and reentries, operating a launch or reentry site, or some combination, is considered a federal action for which environmental impacts must be considered as part of the decision making process as required by NEPA.

Alaska Aerospace Development Corporation (AADC) applied for and was granted a launch site operator license for the operation of KLC in September 1998. A license to operate a launch site remains in effect for 5 years from the date of issuance unless surrendered, suspended, or revoked before the expiration of the term and is renewable upon application by the licensee (14 CFR 420.43). The existing FAA license for the operation of KLC will expire in September 2003.

Should the FAA not reissue a launch site operator's license for KLC to conduct launches, the MDA would be required to choose an alternative that does not include KLC. KLC is the only launch complex evaluated in the EIS that requires a license from the FAA.

An environmental review is just one component of the FAA’s licensing process. FAA Order 1050.1D (*Policies and Procedures for Considering Environmental Impacts*) describes the Agency’s procedures for implementing NEPA. Specifically, it requires that the FAA decision making process facilitate public involvement by including consideration of the effects of the Proposed Action and alternatives; avoidance or minimization of adverse effects attributable to
the Proposed Action; restoration and enhancement of resources, and environmental quality of
the nation. These requirements will be considered in the FAA’s licensing decision.

In addition to the environmental review and determination, applicants must complete a policy
review and approval, safety review and approval, payload review and determination, and a
financial responsibility determination. The purpose of the Policy Review and Approval process
is to determine whether or not the information in the license application presents any issues
affecting U.S. national security or foreign policy interests, or international obligations of the
United States. The purpose of the Safety Review and Approval process is to determine whether
an applicant can safely conduct the launch of the proposed launch vehicle(s) and any payload.
The purpose of the Payload Review and Determination is to determine whether a license
applicant or payload owner or operator has obtained all required licenses, authorization, and
permits. The purpose of the Financial Responsibility Determination is to ensure that all
commercial licensees demonstrate financial responsibility to compensate for the maximum
probable loss from claims by a third party for death, bodily injury, or property damage or loss
resulting from an activity carried out under the license; and the U.S. Government against a
person for damage or loss to government property resulting from an activity carried out under
the license. All of these reviews, including the environmental review, must be completed prior to
issuing a license. All FAA safety analyses would be conducted separately and would be
included in the terms and conditions of the license.

A license to operate a launch site authorizes a licensee to offer its launch site to a launch
operator for each launch point for the type and weight class of launch vehicle identified in the
license application and upon which the licensing determination is based. Issuance of a license
to operate a launch site does not relieve a licensee of its obligation to comply with any other
laws or regulations, nor does it confer any proprietary, property, or exclusive right in the use of
airspace or outer space (14 CFR 420.41).

ES1.8 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

The GMD testing would be of two types: (1) validation of the GMD operational concept and (2)
more robust GMD element testing. The facilities and operations to validate the GMD
operational concept, and improve the realism of GMD element testing, are each a part of the
GMD Test Bed. Each part of the test bed, however, serves a different test function and has
independent utility, purpose, and need. The independent parts of the test bed also have
different implementation schedules. Consequently, the independent parts of the test bed are
being evaluated in separate NEPA analyses. Validation of the operational concept is analyzed
in the GMD Validation of Operational Concept Environmental Assessment (EA). These actions
are designed to validate potential non-launch activities associated with the GMD operational
concept by testing the interoperability of the GMD components in a realistic environment. The
EA analyzed construction, testing, and support activities at Fort Greely, Clear Air Force Station,
and Eielson AFB in central Alaska; Eareckson Air Station on Shemya, Alaska; and Beale AFB,
California.

The second type of GMD testing, which is analyzed in this EIS, would involve more robust
interceptor flight tests with participation of other GMD components such as an SBX and IDTs to
achieve more realistic testing. This enhanced ETR flight testing would be accomplished through
the extension of existing Pacific Region test range areas that are currently supporting GMD test activities. By extending these test range areas, the realism of GMD testing would be increased through the use of multiple missile engagement scenarios, trajectories, geometries, distances, and speeds of targets and interceptors that more closely resemble those for which an operational system would provide an effective defense. Most tests would include the launch of a target missile; tracking by range and other land-based, sea-based, airborne, and space-based sensors; launch of a GBI; and missile intercepts at high altitudes over the Pacific Ocean. Some test events proposed for later in the program would require multiple target and interceptor missile flights to validate GMD element performance.

ES1.9 SCOPING PROCESS

The CEQ Regulations implementing NEPA require an open process for determining the scope of issues related to the Proposed Action and its alternatives. Comments and questions received, as a result of this process, assist the DoD in identifying potential concerns and environmental impacts to the human and natural environment.

The GMD ETR EIS public scoping period began on 28 March 2002, when the Notice of Intent to prepare an EIS was published in the Federal Register. The scoping comment period was originally scheduled to end on 10 May 2002, but was extended to 20 May 2002 in response to public request. Subsequently, inclusion of the SBX in the EIS analysis extended scoping and the comment period even further, through 20 December 2002.

A number of methods were used to inform the public about the GMD ETR Program and of the locations of the scheduled scoping meetings. These included:

- The Notice of Intent announcement in the Federal Register
- Paid advertisements in local and regional newspapers

Public scoping meetings were held at eight locations where communities could be affected by the GMD ETR program. During these public scoping meetings, attendees were invited to ask questions and make comments to the program representatives at each meeting. In addition, written comments were received from the public and regulatory agencies at the scoping meeting, and by letter and e-mail during the extended comment period. Comments received from the public and agencies pertaining to specific resource areas and locations were considered, and more detailed analysis provided in the EIS. Those comments received from the public concerning DoD policy and program issues are outside the scope of what is required to be analyzed in an EIS.
ES1.10 SUMMARY OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT PUBLIC REVIEW PROCESS

The public review and comment period began with the publication of a Notice of Availability (NOA) for the GMD ETR Draft EIS, published in the Federal Register on Friday, 7 February 2003, by the MDA and the FAA. This initiated a review period for the public and interested agencies to review the Draft EIS and submit their comments. Copies of the Draft EIS were made available for review on the MDA web site and in local libraries in the areas affected and were provided to those who requested a copy of the EIS.

In addition to the Draft EIS review process, seven public hearings were held from 24 February 2003 to 6 March 2003. Detailed information on locations and times for each of the public hearings was published in local and regional newspapers 2 weeks in advance, and public-service announcements and press releases were provided to radio and television stations. A total of 255 people attended the public hearings. Chapter 8.0 of the EIS contains a reproduction of all comments and responses to those comments. Comment sources include transcripts of the public hearings, oral comments, electronic mail, and written comments.

ES1.11 METHODOLOGY OF THE ENVIRONMENTAL IMPACT STATEMENT

To assess the significance of any impact, a list of activities necessary to accomplish the Proposed Action was developed. The affected environment at all applicable locations was then described. Next, those activities with the potential for environmental consequences were identified.

Fourteen broad areas of environmental consideration were considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and hazardous waste, health and safety, land use, noise, socioeconomics, transportation, utilities, visual and aesthetic resources, and water resources. Subsistence resources were also considered for potential sites in Alaska. Environmental justice is discussed separately.

ES1.12 SUMMARY OF ENVIRONMENTAL IMPACTS

This section summarizes the conclusions of the analyses made for each of the areas of environmental consideration based on the application of the described methodology. Only those activities for which a potential environmental concern was determined at each candidate location are described for the No Action Alternative and Alternatives 1, 2, and 3. Tables ES-1 through ES-12 include a description of all potential impacts and mitigation measures.
ES1.12.1 NO ACTION ALTERNATIVE

Kodiak Launch Complex

Land Use
AADC applied for and was granted a launch site operator license for the operation of KLC in September 1998. A license to operate a launch site remains in effect for 5 years from the date of issuance unless surrendered, suspended, or revoked before the expiration of the term and is renewable upon application by the licensee (14 CFR 420.43). The existing FAA license for the operation of KLC will expire in September 2003.

If the FAA renews the launch site operator’s license, the AADC would continue launching various commercial and military launch vehicles from KLC. The current operating license allows up to nine launches per year. However, AADC has estimated that approximately five missiles would be launched per year from KLC.

After September 2003, the FAA’s No Action Alternative would be the nonrenewal of the AADC’s launch site operator license that permits them to operate KLC for the purposes of conducting launches. KLC would no longer be licensed by the FAA to conduct launches. In the absence of any other arrangement, launch activity at KLC would be discontinued. The AADC currently holds a 30-year renewable interagency land management assignment from the Alaska Division of Land. If launch activity were discontinued at KLC, AADC would coordinate with the state to determine a proposed future use for the land. The facilities and equipment at the site could be used for other government purposes or handled as government surplus (e.g., sold). The lands on Kodiak Island at Narrow Cape have previously been considered for other development activities such as prisons, schools, and other facilities. The site is located on one of the few improved roads on the Island, and may be available for development for other purposes if AADC were no longer licensed to conduct launches.

ES1.12.2 PROPOSED ACTION ALTERNATIVE 1

Kodiak Launch Complex

Air Quality
There would be an increase in air pollutant emissions from construction of the GBI, target, IDT, and sensor elements of the GMD ETR at KLC. The majority of the ground disturbance would be completed in approximately 15 months. Construction emissions vary from day to day and activity to activity, with each activity having its own potential to release emissions. Because of the variability in timing and intensity of construction, estimating construction-phase pollutant emissions is difficult. Nevertheless, it is assumed that there would be particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM-10), impacts from ground disturbance and other pollutants (carbon monoxide, oxides of nitrogen, volatile organic compounds, and oxides of sulfur) primarily emitted from construction equipment exhaust and construction worker commuting. Once construction ceased, air quality would return to its former level.

The de minimis thresholds are federal limits listed in 40 CFR 51.583(b)(1). Federal actions with emissions below the de minimis levels are presumed to conform, that is, not cause or contribute to new violations of National Ambient Air Quality Standards (NAAQS), in areas that are in non-attainment. For the least severe nonattainment areas, the de minimis level for each criteria
pollutant (and their precursors, in the case of ozone) is 90.7 metric tons (100 tons) per year. Construction emission levels at KLC would be well below the *de minimis* levels, and since the area is currently in attainment for all federal standards, it is anticipated that the proposed construction and commuting emissions would not cause exceedances of the NAAQS or Alaska Ambient Air Quality Standards (AAQS) and would not have a long-term impact to air quality in the area.

The yearly generator and commuting emissions from the Proposed Action would also be below the 90.7-metric-ton (100-ton) per year criteria pollutant federal *de minimis* levels that would apply to a non-attainment area. As KLC is in attainment for all criteria pollutants, it is anticipated that the proposed commuting and generator operations would not cause exceedances of the NAAQS or Alaska AAQS. Use of these generators would however require an amendment to the existing Pre-approved Limit Permit for KLC.

The primary exhaust products of the GBI booster are hydrogen chloride, aluminum oxide, chlorine, carbon monoxide, carbon dioxide, hydrogen, nitrogen, oxygen, and water. The federal *de minimis* threshold limits were used to compare oxides of nitrogen and carbon monoxide. In the event the 5 GBIs were launched in a year, the conservatively estimated annual emissions for oxides of nitrogen were determined to be 31.8 tons, below the 100 tons standard. Carbon monoxide was calculated at 5.4 tons for 5 launches, which is well below the 100 tons annual standard. Dual target and dual GBI launches were analyzed using the Open Burn/Open Detonation Dispersion Model to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. The results of the modeling show that concentrations produced by dual launches of a GBI would remain within NAAQS, Alaska AAQS, and U.S. Air Force standards. The results of modeling a dual Peacekeeper target show that the level of hydrogen chloride would be below the 1-hour Air Force standard, but would exceed the peak hydrogen chloride standard for a short duration. Other emissions were determined to be within NAAQS and Alaska AAQS standards. The nominal launch of a single Peacekeeper Target is anticipated to remain within NAAQS, Alaska AAQS, and Air Force standards as fewer emissions would be released with a single launch.

The KLC EA indicated no significant impacts to air quality as a result of nine annual launches and that impacts would not accumulate with multiple launches. It is not likely that the Proposed Action of up to five launches (GBI and target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year. Overall impacts to regional air quality are not expected to be adverse and would remain within NAAQS and state AAQS. Due to the limited industrialization of Kodiak Island and the surrounding environment, the potential cumulative impacts to air quality due to the proposed interceptor and target facility construction and launches would not be substantial.

**Biological Resources**

No significant impacts to vegetation are anticipated, since new GBI, target, IDT, and sensor-related construction activities would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation (approximately 26 hectares [64.2 acres]) would represent less than two percent of the total vegetation available within KLC boundaries. No federally proposed or listed candidate, threatened, or endangered species are located within the boundaries of KLC. The Steller sea lion (*Eumetopias jubatus*) population near Kodiak Island was included in the population classified as endangered in 1997. The closest Steller sea lion haulout area, approximately 5
kilometers (3 miles) away on Ugak Island, would not be affected by site preparation noise. No Steller sea lion rookeries have been identified in the ROI.

Federally threatened Steller’s eiders and endangered short-tailed albatross offshore would also be outside the range of site preparation noise levels and are not anticipated to be affected. Construction of the GBI launch silos and perimeter fencing around the launch area could disturb approximately 0.6 hectare (1.6 acres) of palustrine, emergent, persistent, seasonally flooded wetlands and 0.2 hectare (0.4 acre) of palustrine, scrub/shrub, broad-leaved deciduous, saturated wetlands. Indirect disturbance to wetlands would be minimized by implementing appropriate AADC Best Management Practices for soil erosion control to control runoff. Normal GBI and target launch activities are not expected to significantly impact vegetation. Disturbance to wildlife from the GBI and target launches would be brief and is not expected to have a lasting impact nor a measurable negative effect. The proposed missile launches would be infrequent, up to five per year over a period of 10 years.

**Hazardous Materials and Hazardous Waste**

The construction of the GBI, target, IDT, and sensor-related facilities would use construction-related hazardous materials. The hazardous materials that are expected to be used are common to construction activities and may include diesel fuel, anti-freeze, hydraulic fluid, lubricating oils, welding gases, and small amounts of paints, thinners, and adhesives.

Hazardous materials management techniques would be used during the construction period to minimize the amount of hazardous materials stored, the threat of their accidental and unplanned release into the environment, and the quantity of hazardous waste generated. Therefore, substantial impacts to the environment are not expected from the presence of potentially hazardous materials and the generation of wastes during the proposed action construction activities. Missile components would be transported to KLC for temporary storage, pre-launch assembly and checkout, and launch preparation in accordance with Department of Transportation (DOT) requirements. The hazardous materials contained within the missiles include solid propellant for the missile boosters and a form of monomethyl hydrazine liquid fuel and nitrogen tetroxide oxidizer for the GBI Exoatmospheric Kill Vehicle. No onsite fueling of the GBI would occur; therefore, the likelihood of release and environmental effect would be small. Small amounts of potentially hazardous and non-hazardous wastes are expected to be generated during launch operations. Wastes would be segregated as nonhazardous, hazardous, and possibly special wastes for collection and disposal in accordance with applicable state and federal requirements. Hazardous waste would be containerized and properly disposed of by individual contractors in accordance with Alaska Administrative Code, Title 18 - Environmental Conservation, Chapter 16 and KLC requirements. Only licensed hazardous waste transporters would transport hazardous wastes offsite. No permitted hazardous waste treatment or disposal facilities exist on Kodiak Island, therefore, all hazardous waste would be transferred by licensed hazardous waste transporters to the mainland for appropriate treatment or disposal.

The volume of nonhazardous, construction generated waste is expected to be small based on past experience. Nonhazardous waste would be removed by individual contractors for appropriate disposal at the Kodiak Island Borough landfill or at a landfill on the Alaska mainland.
Health and Safety

All new construction or structure modification would be accomplished using the same procedures that AADC used to construct the present KLC infrastructure. Restricted public access to the immediate construction site would be ensured through use of signs and fencing. A health and safety plan would be prepared by the contractor and submitted to AADC to ensure the health and safety of onsite workers.

Prelaunch activities would include transportation of boosters, liquid fuel, and liquid oxidizer tanks for the Exoatmospheric Kill Vehicle and missile preparation, assembly, and integration testing. All components and equipment would be handled and shipped in accordance with applicable military, state, and DOT regulations. Missile components would be packaged in shipping containers designed according to Alaska, DOT, and military requirements for protection of missile components and reduction of fire/explosion or risk of hazardous materials release in the event of an accident. The boosters would be processed and prepared for launch in the same manner as previous and ongoing missile launches from KLC. The major system components (boosters, in-flight destruct package, range safety equipment and missile instrumentation) would be assembled and tested in the Integration and Processing Facility. All preparation activities would be conducted in accordance with applicable safety regulations and operations plans.

Before each launch at KLC, the Range Integrator and the KLC Safety Officer must approve all flight plans, trajectories, and planned impact areas. The KLC Safety Officer would issue range clearance and surveillance for the Launch Hazard Area and flight safety corridor. The KLC Safety Officer would establish the safety zones around the launch site and along the missile flight path no less than 4 hours before each launch. Official notifications to airmen and mariners would be used to identify the areas to be cleared. The KLC Safety Officer would then ensure the safety zone is verified clear of non-mission essential personnel and vessels out to the territorial limit approximately 20 minutes before launch.

Water Resources

AADC Best Management Practices and other standard operating procedures would be used during construction and operational activities to minimize erosion and other types of impacts that could reduce the quality of affected water resources. Standard operating procedures related to the handling, disposal, recycling, and other use of hazardous materials and wastes would be followed, including spill prevention, containment, and control measures while transporting equipment and materials. The GBI and Target missiles launched from KLC would disperse certain exhaust emission products over a large area. The primary emission products of concern from a water quality-standpoint are hydrogen chloride and aluminum oxide. These emissions are not expected to cause a significant water quality impact. Environmental monitoring was required as part of the KLC launch site operator license and called for the monitoring of at least the first five launches from KLC. As summarized in Summary Findings of KLC Environmental Monitoring Studies 1998-2001, water quality sampling and analysis indicate there have been no discernable effects on water chemistry from KLC launches to date. Water quality was sampled before and after KLC launches, including pH level, total aluminum, and perchlorate concentration (U.S. Environmental Protection Agency method 314.0 for water).
Vandenberg Air Force Base

Air Quality
The proposed target missiles would contain less solid rocket fuel capacity than previously analyzed Titan IV, Delta II, Atlas V, and Delta IV missiles; therefore, it is anticipated they would produce lower exhaust emissions. Dual Peacekeeper target launches were analyzed using the Open Burn/Open Detonation Dispersion Model to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. The results of the modeling show that the level of hydrogen chloride would be below the 1-hour Air Force standard, but would exceed the peak hydrogen chloride standard for a short duration. Emission levels for both carbon monoxide and aluminum oxide were determined to be within NAAQS and California AAQS. The nominal launch of a single Peacekeeper Target is anticipated to remain within NAAQS, California AAQS, and Air Force standards as fewer emissions would be released with a single launch.

The *de minimis* thresholds are federal limits listed in 40 CFR 51.583(b)(1). Federal actions with emissions below the *de minimis* levels are presumed to conform, that is, not cause or contribute to new violations of NAAQS, in areas that are in non-attainment. For the Vandenberg AFB area, the *de minimis* levels for volatile organic compounds and nitrogen oxide are 45 metric tons (50 tons) per year, and the levels for carbon monoxide, oxides of sulfur, and PM-10 are 90.7 metric tons (100 tons). In the event that five Peacekeeper Targets are launched in a year, the conservatively estimated annual emissions for oxides of nitrogen would total 18.3 metric tons (20.2 tons), below the 45-metric-ton (50-ton) limit. Carbon monoxide was calculated to be 48.8 metric tons (53.8 tons), also below the federal limit of 90.7 metric tons (100 tons).

Previous modeling performed in the Supplemental EELV EIS, analyzed the Delta IV, a slightly larger launch vehicle than the proposed Peacekeeper Target. In the EELV EIS, predicted levels of carbon monoxide and oxides of nitrogen for the Delta IV were determined to be within the NAAQS and California AAQS acceptable levels. It is anticipated that the proposed Peacekeeper Target would also be within the NAAQS and California AAQS.

The review of the proposed action as required by the General Conformity Rule resulted in a finding of presumed conformity to the State Implementation Plan. Total foreseeable direct and indirect emissions caused by the proposed action would be both less than the mandated *de minimis* thresholds and less than 10 percent of the established Santa Barbara County Air Pollution Control District (SBCAPCD) budget. The Determination of Non-Applicability is included as appendix J of the EIS.

Biological Resources
Minor modifications to existing launch facilities would result in little to no ground disturbance, minimizing impacts to vegetation. Launch exhaust products would include hydrogen chloride, aluminum oxide, carbon monoxide, nitrogen dioxide, carbon dioxide, water, and chlorine. Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of the aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited in surface waters would have no adverse effect. The primary potential for impacts to wildlife would be from the noise created during the proposed missile launches. Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed.
Cultural Resources
Minor modifications to existing launch facilities would result in little to no ground disturbance. Potential effects could result from this debris striking the ground where surface or subsurface archaeological deposits or other cultural resources are located resulting in soil contamination, fire, and/or resource damage, which would all require a reparation effort. These efforts would be coordinated with applicable range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary.

Several of the facilities proposed for refurbishment and reuse are eligible for listing on the National Register of Historic Places. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure the protection of, or appropriate mitigation for these facilities.

Land Use
Maximum use would be made of Vandenberg AFB’s existing infrastructure and facilities. Minor facility modifications would be necessary under this alternative. Activities would be accomplished at an existing locale for such use and would not produce an adverse impact involving land use.

Planning and execution of launches would be in compliance with federal, state, local, and range land use requirements. Proposed activities would be compatible with the coastal consistency requirements. Closures of recreational areas and adjacent parks would continue during periods of hazardous operation. To minimize potential land use conflicts, coastline, beach, and recreational area availability would continue to be made known to the public through various local media sources.

Pearl Harbor, Reagan Test Site, Port Hueneme, Naval Station Everett, Port Adak, Port of Valdez
Potential impacts of SBX operations at these locations would be similar as described below, and would apply to Alternatives 1, 2, and 3.

Airspace, Health and Safety
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. However, in order to avoid or minimize adverse effects from electromagnetic radiation/electromagnetic interference, DoD has established a coordination process with responsible agencies and airspace users. A full electromagnetic radiation/electromagnetic interference survey and analysis is being conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey would be used in preparing a DD Form 1494 (Application for Equipment Frequency Allocation) that is required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing. The results of the survey would also be used to define the safe operating area for the SBX (acceptable azimuths and operating angles). This operating area would not interfere with airspace operations and would allow for a safe operating environment.
ES1.12.3 PROPOSED ACTION ALTERNATIVE 2

Kodiak Launch Complex

Air Quality, Biological Resources, Hazardous Material and Hazardous Wastes, Health and Safety, and Water Resources

Impacts would be similar to Alternative 1, with approximately 25 percent less area disturbed during construction. There would be no construction or operations related to GBI launches and their associated support equipment including IDT.

Vandenberg Air Force Base

Air Quality

Under Alternative 2, GBI and target missiles would be launched from Vandenberg AFB. The GBI exhaust emissions are approximately one third as much as the Peacekeeper emissions. Impacts from GBI launches would therefore be similar to but less than those described for Alternative 1.

IDT construction would disturb approximately 5.9 hectares (14.6 acres) and would last approximately 7 months. Emissions would include PM-10 from ground disturbance and other pollutants (carbon monoxide, oxides of nitrogen, volatile organic compounds, and oxides of sulfur) primarily emitted from construction equipment exhaust and construction worker commuting. As Vandenberg AFB is within a non-attainment area for the California AAQS 1-hour ozone standard, exhaust emissions of nitrogen oxides and hydrocarbons would be of concern. For the Vandenberg AFB area, the de minimis levels for volatile organic compounds and nitrogen oxide are 45 metric tons (50 tons) per year, and the levels for carbon monoxide, oxides of sulfur, and PM-10 are 90.7 metric tons (100 tons). IDT construction and worker commuting emissions would be much less than these de minimis levels. Emissions would be monitored in accordance with Memorandum of Agreements between Vandenberg AFB and Santa Barbara County Air Pollution Control District.

The review of the proposed action as required by the General Conformity Rule resulted in a finding of presumed conformity to the State Implementation Plan. Total foreseeable direct and indirect emissions caused by the proposed action would be both less than the mandated de minimis thresholds and less than 10 percent of the established SBCAPCD budget. The Determination of Non-Applicability is included as appendix J of the EIS.

Biological Resources

Impacts would be similar to those described for Alternative 1; however, facility modifications would also include GBI facilities. Other impacts would be as described for Alternative 1.

Cultural Resources

Construction would include minor modifications to existing facilities and construction of an IDT. Several of the facilities proposed for refurbishment and reuse are eligible for inclusion on the National Register of Historic Places. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure the protection of, or appropriate mitigation for these facilities. After selection of an IDT site from the six alternative locations, records on file at Vandenberg AFB would be consulted to determine whether cultural sites have been identified at this location. Should cultural resources be found during the course of any
GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided. The GMD Project Office would be responsible for implementation of any cultural resources avoidance or mitigation measures assigned to this project as a condition of approval for proceeding with any proposed activity.

Flight activity impacts would be similar to those described for Alternative 1.

Land Use
Impacts would be as described for Alternative 1. Proposed activities would be in accordance with coastal consistency requirements.

Water Resources
Construction of an IDT under Alternative 2 would disturb approximately 5.9 hectares (14.6 acres) at Vandenberg AFB. Construction projects that disturb 1 acre or greater require a Construction Activities Storm Water General Permit from the California State Water Resources Control Board, or its local Central Coast Regional Water Quality Control Board. A related Stormwater Pollution Prevention Plan would also need to be prepared before the commencement of any soil-disturbing activities. All appropriate water quality-related Best Management Practices would be followed during construction, and related water quality impacts would not be significant. Operation of the IDT would not cause water quality impacts and potable water supplies are sufficient to handle the minor increase in potable water demand.

ES1.12.4 PROPOSED ACTION ALTERNATIVE 3
Potential environmental impacts of activities in Alternative 3 would be as described for Alternatives 1 and 2. This would include GBI launches from KLC, Reagan Test Site, and Vandenberg AFB, and construction or modification of the required support facilities for dual launches of GBI and target missiles at each location. Impacts described below for the Broad Ocean Area would also apply to Alternatives 1 and 2.

Broad Ocean Area
Airspace
After launch, typically the GBI and target missiles would be above 18,290 meters (60,000 feet) within seconds of launch. As such, all other local flight activities would occur at sufficient distance and altitude that the target missile and GBI missiles would be little noticed. However, activation of stationary altitude reservation procedures, where the FAA provides separation between non-participating aircraft and the missile flight test activities, would impact the controlled airspace available for use by non-participating aircraft for the duration of the altitude reservation, usually for a matter of a few hours, with a backup day reserved for the same hours. Because the airspace in most of the intercept debris areas is not heavily used by commercial aircraft, and is far removed from the en route airways and jet routes crossing the North Pacific, the impacts to controlled/uncontrolled airspace would be minimal. However, the intercept scenarios with targets from KLC and GBIs from Vandenberg AFB may have moderate impacts to airspace due to the potential impacts from intercept debris.
The Range Commanders Council has been determined that intercept debris as small as 1 gram could cause significant damage to a commercial aircraft traveling at cruising speed and altitude. The debris cloud is approximately 35 kilometers (22 miles) in diameter, and the area where the probability of fatality is greater than one in one million is approximately 22 kilometers (13.6 miles) in diameter. This area of higher risk would need to be avoided by all aircraft. The time for the intercept debris to pass through commercial airspace cruising altitudes is approximately 3 hours after the intercept. All en route airways and jet routes that are predicted to pass through the missile intercept debris areas would need to be identified before a test to allow sufficient coordination with the FAA to determine if the aircraft on those routes would be affected, and if so, if they would need to be re-routed or rescheduled. Routing around the debris areas would be handled in a manner similar to severe weather. The additional time for commercial aircraft to avoid the area would generally be less than 5 minutes at cruising altitudes and speeds.

**Biological Resources**

Of particular concern is the potential for impacts to marine mammals from both acoustic and non-acoustic effects. Potential acoustic effects include behavioral disturbance (including displacement), acoustic masking (elevated noise levels that drown out other noise sources), and (with very strong sounds) temporary or permanent hearing impairment. Potential non-acoustic effects include physical impact by falling debris, entanglement in debris, and contact with or ingestion of debris or hazardous materials. The missiles could generate a sonic boom upon launch or reentry. Each missile would propagate a unique sonic boom contour depending upon its mass, shape, velocity, and reentry angle, among other variables. The location of the possible impact point would vary depending upon the particular flight test profile. It is therefore difficult to produce the specific location, extent, duration, or intensity of sonic boom impacts upon marine life. These noise levels would be of very short duration. The first-, second-, and third-stage target missile boosters and the target vehicle’s payload, which all fall to the ocean surface, would impart a considerable amount of kinetic energy to the ocean water upon impact. Missiles and targets would hit the water with speeds of 91 to 914 meters (300 to 3,000 feet) per second. At close ranges, injuries to internal organs and tissues would likely result. However, injury to any marine mammal by direct impact or shock wave impact would be extremely remote (less than 0.0006 marine mammals exposed per year).

Debris impact and booster drops in the Broad Ocean Area could occur within the 322-kilometer (200-mile) limit of the Exclusive Economic Zone of affected islands. The natural buffering capacity of seawater and the strong ocean currents would neutralize reaction to any release of the small amount of liquid propellant contained within the Divert and Attitude Control System or Liquid Propellant Missile. Analysis in the *Marine Mammal Technical Report*, prepared in support of the Point Mugu Sea Range EIS, determined that there is a very low probability that a marine mammal would be killed by falling missile boosters, targets, or debris as a result of tests at the Point Mugu Sea Range (less than 0.0149 marine mammals exposed per year). The potential for an object or objects dropping from the air to affect marine mammals or other marine biological resources is less than $10^{-6}$ (1 in 1 million). The probability of a spent missile landing on a cetacean or other marine mammal is remote.
This probability calculation was based on the size of the area studied and the density of the marine mammal population in that area. The analysis concluded that the effect of this missile debris and intact missiles coming down in the open ocean would be negligible. The range area at Point Mugu is smaller (93,200 square kilometers [27,183 square nautical miles]) than the PMRF range area (144,000 square kilometers [42,000 square nautical miles]) and other open ocean areas proposed for intercepts, and the density of marine mammals in the Point Mugu Sea Range is larger than the density found in PMRF range area and the open ocean. It is reasonable to conclude that the probability of a marine mammal being injured or killed by missile or debris impact from U.S. Navy testing at PMRF and other locations in the open ocean is even more remote than at Point Mugu, since the area at PMRF is larger and the density of marine mammals is smaller. Following formal consultation, the National Marine Fisheries Service concluded that the Proposed Action is not likely to adversely affect any marine mammal species.
Table ES-1A: Impacts and Mitigation Summary, MDA No Action Alternative

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Kodiak Launch Complex</th>
<th>Midway</th>
<th>Reagan Test Site</th>
<th>Pacific Missile Range Facility</th>
<th>Vandenberg Air Force Base</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td>Missile Defense Agency: No change to the region’s current attainment status. Single target and commercial launches would continue. Federal Aviation Administration: No change to the region’s current attainment. No launches would be allowed to occur.</td>
<td>No change to the region’s current attainment status. Midway would continue to serve as a National Wildlife refuge.</td>
<td>No change to the region’s current attainment status. Current missile activities would continue.</td>
<td>No change to the region’s current attainment status. Current missile activities would continue.</td>
<td>No change to the region’s current attainment status. Current missile activities would continue.</td>
</tr>
<tr>
<td><strong>Airspace</strong></td>
<td>Missile Defense Agency: Continued close coordination with the Federal Aviation Administration regarding missile launches would result in no change in airspace status or use. Federal Aviation Administration: No change in airspace status. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Continued close coordination with the Federal Aviation Administration regarding radar operations would result in no change in airspace status or use.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Missile Defense Agency: Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris. Federal Aviation Administration: No impact to biological resources as no launches would be allowed to occur.</td>
<td>No impact.</td>
<td>Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris. Personnel would be instructed to avoid areas designated as avian or sea turtle nesting or avian roosting habitat and to avoid all contact with any nest that may be encountered.</td>
<td>Short-term disturbance to wildlife, including migratory birds, from minor site preparation activities and increased personnel. Reflection from outdoor lighting could disorient the Newell’s Townsend’s shearwater. Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris.</td>
<td>Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris.</td>
</tr>
<tr>
<td><strong>Cultural Resources</strong></td>
<td>Missile Defense Agency: No impact to cultural resources from continued operations. Federal Aviation Administration: No impact to cultural resources as no launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Resources would continue to be managed in accordance with cultural resources regulations.</td>
</tr>
<tr>
<td>Resource Category</td>
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<tr>
<td>Geology and Soils</td>
<td>Missile Defense Agency: Maintenance and improvement construction activities would cause minor soil erosion. No adverse changes to soil chemistry are predicted to occur as a result of missile launch exhaust emissions. Federal Aviation Administration: No impact to geology or soils. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>No adverse changes to soil chemistry are predicted to occur as a result of ongoing missile launch exhaust emissions.</td>
</tr>
<tr>
<td>Hazardous Materials and Hazardous Waste</td>
<td>Missile Defense Agency: Continued handling and use of limited quantities of hazardous and toxic materials related to pre-launch, launch and post-launch activities would generate small quantities of hazardous waste. The use and disposal of hazardous materials and wastes would be in accordance with Kodiak Launch Complex, State of Alaska, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>As described in previous National Environmental Policy Act documentation, impact would be minimal.</td>
<td>Continued handling and use of limited quantities of hazardous and toxic materials related to pre-launch, launch and post-launch activities would generate small quantities of hazardous waste. The use and disposal of hazardous materials and wastes would be in accordance with the U.S. Army Kwajalein Atoll Environmental Standards.</td>
<td>Continued handling and use of limited quantities of hazardous and toxic materials related to pre-launch, launch and post-launch activities would generate small quantities of hazardous waste. The use and disposal of hazardous materials and wastes would be in accordance with Pacific Missile Range Facility, State of Hawaii, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
<td>Continued handling and use of limited quantities of hazardous and toxic materials related to pre-launch, launch and post-launch activities would generate small quantities of hazardous waste. The use and disposal of hazardous materials and wastes would be in accordance with Vandenberg Air Force Base, State of California, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Missile Defense Agency: Planning and execution of target launches would continue. Ground and Launch Hazard Areas, Notices to Airmen and Notices to Mariners, and program Safety plans would protect workers and the general public. Compliance with federal, state, and local health and safety requirements and regulations, as well as Department of Defense and Kodiak Launch Complex Safety Policy would result in no impacts to health and safety. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Planning and execution of target and Ground-Based Interceptor launches would continue. Compliance with Reagan Test Site standards and procedures ensure that potential risks to the general public, workers, and the launch areas do not exceed Range Commanders Council Standard 321-02 criteria, and there would be no impact to health and safety.</td>
<td>Planning and execution of target launches would continue. Ground and Launch Hazard Areas, Notices to Airmen and Notices to Mariners, and implementation of Safety plans would protect workers and the general public. Compliance with federal, state, and local health and safety requirements and regulations, as well as Department of Defense and Pacific Missile Range Facility Safety Policy would result in no impacts to health and safety.</td>
<td>Planning and execution of target and Ground-Based Interceptor launches would continue. Ground and Launch Hazard Areas, Notices to Airmen and Notices to Mariners, and implementation of Safety plans would protect workers and the general public. Compliance with federal, state, local and Vandenberg Air Force Base health and safety requirements ensure there is no increase in risk to workers and the general public.</td>
</tr>
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<td>Resource Category</td>
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<tr>
<td><strong>Land Use</strong></td>
<td>Missile Defense Agency: Continued publication of availability of Kodiak Launch Complex's beaches and coastline. Federal Aviation Administration: No impact to land use as no launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>No impact. As described in previous National Environmental Policy Act documentation, Vandenberg Air Force Base publicizes recreation availability and activities are consistent with the California Coastal Zone Management Program.</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>Missile Defense Agency: No adverse impact. Infrequent noise associated with target and commercial launches would continue to be audible for short periods of time. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>No adverse impact. Infrequent noise associated with planned missile launches would continue.</td>
</tr>
<tr>
<td><strong>Socioeconomics</strong></td>
<td>Missile Defense Agency: No impact. Federal Aviation Administration: Any economic benefits to the Kodiak Island Borough from the periodic presence of launch-related personnel would not occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Though limited in scope, continued target missile launches would have a positive effect on the local economy of the island.</td>
<td>No impact.</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Missile Defense Agency: No change to current level of service on roadways. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>No change to current level of service on roadways.</td>
</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>Missile Defense Agency: Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>No impacts.</td>
<td>Not analyzed.</td>
<td>Any increase in electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
</tr>
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<td>Resource Category</td>
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<tr>
<td><strong>Visual and Aesthetic Resources</strong></td>
<td>Missile Defense Agency: No impact. No construction of new structures or infrastructure is planned. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>No construction of new structures or infrastructure is planned.</td>
</tr>
<tr>
<td><strong>Water Resources</strong></td>
<td>Missile Defense Agency: Minor potential for short-term increase in erosion and turbidity of surface waters during construction. Missile launches would disperse exhaust emission products over a large area. These emissions would not cause a significant water quality impact. Water quality monitoring would continue on an as-needed basis. Federal Aviation Administration: No impact to water resources as no launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Missile launches would disperse exhaust emission products over a large area. Previous studies concluded that water quality impacts would be adverse but not significant.</td>
</tr>
<tr>
<td><strong>Environmental Justice</strong></td>
<td>Missile Defense Agency: No impact. No low-income or minority populations would be disproportionately affected. Federal Aviation Administration: No impact. No launches would be allowed to occur.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
</tr>
<tr>
<td><strong>Subsistence</strong></td>
<td>Missile Defense Agency: No impact to subsistence uses in and around Kodiak Launch Complex. Federal Aviation Administration: Positive impact. There would be no closure of areas to subsistence harvesting as no launches would be allowed to occur.</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Pearl Harbor</td>
<td>Naval Base Ventura County Port Hueneme</td>
<td>Naval Station Everett</td>
<td>Port Adak</td>
<td>Port of Valdez</td>
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<tr>
<td>Air Quality</td>
<td>No change to the region's current attainment status.</td>
<td>No change to the region's current attainment status.</td>
<td>No change to the region's current attainment status.</td>
<td>No change to the region's current attainment status.</td>
<td>No change to the region's current attainment status.</td>
</tr>
<tr>
<td>Airspace</td>
<td>Continuing activities would not conflict with airspace use plans, policies or controls.</td>
<td>Continuing activities would not conflict with airspace use plans, policies or controls.</td>
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<td>Continuing activities would not conflict with airspace use plans, policies or controls.</td>
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<tr>
<td>Biological Resources</td>
<td>Ongoing activities would not impact biological resources.</td>
<td>Ongoing activities would not impact biological resources.</td>
<td>Ongoing activities would not impact biological resources.</td>
<td>Ongoing activities would not impact biological resources.</td>
<td>Ongoing activities would not impact biological resources.</td>
</tr>
<tr>
<td>Hazardous Materials and Hazardous Waste</td>
<td>No change in the use and disposal of hazardous materials and wastes currently occurring at Pearl Harbor.</td>
<td>No change in the use and disposal of hazardous materials and wastes currently occurring at Naval Base Ventura County Port Hueneme.</td>
<td>No change in the use and disposal of hazardous materials and wastes currently occurring at Naval Station Everett.</td>
<td>No change in the use and disposal of hazardous materials and wastes currently occurring at Port Adak.</td>
<td>No change in the use and disposal of hazardous materials and wastes currently occurring at Port of Valdez.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>No change in the type of operations or health and safety plans currently implemented at Pearl Harbor.</td>
<td>No change in the type of operations or health and safety plans currently implemented at Naval Base Ventura County Port Hueneme.</td>
<td>No change in the type of operations or health and safety plans currently implemented at Naval Station Everett.</td>
<td>No change in the type of operations or health and safety plans currently implemented at Port Adak.</td>
<td>No change in the type of operations or health and safety plans currently implemented at Port of Valdez.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Pearl Harbor</td>
<td>Naval Base Ventura County</td>
<td>Port Hueneme</td>
<td>Naval Station Everett</td>
<td>Port Adak</td>
</tr>
<tr>
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</tr>
<tr>
<td>Socioeconomics</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Operations currently conducted at Naval Station Everett would continue. No displacement of populations, residences or businesses would occur within the City of Everett or adjacent areas as a result of the No Action Alternative. The facilities would continue to be utilized as currently designated.</td>
<td>Not analyzed.</td>
</tr>
<tr>
<td>Transportation</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>No impacts.</td>
<td>Not analyzed.</td>
</tr>
<tr>
<td>Utilities</td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
</tr>
<tr>
<td>Visual and Aesthetic Resources</td>
<td>No change in the Visual setting at Pearl Harbor or offshore Barbers Point.</td>
<td>Not analyzed.</td>
<td>No change in the Visual setting at Naval Station Everett.</td>
<td>No change in the Visual setting at Port Adak.</td>
<td>No change in the Visual setting at the Port of Valdez.</td>
</tr>
</tbody>
</table>
### Table ES-2: Impacts and Mitigation Summary, Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Ground-Based Interceptor</th>
<th>Target</th>
<th>In-Flight Interceptor Communication System Data Terminal /TPS-X Radar</th>
<th>Mobile Telemetry</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td>A minimal increase in air emissions from construction would not affect the region’s current attainment status. The results of modeling to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide show that concentrations produced by dual launches of a Ground-Based Interceptor would remain within National Ambient Air Quality Standards (NAAQS), California Ambient Air Quality Standards (AAQS), and U.S. Air Force standards. Significant air quality impacts due to Ground-Based Interceptor launches are not anticipated.</td>
<td>A minimal increase in air emissions from target construction would not affect the region’s current attainment status. The results of modeling a dual Peacekeeper target launch to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide show that the level of hydrogen chloride would be below the 1-hour Air Force standard, but would exceed the peak hydrogen chloride standard for a short duration. Other emissions were determined to be within NAAQS and Alaska AAQS. A single Peacekeeper target launch would be within NAAQS, Alaska AAQS, and U.S. Air Force standards. Significant air quality impacts due to target launches are not anticipated.</td>
<td>Increase in air emissions from construction and operation of the In-Flight Interceptor Communication System Data Terminal and TPS-X Radar would not affect the region’s current attainment status.</td>
<td>Increase in air emissions from operation would not affect the region’s current attainment status.</td>
</tr>
<tr>
<td><strong>Airspace</strong></td>
<td>The use of the required scheduling and coordination with the Federal Aviation Administration and issuance of Notices to Airmen would reduce potential impacts to airspace status or use to the level of insignificance.</td>
<td>The use of the required scheduling and coordination with the Federal Aviation Administration and issuance of Notices to Airmen would reduce potential impacts to airspace status or use to the level of insignificance.</td>
<td>Construction and operation would not impact airspace.</td>
<td>Operation would not impact airspace.</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Loss of small amount of mainly upland vegetation. Fence line would likely be altered to avoid impacts to wetlands. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris.</td>
<td>Loss of small amount of mainly upland vegetation. Fence line would likely be altered to avoid impacts to wetlands. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris.</td>
<td>Loss of small amount of mainly upland vegetation. Temporary, short-term startle effects from noise to terrestrial wildlife and birds. Short-term operational impacts to wildlife (non-listed only) from security lighting and noise from electrical generators required for the site. The TPS-X Radar is not expected to radiate lower than 5 degrees above horizontal and the relatively small radar beam would normally be in motion which reduces the probability of bird species remaining within this limited region of space.</td>
<td>Mobile sensors necessary to support Ground-Based Midcourse Defense Extended Test Range activities would be located on existing disturbed areas with minimal effect to biological resources.</td>
</tr>
</tbody>
</table>
Table ES-2: Impacts and Mitigation Summary, Kodiak Launch Complex (Continued)

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Ground-Based Interceptor</th>
<th>Target</th>
<th>In-Flight Interceptor Communication System Data Terminal/TPS-X Radar</th>
<th>Mobile Telemetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Resources</td>
<td>No impacts are expected for the proposed action because previous archaeological surveys have not indicated that cultural resources are present within the upland areas of Kodiak Launch Complex and because project details would be submitted to the Alaska State Historic Preservation Officer for coordination.</td>
<td>No impacts are expected for the proposed action because previous archaeological surveys have not indicated that cultural resources are present within the upland areas of Kodiak Launch Complex and because project details would be submitted to the Alaska State Historic Preservation Officer for coordination.</td>
<td>No impacts are expected for the proposed action because previous archaeological surveys have not indicated that cultural resources are present within the upland areas of Kodiak Launch Complex and because project details would be submitted to the Alaska State Historic Preservation Officer for coordination.</td>
<td>No impacts are expected for the proposed action because the Mobile Telemetry will be established in areas that have previously been paved.</td>
</tr>
<tr>
<td>Geology and Soils</td>
<td>Final site layout and design for Extended Test Range facilities will consider available information bearing on seismic design and construction. Minor increase in soil erosion would be localized to the construction sites. No adverse changes to soil chemistry are predicted to occur as a result of missile launch exhaust emissions.</td>
<td>Final site layout and design for Extended Test Range facilities will consider available information bearing on seismic design and construction. Minor increase in soil erosion would be localized to the construction sites. No adverse changes to soil chemistry are predicted to occur as a result of missile launch exhaust emissions.</td>
<td>Final site layout and design for Extended Test Range facilities will consider available information bearing on seismic design and construction. Minor increase in soil erosion would be localized to the construction sites.</td>
<td>Soil disturbance from site preparation activities would be minor.</td>
</tr>
<tr>
<td>Hazardous Materials and Hazardous Waste</td>
<td>The Ground-Based Interceptor construction and launch activities would use small quantities of hazardous materials, which would result in the generation of some hazardous and non-hazardous waste that would be similar to current operations. All hazardous materials and waste would be handled in accordance with applicable state and federal regulations.</td>
<td>The target construction and launch activities would use small quantities of hazardous materials, which would result in the generation of some hazardous and non-hazardous waste that would be similar to current operations. All hazardous materials and waste would be handled in accordance with applicable state and federal regulations.</td>
<td>The construction and operation of the In-Flight Interceptor Communication System Data Terminal, and operation of the TPS-X Radar would use small quantities of hazardous materials, which would result in the generation of some hazardous and non-hazardous waste that would be similar to current launch support operations. All hazardous materials and waste would be handled and disposed of in accordance with applicable state and federal regulations.</td>
<td>No impact from short term operation of mobile sensors at existing gravel pad areas.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Ground-Based Interceptor</td>
<td>Target</td>
<td>In-Flight Interceptor Communication System Data Terminal</td>
<td>Mobile Telemetry</td>
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</tr>
<tr>
<td><strong>Health and Safety</strong></td>
<td>Planning and execution of single and dual Ground-Based Interceptor launches would include establishing ground and Launch Hazard Areas, issuing Notices to Airmen and Notices to Mariners, and adherence to program Safety plans. These actions would be in compliance with federal, state, and local health and safety requirements and regulations, as well as Department of Defense and Kodiak Launch Complex Safety Policy and would result in no impacts to health and safety.</td>
<td>Planning and execution of single and dual launches would include establishing ground and Launch Hazard Areas, issuing Notices to Airmen and Notices to Mariners, and adherence to program Safety plans. These actions would be in compliance with federal, state, and local health and safety requirements and regulations, as well as Department of Defense and Kodiak Launch Complex Safety Policy and would result in no impacts to health and safety.</td>
<td>The In-Flight Interceptor Communication System Data Terminal emissions are considered to be of sufficiently low power so that there would be no exposure hazard and no impact to health and safety. TPS-X Radar Electromagnetic Radiation hazard zones would be established within the beam’s tracking space. A visual survey of the area would verify that all personnel are outside the hazard zone prior to startup. Adherence to Alaska Aerospace Development Corporation, Federal Aviation Administration, and Department of Defense safety procedures relative to radar operations would preclude significant impact to health and safety.</td>
<td>For mobile telemetry equipment, the associated radio frequency emissions are considered to be of sufficiently low power so that there is no exposure hazard.</td>
</tr>
<tr>
<td><strong>Land Use</strong></td>
<td>Minimal impacts would occur as a result of site preparation and new construction limiting the utilization of land by livestock for grazing on a minute portion of the overall land available for such activity. The availability of recreational opportunities at Narrow Cape would not be significantly impacted by the Ground-Based Midcourse Defense Extended Test Range activities. Only temporary closures during the transportation of missile components to the launch facilities and up to a full day closure on launch days would occur for the Pasagshak Point Road at the Kodiak Launch Complex site boundary.</td>
<td>Minimal impacts would occur as a result of site preparation and new construction limiting the utilization of land by livestock for grazing on a minute portion of the overall land available for such activity. The availability of recreational opportunities at Narrow Cape would not be significantly impacted by the Ground-Based Midcourse Defense Extended Test Range activities. Only temporary closures during the transportation of missile components to the launch facilities and up to a full day closure on launch days would occur for the Pasagshak Point Road at the Kodiak Launch Complex site boundary.</td>
<td>No impacts would occur as a result of site preparation and new construction limiting the utilization of land by livestock for grazing on a minute portion of overall land for the proposed locations on Kodiak Launch Complex. Of the proposed locations outside the boundaries of Kodiak Launch Complex, any change in land use would be temporary and confined to the immediate operation area with no impacts expected to occur.</td>
<td>No impact would occur as a result of the temporary site use limiting the utilization of land by livestock for grazing on a minute portion of the overall land available for such activity.</td>
</tr>
<tr>
<td><strong>Noise</strong></td>
<td>Intermittent and short-term noise due to construction and infrequent noise associated with Ground-Based Interceptor launches would be audible for only short periods of time and would not be expected to interfere with the area's fishing, camping, or other recreational uses. Dual launches of Ground-Based Interceptors would result in a minor increase in noise levels compared to a single launch.</td>
<td>Intermittent and short-term noise due to construction and infrequent noise associated with target launches would be audible for only short periods of time and would not be expected to interfere with the area’s fishing, camping, or other recreational uses. Dual launches of Ground-Based Interceptors would result in a minor increase in noise levels compared to a single launch.</td>
<td>Intermittent and short-term noise due to construction would be anticipated. Operational noise would stem from use of generators to run the TPS-X Radar and emergency use for the In-Flight Interceptor Communication System Data Terminal. They would not increase the noise levels of the regional environment.</td>
<td>Intermittent and short-term noise due to operation would stem from the use of generators to operate mobile telemetry. Regional noise levels would not be increased.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Ground-Based Interceptor</td>
<td>Target</td>
<td>In-Flight Interceptor Communication System Data Terminal/TPS-X Radar</td>
<td>Mobile Telemetry</td>
</tr>
<tr>
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<td>--------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Socioeconomics</td>
<td>Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding community’s retail sales and tax base with no impact on public services. Coordination with the local tourist industry would be used to reduce the potential for impacts to tourists seeking accommodations when a launch occurs during the peak tourist season. Construction of an addition to the existing Narrow Cape Lodge and/or the construction of an additional mancamp at Kodiak Launch Complex would provide additional accommodations. Personnel associated with Ground-Based Interceptor related activities would operate such systems; therefore no personnel in addition to those already involved in Ground-Based Interceptor operation would be required; furthermore no impacts would occur. Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding community’s retail sales and tax base with no impact on public services.</td>
<td>Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding community’s retail sales and tax base with no impact on public services. Coordination with the local tourist industry would be used to reduce the potential for impacts to tourists seeking accommodations when a launch occurs during the peak tourist season. Construction of an addition to the existing Narrow Cape Lodge and/or the construction of an additional mancamp at Kodiak Launch Complex would provide additional accommodations.</td>
<td>Personnel associated with Ground-Based Interceptor related activities would operate such systems; therefore no personnel in addition to those already involved in Ground-Based Interceptor operation would be required; furthermore no impacts would occur. Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding community’s retail sales and tax base with no impact on public services.</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>Temporary traffic delays to Kodiak Launch Complex via Rezanof Drive as a result of movement of construction equipment and material would cause minimal and infrequent traffic delays.</td>
<td>Temporary traffic delays to Kodiak Launch Complex via Rezanof Drive as a result of movement of construction equipment and material would cause minimal and infrequent traffic delays.</td>
<td>No impact.</td>
<td>No impact.</td>
</tr>
<tr>
<td>Utilities</td>
<td>Increases in the level of electrical demand, potable water consumption, wastewater treatment services, and solid waste disposal services. New potable water and septic systems would be installed as required.</td>
<td>Increases in the level of electrical demand, potable water consumption, wastewater treatment services, and solid waste disposal services. New potable water and septic systems would be installed as required.</td>
<td>Increases in the level of electrical demand, potable water consumption, wastewater treatment services, and solid waste disposal services. New potable water and septic systems would be installed as required.</td>
<td>No impact.</td>
</tr>
<tr>
<td>Visual and Aesthetic Resources</td>
<td>Although the Narrow Cape area is being developed, there is the potential that some concerned viewers would be affected by the additional facilities. Even though the amount of concerned viewers would be somewhat limited, there is a potential for adverse affects to visual resources.</td>
<td>Although the Narrow Cape area is being developed, there is the potential that some concerned viewers would be affected by the additional facilities. Even though the amount of concerned viewers would be somewhat limited, there is a potential for adverse affects to visual resources.</td>
<td>Although the Narrow Cape area is being developed, there is the potential that some concerned viewers would be affected by the additional facilities. Even though the amount of concerned viewers would be somewhat limited, there is a potential for adverse affects to visual resources.</td>
<td>No impact.</td>
</tr>
</tbody>
</table>
### Table ES-2: Impacts and Mitigation Summary, Kodiak Launch Complex (Continued)

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Ground-Based Interceptor</th>
<th>Target</th>
<th>In-Flight Interceptor Communication System Data Terminal/TPS-X Radar</th>
<th>Mobile Telemetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Resources</td>
<td>Minor potential for short-term increase in erosion and turbidity of surface waters during construction. The Ground-Based Interceptor would disperse exhaust emission products over a large area. These emissions would not cause a significant water quality impact.</td>
<td>Minor potential for short-term increase in erosion and turbidity of surface waters during construction.</td>
<td>Minor potential for short-term increase in erosion and turbidity of surface waters during construction.</td>
<td>Mobile telemetry operations would have minimal impact on water resources.</td>
</tr>
<tr>
<td>Subsistence</td>
<td>Although there is a decrease in the amount of land available for subsistence uses the Narrow Cape area hosts only a limited amount of subsistence harvesting and the entire coast from Pasagshak Bay to the southern end of the island is a harvesting area. Temporarily restricting public access during Ground-Based Midcourse Defense Extended Test Range pre-launch and launch activities would not be significant.</td>
<td>Although there is a decrease in the amount of land available for subsistence uses the Narrow Cape area hosts only a limited amount of subsistence harvesting and the entire coast from Pasagshak Bay to the southern end of the island is a harvesting area. Temporarily restricting public access during Ground-Based Midcourse Defense Extended Test Range pre-launch and launch activities would not be significant.</td>
<td>Although there is a decrease in the amount of land available for subsistence uses the potential In-Flight Interceptor Communication System Data Terminals area is not a main subsistence use area in the region.</td>
<td>No impact.</td>
</tr>
</tbody>
</table>

### Table ES-3: Impacts and Mitigation Summary, Midway

(Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.)

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Midway</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-Flight Interceptor Communication System Data Terminal</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>Increase in air emissions from construction on existing paved areas and operation would not affect the region’s current attainment status</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Loss of small amount of previously disturbed vegetation. Temporary, short-term startle effects from noise to terrestrial wildlife and birds. Short-term operational impacts to wildlife (non-listed only) from security lighting and noise from electrical generators required for the site. Any lighting associated with the Proposed Action would be properly shielded following U.S. Fish and Wildlife Service guidelines to minimize disorientation impacts to birds.</td>
</tr>
<tr>
<td><strong>Hazardous Materials and Hazardous Waste</strong></td>
<td>The construction and operation of the In-Flight Interceptor Communication System Data Terminal would use small quantities of hazardous materials, which would result in the generation of some hazardous and non-hazardous waste. All hazardous materials and waste would be handled and disposed of in accordance with applicable state and federal regulations.</td>
</tr>
</tbody>
</table>
### Table ES-4: Impacts and Mitigation Summary, Reagan Test Site

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Ground-Based Interceptor</th>
<th>Target</th>
<th>Sea-Based Test X-Band Radar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td>Single and dual Ground-Based Interceptor launch activities would be similar to previously analyzed launch activities, therefore there would be no change to the region’s current attainment status.</td>
<td>A minimal increase in air emissions from target construction is expected. Single and dual target launch activities would be similar to previously analyzed launch activities. Therefore, there would be no change in the region’s current attainment status.</td>
<td>The Sea-Based Test X-Band Radar would not be considered a stationary source; therefore a U.S. Army Kwajalein Atoll Environmental Standards New Source Review would not be required and the increase in air emissions from the operation of the Sea-Based Test X-Band Radar would not affect the region’s current attainment status.</td>
</tr>
<tr>
<td><strong>Air Space</strong></td>
<td>Not analyzed.</td>
<td>Not analyzed.</td>
<td>Potential impacts to airspace would be minimized by adhering to operational requirements. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. The Sea-Based Test X-Band Radar high energy radiation area would be configured to minimize potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition, Sea-Based Test X-Band Radar information would be published in the Airport Facility section of the FAA Airport Guide, and local Notices to Airmen would be issued. Flight service personnel would brief pilots flying in the vicinity about the Sea-Based Test X-Band Radar high energy radiation area.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Ground-Based Interceptor</td>
<td>Target</td>
<td>Sea-Based Test X-Band Radar</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Biological Resources</td>
<td>Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris. Personnel would be instructed to avoid areas designated as avian or sea turtle nesting or avian roosting habitat and to avoid all contact with any nest that may be encountered.</td>
<td>Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water’s surface could be hit by debris. Personnel would be instructed to avoid areas designated as avian or sea turtle nesting or avian roosting habitat and to avoid all contact with any nest that may be encountered.</td>
<td>Minor, short-term impacts from construction noise, such as startling and temporary displacement. The Sea-Based Test X-Band Radar is not expected to radiate lower than 2 degrees above horizontal and the relatively small radar beam would normally be in motion which reduces the probability of bird species, marine mammals, or sea turtles remaining within this limited region of space. The Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the Sea-Based Test X-Band Radar platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals or sea turtles are anticipated.</td>
</tr>
<tr>
<td>Hazardous Materials and Hazardous Waste</td>
<td>Procedures for handling hazardous materials and hazardous waste related to Ground-Based Interceptor launches are currently utilized at Reagan Test Site. Measures would be employed in accordance with the U.S. Army Kwajalein Atoll Environmental Standards.</td>
<td>Procedures for handling hazardous materials and hazardous waste related to missile launches are already utilized at Reagan Test Site. Measures would be employed in accordance with the U.S. Army Kwajalein Atoll Environmental Standards.</td>
<td>Construction activities would result in generation of added wastes that would be accommodated in accordance with existing protocol and regulations. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. Handling and disposal of hazardous materials and hazardous waste would be in accordance with the U.S. Army Kwajalein Atoll Environmental Standards.</td>
</tr>
</tbody>
</table>
### Table ES-4: Impacts and Mitigation Summary, Reagan Test Site (Continued)

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Reagan Test Site</th>
<th>Sea-Based Test X-Band Radar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health and Safety</strong></td>
<td>Health and safety procedures for the launch of Ground-Based Interceptors are currently in place at Reagan Test Site. Adherence to these procedures would result in no impacts to health and safety.</td>
<td>An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. Implementation of Reagan Test Site operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce. These limitations would be similar to the existing Ground-Based Radar Prototype on Kwajalein, resulting in no impacts to health and safety.</td>
</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>Not analyzed.</td>
<td>No impact.</td>
</tr>
</tbody>
</table>
### Table ES-6: Impacts and Mitigation Summary, Vandenberg Air Force Base

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Vandenberg Air Force Base</th>
<th>In-Flight Interceptor Communication System Data Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td></td>
<td>Minimal increase in air emissions from construction and operational activities would not affect the region's current attainment status.</td>
</tr>
<tr>
<td></td>
<td>The results of modeling to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide show that concentrations produced by dual launches of a Ground-Based Interceptor would remain within National Ambient Air Quality Standards (NAAQS), California Ambient Air Quality Standards (AAQS), and U.S. Air Force standards. The review of the proposed action as required by the General Conformity Rule resulted in a finding of presumed conformity to the State Implementation Plan. Total foreseeable direct and indirect emissions caused by the proposed action would be both less than the mandated de minimis thresholds and less than 10 percent of the established Santa Barbara county Air Pollution Control District (SBCAPCD) budget. The Determination of Non-Applicability is included as appendix J of the EIS. Based upon this, the proposed launches would not cause or contribute to violation of any air quality standards.</td>
<td></td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Temporary effects to vegetation from emissions, discoloration and foliage loss. Temporary, short-term startle effects from noise to wildlife and birds. Although a remote possibility, individual animals close to the water's surface could be hit by debris.</td>
<td>Loss of small amount of previously disturbed vegetation. Temporary, short-term startle effects from noise to terrestrial wildlife and birds. Short-term operational impacts to wildlife (non-listed only) from security lighting and noise from electrical generators required for the site.</td>
</tr>
<tr>
<td><strong>Cultural Resources</strong></td>
<td>Possible minor modifications may be required for buildings 1819 and 1900, as well as LF-02, LF-03, and LF-10. All of these are listed as National Register of Historic Places-eligible. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure their protection or appropriate mitigation to preserve information concerning these buildings. Only in the unlikely event of flight termination over land (necessitating debris recovery within the region of influence) would the possibility for impacts to cultural resources from off-road vehicle activity exist. Even then, all areas affected by ground impacts of flight hardware would be cleared of all recoverable debris in strict accordance with current Vandenberg Air Force Base policy.</td>
<td>Effects could result from construction and modification. Once specific project details are delineated coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg Air Force Base to further ensure that cultural resources would be protected.</td>
</tr>
</tbody>
</table>
Table ES-6: Impacts and Mitigation Summary, Vandenberg Air Force Base (Continued)

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Ground-Based Interceptor</th>
<th>Target</th>
<th>In-Flight Interceptor Communication System Data Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geology and Soils</td>
<td>Ground-Based Interceptor missile launches could cause minor alteration of local soil chemistry as a result of exhaust emissions, but would not result in adverse effects to soils.</td>
<td>Target missile launches could cause minor alteration of local soil chemistry as a result of exhaust emissions, but would not result in adverse effects to soils.</td>
<td>Minor effects to soils would be likely to occur as a result of potential soil erosion, depending on the local relief and soils at the selected alternate site. Before determining the final site layout and design standards for the In-Flight Interceptor Communication System Data Terminal facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.</td>
</tr>
<tr>
<td>Hazardous Materials and Hazardous Waste</td>
<td>Continued handling and use of limited quantities of hazardous and toxic materials related to Ground-Based Interceptor pre-launch, launch and post-launch activities would generate small quantities of hazardous waste. The use and disposal of hazardous materials and wastes would be in accordance with Vandenberg Air Force Base, State of California, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
<td>Continued handling and use of limited quantities of hazardous and toxic materials related to target missile pre-launch, launch and post-launch activities would generate small quantities of hazardous waste. The use and disposal of hazardous materials and wastes would be in accordance with Vandenberg Air Force Base, State of California, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
<td>Procedures for handling hazardous materials and hazardous waste from construction and operation of facilities similar to the In-Flight Interceptor Communication System Data Terminal are already utilized at Vandenberg Air Force Base. Quantities would be within existing use and disposal requirements.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Planning and execution of Ground-Based Interceptor launches would continue. Ground and Launch Hazard Areas, Notices to Airmen and Notices to Mariners, and implementation of Safety plans would protect workers and the general public. Compliance with federal, state, local and Vandenberg Air Force Base health and safety requirements ensure there is no increase in risk to workers and the general public.</td>
<td>Planning and execution of target launches would continue. Ground and Launch Hazard Areas, Notices to Airmen and Notices to Mariners, and implementation of Safety plans would protect workers and the general public. Compliance with federal, state, local and Vandenberg Air Force Base health and safety requirements ensure there is no increase in risk to workers and the general public.</td>
<td>The In-Flight Interceptor Communication System Data Terminal emissions are considered to be of sufficiently low power so that there would be no exposure hazard and no impact to health and safety.</td>
</tr>
<tr>
<td>Land Use</td>
<td>Disruption to land use would occur from routine closures of recreation areas near the region of influence during Ground-Based Interceptor launches. Such action would represent a minimal impact to land use.</td>
<td>Disruption to land use would occur from routine closures of recreation areas near the region of influence during target launches. Such action would represent a minimal impact to land use.</td>
<td>Site preparation and new construction would be routinely accomplished and occur within an area compliant with the overall general land use; therefore no impacts would occur.</td>
</tr>
<tr>
<td>Noise</td>
<td>Noise impacts due to Ground-Based Interceptor launch activities would be similar to those that currently occur at Vandenberg Air Force Base during current missile launch activities. As launches are infrequent, short-term events, ambient noise levels at Vandenberg Air Force Base and the surrounding area would not be substantially affected on an annual basis.</td>
<td>Noise impacts due to target launch activities would be similar to launch activities that currently occur at Vandenberg Air Force Base. As launches are infrequent, short-term events, ambient noise levels at Vandenberg Air Force Base and the surrounding area would not be substantially affected on an annual basis.</td>
<td>Intermittent and short-term noise due to construction would be anticipated. Operational noise would stem from use of backup generator for the In-Flight Interceptor Communication System Data Terminal. This would not increase the noise levels of the regional environment</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Ground-Based Interceptor</td>
<td>Target</td>
<td>In-Flight Interceptor Communication System Data Terminal</td>
</tr>
<tr>
<td>---------------------------------</td>
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</tr>
<tr>
<td>Socioeconomics</td>
<td>Base operations would continue to provide economic benefits with no impacts expected to occur.</td>
<td>Base operations would continue to provide economic benefits with no impacts expected to occur.</td>
<td>The presence of the In-Flight Interceptor Communication System Data Terminal construction personnel represents both a potential increase in local service based employment opportunities and a small but positive temporary economic impact to the local community. Base operations would continue to provide economic benefits with no impacts expected to occur.</td>
</tr>
<tr>
<td>Transportation</td>
<td>No impact.</td>
<td>No impact.</td>
<td>Temporary traffic delays to as a result of movement of construction equipment and material would cause minimal and infrequent traffic delays.</td>
</tr>
<tr>
<td>Water Resources</td>
<td>The Ground-Based Interceptor would disperse exhaust emission products over a large area. Previous studies concluded that water quality impacts would be adverse but not significant.</td>
<td>The target would disperse exhaust emission products over a large area. Previous studies concluded that water quality impacts would be adverse but not significant.</td>
<td>Minor potential for short-term increase in erosion and turbidity of surface waters during construction. In-Flight Interceptor Communication System Data Terminal construction would require a Construction Activities Storm Water General Permit from the California State Water Resources Control Board, or its local Central Coast Regional Water Quality Control Board. A related Stormwater Pollution Prevention Plan would also need to be prepared before the commencement of any soil-disturbing activities. All appropriate water quality-related Best Management Practices would be followed during construction, and related water quality impacts would not be significant.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Pearl Harbor, Moored off of Barbers Point</td>
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<tr>
<td></td>
<td><strong>Sea-Based Test X-Band Radar Primary Support Base and Mooring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>The Sea-Based Test X-Band Radar would not be considered a stationary source and would not require a Prevention of Significant Deterioration review or a Title V permit. Air emissions from the operation of the Sea-Based Test X-Band Radar would be in compliance with appropriate State Implementation Plans.</td>
<td></td>
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</tr>
<tr>
<td><strong>Airspace</strong></td>
<td>Potential impacts to airspace would be minimized by adhering to operational requirements. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. The Sea-Based Test X-Band Radar high energy radiation area would be configured to minimize potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition, Sea-Based Test X-Band Radar information would be published in the Airport Facility section of the FAA Airport Guide, and local Notices to Airmen would be issued. Flight service personnel would brief pilots flying in the vicinity about the Sea-Based Test X-Band Radar high energy radiation area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Minor, short-term impacts from construction noise, such as startling and temporary displacement. The Sea-Based Test X-Band Radar is not expected to radiate lower than 10 degrees above horizontal at the mooring site, and the relatively small radar beam would normally be in motion which reduces the probability of bird species, marine mammals, or sea turtles remaining within this limited region of space. The Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the Sea-Based Test X-Band Radar platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals or sea turtles are anticipated.</td>
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</tr>
<tr>
<td><strong>Hazardous Materials and Hazardous Waste</strong></td>
<td>The small quantities amount of potentially hazardous materials used during construction activities would result in generation of added wastes that would be accommodated in accordance with existing protocol and regulations. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation. Handling and disposal of hazardous materials and hazardous waste would be in accordance with State of Hawaii, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health and Safety</strong></td>
<td>An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. Implementation of Sea-Based Test X-Band Radar operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce. These limitations would be similar to the existing Ground-Based Radar Prototype on Kwajalein, resulting in no impacts to health and safety.</td>
<td></td>
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</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Visual and Aesthetic Resources</strong></td>
<td>Visual impacts would be minor as the Sea-Based Test X-Band Radar would be comparable to ships passing along the horizon. The Sea-Based Test X-Band Radar would be moored at an adequate distance away from the shore and would not obstruct panoramic views. Visual resources could also be affected by the Sea-Based Test X-Band Radar if it is in the line-of-sight from boats to the island. However, the Sea-Based Test X-Band Radar would only inhibit the view of the island temporarily, as the boat passes by.</td>
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</tr>
</tbody>
</table>
**Table ES-8: Impacts and Mitigation Summary, Naval Base Ventura County Port Hueneme**

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Naval Base Ventura County Port Hueneme, Moored at San Nicolas Island</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sea-Based Test X-Band Radar Primary Support Base and Mooring</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>The Sea-Based Test X-Band Radar would not be considered a stationary source and would not require a Prevention of Significant Deterioration review or a Title V permit. Air emissions from the operation of the Sea-Based Test X-Band Radar would be in compliance with appropriate State Implementation Plans.</td>
</tr>
<tr>
<td><strong>Airspace</strong></td>
<td>Potential impacts to airspace would be minimized by adhering to operational requirements. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. The Sea-Based Test X-Band Radar high energy radiation area would be configured to minimize potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition, Sea-Based Test X-Band Radar information would be published in the Airport Facility section of the FAA Airport Guide, and local Notices to Airmen would be issued. Flight service personnel would brief pilots flying in the vicinity about the Sea-Based Test X-Band Radar high energy radiation area.</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Minor, short-term impacts from construction noise, such as startling and temporary displacement. The Sea-Based Test X-Band Radar is not expected to radiate lower than 10 degrees above horizontal at the mooring site, and the relatively small radar beam would normally be in motion which reduces the probability of bird species, marine mammals, or sea turtles remaining within this limited region of space. The Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the Sea-Based Test X-Band Radar platform would preclude the potential for collision with a free-swimming marine mammal. No significant long-term adverse impacts are anticipated to seabirds and shorebirds, Guadalupe fur seals, California sea lions, northern elephant and harbor seals, and sea otters or to widely distributed, open-water species such as gray and killer whales.</td>
</tr>
<tr>
<td><strong>Hazardous Materials and Hazardous Waste</strong></td>
<td>The small quantities of potentially hazardous materials and waste generated during construction activities would result in generation of additional waste which would be accommodated in accordance with existing policies and regulations. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation. Handling and disposal of hazardous materials and waste would be in accordance with State of California, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
</tr>
<tr>
<td><strong>Health and Safety</strong></td>
<td>An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. Implementation of Sea-Based Test X-Band Radar operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce. These limitations would be similar to the existing Ground-Based Radar Prototype on Kwajalein, resulting in no impacts to health and safety.</td>
</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
</tr>
</tbody>
</table>
Table ES-9: Impacts and Mitigation Summary, Naval Station Everett

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Naval Station Everett, Moored at Pier Alpha or Bravo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sea-Based Test X-Band Radar Primary Support Base and Mooring</td>
</tr>
</tbody>
</table>

### Air Quality
The Sea-Based Test X-Band Radar would not be considered a stationary source and would not require a Prevention of Significant Deterioration review or a Title V permit. Air emissions from the operation of the Sea-Based Test X-Band Radar would be in compliance with appropriate State Implementation Plans. Dust suppression measures such as periodic watering of areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near the work areas, and wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas, would be used as required for support facility construction.

### Airspace
Potential impacts to airspace would be minimized by adhering to operational requirements. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. The Sea-Based Test X-Band Radar high energy radiation area would be configured to minimize potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition, Sea-Based Test X-Band Radar information would be published in the Airport Facility section of the FAA Airport Guide, and local Notices to Airmen would be issued. Flight service personnel would brief pilots flying in the vicinity about the Sea-Based Test X-Band Radar high energy radiation area.

### Biological Resources
Minor, short-term impacts from construction noise, such as startling and temporary displacement. The Sea-Based Test X-Band Radar is not expected to radiate lower than 10 degrees above horizontal at the mooring site, and the relatively small radar beam would normally be in motion which reduces the probability of bird species, marine mammals, or sea turtles remaining within this limited region of space. The Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the Sea-Based Test X-Band Radar platform would preclude the potential for collision with a free-swimming marine mammal. No significant long-term adverse impacts are anticipated to seabirds, shorebirds (bald eagle), Chinook salmon, bull trout, or widely distributed, open-water species such as humpback, blue, fin, sei, and sperm whales; green, leatherback, and loggerhead sea turtles; and steller sea lions.

### Hazardous Materials and Hazardous Waste
The small quantities amount of potentially hazardous materials used during construction activities would result in generation of added wastes that would be accommodated in accordance with existing protocol and regulations. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation. Handling and disposal of hazardous materials and hazardous waste would be in accordance with State of Washington, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.

### Health and Safety
An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. Implementation of Sea-Based Test X-Band Radar operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce. These limitations would be similar to the existing Ground-Based Radar Prototype on Kwajalein, resulting in no impacts to health and safety.
<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Naval Station Everett, Moored at Pier Alpha or Bravo</th>
<th>Sea-Based Test X-Band Radar Primary Support Base and Mooring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socioeconomics</strong></td>
<td>Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within the city of Everett and surrounding areas. The additional construction personnel and the 50 on-board personnel associated with the proposed action would represent both a potential increase in local service-based employment opportunities and a small, but positive economic impact to the local economy. Visual impacts to the surrounding area would be partially mitigated by the fact that the Sea-Based Test X-Band Radar would be an additional structure on an existing military base immediately surrounded by industrial land uses thereby reducing the potential impacts to property values. Particularly in a port area where the mooring of ships and other Navy activities are a normal incidence of the military presence, a reduction of property values from the visual effect of large vessels in the harbor does not seem likely. Based on safety standards and documented analysis, the proposed operation of the Sea-Based Test X-Band Radar in port, with appropriate controls and coordination, will not pose a hazard to personnel or equipment. It is however worth noting that the perception by many persons that project related use of electromagnetic radiation does indeed pose a health risk could potentially lead to a diminished level of desirability, and therefore demand, for certain properties within the areas perceived to be affected; thereby having the potential to adversely affect property values within those areas. Given that this impact would be solely attributable to individual interpretation of a perceived risk, the extent and nature of the potential fall in property values, if any, and the areas affected are unable to be determined.</td>
<td></td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Adequate coordination would prevent any conflicts with tribal fishing areas, and would prevent any impacts on current shipping schedules, ship-borne commerce or general transit.</td>
<td></td>
</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td></td>
</tr>
<tr>
<td><strong>Visual and Aesthetic Resources</strong></td>
<td>While there is a high amount of viewer concern, the Sea-Based Test X-Band Radar would be considered visually compatible with the port and present military uses; therefore, only moderate impacts are expected to visual resources.</td>
<td></td>
</tr>
<tr>
<td>Resource Category</td>
<td>Port Adak, Moored at Finger Bay</td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>Sea-Based Test X-Band Radar Primary Support Base and Mooring</td>
<td></td>
</tr>
<tr>
<td>Air Quality</td>
<td>The Sea-Based Test X-Band Radar would not be considered a stationary source and would not require a Prevention of Significant Deterioration review or a Title V permit. Air emissions from the operation of the Sea-Based Test X-Band Radar would be in compliance with appropriate State Implementation Plans.</td>
<td></td>
</tr>
<tr>
<td>Airspace</td>
<td>Potential impacts to airspace would be minimized by adhering to operational requirements. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. The Sea-Based Test X-Band Radar high energy radiation area would be configured to minimize potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition, Sea-Based Test X-Band Radar information would be published in the Airport Facility section of the FAA Airport Guide, and local Notices to Airmen would be issued. Flight service personnel would brief pilots flying in the vicinity about the Sea-Based Test X-Band Radar high energy radiation area.</td>
<td></td>
</tr>
<tr>
<td>Biological Resources</td>
<td>Minor, short-term impacts from construction noise, such as startling and temporary displacement. The Sea-Based Test X-Band Radar is not expected to radiate lower than 10 degrees above horizontal at the mooring site, and the relatively small radar beam would normally be in motion which reduces the probability of bird species, marine mammals, or sea turtles remaining within this limited region of space. The Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the Sea-Based Test X-Band Radar platform would preclude the potential for collision with a free-swimming marine mammal. No significant long-term adverse impacts are anticipated to area seabirds and waterfowl or widely distributed, open-water species such as Steller sea lions, sea otters, harbor seals, and whales that occur around Adak Island.</td>
<td></td>
</tr>
<tr>
<td>Hazardous Materials and Hazardous Waste</td>
<td>The small quantities of potentially hazardous materials used during construction activities would result in generation of added wastes that would be accommodated in accordance with existing protocol and regulations. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation. Handling and disposal of hazardous materials and hazardous waste would be in accordance with State of Alaska, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
<td></td>
</tr>
<tr>
<td>Health and Safety</td>
<td>An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. Implementation of Sea-Based Test X-Band Radar operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce. These limitations would be similar to the existing Ground-Based Radar Prototype on Kwajalein, resulting in no impacts to health and safety.</td>
<td></td>
</tr>
<tr>
<td>Utilities</td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
<td></td>
</tr>
<tr>
<td>Visual and Aesthetic Resources</td>
<td>Due to limited visibility, a moderate scenic value and low viewer concern, there would be minimal adverse impacts to the visual resources at Adak.</td>
<td></td>
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</tbody>
</table>
### Table ES-11: Impacts and Mitigation Summary, Port of Valdez

<table>
<thead>
<tr>
<th>Resource Category</th>
<th>Port of Valdez, Moored in Pipeline Terminal Security Zone or at the Container Dock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sea-Based Test X-Band Radar Primary Support Base and Mooring</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>The Sea-Based Test X-Band Radar would not be considered a stationary source and would not require a Prevention of Significant Deterioration review or a Title V permit. Air emissions from the operation of the Sea-Based Test X-Band Radar would be in compliance with appropriate State Implementation Plans.</td>
</tr>
<tr>
<td><strong>Airspace</strong></td>
<td>Potential impacts to airspace would be minimized by adhering to operational requirements. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. The Sea-Based Test X-Band Radar high energy radiation area would be configured to minimize potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition, Sea-Based Test X-Band Radar information would be published in the Airport Facility section of the FAA Airport Guide, and local Notices to Airmen would be issued. Flight service personnel would brief pilots flying in the vicinity about the Sea-Based Test X-Band Radar high energy radiation area.</td>
</tr>
<tr>
<td><strong>Biological Resources</strong></td>
<td>Minor, short-term impacts from construction noise, such as startling and temporary displacement. The Sea-Based Test X-Band Radar is not expected to radiate lower than 10 degrees above horizontal at the mooring site and the relatively small radar beam would normally be in motion which reduces the probability of bird species, marine mammals, or sea turtles remaining within this limited region of space. The Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the Sea-Based Test X-Band Radar platform would preclude the potential for collision with a free-swimming marine mammal. No significant long-term adverse impacts are anticipated to Essential Fish Habitat, area seabirds and water fowl, or widely distributed, open-water species such as humpback, killer, and minke whales, sea otters, Steller sea lions, harbor seals, and Dall and harbor porpoises that occur in Prince William Sound.</td>
</tr>
<tr>
<td><strong>Hazardous Materials and Hazardous Waste</strong></td>
<td>The small quantities amount of potentially hazardous materials used during construction activities would result in generation of added wastes that would be accommodated in accordance with existing protocol and regulations. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation. Handling and disposal of hazardous materials and hazardous waste would be in accordance with State of Alaska, Environmental Protection Agency, Occupational Safety and Health Administration, Department of Transportation, and Department of Defense policies and procedures.</td>
</tr>
<tr>
<td><strong>Health and Safety</strong></td>
<td>An Electromagnetic Radiation/Electromagnetic Interference survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. Implementation of Sea-Based Test X-Band Radar operational safety procedures, including establishment of controlled areas, and limitations in the areas subjected to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce. These limitations would be similar to the existing Ground-Based Radar Prototype on Kwajalein, resulting in no impacts to health and safety.</td>
</tr>
<tr>
<td><strong>Transportation</strong></td>
<td>Coordination with local Native American groups would be necessary to prevent any impacts to native fishing areas, particularly during the August salmon run and during other peak fishing seasons. Coordination would be required with the U.S. Coast Guard to lessen requirements for channel (Valdez Narrows) closure and preclude potential delays of oil tankers utilizing the area, as well as to establish any required security zone at the mooring site.</td>
</tr>
<tr>
<td><strong>Utilities</strong></td>
<td>Electricity demand, potable water consumption, wastewater usage, and solid waste disposal would be handled by existing facilities.</td>
</tr>
<tr>
<td><strong>Visual and Aesthetic Resources</strong></td>
<td>Because Valdez is the site of the terminus of the Trans-Alaska Pipeline, numerous oil tankers are consistently entering Prince William Sound which would limit the impacts to visual resources caused by the Sea-Based Test X-Band Radar. However, adverse impacts to visual resources could occur due to some concerned viewers and a high scenic integrity rating for the location.</td>
</tr>
<tr>
<td>Resource Category</td>
<td>Ground-Based Interceptor and Target Intercept Debris</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Airspace</td>
<td>Where flight paths cross intercept debris areas, air traffic would be rerouted or rescheduled during a 3- to 4-hour period, approximately five times a year. Routing around the debris areas would be handled in a manner similar to severe weather. The additional time for commercial aircraft to avoid the area would generally be less than 10 minutes at cruising altitudes and speeds.</td>
</tr>
<tr>
<td>Biological Resources</td>
<td>No adverse impact.</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Testing operations pose potential impacts that would be minimized through pre-flight planning and coordination with the Federal Aviation Administration and issuance of Notices to Airmen and Notices to Mariners.</td>
</tr>
<tr>
<td>Transportation</td>
<td>Prior warning of Ground-Based Midcourse Defense Extended Test Range activities would allow commercial shipping to follow alternative routes away from the test area.</td>
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### ACRONYMS AND ABBREVIATIONS

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<th>Description</th>
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<td>30 CES/CEX</td>
<td>Readiness Flight</td>
</tr>
<tr>
<td>30 SW</td>
<td>30th Space Wing</td>
</tr>
<tr>
<td>30 SW/SE</td>
<td>Space Wing/Safety Office</td>
</tr>
<tr>
<td>AAC</td>
<td>Alaska Administrative Code</td>
</tr>
<tr>
<td>AADC</td>
<td>Alaska Aerospace Development Corporation</td>
</tr>
<tr>
<td>AAQS</td>
<td>Ambient Air Quality Standards</td>
</tr>
<tr>
<td>ADT</td>
<td>Average Daily Traffic</td>
</tr>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
</tr>
<tr>
<td>AFI</td>
<td>Air Force Instruction</td>
</tr>
<tr>
<td>ait</td>
<td>Atmospheric Interceptor Technology</td>
</tr>
<tr>
<td>ALTRV</td>
<td>Altitude Reservation</td>
</tr>
<tr>
<td>AMHS</td>
<td>Alaska Marine Highway System</td>
</tr>
<tr>
<td>APSC</td>
<td>Alyeska Pipeline Service Company</td>
</tr>
<tr>
<td>ARTCC</td>
<td>Air Route Traffic Control Center</td>
</tr>
<tr>
<td>AST</td>
<td>Aboveground Storage Tank</td>
</tr>
<tr>
<td>BMDS</td>
<td>Ballistic Missile Defense System</td>
</tr>
<tr>
<td>BOA</td>
<td>Broad Ocean Area</td>
</tr>
<tr>
<td>ºC</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>CAE</td>
<td>Control Area Extension</td>
</tr>
<tr>
<td>CEQ</td>
<td>Council on Environmental Quality</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CHRMMP</td>
<td>Consolidated Hazardous Materials Reutilization and Inventory Management Program</td>
</tr>
<tr>
<td>CLEAN</td>
<td>Comprehensive Long-Term Environmental Action Navy</td>
</tr>
<tr>
<td>CNEL</td>
<td>Community Noise Equivalent Level</td>
</tr>
<tr>
<td>COMSATCOM</td>
<td>Commercial Satellite Communications</td>
</tr>
<tr>
<td>CTA/FIR</td>
<td>Control Area Flight Information Region</td>
</tr>
<tr>
<td>CVN</td>
<td>Aircraft Carrier, Nuclear</td>
</tr>
<tr>
<td>CZM</td>
<td>Coastal Zone Management</td>
</tr>
<tr>
<td>d</td>
<td>Decibel(s)</td>
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<tr>
<td>dB</td>
<td>A-weighted Decibel</td>
</tr>
<tr>
<td>dBA</td>
<td>A-weighted Decibel</td>
</tr>
<tr>
<td>DoD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation</td>
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<tr>
<td>DRMO</td>
<td>Defense Reutilization and Marketing Office</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
</tr>
<tr>
<td>EED</td>
<td>Electroexplosive Device</td>
</tr>
<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
</tr>
<tr>
<td>EKV</td>
<td>Exoatmospheric Kill Vehicle</td>
</tr>
<tr>
<td>EMI</td>
<td>Electromagnetic Interference</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>EMR</td>
<td>Electromagnetic Radiation</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>ESQD</td>
<td>Explosive Safety Quantity Distance</td>
</tr>
<tr>
<td>ETR</td>
<td>Extended Test Range</td>
</tr>
<tr>
<td>EWR</td>
<td>Eastern and Western Range</td>
</tr>
<tr>
<td>EWTA</td>
<td>Eglin Water Test Area</td>
</tr>
<tr>
<td>°F</td>
<td>Degrees Fahrenheit</td>
</tr>
<tr>
<td>FAA</td>
<td>Federal Aviation Administration</td>
</tr>
<tr>
<td>FCA</td>
<td>Flight Caution Area</td>
</tr>
<tr>
<td>FHA</td>
<td>Flight Hazard Area</td>
</tr>
<tr>
<td>FL</td>
<td>Flight Level</td>
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<tr>
<td>GBI</td>
<td>Ground-Based Interceptor</td>
</tr>
<tr>
<td>GBMC2</td>
<td>Ground-Based Battle Management Command and Control</td>
</tr>
<tr>
<td>GBMC3</td>
<td>Ground-Based Battle Management Command, Control, and Communications</td>
</tr>
<tr>
<td>GBR</td>
<td>Ground-Based Radar</td>
</tr>
<tr>
<td>GBR-P</td>
<td>Ground-Based Radar Prototype</td>
</tr>
<tr>
<td>GFC</td>
<td>Ground-Based Midcourse Defense Fire Control</td>
</tr>
<tr>
<td>GFC/C</td>
<td>Ground-Based Midcourse Defense Fire Control/Communications</td>
</tr>
<tr>
<td>GHz</td>
<td>Gigahertz</td>
</tr>
<tr>
<td>GMD</td>
<td>Ground-Based Midcourse Defense</td>
</tr>
<tr>
<td>HAZCORE</td>
<td>Hazardous Materials Consolidation and Redistribution</td>
</tr>
<tr>
<td>HERF</td>
<td>Hazards of Electromagnetic Radiation to Fuels</td>
</tr>
<tr>
<td>HERO</td>
<td>Hazards of Electromagnetic Radiation to Ordnance</td>
</tr>
<tr>
<td>HERP</td>
<td>Hazards of Electromagnetic Radiation to Personnel</td>
</tr>
<tr>
<td>HOST</td>
<td>Hawaii Operational Safety Team</td>
</tr>
<tr>
<td>HQ AFSPC/SG</td>
<td>Headquarters Air Force Space Command Surgeon General</td>
</tr>
<tr>
<td>Hz</td>
<td>Hertz</td>
</tr>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organization</td>
</tr>
<tr>
<td>IDLH</td>
<td>Immediately Dangerous to Life and Health</td>
</tr>
<tr>
<td>IDT</td>
<td>In-Flight Interceptor Communication System Data Terminal</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>IFICS</td>
<td>In-Flight Interceptor Communication System</td>
</tr>
<tr>
<td>IFR</td>
<td>Instrument Flight Rules</td>
</tr>
<tr>
<td>ILMFA</td>
<td>Interagency Land Management Agreement</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organization</td>
</tr>
<tr>
<td>IRP</td>
<td>Installation Restoration Program</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standards</td>
</tr>
<tr>
<td>JP</td>
<td>Jet Petroleum</td>
</tr>
<tr>
<td>KLC</td>
<td>Kodiak Launch Complex</td>
</tr>
<tr>
<td>KTF</td>
<td>Kauai Test Facility</td>
</tr>
</tbody>
</table>
PEL Permissible Exposure Level
PL Public Law
PM-10 Particulate Matter with an Aerodynamic Diameter of Less Than or Equal to 10 Micrometers
PMRF Pacific Missile Range Facility
PMRFINST Pacific Missile Range Facility Instruction
POL Petroleum, Oil, and Lubricant
ppm Parts Per Million
PPMP Pollution Prevention Management Plan
PSB Primary Support Base
QRLV Quick Reaction Launch Vehicle
RCC Range Commanders Council
RCRA Resource Conservation and Recovery Act
RF Radiofrequency
RMI Republic of the Marshall Islands
ROD Record of Decision
ROI Region of Influence
RSS Radar Support Structure
RTS Ronald Reagan Ballistic Missile Defense Test Site
SBCAPCD Santa Barbara County Air Pollution Control District
SBX Sea-Based Test X-Band Radar
SOP Standard Operating Procedure
SPCC Spill Prevention Control and Countermeasures
SR State Route
TAPS Trans-Alaska Pipeline System
THAAD Theater High Altitude Area Defense
TLV Target Launch Vehicle
TPS-X Transportable System Radar
TTS Temporary Threshold Shift
UAF University of Alaska, Fairbanks
UES USAKA Environmental Standards
UNDS Uniform National Discharge Standards
USAKA United States Army Kwajalein Atoll
USC United States Code
USFWS United States Fish and Wildlife Service
UST Underground Storage Tank
VFR Visual Flight Rules
V/m Volts Per Meter
XBR X-Band Radar
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1.0 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 as amended (42 United States Code [USC] 4321, et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), Department of Defense (DoD) Instruction 4715.9, Environmental Planning and Analysis, and the applicable Service environmental regulations that implement these laws and regulations, direct DoD officials to consider environmental consequences when authorizing and approving federal actions. Accordingly, this Environmental Impact Statement (EIS) examines the potential for impacts to the environment as a result of the proposed construction, operation, and test activities associated with the proposed Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR). Under this Proposed Action, additional test facilities, including the Sea Based Test X-Band Radar (SBX), test equipment, infrastructure, and communications links would be constructed and operated for the purpose of providing more realistic GMD flight testing in the North Pacific Region. Existing range facilities would be enhanced, and additional launch and support sites would be established to support more robust missile flight tests.

1.2 BACKGROUND

Within the DoD, the Missile Defense Agency (MDA) (formerly the Ballistic Missile Defense Organization) is responsible for developing and testing a conceptual Ballistic Missile Defense System (BMDS). There are three segments that make up the BMDS: Boost Phase Defense, Midcourse Defense, and Terminal Defense. Each segment of the BMDS is being developed to destroy an attacking missile in the corresponding boost, midcourse, or terminal phase of its flight (see figure 1.2-1). The boost phase is the portion of a missile’s flight in which it produces thrust to gain altitude and acceleration. This phase usually lasts between 3 to 5 minutes. During the midcourse phase, which occurs outside much of the Earth’s atmosphere for medium- and long-range missiles, the missile coasts in a ballistic trajectory. This phase can last as long as 20 minutes in the case of intercontinental ballistic missiles. During the terminal phase, the missile enters the lower atmosphere and continues on to its target. This phase lasts approximately 30 seconds for intercontinental ballistic missiles. Each segment of the BMDS is composed of one or more elements, each of which consists of an integrated set of technology components, such as interceptors, radars, and communications links, which provide a unique missile defense capability. GMD is one such element.

The MDA’s ultimate goal is to develop an integrated BMDS that would be able to destroy an attacking missile in any phase of its flight. However, each prospective element of the different segments of the conceptual BMDS is at a different stage of development and would have a different timetable for integration into the eventual BMDS. Consequently, each element is being designed to provide some capability to defend against an attacking ballistic missile independent of other elements within an overall system. The BMDS development concept is to integrate
Phases of Ballistic Missile Flight and the Concept for Ground-Based Midcourse Defense

EXPLANATION
Note: Locations in this figure are for illustrative purposes only and are notional.


Figure 1.2-1
promising technologies into BMDS elements as their capabilities are demonstrated through testing.

The GMD Joint Program Office, within the MDA, is responsible for overseeing the development of the GMD element, which is designed to intercept long-range ballistic missiles during the midcourse (ballistic) phase of their flight, before they reenter the Earth’s lower atmosphere. An operational GMD element architecture would include the five key components listed below. An illustration of these components, within the concept for GMD testing and operations, is included in figure 1.2-1.

- Ground-Based Interceptors (GBIs)
- X-Band Radar (XBR)
- GMD Fire Control/Communications (GFC/C) facilities and links
- Upgraded Early Warning Radars
- Space-Based Detection Capability

In July 2000, the MDA completed the National Missile Defense (NMD) Deployment EIS to support decisions concerning deployment of a GMD (formerly NMD) element (Ballistic Missile Defense Organization, 2000). At the direction of the Secretary of Defense, the MDA refocused the GMD element on operationally realistic testing under the concept of the GMD ETR. This EIS serves to analyze the proposed GMD ETR actions and alternatives for potential impacts on the environment.

On 17 December 2002, President George W. Bush announced plans to begin deployment of an initial set of missile defense capabilities by the year 2004. The MDA proposes to use existing test facilities and infrastructure to the extent possible in fielding these initial capabilities. Consequently, some of the assets proposed for this initial capability could share assets in common with some of those analyzed as part of the GMD ETR. Additional facilities or activities required at Vandenberg Air Force Base (AFB) to support an initial missile defense capability that would not involve test assets are outside the scope of this EIS. A separate NEPA analysis is being prepared to analyze the environmental impacts of fielding this initial capability. Where there may be cumulative environmental effects at Vandenberg AFB from the combined test and initial missile defense capability activities, they will be discussed in the cumulative effects section of this EIS, as applicable.

1.3 PURPOSE OF THE PROPOSED ACTION

The proliferation of weapons of mass destruction and long-range ballistic missile technology is increasing the threat to our national security. The GMD element would defend all 50 states against limited ballistic missile attack. The Secretary of Defense has identified the need to gain a higher level of confidence in the capability of the GMD to defend the United States through more robust interceptor flight tests under more realistic conditions.

The purpose of the Proposed Action is to provide for more realistic flight tests in support of development of the GMD element. The ETR would achieve this by providing additional target
and interceptor launch locations, and sensors, in a wider range of intercept engagements and under more stressing conditions.

1.4 NEED FOR THE PROPOSED ACTION

More realistic testing using trajectories and distances that closely resemble those required of an operational element is needed to ensure the GMD element being developed has the capability to defend the United States against limited missile attacks. To meet this need, the MDA proposes to gain a higher level of confidence in GMD’s capabilities to defend the United States through more robust interceptor tests under more realistic conditions.

Currently, the existing test ranges located in the Pacific Region and elsewhere are limited in their capabilities to provide for a geographically dispersed operational environment, suitable for GMD types of testing. As a result, current GMD element testing is constrained by how missile flight tests can be conducted, and in opportunities for multiple engagement scenarios.

1.5 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

The GMD testing would be of two types: (1) validation of the GMD operational concept and (2) more robust GMD element testing. The facilities and operations to validate the GMD operational concept and improve the realism of GMD element testing are each a part of the GMD Test Bed. Each part of the test bed, however, serves a different test function and has independent utility, purpose, and need. The independent parts of the test bed also have different implementation schedules. Consequently, the independent parts of the test bed are being evaluated in separate NEPA analyses. Validation of the operational concept is analyzed in the Ground-Based Midcourse Defense (GMD) Validation of Operational Concept (VOC) Environmental Assessment (EA) (U.S. Army Space and Missile Defense Command, 2002a). These actions are designed to validate potential non-launch activities associated with the GMD operational concept by testing the interoperability of the GMD components in a realistic environment. The EA analyzed construction, testing, and support activities at Fort Greely, Clear Air Force Station, and Eielson AFB in central Alaska; Eareckson Air Station on Shemya, Alaska; and Beale AFB, California.

The second type of GMD testing, which is analyzed in this EIS, would involve more robust interceptor flight tests with participation of other GMD components such as SBX and In-flight Interceptor Communication System Data Terminals (IDTs) to achieve more realistic testing. This enhanced ETR flight testing would be accomplished through the extension of existing Pacific Region test range areas that are currently supporting GMD test activities. By extending these test range areas, the realism of GMD testing would be increased through the use of multiple missile engagement scenarios, trajectories, geometries, distances, and speeds of targets and interceptors that more closely resemble those for which an operational system would provide an effective defense. Most tests would include the launch of a target missile; tracking by range and other land-based, sea-based, airborne, and space-based sensors; launch of a GBI; and missile intercepts at high altitudes over the Pacific Ocean. Some test events proposed for later in the program would require multiple target and interceptor missile flights to validate GMD element performance.
Under the proposed GMD ETR concept, target missiles would be launched from Ronald Reagan Ballistic Missile Defense Test Site (RTS) at U.S. Army Kwajalein Atoll (USAKA) in the Marshall Islands; Kodiak Launch Complex (KLC), Alaska; Vandenberg AFB, California; Pacific Missile Range Facility (PMRF) on Kauai, Hawaii; and/or from mobile platforms situated in the North Pacific Ocean. Figure 1.5-1 shows these and other GMD ETR test and test support locations. Interceptor missiles would be launched from RTS, KLC, and/or Vandenberg AFB. Dual target and interceptor missile launches would occur in some scenarios. Existing, modified, or new launch facilities and infrastructure would support these launch activities at the various locations.

Also in support of these launches, missile acquisition and tracking would be provided by existing sea-based sensors, an SBX, and existing land-based sensors in the Pacific Region; a transportable system radar (TPS-X) positioned at Vandenberg AFB, KLC, RTS, or PMRF; the existing prototype XBR at RTS; and existing/upgraded radars at Beale AFB, Clear Air Force Station, and Eareckson Air Station (figure 1.5-1).

IDTs would be constructed at GBI launch sites or placed on a sea-based platform near the proposed GBI launch sites and expected intercept areas or a combination of both. Commercial satellite communications (COMSATCOM) terminals would also be constructed at launch sites that do not have fiber optic communication links and at other locations in the mid-Pacific Region.

Alternative architectures for achieving more realistic interceptor flight tests in the Pacific Region are organized around potential additional interceptor missile launch sites, with other test components being located to provide maximum test effectiveness. For analysis purposes in this EIS, three alternative GMD Test Bed architectures have been identified based on developing additional missile launch capability for GMD testing at:

1. KLC and RTS; or
2. Vandenberg AFB and RTS; or
3. KLC, Vandenberg AFB, and RTS.

A total of approximately 10 launches per year is anticipated for the entire GMD ETR test program. For each of the alternatives, the proposed GMD ETR activities could include up to five missile launches (interceptors and/or targets) from a specific launch facility per year. The GMD ETR activities would be expected to occur over a period of approximately 10 years following a decision to proceed.

In accordance with CEQ Regulations (40 CFR 1502.14(d)), this EIS also analyzes the No Action Alternative, which serves as the baseline from which to compare the alternatives to the Proposed Action. Under the MDA No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not be fully tested under operationally realistic conditions. All existing facilities and launch areas, however, would continue current operations, including support of ongoing GMD-related activities. Existing launch sites and test resources would continue to be used in GMD test scenarios whenever practical.
Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

**EXPLANATION**

Note: Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

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**Potential GMD ETR Test and Test Support Locations**

**Pacific Ocean**

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**Figure 1.5-1**
The Federal Aviation Administration (FAA) will also rely on this EIS to support a site operator license renewal at KLC. The FAA No Action Alternative would be to not issue a license renewal for KLC.

### 1.6 DECISIONS TO BE MADE

The initial decision to be made by the MDA is whether to implement the Proposed Action to construct and operate additional GMD test facilities, test equipment, infrastructure, and communication links to enable the MDA to conduct enhanced GMD element testing; or to choose the MDA’s No Action Alternative. If the MDA selects the Proposed Action, then a second decision would be made as to which of the three alternative missile launch scenarios and locations would most effectively meet the objectives of the enhanced test program. At the completion of the EIS analysis process, these decisions will be documented in a Record of Decision (ROD), to be published in the *Federal Register*.

The FAA, which is a cooperating agency for this EIS, will also rely on this analysis to support its environmental determination for a launch site operator license renewal at KLC. The FAA’s alternatives to be evaluated include renewing the current launch site operator license with no modification as identified in the MDA’s No Action Alternative; issuing a license for the list of activities as identified in the MDA’s Alternative 1; issuing a license for the list of activities as identified in the MDA’s Alternative 2; and FAA’s No Action Alternative, which would be to not issue a license renewal for the KLC. For the purposes of the FAA’s analysis of proposed activities at KLC, the MDA’s Alternative 1 is the same as the MDA’s Alternative 3.

At the conclusion of this environmental review process the FAA will issue a separate ROD to support its licensing determination at KLC. The FAA will draw its own conclusions from the analysis presented in this EIS and relevant information contained in the FAA’s earlier site license *Environmental Assessment of the Kodiak Launch Complex, Kodiak Island, Alaska* (Federal Aviation Administration, 1996) and assume responsibility for its ROD and any related mitigation measures. Further discussion on this particular issue is provided in section 1.7.

### 1.7 COOPERATING AGENCIES

In accordance with CEQ Regulations (40 CFR 1501.6), an invitation for cooperating agency status was extended to the FAA for consultation, review, and comment on the EIS. A cooperating agency is an agency with either jurisdiction over a proposed federal action or special expertise about the environmental effects caused by the action.

The FAA, Office of the Associate Administrator for Commercial Space Transportation, is a cooperating agency because of its regulatory authority in licensing the operation of KLC, as defined in 49 USC Subtitle IX—Commercial Space Launch Activities, 49 USC 70101-70121, and supporting regulations. The FAA has special expertise and legal responsibility related to the licensing of commercial launch facilities. The FAA is responsible for providing oversight and coordination for licensed launches and protecting the public health and safety, safety of property, and national security and foreign policy interests of the United States. Licensing of launches and reentries, operating a launch or reentry site, or some combination, is considered a federal action.
for which environmental impacts must be considered as part of the decision making process as required by NEPA.

Alaska Aerospace Development Corporation (AADC) applied for and was granted a launch site operator license for the operation of KLC in September 1998. A license to operate a launch site remains in effect for 5 years from the date of issuance unless surrendered, suspended, or revoked before the expiration of the term and is renewable upon application by the licensee (14 CFR 420.43, Duration). The existing FAA license for the operation of KLC will expire in September 2003.

Should the FAA not reissue a launch site operator’s license for KLC to conduct launches, the MDA would be required to choose an alternative that does not include KLC. KLC is the only launch complex evaluated in the EIS that requires a license from the FAA.

An environmental review is just one component of the FAA’s licensing process. FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts, describes the Agency’s procedures for implementing NEPA. Specifically, it requires that the FAA decision making process facilitate public involvement by including consideration of the effects of the Proposed Action and alternatives; avoidance or minimization of adverse effects attributable to the Proposed Action; and restoration and enhancement of resources, and environmental quality of the nation. These requirements will be considered in the FAA’s licensing decision.

In addition to the environmental review and determination, applicants must complete a policy review and approval, safety review and approval, payload review and determination, and a financial responsibility determination. The purpose of the Policy Review and Approval process is to determine whether or not the information in the license application presents any issues affecting U.S. national security or foreign policy interests, or international obligations of the United States. The purpose of the Safety Review and Approval process is to determine whether an applicant can safely conduct the launch of the proposed launch vehicle(s) and any payload. The purpose of the Payload Review and Determination is to determine whether a license applicant or payload owner or operator has obtained all required licenses, authorization, and permits. The purpose of the Financial Responsibility Determination is to ensure that all commercial licensees demonstrate financial responsibility to compensate for the maximum probable loss from claims by a third party for death, bodily injury, or property damage or loss resulting from an activity carried out under the license; and the U.S. Government against a person for damage or loss to government property resulting from an activity carried out under the license. All of these reviews, including the environmental review, must be completed prior to issuing a license. All FAA safety analyses would be conducted separately and would be included in the terms and conditions of the license.

A license to operate a launch site authorizes a licensee to offer its launch site to a launch operator for each launch point for the type and weight class of launch vehicle identified in the license application and upon which the licensing determination is based. Issuance of a license to operate a launch site does not relieve a licensee of its obligation to comply with any other laws or regulations, nor does it confer any proprietary, property, or exclusive right in the use of airspace or outer space (14 CFR 420.41).
1.8 SUMMARY OF THE PUBLIC SCOPING PROCESS

The CEQ Regulations implementing NEPA require an open process for determining the scope of issues related to the Proposed Action and its alternatives. Comments and questions received, as a result of this process, assist the DoD in identifying potential concerns and environmental impacts to the human and natural environment.

The GMD ETR EIS public scoping period began on 28 March 2002, when the Notice of Intent to prepare an EIS was published in the *Federal Register*. The scoping comment period was originally scheduled to end on 10 May 2002, but was extended to 20 May 2002 in response to public request. Subsequently, inclusion of the SBX in the EIS analysis extended scoping and the comment period even further, through 20 December 2002.

A number of methods were used to inform the public about the GMD ETR Program and of the locations of the scheduled scoping meetings. These included:

- The Notice of Intent announcement in the *Federal Register*
- Paid advertisements in local and regional newspapers

Public scoping meetings were held at the locations listed in table 1.8-1. During these public scoping meetings, attendees were invited to ask questions and make comments to the program representatives at each meeting. In addition, written comments were received from the public and regulatory agencies at the scoping meeting, and by letter and e-mail during the extended comment period. Comments received from the public and agencies pertaining to specific resource areas and locations were considered, and more detailed analysis was provided in the EIS. Those comments received from the public concerning DoD policy and program issues are outside the scope of what is required to be analyzed in an EIS.

<table>
<thead>
<tr>
<th>Meeting Location</th>
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<tr>
<td>Kodiak, Alaska—Kodiak High School</td>
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<tr>
<td>Anchorage, Alaska—Egan Convention Center</td>
<td>18 April 2002</td>
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<td>Lompoc, California—Town Hall Council Chambers</td>
<td>25 April 2002</td>
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<td>Honolulu, Hawaii—Best Western Hotel</td>
<td>18 September 2002</td>
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<td>Seattle, Washington—Hilton Conference Center</td>
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<td>Oxnard, California—Public Library</td>
<td>22 October 2002</td>
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<td>Port of Valdez—Valdez Civic Center</td>
<td>19 November 2002</td>
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<tr>
<td>Port Adak—Bob Reeves High School</td>
<td>5 December 2002</td>
</tr>
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</table>
Native Village Meetings

A series of village coordination meetings was held on Kodiak Island in June and July 2002 in partial fulfillment of a pledge from the GMD Joint Program Office to reach out to Native residents to explain the Proposed Action at KLC. The team visited the villages of Akhiok, Ouzinkie, Port Lions, Afognak, Kodiak, and Larsen Bay.

Several generic issues were raised, including the following:

- The environmental consequences of flying rockets from KLC
- The inquiry from the Village of Old Harbor about the need for a fallout shelter
- Job opportunities associated with the Proposed Action
- Most village attendees expressed feelings of patriotism and support for what was being planned

Agency Meetings

An agency meeting was held in the offices of the Alaska Division of Governmental Coordination in Anchorage in April 2002 to provide an overview of the Proposed Action to the represented agencies and to solicit input on the EIS. Agencies represented at this meeting included the U.S. Fish and Wildlife Service (USFWS), the Alaska Department of Fish and Game, the U.S. Army Corps of Engineers, the U.S. Coast Guard, and the Alaska Department of Natural Resources. Some of the comments from the agencies are listed below:

- The USFWS recommended that an alternative site to the current proposed launch site at KLC should also be considered, if possible, because this ridge area is a sensitive area and there are public use concerns.
- The agencies requested more detailed information regarding the Proposed Action and alternatives.
- A trip with the agencies to the proposed construction site at Kodiak was suggested and agreed upon for the near future.
- A trip to Kodiak was conducted in May of 2002. The USFWS was the only agency in attendance. After reviewing the proposed KLC sites, the concern over the ridge area noted during the meeting was lessened and the visit focused on visual impacts.

An additional agency meeting was held in the offices of the Alaska Division of Governmental Coordination Offices in Anchorage in November 2002 to provide additional information regarding the potential siting of the SBX at Adak or the Port of Valdez, and to solicit input on the Coordinating Draft EIS. Agencies represented included the Alaska Department of Environmental Conservation, the U.S. Army Corps of Engineers, and the Alaska Department of Natural Resources. Some of the comments from the agencies are listed below:

- Migratory bird site adjacent to Valdez is an Aquatic Resource of National Importance. Air quality is a potential concern.
- Valdez Narrows is closed when a tanker is passing through.
An Alaska Department of Natural Resources permit would be required for all actions within 4.8 kilometers (3 miles) of the shore. This would include barge landing sites and mooring sites. Mooring sites would also require a Section 10 Permit.

Need to add Standard Operating Procedures (SOPs) for debris recovery in case of an accident at KLC, since this operation would have the highest probability for perchlorate contamination.

An agency meeting was held in Honolulu in September 2002 with representatives from the USFWS and the FAA. This meeting centered primarily on the potential siting of the SBX at Pearl Harbor. Some of the comments from the agencies included:

- Questions from the FAA on the proposed operation of the radar and the effects of radiological hazards and interference with air traffic at the Honolulu International Airport
- Questions from the USFWS mainly concerning the effects of the radar on bird populations

An agency meeting was also held at Naval Station Everett in October 2002 with representatives from the State of Washington and the U.S. Navy. Some of the comments included:

- Questions on the proposed operation of the radar, potential radiological hazards, and interference with ship traffic
- Questions on the potential introduction of foreign species into open water
- Questions on the effects of the SBX on seabirds, shorebirds, federally threatened fish species, and widely distributed open water species such as whales and turtles

Results of Public Scoping Meetings

The public scoping meetings used an information/exhibit format with a formal presentation on the GMD Program Overview and the Environmental Analysis Process. A sampling of some of the comments expressed by the public included:

- Concern about the chemicals in the air and the harm that they will do to the environment
- Concern about the pristine fisheries and wilderness, and belief that a thorough investigation of the effects of launch activities should occur in the EIS
- Concern that the EIS could never fully address all the short- and long-term impacts around KLC
- Concern about the expansion of KLC, since the facility is located in a seismically active area
- Concern about putting valuable resources of Kodiak Island at risk due to toxic substances integral to missile launch operations
- Concern with the hazardous materials that are released in the explosion of a rocket, in flight, on the pad, or in a launch silo; the EIS should address the effects of all potential rocket fuels and payloads
- Concern about the safety of the Proposed Action
- Concern about the health hazards from radars such as the X-band
- Concern that mobile telemetry radars will not be limited to the roads and will be taken into sensitive areas and damage will occur to the land
- Concern that GMD is expensive and will require cuts in funding for human services
- Opposition to the U.S. Government’s plan for continuing research and development of the Missile Defense Program
- A desire that additional work be done on measuring the cumulative impacts to the environment
- Concern that the Narrow Cape road on Kodiak Island will be closed

Table 1.8-2 summarizes the number of comments received from the public at the scoping meetings, and from other sources, for each resource category.

**Table 1.8-2: Number of Comments by Resource Area and Location**

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<tr>
<th>Resource Area</th>
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<td>Transportation</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Utilities</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Water Resources</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>17</td>
<td>2</td>
<td></td>
<td>1</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td>32</td>
</tr>
<tr>
<td>TOTAL</td>
<td>114</td>
<td>92</td>
<td>18</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>17</td>
<td>7</td>
<td>307</td>
<td>565</td>
</tr>
</tbody>
</table>

* Note: No comments were received at the Seattle scoping meeting
1.9 SUMMARY OF DRAFT ENVIRONMENTAL IMPACT STATEMENT
PUBLIC REVIEW PROCESS

The public review and comment period began with the publication of a Notice of Availability (NOA) for the GMD ETR Draft EIS, published in the Federal Register on Friday, 7 February 2003, by the Missile Defense Agency and the Federal Aviation Administration. This initiated a review period for the public and interested agencies to review the Draft EIS and submit their comments. Copies of the Draft EIS were made available for review in local libraries in the areas affected and were provided to those who requested a copy of the EIS. Copies of the Draft EIS were available on the MDA website and were placed in the following public libraries:

- Oxnard Public Library, 251 S. A St., Oxnard, CA 93030
- Kodiak City Library, 319 Lower Mill Bay Rd., Kodiak, AK 99615
- Lompoc Public Library, 501 E North Ave., Lompoc, CA 93436
- Anchorage Municipal Library, 3600 Denali St., Anchorage, AK 99503
- Mountain View Branch Library, 150 S. Bragaw St., Anchorage, AK 99508
- Valdez City Library, 212 Fairbanks, Valdez, AK 99686
- Everett Library, 2702 Hoyt Ave., Everett, WA 98201
- Hawaii State Library, Hawaii Documents Center, 478 South King St., Honolulu, HI 96813
- University of Hawaii at Manoa, Hamilton Library, 2550 The Mall, Honolulu, HI 96822

In conjunction with the Draft EIS review process, seven public hearings were held from 24 February 2003 to 6 March 2003. Detailed information on locations and times for each of the public hearings was published in local and regional newspapers (table 1.9-1) 2 weeks in advance, and public-service announcements and press releases were provided to radio and television stations.

The purpose of the public hearings was to solicit public comments on the environmental areas analyzed and considered in the Draft EIS and to identify environmental issues that the public and Government agencies consider to need further analysis. Chapter 8.0 of this EIS contains a reproduction of the transcripts of the public hearings and responses to comments. Table 1.9-2 lists the location, date, times and number of attendees at the public hearings.

In addition to the public hearings, the public could make comments through a 1-800 telephone number, by sending an email, or by sending a written comment. Chapter 8.0 of this EIS contains a reproduction of the telephone, email, and written comments and responses to those comments. Issues identified by the public were provided to resource specialists working on the Final EIS to ensure that all comments were considered during the preparation of the final document. Table 1.9-3 presents a summary of the number of issues identified for each resource area by location.
### Table 1.9-1: Public Hearing Advertisements

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Public Hearing Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Seattle Times</td>
<td>Everett, WA</td>
<td>10, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Bremerton Sun</td>
<td>Everett, WA</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Everett Herald</td>
<td>Everett, WA</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Lompoc Record</td>
<td>Lompoc, CA</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Santa Barbara News</td>
<td>Lompoc and Oxnard, CA</td>
<td>Lompoc: 9, 16, 23 February 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxnard: 12, 16, 23 February 2003</td>
</tr>
<tr>
<td>Ventura County Star</td>
<td>Lompoc and Oxnard, CA</td>
<td>Lompoc: 18, 21, 23, 25 February 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxnard: 9, 16, 23 February 2003</td>
</tr>
<tr>
<td>Kodiak Daily Mirror</td>
<td>Kodiak, AK</td>
<td>5, 21, 24 February 2003</td>
</tr>
<tr>
<td>Anchorage Daily News</td>
<td>Anchorage, AK</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>Valdez Vanguard</td>
<td>Valdez, AK</td>
<td>19, 26, 27 February 2003</td>
</tr>
<tr>
<td>Valdez Star</td>
<td>Valdez, AK</td>
<td>12, 19, 26 February 2003</td>
</tr>
<tr>
<td>The Honolulu Star-Bulletin</td>
<td>Honolulu, HI</td>
<td>Daily newspaper: 23, 26 February 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 March 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mid-week newspaper: 5 March 2003</td>
</tr>
<tr>
<td>The Honolulu Advertiser and The Island Weekly</td>
<td>Honolulu, HI</td>
<td>16, 21, 23 February 2003</td>
</tr>
<tr>
<td>Office of Environmental Quality Control (OEQC) Bulletin</td>
<td>Honolulu, HI</td>
<td>23 February 2003</td>
</tr>
</tbody>
</table>

### Table 1.9-2: Public Hearing Locations, Dates, and Times

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Times</th>
<th>Public Attendees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxnard Public Library, Oxnard, CA</td>
<td>24 February 2003</td>
<td>6:00-8:00 p.m.</td>
<td>48</td>
</tr>
<tr>
<td>Kodiak High School, Kodiak, AK</td>
<td>24 February 2003</td>
<td>6:00-9:00 p.m.</td>
<td>32</td>
</tr>
<tr>
<td>Lompoc City Council Chambers, Lompoc, CA</td>
<td>25 February 2003</td>
<td>6:00-9:00 p.m.</td>
<td>25</td>
</tr>
<tr>
<td>Egan Convention Center, Anchorage, AK</td>
<td>25 February 2003</td>
<td>6:00-9:00 p.m.</td>
<td>38</td>
</tr>
<tr>
<td>Valdez Convention Center, Valdez, AK</td>
<td>26 February 2003</td>
<td>6:00-9:00 p.m.</td>
<td>8</td>
</tr>
<tr>
<td>Everett Holiday Inn, Everett, WA</td>
<td>27 February 2003</td>
<td>6:00-9:00 p.m.</td>
<td>78</td>
</tr>
<tr>
<td>Disabled American Veterans Hall, Keehi Lagoon Park, Honolulu, HI</td>
<td>6 March 2003</td>
<td>6:00-9:00 p.m.</td>
<td>26</td>
</tr>
</tbody>
</table>
Table 1.9-3: Number of Issues by Resource Area and Location

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Oxnard # of Issues</th>
<th>Lompoc # of Issues</th>
<th>Everett # of Issues</th>
<th>Anchorage # of Issues</th>
<th>Kodiak # of Issues</th>
<th>Valdez # of Issues</th>
<th>Honolulu # of Issues</th>
<th>Midway # of Issues</th>
<th>Total # of Issues</th>
<th>% of Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>1</td>
<td>30</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>34</td>
<td>1%</td>
<td>1</td>
<td>34</td>
<td>1%</td>
</tr>
<tr>
<td>Airspace Use</td>
<td>4</td>
<td>126</td>
<td>2</td>
<td>180</td>
<td>312</td>
<td>6%</td>
<td>6%</td>
<td>18%</td>
<td>577</td>
<td>6%</td>
</tr>
<tr>
<td>Biological Resources</td>
<td>6</td>
<td>31</td>
<td>3</td>
<td>13</td>
<td>676</td>
<td>7</td>
<td>736</td>
<td>13%</td>
<td>577</td>
<td>13%</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>EIS Process</td>
<td>5</td>
<td>3</td>
<td>102</td>
<td>5</td>
<td>2</td>
<td>872</td>
<td>2%</td>
<td>18%</td>
<td>991</td>
<td>18%</td>
</tr>
<tr>
<td>Environmental Justice</td>
<td></td>
<td>1</td>
<td>1</td>
<td>337</td>
<td>339</td>
<td>6%</td>
<td>6%</td>
<td></td>
<td>5</td>
<td>0%</td>
</tr>
<tr>
<td>Geology and Soils</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>0%</td>
</tr>
<tr>
<td>Hazardous Materials/Waste</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>12</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>12</td>
<td>0%</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>2</td>
<td>2</td>
<td>268</td>
<td>5</td>
<td>11</td>
<td>352</td>
<td>12%</td>
<td></td>
<td>640</td>
<td>12%</td>
</tr>
<tr>
<td>Land Use</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>13</td>
<td>169</td>
<td>1</td>
<td>189</td>
<td>3%</td>
<td>577</td>
<td>3%</td>
</tr>
<tr>
<td>Noise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>Policy</td>
<td>9</td>
<td>4</td>
<td>23</td>
<td>8</td>
<td>4</td>
<td>20</td>
<td>1%</td>
<td></td>
<td>68</td>
<td>1%</td>
</tr>
<tr>
<td>Program</td>
<td>48</td>
<td>7</td>
<td>1,024</td>
<td>22</td>
<td>25</td>
<td>526</td>
<td>30%</td>
<td></td>
<td>1,661</td>
<td>30%</td>
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<tr>
<td>Socioeconomics</td>
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<td>334</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>6%</td>
<td></td>
<td>346</td>
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<td>Transportation</td>
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<td>21</td>
<td>0%</td>
<td></td>
<td>21</td>
<td>0%</td>
</tr>
<tr>
<td>Utilities</td>
<td>2</td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
<td>7</td>
<td>0%</td>
<td></td>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>Visual Aesthetics</td>
<td>3</td>
<td>82</td>
<td></td>
<td>2</td>
<td></td>
<td>87</td>
<td>2%</td>
<td></td>
<td>87</td>
<td>2%</td>
</tr>
<tr>
<td>Water Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>16</td>
<td>2,052</td>
<td>56</td>
<td>88</td>
<td>3,144</td>
<td>16</td>
<td>5,464</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Notes:
1. Same email from 169 individuals x 19 issues = 3,211 issues
2. Similar written comments from 140 individuals = 577 issues
3. Petition entered as one comment, includes 764 signatures
4. A "0" in the percent column indicates less than one percent
1.10 RELATED ENVIRONMENTAL DOCUMENTATION

A number of other EAs and EISs have previously been prepared to support the development of the specific technologies that may be used as part of the GMD element. The information and analyses contained in these NEPA documents were used in the development of this EIS. Several of the documents have been incorporated by reference and are cited in the EIS where applicable. Appendix A includes a brief overview of each of these NEPA documents as well as a link to a website where the documents can be viewed.

Additional environmental documentation would be completed following completion of the GMD ETR EIS. A separate NEPA analysis is being prepared to analyze the environmental impacts of fielding an initial missile defense capability at Vandenberg AFB. Appendix E includes information on permits, licenses, and entitlements that would be required before the proposed actions could proceed.
2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 GMD Extended Test Range Components and Operations
   2.1.1 Ground-Based Interceptor Systems
   2.1.2 Target Missile Systems
   2.1.3 In-Flight Interceptor Communication System Data Terminal Options
   2.1.4 Sea-Based Test X-Band Radar
   2.1.5 Test Range Sensors and Support Instrumentation
   2.1.6 Flight Test Planning and Operations
   2.1.7 Flight Test Safety
   2.1.8 Flight Test Example Scenarios

2.2 No Action Alternative
   2.2.1 Launch Sites and Other Support Facilities
   2.2.2 Mobile GMD System Elements

2.3 Proposed Action
   2.3.1 Alternative 1
   2.3.2 Alternative 2
   2.3.3 Alternative 3—Combination of Alternatives 1 and 2

2.4 Alternatives Considered But Not Carried Forward
   2.4.1 GBI Launch Location Alternatives
   2.4.2 Target Launch Location Alternatives
   2.4.3 IDT Location Alternatives
   2.4.4 Sea-Based Test X-Band Radar Primary Support Base Alternatives
   2.4.5 Mobile Telemetry and Mobile C-Band Radar Location Alternatives
2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action is to construct and operate additional launch and test facilities in the Pacific Region, and to conduct more realistic GMD element tests in support of GMD development. The extension of existing U.S. test ranges would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, and speeds of targets and interceptors that more closely resemble those for which an operational system would provide an effective defense. The GMD ETR testing would include pre-launch activities, launch of targets and GBIs from a number of widely separated locations, and missile intercepts over the Pacific Ocean.

For the purpose of this EIS, a flight test or test event represents a target missile flight, an interceptor missile flight, an intercept of a target missile, or a test of some sensor(s) independent of a missile flight test. Most tests would include the launch of a target missile; tracking by range and other land-based, sea-based, airborne, and space-based sensors; launch of an interceptor missile; target intercept; and debris impacting into broad open areas of the Pacific Ocean. Some test events proposed for later in the program would require multiple target and/or interceptor missile flights to validate GMD system performance. A total of approximately 10 launches per year is anticipated for the entire GMD ETR test program. For each of the alternatives, the proposed GMD ETR activities could include up to five missile launches (interceptors and/or targets) from a specific launch facility per year. The GMD ETR testing activities would likely occur over a period of approximately 10 years following a decision to proceed.

The alternatives for implementing the Proposed Action represent architectures for achieving more realistic interceptor flight tests in the Pacific Region. These architectures are organized around potential additional GBI missile launch sites, with other new and existing test components being located to provide maximum test effectiveness. For analysis purposes in this EIS, three alternative test architectures have been identified based on developing additional launch capability at (1) KLC and RTS, (2) Vandenberg AFB and RTS, and (3) KLC, Vandenberg AFB, and RTS. Each alternative test architecture would include common GMD test components consisting of GBIs, target missiles, IDTs, the SBX, and other sensors and instrumentation.

In addition to the alternatives for the Proposed Action, this EIS also considers the No Action Alternative. Under the No Action Alternative, the GMD ETR would not be established, and additional facilities and components to be used in ETR operations would not be built. Existing launch sites and test range activities, however, would continue at the various locations, including support of ongoing GMD test activities.

Table 2.0-1 lists the test activities and components associated with the alternatives for implementing the Proposed Action. Those actions and components that would be conducted under the No Action Alternative are also included. In the discussions following table 2.0-1, section 2.1 describes the GMD ETR components (i.e., GBIs, target missiles, the SBX, IDTs, and other sensors and instrumentation) and pre-flight/flight test operations that would normally
Table 2.0-1: Activities and Locations for the Proposed Action and No Action Alternatives for GMD ETR Testing

<table>
<thead>
<tr>
<th>Activity</th>
<th>No Action Alternative</th>
<th>Proposed Action (Establish and Operate the GMD ETR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alternative 1</td>
<td>Alternative 2</td>
</tr>
<tr>
<td>GBI Silo or Launch Pad Construction</td>
<td>None</td>
<td>KLC</td>
</tr>
<tr>
<td>Support Facility Construction</td>
<td>None</td>
<td>KLC</td>
</tr>
<tr>
<td>Silo/Support Facility Modification</td>
<td>None</td>
<td>KLC</td>
</tr>
<tr>
<td></td>
<td>VAFB</td>
<td>VAFB</td>
</tr>
<tr>
<td>Target Launch Pad Construction</td>
<td>None</td>
<td>KLC</td>
</tr>
<tr>
<td>Target Launch Pad Modification</td>
<td>None</td>
<td>KLC</td>
</tr>
<tr>
<td>IDT Construction and Operation plus Mission Communications</td>
<td>Eareckson Air Station</td>
<td>Midway³</td>
</tr>
<tr>
<td></td>
<td>RTS</td>
<td>VAFB</td>
</tr>
<tr>
<td>COMSATCOMs</td>
<td>Eareckson Air Station⁴</td>
<td>KLC Midway³</td>
</tr>
<tr>
<td>TPS-X Radar</td>
<td>RTS</td>
<td>KLC</td>
</tr>
<tr>
<td></td>
<td>VAFB</td>
<td>PMRF</td>
</tr>
<tr>
<td>Mobile Telemetry</td>
<td>KLC</td>
<td>Pasagshak Point, AK</td>
</tr>
<tr>
<td></td>
<td>Cordova, AK</td>
<td>Homer, AK</td>
</tr>
<tr>
<td></td>
<td>Pillar Point, CA</td>
<td>King Salmon, AK</td>
</tr>
<tr>
<td></td>
<td>Adak, AK</td>
<td>Adak, AK</td>
</tr>
<tr>
<td></td>
<td>Cordova, AK</td>
<td>Cordova, AK</td>
</tr>
<tr>
<td></td>
<td>Pillar Mountain, AK</td>
<td>Pillar Mountain, AK</td>
</tr>
<tr>
<td></td>
<td>Pillar Point, CA</td>
<td>Pillar Point, CA</td>
</tr>
<tr>
<td></td>
<td>Midway</td>
<td>Midway</td>
</tr>
<tr>
<td></td>
<td>Bremerton, WA</td>
<td>Bremerton, WA</td>
</tr>
<tr>
<td>GBI Launch (1 = single, 2 = dual)</td>
<td>RTS (2)</td>
<td>KLC (2)</td>
</tr>
<tr>
<td></td>
<td>VAFB (2)¹</td>
<td>VAFB (2)</td>
</tr>
<tr>
<td>Target Launch (1 = single, 2 = dual)</td>
<td>KLC (1)</td>
<td>KLC (2)</td>
</tr>
<tr>
<td></td>
<td>PMRF (1)</td>
<td>PMRF (1)</td>
</tr>
<tr>
<td></td>
<td>VAFB (1)</td>
<td>VAFB (2)</td>
</tr>
<tr>
<td></td>
<td>Mobile (1)²</td>
<td>Mobile (1)²</td>
</tr>
<tr>
<td>SBX</td>
<td>None</td>
<td>Broad Ocean Area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Primary Support Base</td>
</tr>
</tbody>
</table>

Note: KLC Kodiak Launch Complex PMRF Pacific Missile Range Facility
RTS Reagan Test Site VAFB Vandenberg Air Force Base
¹ Booster Verification tests, no intercepts
² Mobile–Air or Sea Launch
³ Midway – Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.
⁴ Military Satellite Communications at Eareckson Air Station
occur. Section 2.2 identifies the major activities, components, and locations involved in conducting the No Action Alternative. Section 2.3 describes the locations for implementing each of the Proposed Action alternatives. Lastly, section 2.4 describes those alternatives considered, but not carried forward in this analysis.

2.1 GMD EXTENDED TEST RANGE COMPONENTS AND OPERATIONS

The sections that follow provide a detailed description of the GMD ETR components to be used in program testing. Where applicable, facility and component construction and developmental requirements are described. A discussion on GMD pre-flight and flight test operational requirements is also included.

2.1.1 GROUND-BASED INTERCEPTOR SYSTEMS

The GBI is the “weapon” of the GMD element that would be used in GMD ETR testing. Its mission is to intercept incoming ballistic missile warheads outside the Earth’s atmosphere and destroy them by force of impact. The GBI missile consists of a three-stage solid propellant booster and an Exoatmospheric Kill Vehicle (EKV) (figure 2.1.1-1). The GBI is approximately 16 meters (54 feet) long and 1.3 meters (4.2 feet) in diameter, and it weighs approximately 20.4 to 22.7 metric tons (22.5 to 25 tons).

For the purposes of analysis, each interceptor booster is assumed to contain approximately 20,500 kilograms (45,000 pounds) of solid propellant, and each EKV is assumed to contain approximately 7.5 liters (2 gallons) of liquid fuel and 5.5 liters (1.5 gallons) of liquid oxidizer. These liquid propellants would consist of a form of monomethyl hydrazine and nitrogen tetroxide, respectively. The liquid fuel and liquid oxidizer tanks would arrive at the site fully fueled. For this analysis, it is assumed that the interceptor (booster stages and EKV) would be assembled at the test sites.

The components associated with a typical GBI launch site include the Launch Control Center, range sensors, and IDT. Commercial power would be used during missile flight tests, with a generator serving as backup.

2.1.1.1 Ground-Based Interceptor Transportation, Handling, and Facilities

Interceptor missile boosters, payloads, and support equipment would be transported by air, ship, or over-the-road common carrier truck from U.S. Government storage depots or contractor facilities to the test range. All shipping would be conducted in accordance with Department of Transportation (DOT) regulations. The interceptor would be placed in existing or proposed new facilities for assembly and launch preparation. Applicable safety regulations would be followed in the transport, receipt, storage, and handling of hazardous materials. A small quantity of liquid propellants (approximately 7.5 liters [2 gallons] of liquid fuel and 5.5 liters [1.5 gallons] of liquid
oxidizer) would be used by the EKV. Presently, there are no plans to store liquid propellants onsite other than the preloaded fuel and oxidizer tanks that would be installed on the EKV. The interceptor may arrive at the test range with the EKV attached, or the booster may be shipped separately from the EKV. In either case, the fuel and oxidizer tanks would be installed in the EKV and the helium tanks on the EKV would be pressurized at the test site. If the booster is shipped separately from the EKV, integration and assembly operations would be performed onsite.

An appropriate explosive safety quantity–distance (ESQD) would be established around facilities where interceptors and ordnance are stored or handled as approved by the DoD Explosives Safety Board.

Maximum use would be made of existing infrastructure and facilities at launch sites. Existing facilities would be modified as necessary to support interceptor missile system operations. Additional infrastructure requirements may include onsite road improvements, fencing, electrical service, potable water, and telephone and data transmission lines.

At some locations, new GBI silos or a launch pad would be required. The silos would be approximately 3 meters (10 feet) in diameter and 21 meters (70 feet) long (deep). The pad, if required, would be approximately 53.3 by 53.3 meters (175 by 175 feet).

2.1.1.2 Ground-Based Interceptor Launch Support Operations

Portable equipment used to support interceptor missile testing may include telemetry vans, personnel trailers, and power generators. For the GBI launch site, a typical launch cycle ramp-up would include 55 to 65 people during the first month, 100 to 130 people during the second month, and 205 to 260 people during the third month. Dual launch would include approximately 55 to 65 people during the first month, 120 to 150 people during the second month, and 235 to 300 people during the third month. After a launch, approximately 75 personnel would depart immediately. Personnel would include contractors, military, and U.S. Government civilians.

The GBI operations at the test site may include missile assembly and checkout, installation of the EKV bi-propellant tanks onto the EKV, inspection of the tanks after installation, final inspections, testing and checkout of the loaded EKV assembly, integration of the EKV with the booster, and placement of the interceptors into the silo(s). The EKV may be integrated with the booster in the silo, or it may be integrated with the third booster stage before integration with the remainder of the boosters.

The GMD testing would use dedicated utilities for environmental control of the silos, and activities associated with testing. An offsite commercial supplier would supply primary power to the site, but a backup battery system and onsite backup diesel generators would supply emergency power. Generators for various GBI-related facilities would range in output from approximately 75 to 900 kilowatts (kW). Each generator would also have its own dedicated aboveground fuel storage tank. These dedicated tanks would range in capacity from approximately 15,140 to 75,710 liters (4,000 to 20,000 gallons).
2.1.1.3 Ground-Based Interceptor Security

When interceptor testing occurs, it would be on a campaign basis, and the security for these tests would be on a similar basis. It is estimated that security related activities would occur for approximately 5 weeks for each campaign.

Security requirements would vary for each potential launch location. A program of continuous protection activities would take place during each campaign, such as monitoring the Intrusion Detection System, operating the base station for the security radio system, guard training, providing daily instructions for guards, and making security badges for those who come to the site.

The existing Intrusion Detection System may be expanded as necessary to include all critical buildings associated with GMD operations. This expansion may include the installation of additional intrusion sensors, lighting, closed circuit television, and a monitor for the sensors.

Additional physical protection features may be constructed or placed to protect GMD assets. These may include, but are not limited to, fences, security lighting, bollards, tapered concrete barriers or similar devices, ditching and/or earth mounds, patrol roads, and observation tower(s).

Security vehicles may be on patrol day and night. Each vehicle would have radio equipment that would be in operation while on patrol. Normal patrols would be confined to existing roads. There may be occasions when these vehicles can be expected to go off road.

Public access would be limited in the vicinity of GBI missile storage, handling, and launch facilities.

2.1.2 TARGET MISSILE SYSTEMS

The purpose of target missiles in GMD testing is to provide realistic targets for testing new and evolving GMD interceptor missile and sensor systems. Targets would be used to validate the capabilities of GMD interceptor systems. Targets typically simulate the expected threat, both in physical size and performance characteristics. Target missiles may be launched from fixed land locations, sea launch vessels, or aircraft.

2.1.2.1 Target Missiles

A typical GMD target missile consists of a launch vehicle (booster) and a payload that may include a target reentry vehicle, guidance and control electronics, decoys, and other countermeasures. The target missile would deliver the target reentry vehicle in a variety of configurations. A booster may consist of one or more stages. A stage refers to the number of rocket motors which sequentially activate. Multiple stages allow the missile to fly at higher velocities and altitudes, and for longer distances. Specific target missiles that may be used in ETR flight testing are described in the following sections and in table 2.1.2-1. These target missiles are meant to represent a class or range of targets. Figure 2.1.2-1 shows a comparison of the representative launch vehicles and target missiles and identifies the existing and proposed launch sites.
Table 2.1.2-1: Extended Test Range Target Missile Data

<table>
<thead>
<tr>
<th>Name</th>
<th>Length in meters (feet)</th>
<th>Diameter in meters (feet)</th>
<th>Launch weight in kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System¹</td>
<td>10.9 (35.8)</td>
<td>1.4 (4.6)</td>
<td>16,670 (36,750)</td>
</tr>
<tr>
<td>Minuteman II Target²</td>
<td>18.2 (59.7)</td>
<td>1.7 (5.6)</td>
<td>33,100 (73,000)</td>
</tr>
<tr>
<td>Peacekeeper Target³</td>
<td>21.8 (71.5)</td>
<td>2.3 (7.5)</td>
<td>87,750 (194,000)</td>
</tr>
<tr>
<td>Trident I (C4) Target⁴</td>
<td>10.4 (34.1)</td>
<td>1.8 (5.9)</td>
<td>33,112 (73,000)</td>
</tr>
</tbody>
</table>

¹ U.S. Army Space and Missile Defense Command, 2001b
² U.S. Army Space and Strategic Defense Command, 1995
³ U.S. Department of the Air Force, 2002
⁴ U.S. Department of the Navy, 2002b

The target reentry vehicle is the portion of the target missile that is designed to represent threat warheads, or reentry vehicles. The target reentry vehicle would separate from the booster before intercept. Target reentry vehicles typically consist of a steel housing assembly, thermal sensors, guidance and control electronics, radio transmitters and receivers, a power supply (which may include lithium or nickel-cadmium batteries), and a payload section.

**Strategic Target System**

The primary components of the Strategic Target System vehicle (figure 2.1.2-1) are the first and second stage Polaris A3 boosters, the third stage Orbus-1 booster, and the development payloads. The Strategic Target System vehicle can maneuver once away from the launch pad and over the Pacific Ocean.

**Target Launch Vehicle (Minuteman II Derivative)**

The Target Launch Vehicle (TLV) (Minuteman II derivative) (figure 2.1.2-1) consists of three solid-propellant rocket engines and a front system. The TLV target would be designed to accommodate a variety of payload sizes, shapes, and interfaces. The TLV target may include a temporary shroud that protects the front section during the early phases of flight.

**Peacekeeper Target Missile**

The Peacekeeper target missile (figure 2.1.2-1) consists of a modified Peacekeeper missile with three solid propellant rocket motors, a liquid propellant fourth stage, and a reentry system. The reentry system is capable of deploying up to 10 reentry vehicles. Each deployed reentry vehicle follows a ballistic path to its target.

**Trident Target Missile**

The Trident target (figure 2.1.2-1) consists of an extensively modified Trident three-stage, solid propellant, inertial guided U.S. Navy Fleet Ballistic Missile.
### Representative Launch Vehicles Comparison

<table>
<thead>
<tr>
<th>Other Representative Launch Vehicles</th>
<th>Potential ETR Targets</th>
<th>GBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conestoga</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taurus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athena 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athena 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atmospheric Interceptor Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick Reaction Launch Vehicle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Target System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peace-Keeper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TLV (Minuteman II)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground Based Interceptor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Ft.**

Source: See Appendix B for NEPA documentation sources.

#### EXPLANATION

- **●** Existing NEPA Documentation
- **○** Additional NEPA Documentation Required (ETR EIS)

**NOTE:** Existing GBI launches from Vandenberg Air Force Base are booster verification only, no intercept.

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**Figure 2.1.2-1**
2.1.2.2 Target Missile Transportation, Handling, Facilities, and Launches

Missile components would be built in contractor facilities and delivered to the launch site by air, barge, and/or over-the-road truck for system assembly and checkout. Missiles would not be shipped with initiators or other explosive devices. Missiles would be tested at the DoD depot activity or contractor’s facility before shipment. All missile components would be packaged in appropriately designed containers, labeled, and handled in accordance with applicable DOT regulations for the transport of hazardous materials. Some missile components may be shipped to an airfield near the launch site and transferred to the launch site by local truck. Trained personnel using only appropriately certified equipment would handle missile components in accordance with approved standard operating procedures.

Ground Launched Target

Ground launched target missiles would include those listed in table 2.1.2-1. Target missile components and support equipment would be transported by air, barge, and/or over-the-road common carrier trucks from U.S. Government storage depots or contractor facilities to an onsite Missile Assembly Building, where the missile components would be assembled for launch. Applicable safety regulations would be followed in the transport and handling of hazardous materials. An appropriate ESQD would be established and maintained around facilities where ordnance is stored or handled. Target missile launch preparation at ground launch sites may include the following activities:

- Construction and/or modification of facilities and infrastructure to support launch preparation and flight test activities
- Transportation, handling, and storage of target missile system components and assemblies
- Assembly and maintenance of target missile and support equipment
- Checkout and testing of target missile system components and assemblies

Maximum use would be made of existing facilities and infrastructure at ground-based launch sites. Existing facilities would be modified and new facilities constructed only as necessary to support target missile system operations.

Land launches of target missiles would be accomplished from a fixed launch pad or silo. Missiles would be assembled and checked out onsite in a Missile Assembly Building, and erected on a launch stool on the pad or transferred to a launch silo before a scheduled launch. Each facility in which a missile is stored or processed would have an ESQD zone established around it. Before launch, a Launch Hazard Area would be established. The Launch Hazard Area is the area that could be affected by pieces of missile debris should an explosion occur on or just above the launch pad or in the event that the missile’s flight must be terminated on the pad or shortly after liftoff. This Launch Hazard Area is cleared of all but mission-essential test personnel during launch operations to ensure personnel are not exposed to missile launch hazards.

The target launch site would be occupied for approximately 2.5 months before a scheduled launch and 2 weeks after a launch. A typical 3-month launch cycle ramp-up would include 25 people during the first month, 55 to 75 people during the second month, and 110 to 150 people during the third month. Dual launch would include 25 people during the first month, 75 to 90...
people during the second month, and 150 to 175 people during the third month. After a launch, approximately 50 personnel would immediately depart, and the remaining personnel would depart after launch site refurbishment. Personnel would include contractors, military, and U.S. Government civilians.

The target missile operations at the test site may include missile assembly and checkout, final inspections, testing and checkout of the reentry vehicle, and placement of the target on the launch pad.

The GMD testing would use dedicated utilities for environmental control of the facilities and activities associated with testing. An offsite commercial supplier would supply primary power to the site, but a backup battery system and onsite backup diesel generators would supply emergency power. Generators for various target missile-related facilities would range in output from approximately 75 to 900 kW. Each generator would also have its own dedicated aboveground fuel storage tank. These dedicated tanks would range in capacity from approximately 15,140 to 75,710 liters (4,000 to 20,000 gallons).

Air Launch Target
A typical Air Launch Target missile would include two refurbished Minuteman II motors, a guidance and control unit, and a simulated reentry vehicle. The rocket motors for Air Launch Targets would be shipped to the air launch aircraft location from U.S. Government or contractor facilities by truck and/or air. Other components, such as the target/pallet assembly, would be shipped to the air launch aircraft location from other contractor locations (as applicable). When the missile boosters and other components arrive at the air launch aircraft location, the motor would be transferred to a Missile Assembly Building or a Booster Assembly Building for installation of the Flight Termination System and integration of the other components. The target reentry vehicle would be attached to the booster; then the booster, pallet and sled assembly, and support equipment would be loaded onto the aircraft.

Applicable safety regulations would be followed in the transport and handling of hazardous materials. An appropriate ESQD would be established and maintained around facilities where ordnance is stored or handled.

Approximately 25 to 30 people would be involved in the transportation, handling, and checkout of the missile. The missile components would arrive approximately 3 weeks before scheduled launch. A roller dock assembly with an 11,340-kilogram (25,000-pound) capacity loader would be required to load the target on its pallet. Other handling and transfer equipment would include a crane, forklifts, and a flatbed trailer equipped with transfer rails for the motor.

Selected installations would be able to accommodate the air launch aircraft and support equipment by using existing support facilities and infrastructure. In addition, aircraft flights from these installations would be a routine activity. Therefore, no construction or additional major equipment would be required.
Air Launch Targets would be launched from specifically configured U.S. Air Force cargo aircraft. This launch would involve a target missile on a standard cargo pallet and specialized pallet. Various target missile configurations could be used depending on the range needed for the particular test. The integrated target/pallet assembly would be loaded into the aircraft and flown to a predetermined drop point. The target/pallet assembly would be pulled from the aircraft by parachute and dropped to a level between approximately 6,096 and 7,620 meters (20,000 and 25,000 feet) above mean sea level. The target would separate from the pallet and then descend via parachutes to approximately 4,100 meters (13,450 feet) above mean sea level. At this altitude, the parachutes would release the target, and motor ignition would occur during free-fall. After firing, the boosters would drop into predetermined areas in the Pacific Ocean. The target would then follow its flight path to interception or to splash down within a designated ocean impact area. The target would be fitted with a Flight Termination System to terminate the flight if unsafe conditions develop. Figure 2.1.2-2 depicts a typical aerial target extraction from the aircraft and the launch sequence.

![Diagram of typical aerial target extraction and launch](image-url)
Sea Launch Target

Sea launches of target missiles would be conducted using specially configured missiles and a Mobile Launch Platform (MLP) based at a port with approved explosive handling capabilities. The Sea Launch Target missile would be obtained by modifying an existing Strategic Target System or Minuteman II target missile.

Target missiles and support equipment would be transported from U.S. Government storage depots or contractor facilities in accordance with DOT regulations. They would be placed in secure storage until assembly and launch preparation. Applicable safety regulations would be followed in the transport and handling of hazardous materials. An appropriate ESQD would be established and maintained around facilities where ordnance is stored or handled.

Approximately 50 people would be involved in the transportation, handling, and checkout of the missile. The missile components would arrive approximately 3 weeks before launch.

The MLP would accommodate needed range support systems such as communications relays (command and control), data collectors (telemetry), and tracking systems (infrared or optical). It would also provide a safe shelter for personnel engaged in the mission.

Sea launches of target missiles would be accomplished using the MLP as a launch platform. The MLP would be towed by an ocean tug to appropriate launch locations to support the launch of a target missile.

The MLP (figure 2.1.2-3) is a converted U.S. Navy LPH-10 helicopter carrier, retrofitted to allow for missile storage and launches. It is currently berthed in Concord, California. Target launches from this mobile platform would follow the same procedures as those for fixed ground-based target launches, except that launches would be made from the MLP. The MLP is free-floating and would not be anchored to the ocean floor during launching. The MLP would provide the ability to change launch azimuths and ranges of target missiles.

The MLP possesses large open and enclosed decks, good sea-state stability, onboard living quarters, and a deck-edge elevator. The maximum usable time of the MLP away from port is approximately 21 days, accommodating up to 100 personnel during operations. The MLP would carry fresh water using both existing ship holding tanks and bottled drinking water. Wastewater would be held in existing ship holding tanks when the MLP is within the regulatory distance from shore.

The MLP would be towed from its anchorage to perform launch preparations. The MLP could be positioned in the open ocean area near any alternative test range to provide a launch platform for ground-based target missile launches. To support an intercept, the MLP would be towed to a launch location in the open ocean. Final assembly and checkout of the target missile would be accomplished on the MLP. The MLP would be towed at slow speed during the launch of the target missile.
DIMENSIONS:
LENGTH - 183.6 meters (602 feet)
BEAM - 31.7 meters (104 feet)
DRAFT - 9.7 meters (32 feet)

SPEED:
9.3 kilometers per hour
(5 knots) (towed)

DISPLACEMENT:
9,978,980 - 17,077,663 kilograms
(11,000 - 18,825 tons)


Figure 2.1.2-3

Representative Mobile Sea Launch Vessel, Alternative Target Launch Mode
2.1.3 IN-FLIGHT INTERCEPTOR COMMUNICATION SYSTEM DATA TERMINAL OPTIONS

The IDT provides communication links between the in-flight GBI missile and GMD Fire Control (GFC) components. IDTs are needed in close proximity to the GBI launch sites, and also at remote sites for each GBI flight test. Alternative IDT configurations that would support GBI flight tests may include a combination of fixed (land-based), relocatable (land-based), or mobile IDTs. The IDT is made up of the integration of the compound, facilities, antenna, communications node equipment, long haul communications, and embedded test capability.

2.1.3.1 Fixed In-Flight Interceptor Communication System Data Terminal

The fixed IDT would be contained in a building that is approximately 30.7 meters by 11.6 meters (101 feet by 38 feet) and would have a 5.5-meter (18-foot) diameter radome mounted on one end of the building (figure 2.1.3-1). The radome, which covers the antenna, would be inflatable. Lightning protection would be provided by lightning masts. Two 9-meter (30-foot) anemometer towers would be located at each site.

A hardened surface of 9.14 meters (30 feet) surrounding the IDT building would permit crane access for installing and, if necessary, replacing the radome or antenna. This area would also provide parking space for two utility vehicles and access for any other equipment that must be brought near the IDT.

An additional modular facility (or facilities) would be temporarily installed within approximately 30 meters (100 feet) of the IDT. This modular facility would be used to provide spare component and repair parts storage and workspace for technicians. There could be an environmentally protected entrance between the IDT and the modular facility. The modular facility would require communications and utility hookups including local commercial power. Interior water tanks and chemical toilets, inside the modular facility, would be frequently serviced and negate the need for water utility pipes and a septic tank system. The estimated size for these facilities would be approximately 186 to 465 square meters (2,000 to 5,000 square feet). An external diesel aboveground fuel tank with a fuel capacity of 3,785 to 5,678 liters (1,000 to 1,500 gallons) would supply fuel to the mission power backup generator, and both would be located near the IDT. This generator would be rated at 300 kW and would be housed in a 3.4- by 1.5-meter (11- by 5-foot) wide enclosure.

A 464.5-square-meter (5,000-square-foot) laydown area that would not interfere with the construction of the IDT buildings would be required. A perimeter fence and a 4.88-meter (16-foot) lockable service gate on the service road would be required for access onto the site. A patrol road is planned around the outside perimeter fence of the IDT compound. Access to the IDT compound would be via an all weather road from the nearest existing service road. There would be a similar road from the gate in the perimeter fence to the IDT building.

2.1.3.1.1 Fixed In-Flight Interceptor Communication System Data Terminal Construction

The IDT would be built on a concrete foundation designed to withstand local seismic events. An all-weather road to the IDT site would be required. A prepared surface perimeter, at least 4.5 meters (15 feet) wide around the building, would be required for crane access and parking for two utility and maintenance vehicles. Each IDT would result in approximately 3.2 hectares (8.0...
Fixed IDT

Mobile IDT

EXPLANATION
IDT = In-flight Interceptor Communication System Data Terminal

Figure 2.1.3-1

Conceptual Fixed and Mobile IDTs
acres) of disturbed area from construction activities within a fenced area. A perimeter patrol road at some locations would result in a total disturbed area of 5.9 hectares (14.6 acres). Local commercial electrical power would be the primary source of power for the IDTs at all locations, but each would also have onsite backup electrical generation provided by the mission power generator. Three fiber optic administrative telephone circuits would be required for voice communications and alarm monitoring. Power and fiber optic cable would be routed in existing right of ways where practicable. Construction would require approximately 35 personnel for 6 months.

2.1.3.1.2 Fixed In-Flight Interceptor Communication System Data Terminal Operations

The IDT is a radio transmitter and receiver that would only function during GMD exercises, missions, and test events. It is a Super High Frequency transceiver that would provide communications between the GFC and the in-flight GBI.

The IDT site would normally be unmanned except during acceptance/flight testing, preventative maintenance, corrective maintenance, and future upgrades by up to approximately 10 personnel. Power to an IDT site would be commercial power with backup power supplied by a dedicated generator at each site. Between generator testing and operations during power outages, it is estimated that the onsite backup generator would operate for approximately 200 hours per year.

Other than the diesel fuel and occasional maintenance of the diesel powered electrical generator and associated backup batteries, no hazardous materials or waste (except from chemical toilets) would be stored or generated onsite. One piece of equipment used on the system consists of a Klystron tube, which contains small amounts of beryllium. Should maintenance be required, a new tube would be brought onsite, and the replaced tube would be sent back to the manufacturer for repair.

2.1.3.2 Relocatable In-Flight Interceptor Communication System Data Terminal

A relocatable type of IDT provides the capability to remove, replace, and relocate the terminal should the need arise. The functions of the fixed and the relocatable IDTs are otherwise identical.

The IDT site would include modular facilities that are similar to the fixed facilities that are described for the fixed IDT in section 2.1.3.1. However the relocatable IDT would have a separate equipment shelter and radome shelter, rather than the combined building at the fixed IDT facility. The modular facility requirements, laydown area, power and manpower requirements, and operations, would be as described in section 2.1.3.1.

There would also be an IDT mounted on the SBX (see section 2.1.4). The SBX IDT would essentially be a modular design with a radome similar to the fixed IDT. Operational requirements would be similar to those of the fixed IDT, including a stable foundation, electricity, communications, utilities, security, lighting, and monitoring systems. Personnel would be transported to and from the platform by boat or helicopter.
2.1.3.3 **Mobile In-Flight Interceptor Communication System Data Terminal**

The mobile IDT (figure 2.1.3-1) would be a vehicle-platform-mounted system. Several vehicles would be required to accommodate the equipment and antennas. The IDT would require substantial redesign to operate as a mobile system. Since the mobile IDT would be an independent standalone system, no site preparation would be required. Separately transported Military Satellite Communication Systems (MILSATCOMs) would provide redundant communication. The primary advantage of the mobile IDT is its ability to move rapidly from site to site.

2.1.3.4 **In-Flight Interceptor Communication System Data Terminal Security**

The IDTs would be designed to meet physical security protection requirements in accordance with DoD 5200.8-R, *Physical Security Program*. They are System Secure Level A assets, and they would typically require protection 24 hours a day. Each IDT would require approximately 3.2 hectares (8.0 acres) of fenced area. Security lighting sufficient for camera observation at each IDT would also be required.

2.1.3.5 **Ground-Based Midcourse Defense Communications Network**

The GMD Communications Network is that portion of the GFC/C component that provides voice and data communications assets consisting of communication network manager resources, transmission equipment and circuits, cryptographic equipment, and local and wide area networks necessary to provide a dedicated, reliable, and secure GMD communication capability.

Components of the GMD Communications Network would be deployed to provide tactical system-like connectivity to all test articles of the ETR. Additional communications capability would also be implemented to provide functional connectivity to components of the IDTs, the GBI and target launch facilities, radars, and the GFC system. Communications would occur via a combination of existing and new communication cables (either fiber optic or copper) and COMSATCOM Earth Terminals.

**Commercial Satellite Communications**

The COMSATCOM Earth Terminal (figure 2.1.3-2) requires a footprint of approximately 0.1 hectare (0.25 acre) to accommodate the Earth Terminal and equipment. Primary power is from a commercial source with

![Figure 2.1.3-2](image)
backup power provided by generator. Communication cable to the launch control complex would be required. Equipment would be housed in a military van, a small building, or an existing adjacent facility if available. Security requirements for fencing include approximately 2.8 hectares (7 acres). The site requirements include a concrete base for the Earth Terminal, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide.

**Communications Cable**

For communication among the components on the same installation, the ETR would maximize use of available communications assets, including cable. If communication cable is not available, new cable would be installed. Installation of new cable would be in existing conduit, if available. If not, new conduit would be constructed along rights-of-way. Where necessary, new conduit would require a route approximately 1 meter (3 feet) wide, buried to a depth of approximately 1 meter (3 feet) from the surface. A manhole and cover would be located approximately every 200 meters (600 feet) to allow access to the cables for maintenance and for future cable installations.

### 2.1.4 SEA-BASED TEST X-BAND RADAR

An SBX would support GMD integrated flight testing. It would exercise all midcourse sensor functions including weapon task plans, in-flight target updates, target object maps, and kill assessments. The SBX would support most ETR test scenarios, with additional support provided by the existing ground-based radar prototype (GBR-P) located at RTS at USAKA.

The SBX is made up of a seagoing platform on which an XBR has been mounted. This section describes the platform, the XBR, and the modifications required to the platform for the XBR to function correctly.

#### 2.1.4.1 Sea-Based Platform

The sea-based platform is an existing commercial platform manufactured by Moss Maritime of Oslo, Norway. The platform is a column-stabilized semi-submersible platform, with two pontoons and six stabilizing columns supporting the upper hull. The bare platform has a completely flat top deck on top of an enclosed double bottom structure. The structure has sufficient strength to support a deck load of 18,144 metric tons (20,000 tons). Table 2.1.4-1 provides the dimensions of the platform.

The sea-based platform is semi-submersible, meaning that it would have large ballast tanks that are evacuated to reduce draft for transit or portside use. When in position for testing, the tanks would be flooded, which both increases the displacement and lowers the center of mass, significantly reducing vulnerability to surface weather. Semi-submersibles can be anchored in up to 1,500 meters (5,000 feet) of water. Figure 2.1.4-1 shows an artist’s concept of the XBR and sea-based platform.
Figure 2.1.4-1

Source: Boeing Corporation, 2002a (modified).
Table 2.1.4-1: Platform Dimensions

<table>
<thead>
<tr>
<th>Platform Characteristic</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Hull</td>
<td></td>
</tr>
<tr>
<td>Length of deck</td>
<td>82.85 meters (272 feet)</td>
</tr>
<tr>
<td>Breadth of deck</td>
<td>70.43 meters (231 feet)</td>
</tr>
<tr>
<td>Height to upper deck</td>
<td>40.65 meters (133 feet)</td>
</tr>
<tr>
<td>Draft during operation (after thrusters are installed)</td>
<td>26.0/28.0 meters (85.3/91.8 feet)</td>
</tr>
<tr>
<td>Draft during transit (after thrusters are installed)</td>
<td>15.24 meters (50.0 feet)</td>
</tr>
<tr>
<td>Pontoons</td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>118.56 meters (389 feet)</td>
</tr>
<tr>
<td>Breadth</td>
<td>14.45 meters (47 feet)</td>
</tr>
<tr>
<td>Depth</td>
<td>10.15 meters (33.3 feet)</td>
</tr>
<tr>
<td>Pontoon spacing</td>
<td>58.00 meters (190 feet)</td>
</tr>
<tr>
<td>Displacement during operation</td>
<td>45,668 metric tons (50,340 tons)</td>
</tr>
<tr>
<td>Displacement in transit</td>
<td>29,756 metric tons (32,800 tons)</td>
</tr>
</tbody>
</table>

2.1.4.2 X-Band Radar

The XBR would be a multifunction radar that would perform tracking, discrimination, and kill assessments of overflying target missiles. The XBR would use high frequency and advanced radar signal processing technology to improve target resolution, which permits the radar to discriminate against various threats. The XBR would provide data from the mid-phase of a target missile’s trajectory and real-time in-flight tracking data to the GFC. The XBR would be mounted on a 27-meter (90-foot) diameter antenna mount track support cylinder housed in a 31-meter (103-foot) base diameter radome. Total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft. The XBR would have either a 65 percent populated array (approximately 39,000 elements) or a fully populated array (approximately 60,000 elements) to support the planned testing.

The XBR transmit/receive radiofrequency (RF) emission pattern would be a narrow beam (several meters diameter at 25 kilometers [15.5 miles]) with most of the energy contained within the main beam. Each main beam would consist of a series of electromagnetic pulses. The main beam would be able to provide near hemispherical coverage; i.e., 360 degrees in azimuth. At no time would the main beam be directed at the ground or water surface. Lesser amounts of energy would be emitted in the form of grating and side lobes in the area around the main beam. The main beam would have a lower limit of 10 degrees above horizontal for calibration and maintenance testing while at the Primary Support Base. The side lobes that reach the ground would be far removed from the main beam and would not contain sufficient energy to present any type of RF emission hazard.

Potential issues associated with electromagnetic radiation (EMR) are related to aircraft, electroexplosive devices (EEDs), communication and electronics equipment, and personnel safety. Figure 2.1.4-2 shows the SBX Radar Potential EMR Interference Areas, and table 2.1.4-2 lists the EMR potential interference distances.
Note: Only a portion of the potential interference distances are shown. The potential interference could be 360° around the SBX radar.

Source: Sages, 2003

<table>
<thead>
<tr>
<th>Type of Interference</th>
<th>Fully Populated</th>
<th>65% Populated</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Commercial Communication/Electronics (Orange)</td>
<td>22.4 kilometers</td>
<td>15.4 kilometers</td>
</tr>
<tr>
<td>B Commercial Aircraft (Grey)</td>
<td>19 kilometers</td>
<td>12.1 kilometers</td>
</tr>
<tr>
<td>C EEDs in Presence and Shipping Phase (Air)(Green)</td>
<td>7.5 kilometers</td>
<td>4.8 kilometers</td>
</tr>
<tr>
<td>D Military Communication/Electronics (Yellow)</td>
<td>7.1 kilometers</td>
<td>3.5 kilometers</td>
</tr>
<tr>
<td>E EEDs in Loading and Handling Phase (Blue)</td>
<td>2.3 kilometers</td>
<td>1.6 kilometers</td>
</tr>
<tr>
<td>F EEDs in Presence and Shipping Phase (Ground)</td>
<td>&lt; 10 meters</td>
<td>&lt; 10 meters</td>
</tr>
<tr>
<td>G Personnel (with software controls)</td>
<td>0 meters</td>
<td>0 meters</td>
</tr>
</tbody>
</table>

Note: Vertical dimensions are consistent with horizontal dimensions

Not to Scale

Figure 2.1.4-2
Table 2.1.4-2: Electromagnetic Radiation Potential Interference Distances for SBX

<table>
<thead>
<tr>
<th>65 Percent Populated</th>
<th>Fully Populated</th>
</tr>
</thead>
<tbody>
<tr>
<td>kilometers (miles)</td>
<td>kilometers (miles)</td>
</tr>
<tr>
<td>Main beam (average field intensity) on an aircraft (air)</td>
<td>12.1 (7.5)</td>
</tr>
<tr>
<td>Main beam on an EED presence/shipping (ground and air) such as a missile mounted on an aircraft wing or an EED in a shipping container</td>
<td>4.8 (3.0)</td>
</tr>
<tr>
<td>Grating lobe on an EED handling (ground) where an EED is in an exposed position</td>
<td>1.6 (1.0)</td>
</tr>
<tr>
<td>Grating lobe on an EED presence/shipping (ground and air) such as a vehicle airbag or an EED in a shipping container</td>
<td>&lt;10 meters (&lt;33 feet)</td>
</tr>
<tr>
<td>Military communications/electronics</td>
<td>3.5 (2.2)</td>
</tr>
<tr>
<td>Commercial communications/electronics</td>
<td>15.4 (9.6)</td>
</tr>
<tr>
<td>Grating or side lobe personnel hazard (exceeds Permissible Exposure Limit within)</td>
<td>85 meters¹ (279 feet¹)</td>
</tr>
<tr>
<td>0 meters² (0 feet²)</td>
<td>(0 meters)² (0 feet²)</td>
</tr>
</tbody>
</table>

¹ Personnel Hazard distance worst case—without software controls
² Personnel Hazard distance with software controls

EED = Electroexplosive Device—a device in which electrical energy is used to initiate an enclosed explosive, propellant, or pyrotechnic material

It should be noted that at the Primary Support Base, even at the lower operating limit of 10 degrees, the altitude of the main beam would be well above the surrounding area as shown in Table 2.1.4-3.

To ensure public safety from potential EMR effects, an EMR/electromagnetic interference (EMI) study is currently underway for each potential operating area. This study would then support an application for spectrum certification and frequency allocation.

Table 2.1.4-3: SBX Main Beam Altitude at 10 Degree Elevation Operating Level

<table>
<thead>
<tr>
<th>Distance From SBX kilometers (miles)</th>
<th>Altitude Above SBX meters (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 (0.25)</td>
<td>132 (293)</td>
</tr>
<tr>
<td>1.6 (1.0)</td>
<td>345 (1,131)</td>
</tr>
<tr>
<td>4.8 (3.0)</td>
<td>912 (2,993)</td>
</tr>
<tr>
<td>8.0 (5.0)</td>
<td>1,480 (4,855)</td>
</tr>
<tr>
<td>11.3 (7.0)</td>
<td>2,047 (6,717)</td>
</tr>
<tr>
<td>14.5 (9.0)</td>
<td>2,615 (8,579)</td>
</tr>
<tr>
<td>19.3 (12.0)</td>
<td>3,466 (11,372)</td>
</tr>
<tr>
<td>22.5 (14)</td>
<td>4,034 (13,234)</td>
</tr>
</tbody>
</table>
Civilian aircraft must be hardened or protected from EMR levels up to 3,000 volts per meter (V/m) (peak power) and 300 V/m (average power) as mandated by the FAA by Notice 8110.71, *Guidelines for the Certification of Aircraft Flying through High Intensity Radiated Field Environments*. The SBX would not exceed the 3,000 V/m peak power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in the life of the aircraft avionics.

For some operating areas, following coordination with the FAA, a high-energy radiation area notice may be requested from the FAA to be published on aeronautical flight information charts. As shown in table 2.1.4-2, based on modeling of the 65 percent and fully populated XBR, the FAA standard for average radiation exposure to aircraft could be exceeded out to a distance of 12.1 kilometers (7.5 miles) from the 65 percent populated radar and out to 19 kilometers (11.8 miles) from the fully populated radar. The potential high-energy radiation area for the XBR would therefore extend out to 12.1 kilometers (7.5 miles) and 19 kilometers (11.8 miles) for the 65 percent and fully populated radar. However, based on the spectrum certification and frequency allocation process, the high energy radiation area would be modified to fit existing airport and airspace requirements. Before operation of the XBR during individual tests, the FAA would provide notice to affected airports and aircraft through a Notice to Airmen (NOTAM).

EEDs are used for a variety of applications from the release of ordnance from the wing of an aircraft, for automatic fire extinguishers on aircraft, for pilot ejection seats, and even for the release of air bags on automobiles. An electrical current sufficient to initiate the EED can be induced by exposure of the device to an electromagnetic field. Thus, high levels of EMR can inadvertently initiate the device. Energy from EMR may also cause the EED to become inactive (a phenomenon known as dudding).

EEDs on aircraft in flight could be illuminated by the mainbeam of the SBX. As shown in table 2.1.4-2, based on modeling of the 65 percent and fully populated XBR, EEDs on aircraft in flight could be illuminated by the mainbeam of the SBX out to a distance of 4.8 kilometers (3 miles) from the 65 percent populated radar and out to 7.5 kilometers (4.6 miles) from the fully populated radar. Software controls and coordination with military and commercial aircraft controllers would eliminate this potential hazard. The power coming off of the grating lobes and side lobes of the SBX could illuminate EEDs on the ground. However, the potential radiation hazard would be limited to less than 10 meters (33 feet) in front of the radar, which includes a portion of the main deck of the SBX. Therefore EEDs on the ground, including those associated with airbags in vehicles, would not be affected.

The proposed SBX operates within the 8,000–12,000 MHz frequency band, commonly referred to as the X-band. RF interference is most likely to occur when two pieces of communications-electronics equipment are operated within the same frequency band. Therefore, equipment whose frequencies fall within the X-band is most likely to be affected by the SBX. Some examples of X-band communications-electronics equipment include airborne weather radars, fire control radars, and bomb/navigation radars. Garage door openers are well below this frequency and would not be affected. Interference is also possible to systems that operate in harmonically-related frequency bands. Harmonic frequencies include those frequencies that are integer multiples of the operating frequencies. Systems that operate in harmonically-related
frequency bands include airport surface detection equipment and broadcasting satellite service. Personal home satellite systems would not be affected.

Systems that operate outside of X-band and the harmonically-related frequency bands could be subject to interference due to high power effects from the SBX. High power effects typically occur in receivers that are located close to high power transmitters. The accepted levels for high power effects are 1 mW/cm² for military equipment and 0.1 mW/cm² for civilian equipment. At power levels below these thresholds, it can be reasonably assumed that high power effects are not likely to occur. At power levels above these thresholds, it cannot be stated with certainty that high power effects would occur, only that they are possible. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any appreciable period of time; thus, the odds of interference from high power effects with any electronic equipment on the ground would be slight, 1/1000000 or 0.0001 percent of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than a second, should this occur.

Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time, and software controls would not allow a full power beam to come in contact with any personnel, on the platform or on land. Two separate, redundant computer systems would monitor all emission energy levels at locations around the radar to assure safe exposure levels are maintained. Similar software controls have been effectively used on the large X-band radar currently operating at Kwajalein Island in the Republic of the Marshall Islands.

2.1.4.3 Assembly and Retrofit Operations

The sea-based platform would be retrofitted at an existing shipyard on the U.S. Gulf Coast. It is possible that some retrofit operations could be completed at a shipyard on the U.S. west coast following transit from the Gulf Coast shipyard. The platform would initially be moored at a shipyard in Brownsville, Texas. After arrival at the shipyard, the platform would be outfitted with a variety of subelements that would allow it to function as a self-propelled seagoing platform. These modifications would include installation of the thrusters and preparation for the radar assembly installation. Upon completion of the ship modifications, the vessel would sail to Corpus Christi, Texas, for installation of the radar assembly. The subelements are divided between the facilities requirements and the XBR payload. Table 2.1.4-4 lists the various subelements.

The Radar Support Structure (RSS) and Drive Platform Control System would be assembled at the shipyard with its materials being transported either by truck or barge. The RSS and the Drive Platform Control System would be fully assembled on a concrete slab (existing or new depending on the shipyard selected). They would then be barged to the platform and lifted into place and installed on the top deck of the platform. At the fabrication site, low power calibration of single elements and subarrays plus low power radiation for systems checkout before integration on the platform would be performed. Full power emissions are defined as emissions from all elements in the array and occur during all other calibration, tracking, and mission tasks.
Table 2.1.4-4: Sea-Based Platform Subelements

<table>
<thead>
<tr>
<th>X-Band Radar Payload</th>
<th>Facilities Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna Mount</td>
<td>Semi-submersible Platform</td>
</tr>
<tr>
<td>Radome</td>
<td>Radar Structure Support Module</td>
</tr>
<tr>
<td>Drive Platform Control System</td>
<td>Thermal Control Subsystem</td>
</tr>
<tr>
<td>Antenna Equipment</td>
<td>Power Control Subsystem</td>
</tr>
<tr>
<td>Receiver/Exciter</td>
<td>Propulsion Subsystem</td>
</tr>
<tr>
<td>Beam Steering Generator</td>
<td>Navigational Subsystem</td>
</tr>
<tr>
<td>Signal Data Processing Equipment</td>
<td>Crew Accommodations Modules</td>
</tr>
<tr>
<td>Auxiliary Equipment</td>
<td>Operations Control Center</td>
</tr>
<tr>
<td>Liquid Conditioning and Circulating System</td>
<td>Radar Maintenance</td>
</tr>
<tr>
<td>System Interconnects</td>
<td>Office Space</td>
</tr>
<tr>
<td>In Flight Interceptor Communication System</td>
<td>Spares Storage</td>
</tr>
<tr>
<td>Communication Subsystem</td>
<td></td>
</tr>
<tr>
<td>Dual Commercial Links</td>
<td></td>
</tr>
<tr>
<td>Commercial Satellite Communications</td>
<td></td>
</tr>
</tbody>
</table>

A full navigation suite would be provided with a high degree of automation to minimize the size of required marine crew. The SBX platform would be self-propelled by four steerable 3.4-megawatt (MW) electrically driven thrusters, which extend below the bottom surface of the platform's pontoons. While in open water, two thrusters would effectively propel and maneuver the SBX without assistance. In port, the SBX would be towed and assisted with at least two tugboats.

The SBX platform thrusters would be a retractable type. While the thrusters are extended, the draft of the SBX platform would be approximately 15.2 meters (50 feet). The retractable thrusters can be lifted into the pontoons to reduce the draft of the platform to approximately 10.7 meters (35 feet), allowing it to enter deep ports.

Crew member accommodations would be for 50 people, which currently include approximately 20 marine crew members and 30 GMD mission support personnel. In addition, there would be sufficient berthing, accommodations, and lifesaving equipment to support an additional 50 people onboard on a temporary basis to support testing.

Communication systems and an IDT would be mounted and positioned on opposite corners of the platform deck below the minimum depression of the radar beam. The SBX would use a single link, dual redundant IDT with two antennas. The two sets offer redundancy and avoid obscuration by the radar. There would also be two COMSATCOM terminals with two antennas each for a total of six antennas on the SBX.
2.1.4.4 Integrated Platform Testing in the Gulf of Mexico

The platform subsystem tests would be conducted in the shipyard. These tests would evaluate the performance of individual subsystems.

The initial sea trials would take place in the Gulf of Mexico. These tests are designed to ensure maneuverability and control of the vessel. Since these tests may run in parallel with the payload installation and checkout tests, mass simulators may be used to represent uninstalled portions during the stability and control evaluations. The emphasis would be on identifying and correcting problem operating conditions, such as vibrations that result from the installation of diesel and electric generators above the main deck or the vessel’s electric thrusters.

During the integrated platform testing, full power radiation for satellite and calibration device tracking would be performed. Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW. This would be supplied by eight 3.64-MW generators. Six generators of the eight would be used at any given time, and two would remain in reserve or as backup in case of failures or routine maintenance. Two of the four 3.4-MW thrusters would typically propel the SBX and consume 7 MW, with approximately 14.8 MW available for ship-board operations and powering the radar. The SBX would have a fuel capacity of approximately 3,100,000 liters (818,000 gallons). Approximate fuel consumption for transit and radar operation would be 54,800 liters (14,500 gallons) per day. Fuel consumption while hooked up to a primary support base pier would be 6,130 liters (1,620 gallons) per day.

2.1.4.5 Transportation of Sea-Based Test X-Band Radar from Assembly Point to Primary Support Base/Operations Area

The SBX would be self-powered, with a nominal cruising speed of approximately 15 kilometers per hour (8 knots) with two 3.4-MW thrusters. Due to the large “sail area” created by the XBR radome, actual cruising speeds would be affected by prevailing wind conditions. A 7-month test period would begin with the trip around South America to the Pacific Ocean. The Panama Canal cannot accommodate the width of the completed SBX platform. The transit time would create opportunities for testing as the vessel travels from the Gulf of Mexico to the Pacific test area.

Periodic test emissions for satellite and calibration device tracking would occur. In transit, the SBX would stop at predetermined locations, the FAA would provide notice to affected airports and aircraft through a NOTAM, marine traffic would be notified through a Notice to Mariners (NOTMAR), and then the SBX would conduct the test.

One or more escort ships may accompany the SBX during transit around South America and during testing.

2.1.4.6 SBX Basing Activities and Primary Support Base Alternatives

In between GMD test missions the SBX would return to a Primary Support Base (PSB) for crew rotations, resupply, and maintenance activities. The SBX would have a 10.7-meter (35-foot) draft. Because most harbors do not have the necessary depth to accommodate the SBX, it would not enter most port facilities after it leaves its assembly point in the Gulf of Mexico. If the SBX arrives at a location that cannot accommodate its deep draft, the vessel would moor or...
anchor offshore. Food, supplies, repair parts, and fuel would be delivered by supply ship. The distance that the SBX would remain offshore would be determined by several factors including water depth, transport capabilities of the support location, and radar testing requirements. Where port facilities have sufficient depth, the SBX would enter the port and utilize existing dockside facilities.

Although specific security guidelines have not been adopted for the SBX, it would likely utilize existing security zones, if they exist, at the PSB. If a security zone does not exist, then the SBX would likely utilize the same protection zone that applies to U.S. Navy vessels that are underway. Established by U.S. Coast Guard rule, this would include a 91.4-meter (100-yard) security exclusion zone around the vessel and a slow speed zone between 91.4 and 457 meters (100 and 500 yards) from the vessel. A security zone like this would likely be in effect as the SBX transits or when it is moored.

It is expected that the SBX would continue to operate the XBR while near or at the PSB. The operation would include system testing, calibration, and tracking of satellites. Radar emissions would occur in 15- to 20-minute periods totaling approximately 1 hour per day.

If existing facilities are not available or adequate at the PSB, some new storage and administration facilities would be constructed. If existing facilities are used, security upgrades, environmental controls for storage areas, fueling capability, ship gases handling facilities, computer networks, phone systems, and hazardous material storage and disposal may be added. Ongoing logistics and support operations such as resupply, fueling and maintenance, and crew/operator training would also occur at the PSB. Potential PSBs include Pearl Harbor, Hawaii; RTS; NBVC Port Hueneme, California; Naval Station Everett, Washington; Adak, Alaska; and Valdez, Alaska. In addition to supporting the ETR test activities, the SBX could also be used to support initial defensive operations capabilities being developed at Fort Greely, Alaska, and Vandenberg AFB, California. The activities described above for the SBX at the PSB would be identical for an SBX supporting initial defensive operations capability. The potential PSBs that would support initial defensive operations are the same as those listed above for the ETR. The evaluation of these PSBs to determine their capability to support initial defensive operations would include additional evaluative criteria. Section 2.4.4 describes the SBX PSB siting process and alternative locations considered.

2.1.4.7 SBX Test Activities
Numerous test flight scenarios would be conducted during the GMD ETR testing. Three SBX performance regions have been established to accomplish effective radar coverage for the test flights. Figure 2.1.4-3 shows the three performance regions that would be used. The SBX would operate within the approximate confines of one of the three performance regions based on the needs of the particular flight test scenario.

Approximately 10 to 12 days before a GMD test mission, the SBX would leave the PSB to travel to the designated performance region. During transit time, on-station time, and the return trip, the SBX would have certain preparation and mission activities. On-station GMD mission activities would include providing data from earlier phases of a target missile’s trajectory and real-time in-flight target tracking data to the GFC. During test activities the SBX would use its
EXPLANATION

- Performance Regions

- Ground-based Midcourse Defense Potential Sites

SBX Performance Regions

Pacific Ocean

Figure 2.1.4-3
multi-directional thrusters to remain in one location or travel at extremely slow speed while the radar is operating. Table 2.1.4-5 shows those pre-mission, mission, and post-mission activities that the SBX would perform. During test activities the SBX would likely utilize the same protection zone that applies to U.S. Navy vessels that are underway. This would include a 91.4-meter (100-yard) security exclusion zone around the vessel and a slow speed zone between 91.4 and 457 meters (100 and 500 yards) from the vessel.

**Table 2.1.4-5: Sea-Based Test X-Band Radar Mission Activities**

<table>
<thead>
<tr>
<th>Status</th>
<th>Duration</th>
<th>Location</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transit Time (Pre-Mission Status)</td>
<td>10 to 12 days</td>
<td>In Transit</td>
<td>Pre-Mission Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre-Operational Checks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine/Radar Crew Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sustainment</td>
</tr>
<tr>
<td>On-Station Time (Mission Status)</td>
<td>10 to 14 days</td>
<td>Afloat/On-Station</td>
<td>Marine/Radar Crew Rehearsals/Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interceptor Flight Test Mission Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sustainment</td>
</tr>
<tr>
<td>Transit Time (Post-Mission Status)</td>
<td>10 to 12 days</td>
<td>In Transit</td>
<td>In-Transit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Data Reduction</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resupply</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Training</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mission Preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stand Down/Standby</td>
</tr>
</tbody>
</table>

Daily activities for the SBX would vary according to what phase of integrated testing the radar is in. Mission preparation activities would consist of satellite and sphere tracking, simulation runs, and operations and maintenance. The total amount of radar RF radiation per week would be approximately 5 to 6 hours. During actual GMD mission activities, the actual total duration of RF radiation would decrease to 3 to 4 hours per week. Table 2.1.4-6 shows the specific types of radar testing that would occur during all phases of SBX activities.

The SBX would operate in a manner similar to other large ocean-going vessels and could stop at ports other than the PSB to resupply. The SBX would utilize dockside facilities if available or anchor/maintain position offshore during the resupply activities.
Table 2.1.4-6: Sea-Based Test X-Band Radar Test Activities

<table>
<thead>
<tr>
<th>Location</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabrication at Gulf Coast Shipyard</td>
<td>Single Element Emission</td>
</tr>
<tr>
<td></td>
<td>■ Calibration</td>
</tr>
<tr>
<td>Sea Trials, Gulf of Mexico</td>
<td>Full Array Emission</td>
</tr>
<tr>
<td></td>
<td>■ Short Duration Tests</td>
</tr>
<tr>
<td></td>
<td>■ Satellite Tracks</td>
</tr>
<tr>
<td></td>
<td>■ Calibration Tracks</td>
</tr>
<tr>
<td>In-Transit—Gulf of Mexico, Atlantic Ocean,</td>
<td>Full Array Emission</td>
</tr>
<tr>
<td>Pacific Ocean</td>
<td>■ Daily Testing</td>
</tr>
<tr>
<td></td>
<td>■ Satellite Tracks</td>
</tr>
<tr>
<td></td>
<td>■ Calibration Tracks</td>
</tr>
<tr>
<td>Potential Final Fabrication at West Coast</td>
<td>Single Element Emission</td>
</tr>
<tr>
<td>Shipyard</td>
<td>■ Calibration</td>
</tr>
<tr>
<td>Primary Support Base</td>
<td>Full Array Emission</td>
</tr>
<tr>
<td></td>
<td>■ Periodic Short Duration Tests</td>
</tr>
<tr>
<td></td>
<td>■ Satellite Tracks</td>
</tr>
<tr>
<td></td>
<td>■ Calibration Tracks</td>
</tr>
<tr>
<td>In-Transit to Test Site</td>
<td>Full Array Emission</td>
</tr>
<tr>
<td></td>
<td>■ Daily Testing</td>
</tr>
<tr>
<td></td>
<td>■ Satellite Tracks</td>
</tr>
<tr>
<td></td>
<td>■ Calibration Tracks</td>
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<td>On-Station at Test Site</td>
<td>Full Array Emission</td>
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<td>■ Periodic Short Duration Tests</td>
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2.1.5 TEST RANGE SENSORS AND SUPPORT INSTRUMENTATION

Sensor systems are used to acquire, record, and process data on targets and interceptor missiles to detect and track targets, direct defensive missiles, and assess whether a target has been destroyed. Sensor systems also include signal-processing components.

The signal-processing components receive the raw data collected by the sensor elements and process it, using computer hardware and software, into usable information such as target location, velocity, and attitude. These and other relevant characteristics can then be used to plan and control intercept engagements.
Sensor systems associated with interceptor missiles that may be used include existing ground-based sensors and newly developed or modified sensor systems. Sensors planned for use would be fixed or portable units. These units are routinely used to support missile flight tests. Potentially, other airborne sensors, ship-based sensors, and space-based sensors would also be used for surveillance and tracking support as part of these proposed GMD missile tests.

Instrumentation associated with the launch of a target missile would include radar, optics, and telemetry sites, and a launch control site. Figure 2.1.5-1 shows representative radar and telemetry equipment. Telemetry is provided through a real-time data acquisition system. Launch control is typically contained in a building, although mobile systems are also used (figure 2.1.5-2). Mobile systems would be brought to the selected location approximately 1 to 2 weeks before the launch date. In most cases the equipment would be removed within days after the launch.

2.1.5.1 Existing Range Sensors
2.1.5.1.1 Kodiak Launch Complex

There are currently no sensors permanently located at KLC. Sensors would be brought in for each launch, as required for a particular operational scenario.

AADC is currently building two Range Safety and Telemetry System vans. Once this system is proven, it would be used as the Range Safety and Telemetry System for launches from KLC. Additional instrumentation at KLC during a launch includes two mobile AN/FPS/MPS-36 class C-band radars, a mobile L-band surveillance radar, up to four mobile optical tracking systems, frequency surveillance antenna, and a transportable system to support mission preparation, data collection, processing, mission control, flight safety, and post mission data analysis.

2.1.5.1.2 Vandenberg Air Force Base

Existing range sensors at Vandenberg AFB include several range radars (AN/TPQ-18, AN/FPS-16, High Accuracy Instrumentation Radar, and AN/MPS-39) as well as fixed and mobile telemetry and optics equipment.
2.1.5.1.3 Reagan Test Site

Range sensors at RTS include the Advanced Research Project Agency Lincoln C-Band Observable Radar, and Long-range Tracking and Instrumentation. Both of these tracking radars are located on Roi-Namur at RTS. Additional radars include the Millimeter Wave Radar on Roi-Namur, Tracking and Discrimination Experiment Radar on Roi-Namur, and two MPS-36 C-band general-purpose instrumentation radars located at Kwajalein. The GBR-P is located on Kwajalein.

Telemetry sites located at Ennylabegan, Roi-Namur, and Gagan Islands include nine autotracking and three fixed antennas configured with multiple receivers and recorders. Optical sensors are also available at RTS.

2.1.5.1.4 Pacific Missile Range Facility

Range Control and the Operation Control Centers are in the Barking Sands operations area on the main base. Tracking and surveillance radars, data processing, and the communications network hut are included in the operations area.

The Makaha Ridge Site, 12.9 kilometers (8 miles) north of the PMRF main base at an elevation of 457 to 549 meters (1,500 to 1,800 feet), features tracking and surveillance radars, primary telemetry receivers and recorders, a Frequency Monitoring Station, and Electronic Warfare and networked communications systems.

Kokee Park, 19.3 kilometers (12 miles) north and east of the PMRF main base, is at an elevation of 1,036 meters (3,400 feet). This site has tracking radars, telemetry, ultra-high frequency and very high frequency communications, and command and control systems. Niihau, a privately owned island, features a remotely operated PMRF surveillance radar.

2.1.5.2 Test Event and Mission Sensors

2.1.5.2.1 Early Warning Radars

Eareckson Air Station Cobra Dane Radar
The AN/FPS-108 Cobra Dane Radar System collects and disseminates exoatmospheric, multiple-object intelligence data. The Cobra Dane is a large L-band, computer-controlled, phased array radar system with local wide- and narrow-band communication systems, and an operations and test complex. A modernization effort has extended the Cobra Dane’s operational life by 15 years and enhanced its performance to meet upgraded mission requirements. The upgrades include new hardware, including the signal and data processing system, receivers, displays, and software. Planned modification to the radar to support validation of the GMD operational concept would also support GMD ETR testing.

Beale Air Force Base Early Warning Radar
The Early Warning Radar at Beale AFB has a coverage that includes the West Coast of the continental United States. Planned modification to the radar to support validation of the GMD operational concept would also support GMD ETR testing.
Clear Air Force Station Early Warning Radar

The Early Warning Radar at Clear Air Force Station has a coverage that extends from the Arctic Ocean to the West Coast of the continental United States. Previously planned modification to the radar to support GMD deployment would also support GMD ETR testing.

2.1.5.2.2 Midcourse Sensors

Cobra Judy

Observation Island (Cobra Judy) is a U.S. Air Force shipboard phased array radar system. The Military Sealift Command is responsible for operating the ship, while the U.S. Air Force is responsible for operating the radar systems and overall mission accomplishment. Due to U.S. Air Force restructuring, the responsibility for mission accomplishment has been transferred to the Air Force Technical Applications Center, the U.S. Air Force Center of Excellence for providing national authorities with precision technical measurements to monitor treaty compliance.

Observation Island is a mobile platform that supports the Cobra Judy radar systems which are a national means for technical verification of foreign ballistic missile reentry systems. The instrumentation consists of the world’s largest ship-borne phased array radar, a parabolic dish-type radar and a telemetry system.

AN/SPY-1 Radar

The Aegis weapon system is a multi-mission weapon system employed on both cruisers and destroyers. The AN/SPY-1 radar, although designed primarily for the Anti-Air Warfare mission, has been modified to perform the ballistic missile detection and tracking as part of its new capability to perform Theater Ballistic Missile Defense. The AN/SPY-1 radar is capable of collecting ballistic missile track data during the boost and ascent phase of the missile. The radar would be integrated into the GMD Communications Network as an external-reporting sensor for the GFC/C.

Based on planned interceptor flight test target trajectories, AN/SPY-1 radar would establish the appropriate search fences to detect the target based on planned target launch points. On-ship radar mission operators would monitor the test control network to determine target launch time and status. Upon acquisition of the target, the radar would place the target under track and initiate track reporting.

TPS-X Radar

This radar is an aircraft transportable wide band, X-band, single faced, phased array radar system of modular design. The radar consists of five individual units: Antenna Equipment Unit, Electronic Equipment Unit, Cooling Equipment Unit, Prime Power Unit, and Operator Control Unit. The Antenna Equipment Unit includes all transmitter and beam steering components as well as power and cooling distribution systems. The Electronic Equipment Unit houses the signal and data processing equipment, operator workstations, and communications equipment. The Cooling Equipment Unit contains the fluid-to-air heat exchangers and pumping system to cool the antenna array and power supplies. The Prime Power Unit would be used to power the radar system or act as a standby power source if commercial power is available. The Prime Power Unit is a self-contained trailer with a noise-dampening shroud that contains a diesel
generator, governor, and associated controls, a diesel fuel tank, and air-cooled radiators. The Antenna Equipment Unit, Electronic Equipment Unit, Cooling Equipment Unit, and Prime Power Unit are housed on separate trailers interconnected with power and signal cabling, as required (see figure 2.1.5-3). Potential locations for the TPS-X radar include one site at KLC, previously disturbed areas at PMRF, and existing, previously analyzed sites at RTS and Vandenberg AFB.

**AN/FPQ–14 Radar**

The AN/FPQ-14 radar performs range tracking functions and is located at Kaena Point, Oahu, Hawaii. The radar is operated by the Air Force, 22nd Space Operations Squadron assigned to the 50th Space Wing, Schriever AFB, Colorado.

**2.1.5.3 Mobile Telemetry Systems and Mobile C-Band Radar**

The Mobile Telemetry Systems would consist of an 11-meter (37-foot) truck, two 5.4-meter (17.7-foot) antennas, and dual 10-kW generators. Figure 2.1.5-4 shows representative mobile telemetry equipment including the mobile telemetry and an instrumentation trailer. The mobile C-band radar would perform range tracking functions. A relatively level area or improved road would be required to site the systems. Intended operations would be to pull the telemetry and radar equipment into a prepared area and utilize a commercial power drop. Generators would provide a backup source of power. Uninterrupted Power Supplies are contained in each unit as an emergency backup if power is lost during a test flight.
Mobile Telemetry Systems and radar would be required to support the flight testing as a part of the proposed GMD action. Target telemetry and radar requirements include an up-range, mid-range, and down-range telemetry system to support launches. Figure 2.1.5-5 shows potential mobile telemetry locations.

Up-range telemetry and radar locations in Alaska that may be used include:

- KLC
- Pasagshak Point
- Homer
- King Salmon
- Adak
- Cordova
- Pillar Mountain

Mid-range telemetry and radar locations could include:

- Makaha Ridge, Hawaii (existing telemetry)
- PMRF, Hawaii (existing telemetry)
- Pillar Point, California
- Midway
- Bremerton, Washington

Downrange telemetry and radar locations could include:

- Wake Island (existing telemetry)

2.1.6 FLIGHT TEST PLANNING AND OPERATIONS

The target launch site would be occupied for approximately 2.5 months before a scheduled launch and 2 weeks after a launch. A typical 3-month launch cycle ramp-up would include 25 people during the first month, 55 to 75 people during the second month, and 110 to 150 people during the third month. Dual launch would include 25 people during the first month, 75 to 90 people during the second month, and 150 to 175 people during the third month. After a launch, approximately 50 personnel would immediately depart, and the remaining personnel would depart after launch site refurbishment.

For the GBI launch site, a typical launch cycle ramp-up would include 55 to 65 people during the first month, 100 to 130 people during the second month, and 205 to 260 people during the third month. Dual launch would include approximately 55 to 65 people during the first month, 120 to 150 people during the second month, and 235 to 300 people during the third month. After a launch, approximately 75 personnel would depart immediately.
Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

EXPLANATION
Note: Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

Mobile Telemetry Location Alternatives

Figure 2.1.5-5

Pacific Ocean


GMD ETR Final EIS

2-35
Interceptor and target missile contractor test personnel would be housed in motels, hotels, or mancamps in the vicinity and would commute to the launch site daily. U.S. Government and military test personnel may use military or commercial lodging if available.

2.1.6.1 Explosive Safety Quantity–Distances

An ESQD is established to account for the possibility of an unplanned event. Such an event would be characterized by either an explosion of the missile propellants or by the propellants burning without an actual explosion. An ESQD zone surrounding the explosives would be calculated in accordance with DoD Standard 6055.9, *Ammunition and Explosives Safety Standards*, and would consider factors such as the hazard classification of the explosive and actual test results for that explosive. The ESQD determination would be based on the equivalent explosive force of all propellant and pyrotechnic materials involved. Establishment of the ESQD zone represents DoD’s determination that areas outside the zone provide acceptable protection, and requires that areas inside the ESQD zone be cleared of non-mission-essential personnel for the entire period during which the explosives are present. Additionally, fire suppression, hazardous materials emergency response, and emergency medical teams would routinely be provided during the actual launch operations.

2.1.6.2 Typical Flight Test

The duration of a typical test flight would be approximately 20 to 30 minutes. Airspace surveillance procedures would last as little as 45 minutes, or as long as 3.5 hours if the test is delayed, after which it would be rescheduled. After launch, the missile would slowly gain speed in the first few seconds of flight, and then rapidly accelerate out of sight and earshot.

Approximately 1 minute into flight, the target missile would be at an altitude of approximately 19.3 kilometers (12 miles). The first stage would burn out and fall within the predicted booster impact area. The second and third stages would perform in similar manners, and the target missile would climb out of the atmosphere and into space. The target would reenter the atmosphere and decelerate until it is intercepted or impacts into the Pacific Ocean.

The tracking radar would acquire and track the target while the interceptor command and control system computes the best time to launch the interceptor missile. The interceptor missile would then be launched. Approximately 1 minute into flight, the interceptor would be at an altitude of 50 kilometers (31 miles) and approximately 65 to 80 kilometers (40 to 50 miles) downrange. The first stage would burn out and fall within the predicted booster impact area. The second and third stages would ignite, and the interceptor would continue toward the intercept point. After burnout, the second and third stages would fall into the ocean. The EKV would be deployed after third stage burnout. If the intercept is unsuccessful, the EKV would reenter the atmosphere and is anticipated to burn up on reentry. All booster stages would be programmed to land in predetermined and verified clear areas. Intercept altitudes could vary from approximately 100 to more than 250 kilometers (62 to 155.3 miles).

Intercept debris is the result of the collision between the target missile descending on its reentry trajectory and an interceptor missile moving horizontally or in a slight descent toward the target. For the most part, the target missile debris would continue downward, along the path toward its intended impact point. Similarly, the interceptor missile debris would continue along its path until gravity takes over and the pieces fall to Earth.
The most likely outcome of a successful intercept would be a few large pieces (tens of kilograms), more medium size pieces (less than a kilogram), and mostly small pieces of missile debris (less than 10 grams [0.35 ounces]). Some of the pieces would be small and heavy and have a low coefficient of drag. Others would be larger and lighter and have a high coefficient of drag. Each piece of debris would also have its own kinetic energy, which would be a function of its mass (how heavy it is) and its velocity (how fast it is). A heavy, fast piece of debris has more kinetic energy than a smaller, slower piece of debris. Air resistance, especially wind, has a large influence on where debris lands. A typical target missile reentry vehicle may weigh approximately 884.5 kilograms (1,950 pounds). A typical interceptor kill vehicle may weigh about 110 kilograms (240 pounds) at intercept. If an intercept is not successful, both the target and interceptor missiles would fall into the Pacific Ocean within designated clearance zones. Under normal conditions, missile components would not be recovered from the ocean.

2.1.6.3 Flight Test Clearance Areas

When a missile flight test is planned, there are certain areas where missile components and debris are expected to impact, called the booster drop zone and the debris impact area. These areas are verified safe as part of the test plan. There are other areas where debris may land if the test does not proceed as planned. These predetermined areas may be subject to the risk of mishap, such as an explosion or flight termination. Clearance areas are defined by the Range Safety Office to encompass the maximum probable distribution of debris or impact points of missile components. Figure 2.1.6-1 depicts typical GMD flight test clearance areas.

Each missile flight test event would be modeled using computer predictions of the behavior of the missiles. This modeling predicts what the missile may do in a number of situations where the missile, or parts of the missile, would fall to Earth. The models incorporate a number of variables such as the missile mass, velocity, trajectory, altitude, and descriptions of the environments that may affect the missile in flight, such as surface and high altitude winds.

Modeling that is done long ahead of the actual test would use average weather predictions. Modeling would be done on the day of test to verify safety under actual test conditions.

The Range Safety Office would communicate the extent of the clearance area, time, and date of the flight test, once they are defined, to the FAA, the U.S. Coast Guard, appropriate emergency management agencies, and local police jurisdictions for assistance in the clearance of designated land and sea-surface areas. Other areas under the flight path but not in a predicted impact or debris area would be monitored before the test event to determine the location of population or traffic. If the Range Safety Office determined that the population or ship traffic was in a safe position, the test would proceed.

Ground and range safety areas are developed to protect the public and private property against potential test mishaps. These safety areas are defined in terms of three scenarios: termination or explosion on the ground, either in the Missile Assembly Building or storage areas, or on the launch pad; termination of a missile’s flight shortly after liftoff; and termination of a missile’s flight after it has left the vicinity of the launch site.
Figure 2.1.6-1

Typical GMD Flight Test Clearance Areas

- Flight Safety Corridor
- Ground Projection of Flight Path
- First Stage Booster Flight Path
- Second Stage Booster Flight Path
- Third Stage Booster Flight Path
- Interceptor Flight Path
- Ballistic Missile Flight Path

EXPLANATION

EKV = Exoatmospheric Kill Vehicle
ESQD = Explosive Safety Quantity Distance
GBI = Ground-Based Interceptor

Not to Scale
2.1.6.4 Launch Hazard Areas

Before MDA would launch a missile, the Range Safety Office would determine if the missiles could be safely launched from the proposed location. To do this, the Range Safety Officer develops a Launch Hazard Area around the proposed launch site. The Launch Hazard Area is the area that could be affected by pieces of missile debris should an explosion occur just above the launch pad or in the event that the missile’s flight must be terminated in the early flight phase. This Launch Hazard Area is cleared of all but mission-essential test personnel during launch operations. Appendix C, Missile Launch Safety and Emergency Response, addresses Representative Launch Hazard Areas for each proposed launch location.

2.1.6.5 Flight Corridor

Another component of range safety is based on the possibility of a flight termination after the missile has exited the vicinity of the launch pad. A termination of this kind would occur in the event of an off-course flight. Mission planning and procedures would ensure the Flight Termination System would be activated in time for the flight vehicle to fall within its predicted flight corridor in the event of an off-course flight.

Should the missile head off course such that it is leaving its predicted flight corridor, the Range Safety Officer would activate the Flight Termination System. This would stop the flight vehicle’s thrust, and the missile pieces would then fall ballistically into the sea. This impact could occur outside cleared areas, but within a predetermined flight corridor.

2.1.7 FLIGHT TEST SAFETY

Once a test event is scheduled, there would be a standard sequence of notification and coordination procedures between the Range Safety Office and the agencies that would enforce the clearance of land, air, and sea areas. These areas are discussed below. The date and location of scheduled flight tests or training events would be published approximately 1 week in advance as described below for land, air, and sea areas.

Land Areas

Land areas that would need to be cleared are the Launch Hazard Area for each missile. Land areas would be cleared in cooperation with appropriate local law enforcement officials. Land areas would need to be cleared approximately 1 to 4 hours before a launch. As soon as the Range Safety Officer determines that the area is safe, the Launch Hazard Area could be reoccupied.

A Notice of Intent to clear certain land areas for safety reasons would be published in the local newspapers and broadcast in the local news media. The boundaries of Launch Hazard Areas would be posted with notifications. The areas would be closed approximately 1 to 4 hours before the planned launch and guarded to ensure they remain clear of non-mission personnel.

Airspace

FAA-controlled airspace is that in which most commercial aviation operates; that is, airspace up to an altitude of 18,288 meters (60,000 feet). Military Special Use Airspace may extend to higher altitudes, depending upon the individual restricted or warning area. The missiles involved in these GMD flight tests rapidly climb through this airspace and follow trajectories
high above this airspace. FAA-controlled airspace that would be affected includes airspace above the Launch Hazard Area for both the interceptor and the target launches, airspace above the booster drop zones, airspace above the predicted debris impact zone, and airspace above the predicted interceptor missile and target reentry vehicle impact zones if there is not an intercept.

Debris modeling for the day of test would predict the dispersion and linger time for test impact debris. Linger time is the time it would take for debris as small as 1 gram (0.04 ounce) to fall to Earth given the weather conditions at the time. Such small debris is important because it could be ingested into aircraft engines in flight, causing them to fail. This debris dispersion area may also have to be cleared of aircraft for some time after an intercept. Airspace would need to be cleared in advance of a planned test event to allow sufficient time to ensure that it is indeed clear; this would be approximately a half-hour before test launch. As soon as the Range Safety Officer determines that the area is safe, the airspace could be reoccupied. It could be as long as 2 to 4 hours before a debris dispersion area is declared clear.

The FAA would publish a NOTAM to avoid certain airspace areas for safety reasons. Conditions that are expected to exist for an extended period of time are reported in a Flight Data Center or NOTAM, and are published in the next biweekly NOTAM publication. The boundaries of Launch Hazard Areas would be posted with notifications, and range radar and aircraft would patrol the airspace to ensure that it is clear of aircraft before each flight test.

**Sea-Surface Areas**

Sea-surface areas that would have to be cleared include the Launch Hazard Area that extends over water, the predicted booster drop zones, the predicted debris impact zone, and the predicted impact zone for the interceptor missile and reentry vehicle. Sea-surface areas would be cleared with the cooperation of the U.S. Coast Guard. Sea-surface areas would need to be cleared in advance of a planned test event to allow sufficient time to ensure that it is indeed clear; this would be approximately 4 hours before test launch. As soon as the Range Safety Officer determines that the area is safe, the sea-surface areas could be reoccupied.

The Coast Guard would publish a NOTMAR to clear certain sea-surface areas for safety reasons. A Notice of Intent to clear certain sea-surface areas for safety reasons would be published in local newspapers, broadcast in local news media, and distributed to commercial fishing and tourist boating trade associations. Subject to the conditions of appropriate Memoranda of Agreement, U.S. Coast Guard officials would close the sea-surface area(s) up to 4 hours before the planned launch and then survey them to ensure that they are clear of ships or watercraft. Typically, U.S. Coast Guard vessels and range safety aircraft would patrol the area to ensure that it is clear of ships or watercraft.

Each missile in a flight test is tracked by a variety of sensor equipment to determine exactly where the missile is at all times during the flight. This tracking provides useful data to the program to satisfy test objectives as well as a range safety tool. The Range Safety Officer uses the real-time tracking capability, linked with the predictive modeling capability, to predict at any moment in the flight where the missile may land if thrust were terminated at that moment. This prediction is called an instantaneous impact point. Should a missile veer from its predicted flight path, the impact point predicts where it would fall. If the missile is predicted to leave the flight corridor or clearance areas, the Range Safety Officer would terminate the flight.
2.1.7.1 Post-Test Clearance Release

After completion of a missile flight test, the clearance areas would be released, or allowed to be re-entered. The Range Safety Officer would release the clearance areas as soon as he or she was assured that any hazardous aspect of the test was completed. Residual hazardous concerns may be gases from missile exhaust, presence of hazardous debris, debris still falling after an intercept, or other potentially dangerous consequences. Notification would be by radio, telephone, or computer to aviation and maritime authorities.

2.1.7.2 Debris Recovery

Following a successful intercept, debris would not normally be recovered from the Pacific Ocean. Potential debris from Air Launch Targets could include the target impact debris, pallet, and parachutes. Pallet debris could include metal fragments. The pallet and associated debris impacting the open ocean would sink and would not be recovered.

Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with all applicable range procedures. If required, debris recovery may involve the use of helicopters and off-road vehicles. If the potential exists to disturb biological or cultural resources during debris recovery activities, recovery efforts would be coordinated with applicable range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts. After a successful launch, ground equipment would be parked and the site secured.

2.1.7.3 Mishap Response

Mishaps are, by definition, unplanned events, but they are not unforeseen. The Range Safety Officer would anticipate mishaps and plan responses ahead of time. These response plans both minimize the potential harm and speed recovery from the mishap. Flight termination is accomplished by stopping the propulsive thrust of the rocket motor. This is done by splitting the motor casing with a linear-shaped explosive charge or blowing open thrust ports, which releases the compression on the burning fuel. The linear-shaped charge or thrust ports are activated by a redundant Flight Termination System using radio signals from the Range Safety Officer. When thrust is terminated, the missile pieces continue along the current flight path and fall to Earth under the influence of gravity. Mishap scenarios and their consequences are described in chapter 4.0. Each launch location has an emergency response plan that includes the appropriate response to a launch-related mishap as described in appendix C.

2.1.8 FLIGHT TEST EXAMPLE SCENARIOS

As part of the alternatives for implementing the Proposed Action, interceptors launched against targets may originate from KLC, Vandenberg AFB, or RTS. Target missiles launched as a part of this ETR program may originate from KLC, Vandenberg AFB, PMRF, RTS, or from the MLP sea launch, or from an air launch platform in the Pacific region. All missile intercepts would occur over the Pacific Ocean. In the event the interceptor misses the target, the interceptor and target missiles would land in the Pacific Ocean. Under normal conditions, missile components would not be recovered from the Pacific Ocean.

Several examples of interceptor and target missile flight test trajectories are presented here to illustrate representative testing events that could occur as part of the GMD ETR test schedule (figures 2.1.8-1 through 2.1.8-6). These examples are meant to show representative GMD flight
Scenario 1: Target Launch from Vandenberg Air Force Base, Intercepted from Reagan Test Site

EXPLANATION

- Blue: Ground-Based Interceptor (GBI) Trajectory
- Red: Target Trajectory
- Black: 11 ft-lb Injury Debris
- Blue: 1 Gram GBI Missile Debris
- Red: 1 Gram Target Missile Debris
- Interceptor Debris
- Target Debris
- Wake Island
- Midway Atoll
- Kodiak Launch Complex
- Vandenberg Air Force Base
- Pacific Missile Range Facility
- Reagan Test Facility

Note: 76 ft-lb Debris is Contained Within the Area Shown as 11 ft-lb Debris

Special Use Airspace
High Altitude Jet Routes


Figure 2.1.8-1
Scenario 2: Target Launched from Kodiak Launch Complex, Intercepted from Reagan Test Site

EXPLANATION

- Ground-Based Interceptor (GBI) Trajectory
- Target Trajectory
- 11 ft-lb Injury Debris
- 1 Gram GBI Missile Debris
- 1 Gram Target Missile Debris
- Intercept Point

Note: 76 ft-lb Debris is Contained Within the Area Shown as 11 ft-lb Debris

Special Use Airspace
High Altitude Jet Routes

Pacific Ocean

Figure 2.1.8-2

Scenario 3: Target Launched from Kodiak Launch Complex, Intercepted from Vandenberg Air Force Base

Pacific Ocean

Figure 2.1.8-3
Scenario 4: Target Launch from Pacific Missile Range Facility, Intercepted from Kodiak Launch Complex

EXPLANATION

- Ground-Based Interceptor (GBI) Trajectory
- Target Trajectory
- 11 ft-lb Injury Debris
- 1 Gram GBI Missile Debris
- 1 Gram Target Missile Debris

Intercept Point

Note: 76 ft-lb Debris is Contained Within the Area Shown as 11 ft-lb Debris

Special Use Airspace

High Altitude Jet Routes


Figure 2.1.8-4
Scenario 5: Air Launch Target, Intercepted from Kodiak Launch Complex

EXPLANATION

- Blue: Ground-Based Interceptor Trajectory
- Red: Target Trajectory
- Black: 11 ft-lb Injury Debris
- Dark Blue: 1 Gram Interceptor Missile Debris
- Red: 1 Gram Target Missile Debris

Intercept Point

Note: 76 ft-lb Debris is Contained Within the Area Shown as 11 ft-lb Debris

Special Use Airspace

High Altitude Jet Routes


Figure 2.1.8-5
**EXPLANATION**

- **Blue** Ground-Based Interceptor (GBI) Trajectory
- **Red** Target Trajectory
- **Black** 11 ft-lb Injury Debris
- **Blue** 1 Gram GBI Missile Debris
- **Red** 1 Gram Target Missile Debris

- **Interceptor Debris**
- **Target Debris**
- **Sea Launch**
- **Kodiak Launch Complex**
- **Vandenberg Air Force Base**
- **Wake Island**
- **Midway Atoll**
- **Reagan Test Facility**
- **Pacific Missile Range Facility**
- **Special Use Airspace**
- **High Altitude Jet Routes**

**Scenario 6: Sea Launch Target, Intercepted from Kodiak Launch Complex**

*Note: 76 ft-lb Debris is Contained Within the Area Shown as 11 ft-lb Debris*


**Figure 2.1.8-6**
tests that could be conducted as a part of this Proposed Action; they are not meant to be inclusive or exclusive of other testing possibilities or launch trajectories.

The footprints displayed for debris represent the area within which all pieces of debris equal to or larger than 1 gram (0.04 ounce), 1.43 kilogram-meters (11 foot-pounds), and 9.9 kilogram-meters (76 foot-pounds) would fall. The 1-gram debris is the minimum for potential impacts to aircraft; 1.43 kilogram-meters (11 foot-pounds) is the lower limit for personnel injury; and 9.9 kilogram-meters (76 foot-pounds) is the level for personnel fatality (Range Commanders Council, Range Safety Group, 2002). If the interceptor misses the target it would burn up upon reentry. The target reentry vehicle would continue on its trajectory and land in the open waters of the Pacific Ocean. The appropriate Range Safety Officer would review test scenarios to ensure the interceptor kill vehicle and target reentry vehicle would not impact land areas should they miss.

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not be fully tested under operationally realistic conditions. All existing launch areas and other support facilities would continue current operations for GMD and other mission activities as described in the following paragraphs. Use of mobile GMD test elements is also described.

2.2.1 LAUNCH SITES AND OTHER SUPPORT FACILITIES

Kodiak Launch Complex

In defining the No Action Alternative at KLC, there are two decision points to be made by two different agencies (MDA and FAA); thus, there are two possible No Action Alternatives for this location.

The first is the MDA’s No Action Alternative, in which the GMD ETR would not be established. For KLC, this would result in a continuation of the status quo through September 2003 with up to nine launches occurring per year from the facility. The current launch site operator license for KLC expires in September 2003. At that time, it is possible that the FAA would renew the KLC launch site operator license to continue launch operations. Under the new KLC license, it would be possible for the MDA to conduct launches that meet the conditions of the KLC license. Selection of the MDA’s No Action Alternative would not preclude launches from the KLC. However, the activities associated with the ETR would not be conducted as described in this EIS.

If the FAA renews the launch site operator license for KLC, the AADC would continue launching various commercial and military launch vehicles from KLC. As shown in figure 2.1.2-1, several launch vehicles have been proposed for use and several others have already been launched from KLC. These launch vehicles are similar in size or larger than those included in the Proposed Action, and have similar potential environmental impacts. The Strategic Target System missiles launched from KLC would support GMD testing.

Under the second No Action Alternative by the FAA, the AADC’s launch site operator license, which permits them to operate KLC for the purposes of conducting launches, would not be renewed. In the absence of any other arrangement, launch activities at KLC would be discontinued. The AADC currently holds a 30-year renewable Interagency Land Management
Assignment from the Alaska Department of Natural Resources. If launch activity were discontinued at KLC, AADC would coordinate with the state to determine a proposed future use for the land. It is possible that the facilities and equipment at the site would be used for other government purposes or handled as government surplus (e.g., sold) as described in the FAA’s 1996 EA for KLC.

The lands on Kodiak Island at Narrow Cape have previously been considered for other development activities, such as prisons, schools, and other facilities. The site is located on one of the few improved roads on the island, and would be available for development for other purposes if AADC were no longer licensed to conduct launches.

For purposes of the analysis in this EIS, the FAA’s No Action Alternative covers only the discontinued use of KLC, and does not specifically include any decommissioning or remediation activities that may be associated with the discontinued use of the facility.

**Midway**

No GMD-related test activities would be conducted at Midway.

**RTS**

RTS supports testing for a variety of ballistic missiles and sensor test activities. Missile flight test activities would continue at RTS, and GMD would continue to use the Meck Island launch complex for single and dual launches of GMD missiles, including GBI missiles. The existing range radars, including the GBR-P, and the existing IDT would continue to provide GMD missile test program support.

Previous environmental documents have analyzed potential impacts and mitigations associated with launching 12 to 28 strategic missiles per year from Meck. Other missile defense test programs at RTS may include the Theater High Altitude Area Defense (THAAD) missile system.

**PMRF**

PMRF supports a wide variety of Fleet Training, Land-Based Training, and Test and Evaluation Activities. Fleet Training includes missile operations, air operations, gunnery, bombing, mining, electronic warfare, undersea warfare, and submarine operations. Land-based training includes solid and liquid propellant aerial target and missile launches, electronic warfare and countermeasures, radar, optical, telemetry, and communication systems operations, and troop exercises. Test and Evaluation activities include torpedo, torpedo defense, submarine and periscope detection, submarine systems, anti-submarine warfare, ship-defense systems, and land sensors.

Based on previous environmental analysis and current agreements, the Strategic Target System missile could be launched up to four times per year to support GMD or other missile test related programs. Additional missile tests at PMRF may include the THAAD missile system, Sea-Based Midcourse Defense, and various Fleet Training exercises such as the Rim of the Pacific exercise.
Vandenberg AFB

Vandenberg AFB typically supports approximately five Minuteman or Peacekeeper launches per year from northern Vandenberg AFB launch sites. Based on previous environmental studies and a Letter of Authorization with the National Marine Fisheries Service, up to 10 Minuteman and Peacekeeper launches per year could occur from northern Vandenberg AFB launch sites. GMD target missiles and GBI booster verification missiles would be included in this number. Approximately three GMD target launches and two GBI booster verification launches would occur per year from north Vandenberg AFB. However, GBI booster verification launches would not include intercepts of target missiles over the ocean.

Eareckson Air Station

Existing IDT, MILSATCOM, and the Cobra Dane Early Warning Radar would continue to be utilized at Eareckson Air Station.

2.2.2 MOBILE GMD SYSTEM ELEMENTS

Mobile Telemetry and Radar

Mobile telemetry and C-band radar would continue to be used as required to support target missile launches from KLC.

TPS-X Radar

The TPS-X radar would continue to operate at either RTS or Vandenberg AFB in support of ongoing MDA test activities.

AN/SPY-1 Radar

The AN/SPY-1 radar, although designed primarily for the Anti-Air Warfare mission, has been modified to perform ballistic missile detection and tracking as part of its new capability to perform Theater Ballistic Missile Defense. The Aegis ship would be positioned at various locations in the Pacific to provide missile tracking support during various MDA test activities.

Cobra Judy

Observation Island (Cobra Judy) is a U.S. Air Force shipboard phased array radar system. Cobra Judy would continue to operate in support of ongoing MDA test activities.

SBX

The SBX would not be built and operated in support of the GMD ETR. Initial testing of the SBX in the Gulf of Mexico would not occur, nor would there be a need for a port facility in the Pacific Region to support the SBX.

2.3 PROPOSED ACTION

This section describes the locations and components necessary for implementing each of the Proposed Action alternatives listed in table 2.0-1. Each alternative includes the components described in section 2.1 located at various sites that provide maximum test effectiveness. For analysis purposes in this EIS, three alternative test architectures have been identified based on
developing additional interceptor launch capability at (1) KLC, (2) Vandenberg AFB, and (3) both KLC and Vandenberg AFB. Each alternative test architecture would include common GMD test components consisting of GBIs, target missiles, IDTs, the SBX, and other sensors and instrumentation.

2.3.1 ALTERNATIVE 1
Alternative 1 includes the following components and locations:

- Single and dual GBI launches from KLC and RTS
- Single and dual target launches from KLC, Vandenberg AFB, and RTS
- Single target launches from the PMRF
- Target launches from mobile sea or air platforms
- Construction of two GBI silos or one GBI launch pad, and an additional target launch pad that could accommodate GBI launches if needed, and associated support facilities at KLC
- Target pad modifications at KLC and RTS
- COMSATCOMs at KLC, Midway, and/or sea-based
- Site preparation and operation of TPS-X radar at KLC or PMRF, or use of existing TPS-X at RTS or Vandenberg AFB
- Construction of an IDT at KLC, Midway, and/or sea-based
- Placement of small mobile telemetry units and mobile C-band radar at KLC and at one or two of the following locations: Pasagshak Point, Kenai, Homer, Soldotna, King Salmon, Adak, Cordova, and Pillar Mountain, Alaska; Pillar Point, California; Bremerton, Washington; Makaha Ridge and PMRF, Hawaii; Midway; and Wake
- SBX construction, Primary Support Base, and operation

2.3.1.1 Kodiak Launch Complex and Vicinity
As part of Alternative 1, the proposed GMD infrastructure for launching targets and interceptors would consist of the following:

- Two GBI launch sites, supporting facilities, and ancillary equipment to host two sets of Command Launch Equipment and all utilities and facilities to support operations
- Two target launch pads, supporting utilities, and infrastructure
- A Missile Assembly Building
- A Movable Missile Building
- Addition to the planned AADC Maintenance and Storage Facility
- Addition to the Launch Control Center
- Missile Storage Facility
- An IDT facility
- COMSATCOM equipment
- A new mancamp to support construction and operational personnel
- TPS-X radar
- An addition to the existing Narrow Cape Lodge adjacent to KLC
- Barge landing for large GBI components—adjacent to KLC

It is anticipated that the GBI and Target related construction periods would not occur at the same time.

**Existing and Proposed Launch Support Structures**

Existing facilities to be used, and in some cases modified, by GMD are listed in table 2.3.1-1. Proposed new facilities to support GMD are listed in table 2.3.1-2. The approximate area that would be affected during construction of the various components and facilities is listed in table 2.3.1-3. As shown in table 2.3.1-3, GBI related facilities include GBI access roads, GBI fenced area, GBI silos/Launch Pad, Mechanical/Electrical Building, Oxidizer Storage Building and road, entry control buildings, Maintenance Storage Building addition, Launch Control Center addition, existing lodge expansion, and a new mancamp. Construction for GBI-related components would require approximately 100 personnel for 12 to 15 months. Target-related facilities include target access roads, target launch pad, Movable Missile Building, Missile Assembly Building, Motor Storage Building and access road, existing lodge expansion, and a new mancamp. Construction for target-related facilities would require approximately 100 personnel for 12 to 15 months. Construction of the IDT would require approximately 35 personnel for 6 months.

**Table 2.3.1-1: Alternative 1—Existing Facilities to be Used and/or Modified for Ground-Based Midcourse Defense at Kodiak Launch Complex and Vicinity**

<table>
<thead>
<tr>
<th>Existing Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Control Center</td>
<td>1</td>
<td>53.3 meters (175 feet) long, 24.4 meters (80 feet) wide, and 12.2 meters (40 feet) high; 100-person occupancy during launches</td>
</tr>
<tr>
<td>Payload Processing Facility—potential minor modifications</td>
<td>1</td>
<td>Includes a clean room high bay and processing bay</td>
</tr>
<tr>
<td>Spacecraft Assembly and Transfer Building—no modifications</td>
<td>1</td>
<td>An environmentally conditioned mobile structure used to transfer the launch vehicle stages from the Integration and Processing Facility to Launch Pad 1</td>
</tr>
<tr>
<td>Integration and Processing Facility—no major modifications</td>
<td>1</td>
<td>Includes a high bay</td>
</tr>
<tr>
<td>Target Launch Pad and Launch Service Structure (LSS)—minor modifications to the LSS</td>
<td>1</td>
<td>Launch Pad 1 consists of the pad and apron, a flame duct, launch equipment vault, and an LSS. The LSS allows for environmental protection and access to the launch vehicle for final assembly and check out in the vertical position.</td>
</tr>
<tr>
<td>Planned Maintenance and Storage Facility</td>
<td>1</td>
<td>Planned AADC maintenance and storage facility to be completed by 2004</td>
</tr>
<tr>
<td>Planned Gravel Pad for Antenna Array</td>
<td>1</td>
<td>To be completed by 2004, approximately 8,083 square meters (87,000 square feet)</td>
</tr>
<tr>
<td>COMSATCOM—no modifications</td>
<td>1</td>
<td>Existing satellite communications facility</td>
</tr>
<tr>
<td>Hypergolic Fuel Storage Facility—no modifications</td>
<td>1</td>
<td>Storage of liquid fuel</td>
</tr>
<tr>
<td>Barge Landing Site 1</td>
<td>1</td>
<td>Site previously used to bring in the Narrow Cape Lodge; no construction of structures</td>
</tr>
<tr>
<td>Construction Laydown Areas—no modifications</td>
<td>2</td>
<td>Previously disturbed areas for construction equipment</td>
</tr>
</tbody>
</table>
### Table 2.3.1-2: Alternative 1—Proposed New Facilities for Ground-Based Midcourse Defense at Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Proposed Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBI silo</td>
<td>2</td>
<td>Each silo is approximately 3 meters (10 feet) across, 21 meters (70 feet) deep, and they are located approximately 70 meters (230 feet) apart</td>
</tr>
<tr>
<td>GBI Mechanical Electrical Building</td>
<td>1</td>
<td>Approximately 5 meters (16.4 feet) by 5 meters (16.4 feet)</td>
</tr>
<tr>
<td>GBI Launch Pad</td>
<td>1</td>
<td>Potential option for pad launch of GBI if silos are not constructed; pad would be constructed in same location as proposed silos, or could be constructed as part of the proposed new target launch pad site</td>
</tr>
<tr>
<td>Missile Assembly Building</td>
<td>1</td>
<td>Approximately 15 meters (50 feet) wide, 30 meters (100 feet) long, and 18 meters (60 feet) high</td>
</tr>
<tr>
<td>Movable Missile Building</td>
<td>1</td>
<td>Approximately 12 meters (40 feet) wide, 21 meters (70 feet) long, and 33.5 meters (110 feet) high, and it would have doors at both ends of the structure</td>
</tr>
<tr>
<td>Missile Storage Facility and access road</td>
<td>1</td>
<td>Approximately 30.5 meters (100 feet) wide, by 38.1 meters (125 feet) long, by 5.5 meters (18 feet) high</td>
</tr>
<tr>
<td>New Target Launch Pad (may be used for GBI)</td>
<td>1</td>
<td>Approximately 53.3 meters (175 feet) by 53.3 meters (175 feet)</td>
</tr>
<tr>
<td>Oxidizer Storage Facility</td>
<td>1</td>
<td>Similar to the existing hypergolic fuel storage facility. Approximate 5 meters (16.4 feet) by 5 meters (16.4 feet)</td>
</tr>
<tr>
<td>Mancamp</td>
<td>1</td>
<td>Approximately 50 meters (164 feet) wide, 90 meters (295 feet) long, and 10 meters (33 feet) high, with the capacity to house approximately 60 personnel</td>
</tr>
<tr>
<td>Addition to existing Narrow Cape Lodge</td>
<td>1</td>
<td>Approximately same size as mancamp proposed on KLC</td>
</tr>
<tr>
<td>Addition to the planned KLC Maintenance and Storage Facility—add 1,394 square meters (15,000 square feet)</td>
<td>1</td>
<td>Addition to the planned AADC maintenance and storage facility</td>
</tr>
<tr>
<td>Addition to the Launch Control Center—add 464.5 square meters (5,000 square feet)</td>
<td>1</td>
<td>Addition to the existing Launch Control Center</td>
</tr>
<tr>
<td>IDT</td>
<td>1</td>
<td>Approximately 30.7 meters by 11.6 meters (101 feet by 38 feet) and would have a 5.5-meter (18-foot) diameter radome mounted on one end of the building</td>
</tr>
<tr>
<td>TPS-X Radar</td>
<td>1</td>
<td>Requires gravel pad area of approximately 0.3 hectare (0.8 acre)</td>
</tr>
<tr>
<td>COMSATCOM</td>
<td>1</td>
<td>Similar to existing COMSATCOM</td>
</tr>
<tr>
<td>Entry control</td>
<td>1</td>
<td>Approximately 5 meters (16.4 feet) by 5 meters (16.4 feet)</td>
</tr>
<tr>
<td>Barge landing sites 2 and 3</td>
<td>2</td>
<td>Alternative locations for barge landing; no construction of structures</td>
</tr>
</tbody>
</table>
Table 2.3.1-3: Alternative 1—Potential Ground Disturbance for Ground-Based Midcourse Defense at Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Primary Component</th>
<th>Hectares (Acres)</th>
<th>Associated Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBI Associated Construction (12-15 months)</td>
<td>14.4 (35.5)</td>
<td>GBI access roads, GBI fenced area, GBI silos/Launch Pad, Mechanical/Electrical Building, Oxidizer Storage Building and road, entry control buildings, Maintenance Storage Building addition, Launch Control Center addition, existing lodge expansion, new mancamp</td>
</tr>
<tr>
<td>IDT in Fenced Area (6 months)</td>
<td>5.9 (14.6)</td>
<td>IDT area and road is included</td>
</tr>
<tr>
<td>COMSATCOM Fenced Area (1 month)</td>
<td>2.8 (7.0)</td>
<td>COMSATCOM area is 0.1 hectare (0.2 acre); remainder is cleared area with possible disturbance</td>
</tr>
<tr>
<td>Mobile Telemetry/Mobile C-Band Radar</td>
<td>0.6 (1.4)</td>
<td>Gravel pad</td>
</tr>
<tr>
<td>TPS-X Radar (1 month)</td>
<td>0.3 (0.8)</td>
<td>Gravel pad, same location as IDT site south of Loran C Station</td>
</tr>
<tr>
<td>Target Associated Construction (12-15 months)</td>
<td>10.5 (26.0)</td>
<td>Target access roads, target launch pad, Movable Missile Building, Missile Assembly Building, Motor Storage Building and access road, existing lodge expansion, new mancamp</td>
</tr>
</tbody>
</table>

Since either GBI-related facilities or target-related facilities, or both, could be constructed at KLC, the areas are listed separately for each related facility. If both GBI- and target-related facilities are constructed, there would be an overlap of approximately 8.5 hectares (21 acres). Considering the overlap, the total potential disturbed area for GBI, target, COMSATCOM, mobile telemetry, TPS-X, and associated facilities would be approximately 26 hectares (64.2 acres).

The locations of the existing and proposed facilities are shown in figures 2.3.1-1 through 2.3.1-4.

Proposed Facilities

New GBI Silos
New GBI silos or a launch pad would be required at KLC. The silos are approximately 3 meters (10 feet) in diameter and 21 meters (70 feet) long (deep). The pad, if required, would be approximately 53.3 by 53.3 meters (175 by 175 feet). A Mechanical/Electrical Building would be constructed adjacent to the silos.

New Target Launch Pad
A new launch pad would be constructed to meet design specifications for the launch of target missiles. The pad could also support GBI missiles, although additional equipment would be required. The pad would be approximately 53.3 meters (175 feet) by 53.3 meters (175 feet).

USCG = United States Coast Guard

Kodiak Island, Alaska

Figure 2.3.1-1
Figure 2.3.1-2

Existing KLC and Proposed GMD Facilities Layout in South Kodiak Launch Complex

Source: Alaska Aerospace Development Corporation, 2002; Boeing Corporation, 2002b.

EXPLANATION
- Transportation ESQD (1.1) 260.6 meters (855 feet)
- Inhabited Building ESQD (1.1) 434.3 meters (1,425 feet)
- Inhabited Building and Transportation ESQD (1.3) 74.6 meters (245 feet)
- Water
- Roads

GBI = Ground Based Interceptor
IDT = In-flight Interceptor Communication System Data Terminal
COMSATCOM = Commercial Satellite Communications
TPS-X = Transportable System Radar

Installation Boundary
Existing KLC and Proposed GMD Facilities Layout in Northeast Kodiak Launch Complex

Figure 2.3.1-3

Source: Alaska Aerospace Development Corporation, 2002; Boeing Corporation, 2002b.

EXPLANATION
- Transportation ESQD (1.1) 260.6 meters (855 feet)
- Inhabited Buildings ESQD (1.1) 434.3 meters (1,425 feet)
- Inhabited Buildings ESQD (1.1) 74.6 meters (245 feet)
- Water
- Roads

Scale

0 241 482 meters

0 791.5 1,583 feet

IDT = In-flight Interceptor Communication System Data Terminal
COMSATCOM = Commercial Satellite Communications
USCG = United States Coast Guard
TPS-X = Transportable System Radar

Installation Boundary

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Existing KLC and Proposed GMD Facilities Layout in Northwest Kodiak Launch Complex

EXPLANATION

- IDT = In-flight Interceptor Communication System Data Terminal
- COMSATCOM = Commercial Satellite Communications
- LCC = Launch Control Center
- AADC = Alaska Aerospace Development Corporation
- USCG = United States Coast Guard
- TPS-X = Transportable System Radar

Source: Alaska Aerospace Development Corporation, 2002; Boeing Corporation, 2002b.

Figure 2.3.1-4
New Missile Assembly Building

Although the current plans include use of the existing Integration and Processing Facility for missile assembly activities, the construction of an additional Missile Assembly Building will be evaluated in the EIS. The proposed Missile Assembly Building would be the location for processing launch vehicles and, for some configurations, mating of payloads to launch vehicles. The facility would be about 15 meters (50 feet) wide, 30 meters (100 feet) long, and 18 meters (60 feet) high, covering an area of 460 square meters (5,000 square feet). Exterior features would include the following:

- Paved access road and parking for staff vehicles and tractor trailers
- A paging and area warning system
- Wall-mounted sodium-vapor lighting
- Aircraft obstruction lighting
- A 500-kW diesel generator (maximum 146 liters [39.3 gallons] of fuel per hour)
- A 9,500-liter (2,500-gallon) storage tank for Number 2 diesel fuel
- A 59-square-meter (625-square-foot), 1.8-meter-high (6-foot-high) mounded absorption bed (buried 4,700-liter [1,250-gallon] septic tank)

The interior of the proposed Missile Assembly Building would contain a large, central working area with an overhead crane and a peripheral entry room, restroom, utility rooms, and an equipment airlock. Portable detectors would be used to monitor for hazardous vapors. Depending on the type of launch vehicle involved, fairing-enclosed payloads would be connected to the launch vehicles, and multi-stage launch vehicles inter-connected, in a horizontal position on carts. The integrated assemblies would be electronically tested. The facility would be designed for a 20-person capacity. Peak water demand and sanitary discharge would be approximately 2,400 liters (650 gallons) per day. The proposed Missile Assembly Building would be similar to the existing Integration and Processing Facility shown in figure 2.3.1-5.
New Movable Missile Building
The proposed Movable Missile Building (figure 2.3.1-6) would be a mobile structure used to enclose missile assemblies for transfer to the launch pad. The new facility would be approximately 12 meters (40 feet) wide, 21 meters (70 feet) long, and 33.5 meters (110 feet) high, and it would have doors at both ends of the structure. The structure would be mounted on rollers on steel rails imbedded in concrete foundations. The assemblies would be wheeled on carts out of the Missile Assembly Building and into the Movable Missile Building through abutting doorways. Detectors would be used to monitor for hazardous vapors. After closing doors and securing carts, a tractor would move the Movable Missile Building with target missile to the target launch pad or over the GBI silos or pad.

Once at the target launch pad, the target launch vehicle and payload would be lifted from the horizontal to the vertical position (figure 2.3.1-7) and would be enclosed in the Movable Missile Building until the time of launch, at which time the building would be moved away. External features would include the following:

- A 53-meter (175-foot) square concrete pad
- Steel-lined concrete ductwork to deflect launch-exhaust flame and accompanying noise toward the north
- A paging and a warning system
- Wall mounted sodium-vapor lighting
- Rail system between the new Missile Assembly Building and GBI silos or launch pads
- Aircraft obstruction lighting

Internal features would include vertically adjustable platforms for accessing various levels of the target missile and payload, a crane, clean work areas, utility rooms, and communications umbilicals to link the target missile to the Launch Control Center. Emergency power would be supplied from the Missile Assembly Building, and uninterruptible-power-supply batteries would serve critical loads. Portable detectors would be used to monitor for hazardous vapors.

Missile Storage Facility
The Missile Storage Facility would be approximately 30.5 meters (100 feet) wide, by 38.1 meters (125 feet) long, by 5.5 meters (18 feet) high. The Missile Storage Facility would have a perimeter fence.
Target Missile at Launch Pad


Figure 2.3.1-7
**Oxidizer Storage Facility**

An oxidizer storage building would be constructed in the vicinity of the existing hypergolic fuel storage building. The building would be approximately 5 meters (16.4 feet) by 5 meters (16.4 feet) with a security fence similar to the fence at the hypergolic fuel storage facility.

**Mancamp**

The proposed mancamp would be located on KLC property to the west of the Launch Control Center to house construction and operational personnel. The building would be approximately 50 meters (164 feet) wide, 90 meters (295 feet) long, and 10 meters (35 feet) high, with the capacity to house approximately 60 personnel. The mancamp would have perimeter fence. An additional alternative is an addition to the existing Narrow Cape Lodge mancamp. This addition would be approximately the same size as the proposed mancamp.

**Commercial Satellite Communications**

The COMSATCOM Earth Terminal (figure 2.1.3-2) requires a footprint of approximately 0.1 hectare (0.25 acre) to accommodate the Earth Terminal and equipment. Primary power is from a commercial source with backup power provided by generator. Communication cable to the launch control complex would be required. Equipment would be housed in a military van, a small building, or an existing adjacent facility if available. Security requirements for fencing increase desired acreage to approximately 2.8 hectares (7 acres). The minimal requirements include a concrete base for the Earth Terminal, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide. KLC would require two COMSATCOMs for redundancy requirements. One existing COMSATCOM would be utilized and a new COMSATCOM would be constructed at one of the proposed IDT locations identified on figures 2.3.1-2, 2.3.1-3, and 2.3.1-4.

**Communications Cable**

For communication among the components on the same installation, the ETR would maximize use of available communications assets, including cable. If communication cable is not available, new cable would be installed. Installation of new cable would be in existing conduit, if available. If not, new conduit would be constructed along rights-of-way. Where necessary, new conduit would require a route approximately 1 meter (3 feet) wide, buried to a depth of approximately 1 meter (3 feet) from the surface. A manhole and cover would be located approximately every 200 meters (600 feet) to allow access to the cables for maintenance and for future cable installations.

**In-Flight Interceptor Communication System Data Terminal**

As described in section 2.1.3, the IDT could be a fixed or relocatable land-based unit. A fixed IDT would be contained in a building that is approximately 30.7 meters by 11.6 meters (101 feet by 38 feet) and would have a 5.5-meter (18-foot) diameter radome mounted on one end of the building (figure 2.1.3-1). The radome, which covers the antenna, would be inflatable. An external aboveground fuel tank would be located near the building. The mission backup power generator would be located adjacent to the IDT. This backup generator would be rated at 250 kW and would be housed in a 3.4- by 1.5-meter (11- by 5-foot) wide enclosure.

A relocatable IDT would require approximately the same area and have similar utilities requirements as a fixed IDT. Figures 2.3.1-2, 2.3.1-3, and 2.3.1-4 show the three alternative
sites for the IDT at KLC. Operations and security requirements would be as described in section 2.1.3.

**TPS-X Radar**
As described in section 2.1.5.2, the TPS-X radar is a transportable wide band, X-band, single faced, phased array radar system of modular design. The alternative site for IDT, located south of the existing Loran C Station, shown on figure 2.3.1-4, could also be used for the TPS-X radar. The TPS-X site would require 0.3 hectare (0.8 acre). The Prime Power Unit is a 1.5-MW generator that provides power to the radar during testing. Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations. Spill control procedures that meet AADC’s approved SPCC, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

The Cooling Equipment Unit is a closed system, and no discharges of the ethylene glycol solution are planned. However, because of the remote potential for leaks or spills during system hook-up, or the possibility of ruptured hoses or accidental disconnection, impermeable ground cover would be in place as was described for the Prime Power Unit.

EMR hazard exclusion areas would be established around the TPS-X radar antenna. The personnel exclusion area would extend for 150 meters (492 feet) in front of the radar. The FAA would be requested to establish a navigation warning advising aircraft to remain at least 1,500 meters (4,900 feet) from the TPS-X radar site. EEDs in the presence and shipping phase, such as a missile mounted on an aircraft, would need to be at least 800 meters (2,625 feet) from the radar. EEDs in the handling phase would need to be at least 400 meters (1,312 feet) from the radar due to potential sidelobe exposure. Figure 2.3.1-8 depicts these potential TPS-X radar radiation interference areas.

**Launch Complex Security**
It is assumed that testing would be on a campaign basis and the security for these tests would be on a similar basis. It is estimated that the security activities would occur for approximately 5 weeks for each campaign.

Security force personnel would be present at KLC during each campaign. There would be one Security Operations Center, located in the addition to the Launch Control Center, which would be shared with the KLC security personnel. This building would house the central program protection activities for the site and all operations equipment. Lights would be installed outside the building.
TPS-X Radar Radiation Interference Areas

Explanations:
- Aircraft - Main Beam Exposure
- EEDs in presence and shipping phase - (600 meter) - Main Beam Exposure
- EEDs in loading and handling phase - (400 meter) - Side Lobe Exposure
- Personnel - (150 meter) - Side Lobe Exposure

TPS-X = Transportable System Radar


Figure 2.3.1-8

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A parking area would be established at the building for patrol and private vehicles. Additional roads may be needed depending on the site chosen for the building. Additional buried telephone and power lines would also be required to the building.

Up to three Access Control Facilities may be required that include one to the entrance of KLC and two other locations. These may be mobile or permanent construction depending on their location and overall utility. Wherever located, each Access Control Facility would require power for internal and external lighting. Parking and one portable restroom would be required per Access Control Facility.

The existing Intrusion Detection System would be expanded to include all critical buildings associated with the GMD operations. This would include the installation of additional intrusion sensors, lighting, closed circuit television, and a monitor for the sensors. These systems are common and are used at other sites used by the GMD.

Additional physical protection features may be constructed or placed to protect GMD assets. These may include, but are not limited to, fences, security lighting, bollards, tapered concrete barriers or similar devices, ditching and/or earth mounds, patrol roads, and observation tower(s).

During the operational day, security vehicles would be on patrol. At night, there would be additional vehicles in use as needed. Each vehicle would have radio equipment that would be in operation while on patrol. Normal patrols would be confined to existing roads. There would be occasions when these vehicles would be expected to go off-road.

Public Access Limitation

For safety reasons, the public would be denied access to KLC and the use of Fossil Beach for up to 1 day during any interceptor or target launch. It is anticipated that an Access Control Facility would be established at the entrance of KLC during a campaign to record vehicles entering and leaving the site. Additionally, beach access would be restricted for hours at a time during hazardous operations in accordance with the existing KLC safety plan. The beach could also be closed during times of heightened national security.

2.3.1.2 Midway—In-Flight Interceptor Communication System Data Terminal and Commercial Satellite Communications

Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed. Under Alternative 1, an IDT and two COMSATCOMs, located in close proximity, would be required in a performance region located in the Pacific Ocean. Figure 2.3.1-9 provides the candidate IDT and COMSATCOM locations on Midway. Two of the potential sites include collocated telemetry, COMSATCOM, and IDT. There is also a third site that is COMSATCOM only. In addition, there is an existing COMSATCOM site that could be refurbished for GMD use.
Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

Candidate IDT and COMSATCOM Locations

Midway

Figure 2.3.1-9

EXPLANATION

- **Pacific Ocean**
- **Airfield**
- **Land**
- **Roads**

**Scale**

0  381  762 meters
0  1,250  2,500 feet

Note: Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

Source: Camber Corporation, 2002 (modified); Ikonos Satellite, 2002 (modified).
As described in section 2.1.3, the IDT could be a fixed or relocatable land-based unit. A fixed IDT would be contained in a building that is approximately 30.7 meters by 11.6 meters (101 feet by 38 feet) and would have a 5.5-meter (18-foot) diameter radome mounted on one end of the building (figure 2.1.3-1). The radome, which covers the antenna, would be inflatable. An external aboveground fuel tank would be located near the building. The mission power generator would be located adjacent to the IDT. This generator would be rated at 250 kW and would be housed in a 3.4- by 1.5-meter (11- by 5-foot) wide enclosure. Dimensions are approximations only.

The COMSATCOM Earth Terminal (see figure 2.1.3-2) requires a footprint of approximately 0.1 hectare (0.25 acre) to accommodate the Earth Terminal and equipment. Primary power would be from the existing Midway power supply with backup power provided by generator. Equipment would be housed in a military van, a small building, or an existing adjacent facility if available. Security requirements for fencing include approximately 2.8 hectares (7 acres). The site requirements include a concrete base for the Earth Terminal, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide.

Construction of the IDT and COMSATCOM would require approximately 35 personnel for a period of 6 months.

2.3.1.3 Ronald Reagan Ballistic Missile Defense Test Site

Under Alternative 1 the RTS would continue to be a launch site for GBIs. The following activities would continue at RTS:

- Launch of GBIs from Meck and use of existing IDT on Kwajalein
- Use of extensive range instrumentation
- Use of the GBR-P ground-based XBR
- Missile intercepts in the Broad Ocean Areas (BOAs) north and northeast of RTS

The existing Payload Launch Vehicle GBI silo could be modified to provide the capability to launch target missiles. The candidate GMD locations at Meck Island are shown on figure 2.3.1-10.

RTS is also a potential PSB location for the SBX. Although the piers at the RTS harbor do not offer adequate depth to accommodate the draft of the SBX, the vessel can enter the Kwajalein Lagoon and moor in a protected anchorage. A dedicated resupply vessel would not be required as RTS has a full complement of supply and fueling vessels. The mooring area would be approximately 5 to 6 kilometers (3 to 4 miles) north of the RTS harbor (see figure 2.3.1-11). The SBX would enter the lagoon either through Gea Pass on the west side of the atoll or at Mellu Pass on the north side. Both passes offer sufficient depth to accommodate the vessel. Mellu Pass, however, offers a much greater width for maneuverability. If entering at Mellu Pass (the preferred entry point), harbor officials at RTS have identified a likely transportation route to the mooring location called the Kwaj-Roi Highway. There are some obstacles (coralheads, shipwrecks), though, where avoidance would require navigation around and coordination with harbor officials. Personnel would be ferried to the SBX each day either by watercraft or helicopter.

Existing warehouse and administrative space at RTS is available to support SBX operations.
Candidate
Ground-Based
Midcourse Defense
Locations

Meck Island, RTS

Figure 2.3.1-10

Source: Camber Corporation, 2002 (modified); Woods, 2002.
Potential Interference Distances
- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Reagan Test Site
Potential SBX Mooring Area
United States Army
Kwajalein Atoll

Figure 2.3.1-11

INDEX MAP

EXPLANATION
- Land
- Coral
- SBX Mooring Site

Scale
0 7.5 15 kilometers
0 4.75 9.5 miles

NORTH 0 4.75 9.5 miles

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2.3.1.3.1 Existing Dual Ground-Based Interceptor Launch Capability

Single and dual launches of GBIs would occur from existing silos Com 1 and Com 2 on Meck. The existing GBI Missile Assembly Building, missile storage, maintenance and storage, and launch control facilities would also be utilized (table 2.3.1-4 and figure 2.3.1-10).

Table 2.3.1-4: Existing Facilities Proposed for Ground-Based Midcourse Defense at Meck Island, Ronald Reagan Ballistic Missile Defense Test Site

<table>
<thead>
<tr>
<th>Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Control Center—no modifications</td>
<td>1</td>
<td>Existing Launch Control Center</td>
</tr>
<tr>
<td>Missile Assembly Building—no modifications</td>
<td>1</td>
<td>Currently used for GBI missile assembly</td>
</tr>
<tr>
<td>Missile Storage Facility—no modifications</td>
<td>1</td>
<td>Currently used for GBI missile storage</td>
</tr>
<tr>
<td>Maintenance and Storage Facility—no modifications</td>
<td>1</td>
<td>Currently used for GBI</td>
</tr>
<tr>
<td>Payload Launch Vehicle GBI Silo—modification to launch target missiles</td>
<td>1</td>
<td>Interior of the silo would be modified to accommodate a Minuteman target missile</td>
</tr>
<tr>
<td>GBI Launch Silos Com 1 and Com 2—no modifications</td>
<td>1</td>
<td>Recently constructed silos</td>
</tr>
<tr>
<td>Target Launch Pad—New construction</td>
<td>1</td>
<td>Previously disturbed area to have reinforced concrete and target launch stool installed on existing launch hill</td>
</tr>
<tr>
<td>Construction Laydown Area—no modifications</td>
<td>1</td>
<td>Previously disturbed area for construction equipment</td>
</tr>
</tbody>
</table>

Target Missile Launch

Dual launches of target missiles would occur from a modified Payload Launch Vehicle GBI silo and a new launch pad, both on Meck. Existing GBI missile launch support facilities identified above would be utilized to support target missile launches.

Existing Instrumentation

Existing sensors and other instrumentation that would be used at RTS include range radars, the GBR-P prototype XBR, and telemetry instrumentation as described in section 2.1.5.1.3. The GBR-P would be upgraded through the addition of radar elements to the existing radar face and software upgrades.

2.3.1.4 Pacific Missile Range Facility

Under Alternative 1, the capability exists at PMRF to support the following activities:

- Launch of a single strategic target for intercepts from either RTS or KLC
- Use of existing range instrumentation to monitor target launch and intercept debris
- TPS-X radar on the Main Base or Makaha Ridge
2.3.1.4.1 Existing Single Target Launch

Up to four Strategic Target System missiles per year may currently be launched from the Kauai Test Facility (KTF) at PMRF. No new missile launch azimuths would be required for the Proposed Action. The current missile trajectories are toward the USAKA/RTS BOA and toward the BOA off the northwest coast of North America. The USAKA/RTS trajectory has been successfully used four times in the last 10 years. Northern trajectories would be implemented using current launch azimuths. Once over open ocean, the missile would then execute a turning maneuver (or series of turns) to bring it onto the desired flight trajectory. As such, the Proposed Action would not require new launch azimuths or the establishment of new special use airspace zones. Facilities required to support a target launch are listed in table 2.3.1-5.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Control Center—no modifications</td>
<td>1</td>
<td>Kauai Test Facility</td>
</tr>
<tr>
<td>Missile Assembly Building—no modifications</td>
<td>1</td>
<td>Kauai Test Facility</td>
</tr>
<tr>
<td>Missile Storage Facility—no modifications</td>
<td>1</td>
<td>Kauai Test Facility</td>
</tr>
<tr>
<td>Maintenance and Storage Facility—no modifications</td>
<td>1</td>
<td>Kauai Test Facility</td>
</tr>
<tr>
<td>Target Launch Pad—no modifications</td>
<td>1</td>
<td>Strategic Target System Launch Pad</td>
</tr>
<tr>
<td>TPS-X—open area, no modifications</td>
<td>1</td>
<td>Alternate site for THAAD radar, existing pad at Makaha Ridge</td>
</tr>
<tr>
<td>Construction Laydown Area—no modifications</td>
<td>1</td>
<td>Previously disturbed area for construction equipment</td>
</tr>
</tbody>
</table>

2.3.1.4.2 Existing Instrumentation

Existing sensors and other instrumentation that would be used at PMRF are described in section 2.1.5.

2.3.1.4.3 TPS-X Radar

As described in section 2.1.5, the TPS-X radar is a transportable wide band, X-band, single faced, phased array radar system of modular design. There are two alternative sites at PMRF for the TPS-X as shown on figure 2.3.1-12. The main base TPS-X site is also an alternative site for the THAAD Radar. At Makaha Ridge, the TPS-X would be set up on an existing disturbed area. The TPS-X site would require 0.3 hectare (0.8 acre). The Prime Power Unit is a 1.5-MW generator that provides power to the radar during testing. Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations. Spill control procedures would be established in cooperation with PMRF, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.
EXPLANATION

PMRF = Pacific Missile Range Facility
MAB = Missile Assembly Building
STARS = Strategic Target System

PMRF Installation Boundary

Potential TPS-X Radar Sites

Pacific Missile Range Facility
Kauai, Hawaii

Figure 2.3.1-12
The Cooling Equipment Unit is a closed system, and no emissions of the ethylene glycol solution are planned. However, because of the remote potential for leaks or spills during system hookup, or the possibility of ruptured hoses or accidental disconnection, impermeable ground cover would be in place as was described for the Prime Power Unit.

EMR hazard exclusion areas would be established around the TPS-X radar antenna as shown on figure 2.3.1-8.

2.3.1.5 Vandenberg Air Force Base

Under Alternative 1 Vandenberg AFB would continue to be a launch site for GMD target missiles. The following activities would continue at Vandenberg AFB:

- Launch of single or dual target missiles
- Use of extensive range instrumentation
- Use of TPS-X radar

Vandenberg AFB functions as the test area for space and missile operations, and includes a network of tracking and data-gathering facilities (supplemented by instrumentation on aircraft) throughout California, Hawaii, and the central Pacific. Vandenberg AFB includes a large area of operation and the capabilities to perform a wide range of missile testing. Existing facilities that would be used at Vandenberg AFB are listed in table 2.3.1-6.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Control Center—possible minor modifications</td>
<td>1-2</td>
<td>Building 1974</td>
</tr>
<tr>
<td>Missile Assembly Building—possible minor modifications</td>
<td>1</td>
<td>Building 6816</td>
</tr>
<tr>
<td>Missile Storage Facility—possible minor modifications</td>
<td>1</td>
<td>Existing Bunker</td>
</tr>
<tr>
<td>Maintenance and Storage Facility—possible minor modifications</td>
<td>1</td>
<td>Building 6816</td>
</tr>
<tr>
<td>Target Launch Silos—possible minor modifications</td>
<td>2</td>
<td>Launch Facility- (LF-) 6 and LF-3</td>
</tr>
<tr>
<td>TPS-X Radar—Transportable Unit</td>
<td>1</td>
<td>Located at Area 460 Site</td>
</tr>
</tbody>
</table>

Note: If LF-3 is used to support an initial defensive operations capability, then an additional silo would need to be identified to support a dual target launch. At such time as dual launch requirements are defined, additional environmental planning would be carried out as required.

2.3.1.5.1 Target Launch

Target missiles are currently launched from Launch Facility (LF) -6 and LF-3 in support of the GMD program (see section 2.3.2.1.2). Building 6816 would continue to be used for missile assembly and maintenance and storage. A dual launch capability would require minor interior modifications to some existing facilities.
2.3.1.6 Pearl Harbor, Hawaii

Pearl Harbor is a potential PSB location for the SBX. Pier Victor 3, located on the southeast tip of Pearl City Peninsula, has been identified by the U.S. Navy as the most likely area to support potential SBX activities. The pier is 135 meters (442 feet) long. It is currently supplied with potable water. Prior to November 2002, two types of jet fuel (which could be converted to supply marine diesel oil) were supplied to the pier. Additional work would be required to reestablish fuel service. Power lines run near the pier, allowing for relatively easy modifications to provide the platform with power. Structural augmentation would likely be required to support mooring and material handling operations. The pier is relatively secluded, and it would provide limited access and good security. New warehouses and administrative facilities in the same fenced compound as Pier Victor 3 could be constructed for SBX use. An alternative would be to lease existing administrative/warehouse facilities at an off-base location. If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. A resupply ship would service the SBX, and personnel would be ferried to the SBX each day either by watercraft or helicopter. If an alternate mooring location is identified for Pearl Harbor, additional environmental planning would be performed.

2.3.1.7 Naval Base Ventura County Port Hueneme (California)

NBVC Port Hueneme is a potential PSB location for the SBX. It is located 97 kilometers (60 miles) northwest of Los Angeles and 80 kilometers (50 miles) south of Santa Barbara. The base itself covers more than 647 hectares (1,600 acres). Warehouse and administrative space is available for lease. An alternative would be to lease existing admin/warehouse facilities at an off-base location. The actual port is neither wide enough nor deep enough to allow the SBX to have pier-side operations. However, San Nicolas Island, located approximately 97 kilometers (60 miles) offshore (figure 2.3.1-14), provides an excellent mooring location. Situated within the Navy’s 93,240-square-kilometer (36,000-square-mile) sea test range, San Nicolas Island would also provide a large area of controlled air and sea space for SBX operations while in port. Mooring would probably be on the leeward side of the island, which is on the south/southeast side. Water depths there allow for mooring approximately 800 meters (2,625 feet) offshore. There is a fuel mooring site and undersea pipeline at San Nicolas Island that could support refueling operations. Naval Air Warfare Center, Weapons Division (NAWCWD) controls all air and sea area within the sea range as well as RF management. Both flights and commercial shipping either into or out of Los Angeles pass north or south of the sea test range unless permission is granted by NBVC officials. Flights out of Los Angeles pass either north or south of the sea test range.

San Nicolas Island has a 3,048-meter (10,000-foot) runway and its own power plant. San Nicolas Island is also fully integrated via fiber optics with NBVC Port Hueneme. Construction of a new pier on the island will be completed within 18 months. This pier would not support SBX pier-side operations, but would support ship-to-shore supply operations. Radar emitting at the mooring site is not anticipated to present any conflicts with current operations. Emission fans would be required to work around personnel and contractors living and working on the island, and the sensitive wildlife species found there.
Pearl Harbor Potential SBX Mooring Area

Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Source: State of Hawaii GIS Data Clearing House, 2002 (modified)

GMD ETR Final EIS

Figure 2.3.1-13
INDEX MAP

San Nicolas Island
Potential SBX Mooring Area

Source: Census 2000 Tiger/Line Data, 2002 (modified).

EXPLANATION

Potential Interference Distances
- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Scale

0 12.5 25 kilometers

NORTH

0 8 16 miles

Port Hueneme, California

Figure 2.3.1-14

GMD ETR Final EIS

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2.3.1.8 Naval Station Everett (Washington)

Naval Station Everett is a potential PSB location for the SBX. It is homeport for the Abraham Lincoln Carrier Battle Group, which includes a carrier, three frigates, and three destroyers. The base consists of approximately 47 hectares (116 acres). Currently there is excess warehouse and administrative space available that could be used for the SBX. An alternative would be to lease existing administrative and warehouse facilities at an off-base location. The base has several piers to support the carrier battle group. Pier A has a 16-meter (54-foot) depth, which is used for USS Abraham Lincoln. This carrier is out of port approximately 6 months out of the year. The SBX would conduct pier-side operations at either Pier A or the adjacent Pier B. Figure 2.3.1-15 provides a general location of Naval Station Everett and the SBX location. Depths in the harbor would allow the SBX to submerse to operating levels if needed. Naval Station Everett is located relatively close and provides easy access to the Puget Sound main channel.

2.3.1.9 Adak, Alaska

Adak, Alaska, is a potential PSB location for the SBX. Adak is located in the Western Aleutian Islands, approximately 2,092 kilometers (1,300 miles) southwest of Anchorage. A naval base was established on the island when allied forces captured it in 1942. Before its closure in 1996 the population of Adak was about 6,000. The Adak Reuse Corporation is working to develop a community on the island by promoting new business developments. Adak Fisheries Development Council operates a seafood processing and cold storage plant on the island. Currently, there are approximately 250 personnel on Adak. Former government quarters rented out as individual units serve as lodging accommodations for visitors to Adak. The island also has a hotel, a grocery store, and more than 1,000 housing units each with electric, water, sewer, telephone, and cable television. Dining facilities are limited to two restaurants. Adak has two 2,377-meter (7,800-foot) paved runways with advanced navigation and weather systems as well. There are also the remaining facilities that were established as a part of the naval base, including a port. The Adak port facilities are primarily used by research ships, station work vessels, cruise ships, factory trawlers, and fishing boats. The Port of Adak maintains three cargo and petroleum piers. Docks have approximately 9 meters (30 feet) of draft at mean low tide. The proposed mooring location for the SBX would be in Finger Bay, a relatively deep and protected fjord located south of the main port. Figure 2.3.1-16 provides a general location of Port Adak and the potential mooring location at Finger Bay.

2.3.1.10 Valdez, Alaska

The Port of Valdez is a potential PSB location for the SBX. It is located at the upper end of a 19-kilometer (12-mile) inlet in the Northeast part of Prince William Sound. Valdez is accessible by road, sea, and air, primarily through the Richardson Highway, the Port of Valdez, and the Valdez Airport, respectively. Valdez maintains a year-round population of approximately 4,500 residents, with another 800 to 1,000 seasonal residents.

The Port of Valdez is also the terminus of the 1,287-kilometer (800-mile) long Trans-Alaska oil pipeline. Supertankers regularly navigate the Port of Valdez to transport more than 1.5 million barrels per day. The port serves other industries such as commercial fishing, seafood processing plants, and tourist traffic including several cruise ships per year.
Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 5.1 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Source: Census 2000 Tiger/Line Data, 2002 (modified).
EXPLANATION

Potential Interference Distances
- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Port Adak Potential SBX Mooring Area

Adak, Alaska

Figure 2.3.1-16

Source: Census 2000 Tiger/Line Data, 2002 (modified).
The City Dock would not accommodate the SBX and currently cannot accommodate cruise ships. The City of Valdez is working to upgrade the City Dock to accommodate cruise ships. The North Pacific Fuel Dock, next to the City Dock, is deep enough to accommodate the SBX at high tide. Pier-side operations could be carried out for the SBX at the Container Dock where depths exceed 15.2 meters (50 feet). Valdez does not maintain the pier capacity to commit Container Dock pier-space year round for the SBX, which would yield to cruise ships during the tourist season of May through September. However, there are mooring locations near the container dock and across the Port of Valdez near the Alaska Pipeline terminus. Figure 2.3.1-17 shows a general location of the Port of Valdez.

The Container Dock has approximately 8.5 hectares (21 acres) of staging area. This area is one potential location for constructing warehouse and administration space. The “Old Town” area of Valdez, destroyed in the 1964 earthquake, is another possible location for constructing warehouse and administration space.

### 2.3.1.11 Mobile Telemetry and C-Band Radar

As described in section 2.1.5.3, Mobile Telemetry Systems and mobile C-band radar would be required to support the flight testing as a part of the proposed GMD action. Target telemetry requirements include an up-range, mid-range, and down-range telemetry system to support launches. A relatively level area or improved road would be required to site the systems. Intended operations would be to pull the telemetry and radar equipment into a prepared area and utilize a commercial power drop. Generators would provide a backup source of power. Uninterrupted Power Supplies are contained in each unit as an emergency backup if power is lost during a test flight.

### 2.3.1.12 AN/SPY-1 Radar

See section 2.1.5.2.2 for a description of the AN/SPY-1 radar system. The Aegis ship would be positioned at various locations in the Pacific to provide missile tracking support during a GMD test.

### 2.3.1.13 Sea Launch Target

See section 2.1.2.2 for a description of the Sea Launch Target. The MLP would be positioned at various locations in the Pacific to provide target missiles during a GMD test.

### 2.3.1.14 Air Launch Target

See section 2.1.2.2 for a description of the Air Launch Target. The Air Launch Target plane would be positioned at various locations in the Pacific to provide target missiles during a GMD test.

### 2.3.1.15 Cobra Judy

See section 2.1.5.2.2 for a description of the Cobra Judy system. The Cobra Judy ship would be positioned at various locations in the Pacific to provide missile tracking support during a GMD test.
EXPLANATION

- Land
- Water
- Roads
- Potential SBX Mooring Site
- Trans-Alaska Pipeline

Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Port of Valdez
Potential SBX Mooring Area

Valdez, Alaska

Figure 2.3.1-17

GMD ETR Final EIS

Source: Census 2000 Tiger/Line Data, 2002 (modified).
2.3.1.16 Components of the Validation of Operational Concept That Would Also Support GMD ETR Testing

As discussed in section 1.5, the operationally realistic testing of the GMD element directed by MDA is part of the BMDS Test Bed and consists of ground testing to validate the GMD operational concept, and robust flight testing to validate the GMD components. The GMD ETR has several activities and facilities in common with the Validation of Operational Concept testing, including:

- Cobra Dane Radar at Eareckson Air Station, Alaska
- Early Warning Radar at Beale AFB, California
- GFC Nodes at Peterson AFB, Colorado; Schriever AFB, Colorado; Cheyenne Mountain Complex, Colorado; Beale AFB, California; Eareckson Air Station, Alaska; Fort Greely, Alaska; and Boeing facilities in California and Alabama

2.3.2 ALTERNATIVE 2

Alternative 2 would be similar to Alternative 1 with the exception that GBI launches would be from Vandenberg AFB and RTS instead of KLC and RTS. The GBI launch would require construction of an IDT and modifications of existing support facilities at Vandenberg AFB. The existing TPS-X radar at Vandenberg AFB would be utilized. The other components described in Alternative 1 would remain the same.

2.3.2.1 Vandenberg Air Force Base

Under Alternative 2, Vandenberg AFB would continue to be a launch site for GMD target missiles and would support single and dual GBI launches. The following activities would occur at Vandenberg AFB:

- Single and dual launch of target missiles
- Single and dual launch of GBI missiles
- Construction and operation of a fixed or relocatable IDT
- Use of the existing TPS-X radar
- Use of existing range instrumentation

2.3.2.1.1 Target Launch

The facilities required to support target missile launches are described in section 2.3.1.5.

2.3.2.1.2 Ground-Based Interceptor Launch

The following facilities located on Vandenberg AFB may be required for the GBI tests: two silos (to be chosen among silos LF-2, LF-3, LF-10, LF-21, LF-23, and LF-24); Buildings 975, 976, 1032, 1768, 1777, 1801, 1819, 1871, 1900, 1959, 1970, 1978, 6510, 6819, 7000, and 8500, as shown on figure 2.3.2-1 and listed in table 2.3.2-1. Many of these facilities have been used to support GBI booster verification tests and as such would require only minor interior modifications to support continued GMD testing.
Proposed Ground-Based Midcourse Defense Facilities

Vandenberg Air Force Base, California

Figure 2.3.2-1

Source: Vandenberg Air Force Base, 2002a (modified).

EXPLANATION

- Pacific Ocean
- Vandenberg Air Force Base
- Land
- Target Launch Site
- GBI Launch Site
- IDT Candidate Sites
- Existing TPS-X Radar Site

Scale

<table>
<thead>
<tr>
<th>0</th>
<th>2.92</th>
<th>5.84 kilometers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.82</td>
<td>3.63 miles</td>
</tr>
</tbody>
</table>

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Table 2.3.2-1: Alternative 2 Existing Facilities Proposed for Ground-Based Midcourse Defense at Vandenberg Air Force Base, California

<table>
<thead>
<tr>
<th>Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative space (office space)</td>
<td>1</td>
<td>Locations within Buildings 1959, 6510, 1801, 1900, and 8500</td>
</tr>
<tr>
<td>Launch Control Center—possible modifications</td>
<td>2</td>
<td>Building 1768 and Building 1801</td>
</tr>
<tr>
<td>Missile Assembly and GBI Integration and checkout—possible modifications</td>
<td>1</td>
<td>Buildings 1819, 1900, and 1032</td>
</tr>
<tr>
<td>Missile Fuel Storage</td>
<td>1</td>
<td>Building 976 (This would be requested as a service)</td>
</tr>
<tr>
<td>Oxidizer Storage</td>
<td>1</td>
<td>Building 975 (This would be requested as a service)</td>
</tr>
<tr>
<td>Missile Storage Facility—possible minor modifications</td>
<td>1</td>
<td>Building 6819</td>
</tr>
<tr>
<td>Maintenance and Storage—possible minor modifications</td>
<td>1</td>
<td>Buildings 1777, 1959, and 1801</td>
</tr>
<tr>
<td>Support Equipment Storage</td>
<td>1</td>
<td>Building 1970</td>
</tr>
<tr>
<td>Target Launch Silos—possible minor modifications</td>
<td>2</td>
<td>LF-6 and LF-3</td>
</tr>
<tr>
<td>GBI Launch Silo alternatives</td>
<td>2</td>
<td>LF-02, LF-03, LF-10, LF-21, LF-23, and LF-24</td>
</tr>
<tr>
<td>Security Response Force Outpost</td>
<td>1</td>
<td>Located in vicinity of Launch Facilities</td>
</tr>
<tr>
<td>TPS-X Radar—Transportable Unit</td>
<td>1</td>
<td>Located at Area 460 Site</td>
</tr>
</tbody>
</table>

Note: If LF-03 is used as a GBI silo, then an additional silo would need to be identified to support a dual target launch. At such time as dual launch requirements are defined, additional environmental planning would be carried out as required.

Buildings 1032, 1819, and 1900 may be used for missile assembly and interceptor integration and checkout before launch, and storage of testing and checkout equipment for the GBI missile. They may require facility modifications such as hazardous material detection, alarm, and ventilation to accommodate the EKV processing operations. Building 1900 could be used for missile transporter storage; Buildings 1777, 1801, and 1959 could be used for maintenance and storage. Building 6819 is an existing explosive storage facility that would be used for missile storage. Building 1970 would be used as a storage facility for supporting equipment.

Storage facilities for EKV tanks with small quantities (7.5 liters [2 gallons] or less each) of fuel and oxidizer would be Building 975 for the oxidizer and Building 976 for the fuel.

Buildings 1768 and 1801 could be used as the Launch Control Center for the GBI tests. Modifications inside the buildings would be required.

Buildings 1801, 1900, 1959, 6510, and 8500 would be used for administrative space. Most facilities would require minor modifications. However, Building 1801 would require fairly extensive interior modifications, and the facility has the potential to encounter lead-based paint and asbestos.
LF-21 and LF-23 are currently used for GMD Booster Verification testing. LF-02 is an active silo currently used by the Peacekeeper missile program. LF-03 is an active silo currently used as an MDA target missile silo. LF-10 is an active silo currently used by the Minuteman III missile program. LF-24 is an inactive Minuteman II silo.

Site preparations and modifications were made to LF-21 in order to utilize it for Booster Verification test flights. These modifications were analyzed in the Booster Verification Tests EA (1999). Refurbishments have also been made to LF-23 in order for it to be utilized for GBI launches. These refurbishments were made for the Alternate Boost Vehicle test program and have been previously analyzed under the Alternate Boost Vehicle Verification Tests EA (2002).

Some level of modifications and site preparation could be required at each of the remaining LFs included in the Proposed Action. The proposed launch sites would each include the launch silo, equipment located above ground and within existing below-ground locations, the existing silo access roadways, site utility distribution, and any auxiliary mechanical support equipment. Site preparation could include modifying the existing silo(s) to receive a new prefabricated launch station that would accommodate the installation of the GBI. A “headworks” consisting of a foundation and silo top block would provide an interface for insertion and removal of the GBI. An operational launch silo closure mechanism would be installed at each LF.

All construction staging areas would be located on paved or previously disturbed graded areas. The GMD program would perform sampling and abatement for lead-based paint, asbestos, and polychlorinated biphenyls (PCBs) as required before modification, using Vandenberg AFB-approved procedures. If any of the modifications require the removal of these hazardous wastes, they would be properly disposed of in accordance with work plans developed by GMD personnel and approved by Vandenberg AFB 30th Civil Engineering Squadron/Environmental Management Flight (30 CES/CEV).

**In-Flight Interceptor Communication System Data Terminal**

As described in section 2.1.3, the IDT at Vandenberg AFB could be a fixed land-based unit, a relocatable unit, or a sea-based unit. A fixed IDT would be contained in a building that is approximately 30.7 meters by 11.6 meters (101 feet by 38 feet) and would have a 5.5-meter (18-foot) diameter radome mounted on one end of the building (figure 2.1.3-1). The radome, which covers the antenna, would be inflatable. An external aboveground fuel tank would be located near the building. The mission backup power generator would be located adjacent to the IDT. This generator would be rated at 300 kW and would be housed in a 3.4- by 1.5-meter (11- by 5-foot) wide enclosure. An additional modular facility (or facilities) would be temporarily installed within approximately 30 meters (100 feet) of the IDT. This modular facility would be used to provide spare components and repair parts storage and workspace for technicians. There could be an environmentally protected entrance between the IDT and the modular facility. The modular facility would require communications and utility hookups including local commercial power. Interior water tanks and chemical toilets, inside the modular facility, would be frequently serviced and negate the need for water utility pipes and a septic tank system. The estimated size for these facilities would be approximately 186 to 465 square meters (2,000 to 5,000 square feet). Up to 10 technicians would observe, operate, test, and maintain this facility.
The IDT site would disturb approximately 5.9 hectares (14.6 acres), and include a fenced area of approximately 3.2 hectares (8.0 acres). One IDT site would be selected from the alternative IDT locations shown on figure 2.3.2-1 and listed in table 2.3.2-2. Either a fixed or relocatable IDT could be located at the selected site on Vandenberg AFB. Once the IDT site is selected, the layout would be finalized with installation personnel including 30 CES/CEV. Construction of the IDT would require approximately 35 personnel for a period of 6 months.

<table>
<thead>
<tr>
<th>Location</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAVE STARE Site</td>
<td>Power and communications on site, existing concrete foundation, existing security fence and light poles</td>
</tr>
<tr>
<td>Doppler Station Site</td>
<td>Power and communications on site, existing concrete base</td>
</tr>
<tr>
<td>TALO Road Site</td>
<td>Power and communications within approximately 400 meters (1,312 feet) but capacity may be limited; munitions storage and endangered plants nearby</td>
</tr>
<tr>
<td>Tracking Station East Site</td>
<td>Power and communications within approximately 120 meters (394 feet), approximately 50 meters (164 feet) of road construction required</td>
</tr>
<tr>
<td>Borrow Pit Site</td>
<td>Power and communications within approximately 500 meters (1,640 feet) (along road)</td>
</tr>
<tr>
<td>Titan Pasture</td>
<td>Power and communications within 850 meters (2,789 feet) (along road), approximately 50 meters (164 feet) road construction required</td>
</tr>
</tbody>
</table>

The relocatable IDT would essentially be a modular design with a radome similar to the fixed IDT. Operational requirements would be similar to those of the fixed IDT, including a stable foundation, electricity, communications, utilities, security, lighting, and monitoring systems.

Operations and security requirements would be as described in section 2.1.3.

Communications Cable

For communication among the components at Vandenberg AFB, the ETR would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits, which would be placed in routes designed to avoid environmental impacts and approved by 30 CES/CEV. Trenching for the new communications cable/conduit would have a maximum depth of 0.91 meter (3 feet). Slant/directional drilling is also being proposed as a means of minimizing impacts to the environment if required. Also, the new communications cable/conduit would be buried along existing roads, if possible.

If previously undocumented cultural resource items are discovered during excavation, grading, or other ground-disturbing activities, work would immediately cease. In addition, work would be temporarily suspended within 30 meters (100 feet) of the discovered item until it has been properly evaluated and secured. Any discovery of previously unidentified cultural resources would be reported to the Vandenberg Base Historic Preservation Officer.
Reuse of LF-2, LF-3, or LF-10 would require consultation with the California State Historic Preservation Officer and potential mitigation. Alteration or reuse of any other National Register-eligible Cold War-era facilities would be included in the required consultation.

2.3.2.1.3 Launch Complex Security

When interceptor testing occurs, it would be on a periodic basis. It is assumed that testing would be on a campaign basis, and the security for these tests would be on a similar basis. It is estimated that the potential security impacts would occur for several weeks for each campaign.

GBI security force personnel would support each campaign. A Security Response Force Outpost would be established in the vicinity of the launch facilities and would be coordinated with Vandenberg security personnel. The installation of additional facility-mounted exterior lighting and chain link security fencing could be required.

Additional physical protection features may be constructed or placed to protect GMD assets. These may include, but are not limited to, fences, security lighting, bollards, tapered concrete barriers or similar devices, ditching and/or earth mounds, patrol roads, and observation tower(s).

Estimates are for several security vehicles to be used. During the operational day, vehicles would be on patrol. At night, additional vehicles would be used as needed. Normal patrols would be confined to existing roads. There would be occasions when these vehicles could be expected to go off-road.

2.3.2.2 Kodiak Launch Complex

The proposed actions at KLC under Alternative 2 are identical to those described under Alternative 1 for Target missiles. No GBI launches or silo, IDT, or COMSATCOM construction would occur at KLC under Alternative 2. Tables 2.3.2-3 through 2.3.2-5 list existing and proposed facilities for Alternative 2 at KLC.

2.3.2.3 Midway

The proposed actions at Midway under Alternative 2 are identical to those described under Alternative 1. See section 2.3.1.2 for a description of construction and operations of IDT at Midway. Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

2.3.2.4 Reagan Test Site

The proposed actions at RTS under Alternative 2 are identical to those described under Alternative 1. See section 2.3.1.3 for a description of dual GBI launches and the SBX PSB at RTS.
2.3.2.5 Pacific Missile Range Facility

The proposed actions at PMRF under Alternative 2 are identical to those described under Alternative 1. See section 2.3.1.4 for a description of single target launches and potential operating areas for TPS-X at PMRF.

Table 2.3.2-3: Alternative 2 Existing Facilities to be Used for Ground-Based Midcourse Defense at Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Existing Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch Control Center—minor modifications possible</td>
<td>1</td>
<td>53.3 meters (175 feet) long, 24.4 meters (80 feet) wide, and 12.2 meters (40 feet) high; 100-person occupancy during launches</td>
</tr>
<tr>
<td>Payload Processing Facility—potential minor modifications</td>
<td>1</td>
<td>Includes a high bay and a processing bay</td>
</tr>
<tr>
<td>Spacecraft Assembly and Transfer Building—no modifications</td>
<td>1</td>
<td>An environmentally conditioned mobile structure used to transfer the launch vehicle stages from the Integration and Processing Facility to Launch Pad 1</td>
</tr>
<tr>
<td>Integration and Processing Facility—no major modifications</td>
<td>1</td>
<td>Includes a clean room high bay</td>
</tr>
<tr>
<td>Target Launch Pad and Launch Service Structure (LSS)—minor modifications to the LSS</td>
<td>1</td>
<td>Launch Pad 1 consists of the pad and apron, a flame duct, launch equipment vault, and an LSS; the LSS allows for environmental protection and access to the launch vehicle for final assembly and check out in the vertical position.</td>
</tr>
<tr>
<td>Planned Maintenance and Storage Facility</td>
<td>1</td>
<td>Planned AADC maintenance and storage facility to be completed in early 2003</td>
</tr>
<tr>
<td>COMSATCOM—no modifications</td>
<td>1</td>
<td>Existing satellite communications facility</td>
</tr>
<tr>
<td>Hypergolic Fuel Storage Facility—no modifications</td>
<td>1</td>
<td>Storage of liquid fuel</td>
</tr>
<tr>
<td>Construction Laydown Areas—no modifications</td>
<td>2</td>
<td>Previously disturbed areas for construction equipment</td>
</tr>
</tbody>
</table>

Table 2.3.2-4: Alternative 2 Proposed New Facilities for Ground-Based Midcourse Defense at Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Proposed Facility</th>
<th>Quantity</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile Assembly Building</td>
<td>1</td>
<td>Approximately 15 meters (50 feet) wide, 30 meters (100 feet) long, and 18 meters (60 feet) high</td>
</tr>
<tr>
<td>Movable Missile Building</td>
<td>1</td>
<td>Approximately 12 meters (40 feet) wide, 21 meters (70 feet) long, and 33.5 meters (110 feet) high, and it would have doors at both ends of the structure</td>
</tr>
<tr>
<td>Missile Storage Facility and access road</td>
<td>1</td>
<td>Approximately 30.5 meters (100 feet) wide, by 38.1 meters (125 feet) long, by 5.5 meters (18 feet) high</td>
</tr>
<tr>
<td>New Target Launch Pad</td>
<td>1</td>
<td>Approximately 53.3 meters (175 feet) by 53.3 meters (175 feet)</td>
</tr>
<tr>
<td>Mancamp</td>
<td>1</td>
<td>Approximately 50 meters (164 feet) wide, 90 meters (295 feet) long, and 10 meters (35 feet) high, with the capacity to house approximately 60 personnel</td>
</tr>
<tr>
<td>Addition to existing Narrow Cape Lodge</td>
<td>1</td>
<td>Approximately same size as proposed mancamp</td>
</tr>
</tbody>
</table>
Table 2.3.2-5: Alternative 2 Potential Ground Disturbance for Ground-Based Midcourse Defense at Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Primary Component</th>
<th>Hectares (Acres)</th>
<th>Associated Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Associated Construction</td>
<td>10.5 (26.0)</td>
<td>Target access roads, target launch pad, Movable Missile Building, Missile Assembly Building, Motor Storage Building and access road, existing lodge expansion, mancamp</td>
</tr>
<tr>
<td>Mobile Telemetry/Mobile C-Band Radar</td>
<td>0.6 (1.4)</td>
<td>Gravel pad</td>
</tr>
</tbody>
</table>

2.3.2.6 Pearl Harbor, Hawaii
See section 2.3.1.6 for a description of the SBX PSB at Pearl Harbor, Hawaii.

2.3.2.7 Naval Base Ventura County Port Hueneme, California
See section 2.3.1.7 for a description of the SBX PSB at NBVC Port Hueneme, California.

2.3.2.8 Naval Station Everett, Washington
See section 2.3.1.8 for a description of the SBX PSB at Naval Station Everett, Washington.

2.3.2.9 Adak, Alaska
See section 2.3.1.9 for a description of the SBX PSB at Adak, Alaska.

2.3.2.10 Valdez, Alaska
See section 2.3.1.10 for a description of the SBX PSB at Valdez, Alaska.

2.3.2.11 Mobile Telemetry and C-Band Radar
See section 2.3.1.11 for a description of mobile telemetry and C-band radar usage to support GMD ETR tests. The mobile telemetry and C-band radar would be positioned at various locations to provide missile tracking support during a GMD test.

2.3.2.12 AN/SPY-1 Radar
See section 2.1.5.2.2 for a description of the AN/SPY-1 radar system. The Aegis ship would be positioned at various locations in the Pacific to provide missile tracking support during a GMD test.

2.3.2.13 Sea Launch Target
See section 2.1.2.2 for a description of the Sea Launch Target. The MLP would be positioned at various locations in the Pacific to provide target missiles during a GMD test.
2.3.2.14 Air Launch
See section 2.1.2.2 for a description of the Air Launch Target. The Air Launch Target plane would be positioned at various locations in the Pacific to provide target missiles during a GMD test.

2.3.2.15 Cobra Judy
See section 2.1.5.2.2 for a description of the Cobra Judy system. The Cobra Judy ship would be positioned at various locations in the Pacific to provide missile tracking support during a GMD test.

2.3.2.16 Components of the Validation of Operational Concept that Would Also Support GMD ETR Testing
The proposed actions addressed in the Validation of Operational Concept EA under Alternative 2 are identical to those described under Alternative 1. See section 2.3.1.16 for a list of facilities and activities that are a part of ETR flight testing that have been analyzed in the Validation of Operational Concept EA.

2.3.3 ALTERNATIVE 3—COMBINATION OF ALTERNATIVES 1 AND 2
Alternative 3 would include activities proposed for Alternatives 1 and 2. This would include GBI launches from KLC, RTS, and Vandenberg AFB, and construction of the required support facilities for dual launches of GBI and target missiles at each location. At KLC Alternative 3 is the same as Alternative 1.

2.4 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD
As a logical progression leading to the construction of the GMD ETR components, and as an integral part of the NEPA process, a siting study, including the identification of and evaluation of alternative candidate locations, was conducted. Components of the GMD ETR element were evaluated in accordance with the methodology presented in the Ballistic Missile Defense Organization Directive No. 6051, Comprehensive Siting Analysis Process. The process consists of several phases: identification of the performance region, Area Narrowing, and Location Evaluation. Exclusionary and evaluative criteria are defined and applied to discriminate among potential candidate locations and sites, and to measure the relative suitability of each to support component operation and sustainment.

The following sections summarize the results of the GMD ETR Siting Study regarding locations that were considered for GMD ETR components but were not carried forward for analysis.

2.4.1 GBI LAUNCH LOCATION ALTERNATIVES
Johnson Atoll, PMRF, and Wake Island were candidate GBI locations that were considered but not carried forward. Johnson Atoll was eliminated because it does not have a functionally similar mission due to the recent transfer of the atoll back to the USFWS. PMRF was not carried forward as a GBI launch location due to its location in line with the other two primary launch locations, Vandenberg AFB and RTS. Due to the flight geometries, a GBI launch site at PMRF would not meet the ETR test objectives. Wake Island was evaluated as a subset of RTS. Due to the proximity of Wake Island and Meck Island in the overall ETR, only one of the sites
could be used. Wake Island was not selected because the facilities at Meck Island are far superior to the facilities at Wake Island.

2.4.2 TARGET LAUNCH LOCATION ALTERNATIVES

Johnson Atoll and Wake Island are the only candidate target locations that were not carried forward. As discussed for the GBI, Johnson was eliminated because it does not have a functionally similar mission due to the recent transfer of the atoll back to the USFWS. Wake Island does not provide additional trajectory options when compared to RTS and lacks the instrumentation available at RTS.

2.4.3 IDT LOCATION ALTERNATIVES

2.4.3.1 Remote Land-Based IDT

The remote IDT Performance Region is located in the middle of the Pacific Ocean. Kure and Midway Atoll (Eastern, Sand, and Spit Islands) were evaluated as candidate locations for the Land-based IDT within the Mid-Pacific performance region. Kure Atoll, Eastern Island, and Spit Island were not carried forward due to insufficient acreage and lack of available infrastructure.

Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT onboard the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

2.4.4 SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE ALTERNATIVES

The SBX has three candidate performance regions (figure 2.1.4-3). Using the three Performance regions, potential locations for a PSB were identified from one of three geographic areas located within a 2,667-kilometer (1,440-nautical-mile) distance of each performance region. The three areas include southwest Alaska, the U.S. West Coast, and the south/middle Pacific. A minimum of two potential locations in each of the geographic areas were evaluated as PSB Alternatives.

In the southwest Alaska area, Port of Anchorage and Port of Seward did not meet the Mission Compatibility criteria that a PSB location must be capable of supporting storage and transfer of supplies for large-scale commercial shipping activities. The harbor must currently maintain infrastructure to berth and support an offshore supply vessel requiring at least a 24.4-meter (80-foot) pier. Additionally, the location cannot have current or planned activities that would conflict with GMD requirements either at pierside or offshore mooring location.

In the U.S. West Coast area, Naval Magazine Indian Island, Detachment Concord, Naval Submarine Base San Diego, and Naval Weapons Station San Diego, California; and Naval Submarine Base Bangor and Puget Sound Naval Shipyard, Washington, did not meet the Mission Compatibility criteria.
In the south/middle Pacific area, Johnson Atoll, Kaneohe Bay, Hawaii, and Wake Island did not meet the Mission Compatibility criteria. Midway Atoll did not meet the Ownership criteria that the PSB facility shall be located on U.S. DoD land not dedicated toward special-use purposes, or historical sites, etc., or set aside for purposes which are incompatible with the proposed GMD usage.

Based on the application of evaluative criteria, a preliminary rank-order list of 11 sites was developed.

The decision was made to carry forward the top ranked sites, but not more than two sites per area. Sites carried forward in the ETR EIS include:

- Alaska: Port Adak, Alaska and Port of Valdez, Alaska
- U.S. West Coast: Naval Station Everett, Washington and NBVC Port Hueneme, California
- South/Middle Pacific: Naval Station Pearl Harbor, Hawaii and RTS, Kwajalein Atoll

Locations not carried forward for further analysis included Naval Station San Diego and Naval Station North Island, California; Dutch Harbor and U.S. Coast Guard Station Kodiak, Alaska; and Naval Station Bremerton, Washington.

A supplemental SBX siting study is underway to support the initial defensive operations capability mentioned in section 1.2. Because the SBX operations at the PSB in support of initial defensive operations would be identical to those in support of the ETR, the supplemental siting study will start with the six PSB locations identified for the ETR. The application of additional evaluative criteria related to initial defensive operations will be applied to determine the final rank order of the six candidate PSBs. This ranking is likely to be different than the preliminary rank order of the 11 sites.

2.4.5 MOBILE TELEMETRY AND MOBILE C-BAND RADAR LOCATION ALTERNATIVES

Locations evaluated as potential sites for mobile telemetry and mobile C-band radar but not carried forward for further analysis included Soldotna, Kenai, King Cove, Sand Point, Seldovia, Cold Bay, Dillingham, Sitka, Juneau, and Chignik, Alaska. The lack of sufficient parcel size, supportability, commercial power, and line of sight requirements made these sites unsuitable for the placement of mobile telemetry and mobile C-band radar.
3.0 AFFECTED ENVIRONMENT

This chapter describes the environmental characteristics that may be affected by the Proposed and Alternative Actions. The information provided serves as a baseline from which to identify and evaluate environmental changes resulting from construction and operation required for the GMD ETR program. To provide a baseline point of reference for understanding any potential impacts, the affected environment is briefly described; any components of greater concern are described in greater detail.

Available reference materials, including EAs, EISs, environmental baselines, monitoring reports, and base master plans, were reviewed. To fill data gaps (questions that could not be answered from the literature) and to verify and update available information, installation and facility personnel; federal, state, and local regulatory agencies; and private individuals were contacted.

Environmental Resources
The affected environment is discussed in terms of 14 resource areas: air quality, airspace, biological resources, cultural resources, geology and soils, hazardous materials and hazardous waste, health and safety, land use, noise, socioeconomics, transportation, utilities, visual and aesthetic resources, and water resources. In addition, subsistence resources are discussed for potential Alaska sites. Each resource area is discussed at each location as applicable. Environmental justice is discussed separately in section 3.12.

Existing Related Environmental Documentation
The FAA prepared an EA in 1996 for the construction and operation of KLC, which supported the licensing of the complex for commercial operations (Federal Aviation Administration, 1996). The U.S. Air Force prepared an EA in 1997 that proposed launching two sub-orbital test vehicles (the atmospheric interceptor technology [ait] program) on a southeasterly course from KLC (U.S. Department of the Air Force, 1997a). The U.S. Air Force also prepared an EA in 2001 that proposed launching one Quick Reaction Launch Vehicle (QRLV) per year beginning in 2001 and ending in 2008 (U.S. Department of the Air Force, 2001). The U.S. Army Space and Missile Defense Command prepared an EA in 2001 that proposed launching the Strategic Target System from KLC and PMRF (U.S. Army Space and Missile Defense Command, 2001b). These documents discuss the existing affected environment on Kodiak Island in detail and are incorporated into this document by reference.

Several NEPA documents have been prepared for activities on Midway, including the EA for the Proposed Refuge Logistics and Operations Support and Public Use Program at Midway Atoll National Wildlife Refuge, 1996, and the 1997 Public Use Plan for Midway Atoll National Wildlife Refuge. These documents discuss the affected environment in detail and are incorporated by reference.

The existing environment at RTS was described in the Final Supplemental EIS for Proposed Actions at USAKA (U.S. Army Space and Strategic Defense Command, 1993a). This document discusses the affected environment in detail and is incorporated by reference.
The existing environment at PMRF was described in the *Pacific Missile Range Facility Enhanced Capability Environmental Impact Statement* (Pacific Missile Range Facility, Barking Sands, 1998) and the *North Pacific Targets Program Environmental Assessment* (U.S. Army Space and Missile Defense Command, 2001b). These documents discuss the affected environment in detail and are incorporated by reference.


The documents mentioned above, and other related environmental documents, are summarized in appendix A. The following sections summarize applicable data from the documents mentioned above. Information from other sources of data is specifically referenced.

### 3.1 KODIAK LAUNCH COMPLEX

The existing environment at KLC was described in the *Environmental Assessment of the Kodiak Launch Complex* (Federal Aviation Administration, 1996), the *Final Environmental Assessment for U.S. Air Force Quick Reaction Launch Vehicle Program* (U.S. Department of the Air Force, 2001), the *Final Environmental Assessment for the North Pacific Targets Program* (U.S. Army Space and Missile Defense Command, 2001b), and the *Environmental Assessment for the U.S. Air Force Atmospheric Interceptor Technology Program* (U.S. Department of the Air Force, 1997a). For the most part, those descriptions are still accurate and are not repeated in this document. Rather, for resources that may be affected by ETR activities at KLC, the pertinent resource discussions are summarized and any differences in existing environmental conditions, including new facilities or infrastructure, are noted. The more detailed discussion in the Final EAs are incorporated by reference and will be made available for review by those who wish for more information concerning the existing environment at KLC.

#### 3.1.1 AIR QUALITY—KODIAK LAUNCH COMPLEX

Appendix B includes a definition of air quality and the main regulations and laws that govern its protection.

##### 3.1.1.1 Region of Influence

Identifying the region of influence (ROI) for air quality assessment requires knowledge of the pollutant types, source emission rates and release parameters, the proximity relationships of project emission sources to other emission sources, and local and regional meteorological conditions. For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to an area extending no more than a few kilometers downwind from the source. The prevailing wind direction is from the northwest. The ROI for ozone may extend much further.
downwind than the ROI for inert pollutants; however, as the project area has no heavy industry and very few automobiles, tropospheric ozone and its precursors are not of concern.

The ROI for project operational activities is a circular area with a 5-kilometer (3.1-mile) radius centered on the site of activity. This ROI distance was chosen due to previous analysis in the KLC EA (Federal Aviation Administration, 1996). In that EA the highest concentration of launch emissions was predicted on an uninhabited mountain 5 kilometers (3.1 miles) from the existing launch site. Most activities would be centered at KLC. However, one or two remote telemetry sites would be chosen in Alaska from the sites listed in section 2.1.5.3.

3.1.1.2 Affected Environment

Climate

The climate of Kodiak is characterized as maritime, including short, cool summers and long mild winters. Winter weather tends to last from November to March, with an average daily temperature of -1°C (30°F). Average wind speeds reach 19 kilometers (12 miles) per hour during these winter months. The months of September and October are considered fall, with temperatures between 4°C and 10°C (40°F and 50°F) and winds averaging 16 kilometers (10 miles) per hour. The summer months, June to August, are characterized by average daily highs of 15.6°C (60°F). April and May are regarded as spring months, in which the average monthly temperatures are from 1°C to about 4°C (34°F to about 40°F), and the windspeeds are approximately 19 kilometers (12 miles) per hour.

Surface winds along the coast are much stronger and more persistent than at inland areas. While winds tend to be from the northwest at about 19 kilometers (12 miles) per hour, high winds occur throughout the year. Peak gusts range from 56 kilometers (35 miles) per hour in June to 134 kilometers (83 miles) per hour in December. Typically 1 day of heavy fog occurs per month, with visibility of 0.4 kilometer (0.25 mile) or less. During July, fog averages 3 days per month. (Federal Aviation Administration, 1996) The largest monthly snowfall occurs during December and January, with the maximum snowfalls ranging from 100 to 110 centimeters (40 to 45 inches) per month.

Regional Air Quality

Kodiak Island is classified as a Class II attainment area. It is part of a larger area that is in attainment with the National Ambient Air Quality Standards (NAAQS) (Alaska Legislature, 2002). The island’s climatology includes periods of high winds and overcast skies, which make the island’s atmosphere optimal for dispersion of air pollutants. The atmosphere is classified as neutral (D stability) for this dispersion capability. (Federal Aviation Administration, 1996)

Existing Emission Sources

Wind-blown volcanic dust is the primary air contaminant on the island. Human activities in the vicinity of KLC that would affect background air quality are ranching, occasional vehicular traffic, the occasional operation of two standby generators at the U.S. Coast Guard Loran-C Station, and the periodic use of KLC for vehicle launches.

Backup power at KLC is provided by diesel-driven standby generators located at the Launch Control Center, Payload Processing Facility, and Integration and Processing Facility. All
generators at the complex have block heaters and are contained in heated enclosures. Gas particulate air emissions from launch operations at KLC include the rocket-motor exhaust plume emitted during launch and diesel generator emission. Table 3.1.1-1 lists the estimated emissions generated by the four standby generators at KLC. KLC currently maintains a Preapproved Limit Permit for these generators.

Table 3.1.1-1: Existing Generator Emissions at KLC

<table>
<thead>
<tr>
<th>Emissions (240 hours/year)</th>
<th>Oxides of Nitrogen (metric tons/tons)/year</th>
<th>Hydrogen Chloride (metric tons/tons)/year</th>
<th>Carbon Monoxide (metric tons/tons)/year</th>
<th>PM-10 (metric tons/tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.76 (3.04)</td>
<td>0.37 (0.41)</td>
<td>3.46 (3.81)</td>
<td>0.14 (0.15)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1.1-2 lists the estimated concentration of the principal pollutants in the exhaust products from the Athena-2 (formally known as the Lockheed Martin Launch Vehicle) as presented in the KLC EA (Federal Aviation Administration, 1996). The Athena-2 was selected because it represents the largest class of solid rocket booster that can be flown from KLC.

Table 3.1.1-2: Estimated Rocket Launch Pollutant Emission Concentrations from Athena-2 at KLC

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>U.S. Air Force Standard or Noncriteria Pollutant Guidance Level</th>
<th>Athena-2$^{(1)}$ Launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Chloride</td>
<td>10 ppm</td>
<td>8 ppm</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>150 μg/m$^3$</td>
<td>146 μg/m$^3$</td>
</tr>
</tbody>
</table>

Source: Federal Aviation Administration, 1996.

$^{(1)}$ Castor 120 motor
μg/m$^3$ = micrograms per cubic meter  ppm = parts per million

Under worst-case meteorological conditions, which are estimated to occur 2 percent of the time, the maximum downwind concentrations of hydrogen chloride and aluminum oxide would occur at an uninhabited 610-meter (2,000-foot) high mountain peak and would be within the applicable air quality standards. (Federal Aviation Administration, 1996)

U.S. Air Force Standards are appropriate since the ceiling limit set by the Occupational Safety and Health Administration (OSHA) is for stationary sources (such as inside an industrial plant). However, launches are classified as mobile sources and their emissions are temporary. The standard is based on measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches. (National Research Council, Commission of Life Sciences, Board of Environmental Studies and Toxicology, Committee on Toxicology, Subcommittee on Rocket-Emission Toxicants, 1998)
3.1.2 AIRSPACE—KODIAK LAUNCH COMPLEX

Airspace, or that space which lies above a nation and comes under its jurisdiction, is generally viewed as being unlimited. However, it is a finite resource that can be defined vertically and horizontally, as well as temporally, when describing its use for aviation purposes. The time dimension is a very important factor in airspace management and air traffic control.

Under Public Law (PL) 85-725, *Federal Aviation Act of 1958*, the FAA is charged with the safe and efficient use of our nation’s airspace and has established certain criteria and limits to its use. The method used to provide this service is the National Airspace System. This system is “…a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information and manpower and material.” Appendix B includes a detailed description of airspace.

3.1.2.1 Region of Influence

The ROI for airspace at KLC includes commercial air corridors, and the airspace over and surrounding KLC (figure 3.1.2-1).

3.1.2.2 Affected Environment

Controlled and Uncontrolled Airspace

The closest controlled airspace is approximately 40 kilometers (25 miles) northeast of KLC at the Kodiak Airport. Class C and Class D airspace is in effect at Kodiak Airport. Airspace above KLC up to flight level (FL) 180 is uncontrolled class G airspace. Airspace above FL 180 is controlled airspace. The Anchorage Air Route Traffic Control Center (ARTCC) and the Kodiak Air Traffic Control Tower regulate air traffic in the vicinity of KLC.

Special Use Airspace

KLC coordinates launches with airspace users through the existing airspace coordination protocol among KLC, commercial aircraft carriers, and military aircraft. Launches from KLC do not affect U.S. Air Force training exercises.

En Route Airways and Jet Routes

Commercial air corridors enter and exit Kodiak Airport to and from the west, north, and south. Routes include G2 (J604), G10, R341, B27 (J123), V506, V439, V438, and V357. These corridors are north of the Narrow Cape area, more than 24 kilometers (15 miles) from the launch area to the edge of the V506 Corridor. Although generally north of KLC, orient-bound aircraft use flexible tracks to transition to the North Pacific route system. These routes are generated based on the prevailing jetstream and their position relative to KLC may vary. These routes are not depicted on charts. Current coordination procedures minimize any potential impacts to aircraft on these routes. (Goward, 2002)
Figure 3.1.2-1

Kodiak Launch Complex Airspace

EXPLANATION

- Land
- Water
- Kodiak Launch Complex
- High Altitude Air Routes (J)
- Low Altitude Air Routes (G,B,V)
- Airports

Kodiak Island, Alaska

Scale

0 4.5 9 kilometers

0 2.75 5.5 miles


Port Lions
Trident Basin
Kodiak
Kodiak Island, Alaska

GMD ETR Final EIS
**Airports/Airfields**
Kodiak Airport is the airport closest to KLC. It is located approximately 40 kilometers (25 miles) northeast of the launch site. It is a state operated regional airport that routinely handles daily passenger and cargo jet service and has accommodated C-141 and C-5 military aircraft.

**3.1.3 BIOLOGICAL RESOURCES—KODIAK LAUNCH COMPLEX**
Appendix B includes a definition of biological resources and the main regulations and laws that govern their protection. For this analysis, scientific names are only provided the first time that threatened and endangered species are mentioned in the text, unless required for clarification.

**3.1.3.1 Region of Influence**
The ROI includes areas that may potentially be affected by construction and operation activities. The ROI includes KLC and surrounding areas within a 9.7-kilometer (6-mile) radius of launch pad 1, as determined during original agency consultation in 1996, such as Ugak Island and Narrow Cape, which may be affected by noise, toxic spills, and debris.

**3.1.3.2 Affected Environment**
**Vegetation**
The predominant vegetation types covering KLC include hairgrass-mixed forb (broad leaved herbs) and open willow-hairgrass-mixed forb meadow, shrublands, wetlands, and intermittent stands of spruce (figure 3.1.3-1) (Alaska Aerospace Development Corporation, 1995b). Some of the most common plants are hairgrass, meadow fescue, alder, willow, and Sitka spruce. The vegetation community structure of the Narrow Cape region has been affected by grazing from farmed cattle, bison, and horses (Alaska Aerospace Development Corporation, 1995b).

*Threatened and Endangered Plant Species*
No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**
The KLC site provides habitat for about 143 species of birds. Typical birds found in the area include loons, grebes, harlequin ducks, kingfishers, chickadees, juncos, sparrows, and terns.

Seabird colonies and nesting areas in the vicinity of KLC are shown in figure 3.1.3-2. The seabird colony closest to the KLC site, believed to be an Arctic and Aleutian tern colony, is approximately 3 to 5 kilometers (2 to 3 miles) north of the launch pad. This colony was not active during a 1994 survey, and has not been active since (Cuccarese, 2002). Ugak Pass is attractive to marine birds year-round due to its shallow waters and abundant fish and invertebrates.
Map of Major Vegetation Types and Wetlands in the Vicinity of Narrow Cape

Kodiak Launch Complex, Alaska

Figure 3.1.3-1


EXPLANATION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Closed Sitka Spruce Forest</td>
</tr>
<tr>
<td>2</td>
<td>Open Sitka Spruce Forest</td>
</tr>
<tr>
<td>3</td>
<td>Closed Alder Shrubland</td>
</tr>
<tr>
<td>4</td>
<td>Closed Mixed Alder/Willow Shrubland</td>
</tr>
<tr>
<td>5</td>
<td>Low Shrub-Forb Meadow</td>
</tr>
<tr>
<td>6</td>
<td>Open Willow-Hairgrass-Mixed Forb Meadow</td>
</tr>
<tr>
<td>7</td>
<td>Mixed Dwarf Shrub-Graminoid Meadow</td>
</tr>
<tr>
<td>8</td>
<td>Hairgrass-Mixed Forb Meadow</td>
</tr>
<tr>
<td>9</td>
<td>Lupine Meadow</td>
</tr>
<tr>
<td>10</td>
<td>Disturbed</td>
</tr>
<tr>
<td>101</td>
<td>Permanently flooded bodies of water</td>
</tr>
<tr>
<td>102</td>
<td>Permanently flooded waterbodies with rooted vascular aquatic vegetation</td>
</tr>
<tr>
<td>103</td>
<td>Semipermanently flooded areas, less than 30 percent cover of vegetation</td>
</tr>
<tr>
<td>104</td>
<td>Saturated, emergent sedge-forb or sedge-forb-moss meadows</td>
</tr>
<tr>
<td>105</td>
<td>Semipermanently flooded emergent sedge marshes</td>
</tr>
<tr>
<td>106</td>
<td>Saturated, tall shrub thickets and graminoid-dwarf shrub-moss</td>
</tr>
<tr>
<td>107</td>
<td>Saturated, shrub meadows and shrub bogs with semipermanently flooded, emergent sedge</td>
</tr>
<tr>
<td>108</td>
<td>Saturated sedge moss</td>
</tr>
<tr>
<td>109</td>
<td>Subtidal, low energy, brackish bodies of open water</td>
</tr>
<tr>
<td>110</td>
<td>Brackish marsh and beach vegetation flooded irregularly by tidal water</td>
</tr>
<tr>
<td>111</td>
<td>Unvegetated beaches</td>
</tr>
<tr>
<td>112</td>
<td>Unvegetated upper beaches and rocky coastlines</td>
</tr>
</tbody>
</table>

United States Coast Guard (USCG)
Integration and Processing Facility (IPF)
Spacecraft Assemblies Transfer (SCAT)
Launch Service System (LSS)
The bald eagle, which is protected by the Bald and Golden Eagle Protection Act, is common throughout the year on Kodiak Island and is often seen in the Narrow Cape area. Aerial surveys were conducted in the spring of 1999, 2000, and 2001 to document bald eagle nesting activities at KLC. One active nest was observed at Narrow Cape and one at Lone Point, 8 kilometers (5 miles) north of Narrow Cape. Nine bald eagles were observed in 2000, with the same two nests appearing active. Twelve bald eagles were observed in 2002, with indications of possibly three active nests (Narrow Cape and Lone Point, and Bird Point, which is approximately 3 kilometers [2 miles] north of Narrow Cape). (Alaska Aerospace Development Corporation, 2002b)

Little brown bat, tundra vole, red fox, brown bear, short-tailed weasel, and river otter are common terrestrial mammals found at KLC. Snowshoe hare, red squirrel, muskrat, beaver, Sitka black-tailed deer, buffalo, and mountain goat are examples of species introduced to Kodiak Island.

Horses, cattle, and bison graze nearby under lease to a local ranch. A 2-meter (7-foot) chain link fence surrounds each of the structures at KLC to prevent animals from wandering onto the launch complex.

The fence and nearby steep topography keep grazing animals away from the launch stool. The nearest game trail passes approximately 76 meters (250 feet) south of the launch stool location (U.S. Department of the Air Force, 2001).

The harbor seal is a year-round resident of the area. Several haulout and general use areas occur near KLC, the closest of which is Ugak Island, approximately 5 kilometers (3 miles) southeast. The northern fur seal occurs offshore of the KLC site from January through April. The sea otter is found along most of Kodiak Island’s coast in all months of the year. A number of cetacean species, including Dall’s and harbor porpoise, Pacific white-sided and Risso’s dolphins, and killer whales, are found year-round in the water surrounding Kodiak Island. The migratory path of the recently delisted gray whale includes the eastern nearshore edge of Kodiak Island. The greatest number of gray whales in this area occurs during April, May, November, and December. (Alaska Aerospace Development Corporation, 1995b)

**Essential Fish Habitat**

Approximately 12 percent of the KLC site is occupied by open water including small streams, two freshwater lakes, and a series of lagoons. Two of the streams have been incorporated into the Alaska Department of Fish and Game’s anadromous stream catalog since coho salmon juveniles were detected there (Alaska Aerospace Development Corporation, 1995b). The waters south of Kodiak Island, including the Narrow Cape vicinity, are essential habitat for commercially important fish species year-round. Habitat Areas of Particular Concern include all streams, lakes, and other freshwater areas used by salmon and other anadromous fish. The closest major salmon stream to KLC is the Pasagshak River, which is approximately 10 kilometers (6 miles) to the northwest. Alternate barge landing sites 1, 2, and 3 are close to small order anadromous fish streams, which support pink salmon and are listed in the Alaska Department of Fish and Game’s “Anadromous Fish Stream Catalogue” (McCrea, 2003). The most common marine fish in nearshore and offshore water around Kodiak Island are flounder, sole, pollock, skate, cods, and halibut. Other common marine organisms include crabs, scallops, octopus, shrimp, and clams.
Threatened and Endangered Wildlife Species

No federally proposed or listed candidate, threatened, or endangered species are located within the boundaries of KLC. However, several species occur in the ROI, including marine waters in the area (table 3.1.3-1). The Steller sea lion (*Eumetopias jubatus*) population near Kodiak Island was included in the population classified as endangered in 1997. Ugak Island, approximately 5 kilometers (3 miles) southeast of KLC, contains the closest sea lion haulout. No Steller sea lion rookeries have been identified in the ROI (Smith, 2001). Although seven whale species are found in the waters near Kodiak Island, only the delisted gray whale and the endangered humpback whale (*Megaptera novaeangliae*) use the nearshore waters of Kodiak Island within the ROI (Federal Aviation Administration, 1996). Humpback whales are generally found in the nearshore areas of Kodiak Island in the summer. They have been occasionally observed in the Narrow Cape and Ugak Island area. Figure 3.1.3-2 depicts the locations of seabird colonies and pinniped haulout areas in the vicinity of KLC.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>State</th>
<th>Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Phoebastria albatrus</em></td>
<td>Short-tailed albatross</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><em>Polysticta stelleri</em></td>
<td>Steller’s eider</td>
<td>T</td>
<td>SSC</td>
</tr>
</tbody>
</table>

Mammals

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>State</th>
<th>Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Balaena glacialis</em></td>
<td>Northern right whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><em>Balaenoptera borealis</em></td>
<td>Sei whale</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td><em>Balaenoptera musculus</em></td>
<td>Blue whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><em>Balaenoptera physalus</em></td>
<td>Fin whale</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td><em>Megaptera novaeangliae</em></td>
<td>Humpback whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><em>Physeter macrocephalus</em></td>
<td>Sperm whale</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td><em>Eumetopias jubatus</em></td>
<td>Steller sea lion</td>
<td>E</td>
<td>SSC</td>
</tr>
</tbody>
</table>

Source: U.S. Fish and Wildlife Service, 2000

-- = Not Listed  E = Endangered  SSC = State Species of Special Concern  T = Threatened

Most of the world’s Steller’s eiders (*Polysticta stelleri*) winter along the Alaskan Peninsula, an area that includes Kodiak Island, and through the Aleutian Islands. Most of the world’s Steller’s eiders nest in northeastern Siberia with a small portion (less than 5 percent) nesting in Alaska (State of Alaska Online, 2002c). The USFWS has classified this Alaska nesting population as threatened. The Steller’s eiders occur in the Kodiak Island area primarily during the winter months. Rafts of Steller’s eiders were primarily observed offshore of North and South Lagoons and offshore of Pasagshak Bay during surveys conducted in 1997 and 1998 (Alaska Aerospace Development Corporation, 1998).

The federally and state endangered short-tailed albatross (*Phoebastria albatrus*) could occur in the ROI primarily during the summer months (U.S. Fish and Wildlife Service, 2000). The short-tailed albatross is a very large seabird with narrow 2-meter-long (7-foot-long) wings. Adults also spend the summer non-breeding season at sea, feeding on squid, fish, or other organisms. Most summer sightings are in the Aleutian Islands, Bering Sea, and Gulf of Alaska. (State of Alaska Online, 2002b) The world population, which is increasing, is estimated to be 1,200 (U.S. Fish and Wildlife Service, Alaska Region, 2001).
Environmentally Sensitive Habitat

Wetlands
Wetlands in Alaska are defined by the U.S. Army Corps of Engineers as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” The U.S. Army Corps of Engineers Alaska District and the U.S. Environmental Protection Agency (EPA) regulate wetlands through the Clean Water Act Section 404 Permitting Program. Wetlands cover approximately 29 percent of the KLC site, as shown in figure 3.1.3-1. Palustrine, emergent, persistent, seasonally flooded and palustrine scrub/shrub, broad-leaved deciduous, saturated wetlands are located within the area proposed for the new GBI launch site.

Critical Habitat
In surveys around Kodiak and southern Afognak Islands, Steller's eiders were reported to be present, and hundreds to low thousands are counted during the Christmas Bird Count in Kodiak. Consistent and extensive use of the Kodiak area by the Steller's eider has been observed. Although critical habitat has not been designated in the Kodiak Archipelago, the area still contains important habitat for Steller’s eiders and protection afforded by the Endangered Species Act still applies.

Critical habitat for the Steller sea lion includes a special aquatic foraging area in the Shelikof Strait area consisting in part of an area between the Alaskan Peninsula and Kodiak Island (50 CFR 226.202, Critical Habitat for Steller Sea Lions). This area is along the western side of Kodiak Island and outside the ROI.

3.1.4 CULTURAL RESOURCES—KODIAK LAUNCH COMPLEX
Appendix B includes a description of cultural resources and the laws and regulations pertaining to them.

3.1.4.1 Region of Influence
The term ROI is synonymous with the area of potential effect as defined under cultural resources regulations (36 CFR 800.16[d], Protection of Historic Properties, Program Alternatives). In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility or utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. At KLC this includes the locations described in section 2.3.1.1 and shown on figures 2.3.1-2, 2.3.1-3, and 2.3.1-4.

3.1.4.2 Affected Environment
Prehistoric and Historic Archaeological Resources
In 1994, the Alaska State Office of History and Archaeology performed an archaeological survey in and around the KLC site. The study focused primarily on areas near the following facilities: the existing Integration and Processing Facility, the existing Launch Pad 1, the proposed Missile Assembly Building, the proposed GBI silos, the existing Payload Process Facility, the proposed
Oxidizer Storage, and the existing Launch Control Center (figures 2.3.1-2 and 2.3.1-4). There was no evidence of cultural resources recorded during this survey. However, there are two archaeological sites and a World War II bunker complex within approximately 1.6 kilometers (1 mile) of KLC. (Federal Aviation Administration, 1996)

**Historic Buildings and Structures**

The first recorded contact with the Kodiak natives occurred in 1763 by the Russian Stephen Glotov and in 1792 by the Russian fur trapper Alexander Baranov. The Russians continued to explore the area primarily to search for sea otter. As the Russians began to settle the area, Kodiak became the first capital of Russian Alaska. As the area was settled, the sea otter population fell to near extinction and the Kodiak natives’ culture had significantly declined. By 1867, Alaska had become a U.S. territory. In 1882, the opening of a fish cannery produced the development of commercial fishing in the area. In 1940, the Town of Kodiak was established.

Kodiak Island was used extensively by the U.S. Army and the U.S. Navy during World War II, and the population of the island rose to more than 25,000. The U.S. Navy constructed a submarine base and an air station while the U.S. Army constructed an outpost near the Buskin River. (Alaska Department of Community and Economic Development, Division of Community and Business Development, 2002)

**Native Populations/Traditional Resources**

The primary native population of Kodiak is a group of Alaska Native people known as the Alutiiqs. Some archaeologists believe that the Alutiiq people have occupied the Kodiak region for at least 7,000 years. Several distinct cultural traditions have been identified in the Kodiak Island region, including the Ocean Bay (ca. 4500–1400 BC), the Kachemak (ca. 1400 BC–1200 AD), the Koniaq (ca. 1200–1784 AD), and the Chugash, who were present when the first Europeans arrived.

The Koniaqs and Chugash lived in permanent sod houses in the winter and set up temporary fish camps in the summer. They hunted whales, seals, sea lions, and sea otters with harpoons and clubs. Salmon was also a major dietary staple of all the Alutiiqs.

When Russian hunters began to occupy the region to benefit from sea otter furs, they used Native labor to assist them. The Alutiiq men were forced to hunt at sea while the women and children worked on the shore. Before the Russians had established a colony on Kodiak Island, there were approximately 8,000 Alutiiq. By the time the Russians left, the Alutiiq population had fallen to around 2,000 (kodiakisland.net, 1999).

Previous archaeological surveys have indicated that cultural resources are not present in upland areas occupied by KLC. However, records have indicated the presence of cultural resources near 2 of the proposed barge landing sites described in section 2.3.1 and shown in figure 2.3.1-1. Koniaq house pits and refuse have been identified near Barge Landing Site 1 – Narrow Cape Vicinity and Koniaq house pits and shell midden have been found near Site 3 – Pasagshak Bay Area (Bittner, 2003).
Paleontological Resources
Paleontological resources on the upland areas of KLC are generally found in the Narrow Cape formation which is located below the surface soils. These resources include shallow-water marine invertebrates of Oligocene and Miocene age. (Alaska Department of Natural Resources, 2003)

3.1.5 GEOLOGY AND SOILS—KODIAK LAUNCH COMPLEX
Geology and soils are those earth resources that may be adversely affected by the proposed GMD ETR test program. This resource is described in terms of landforms, geology, and soil conditions as they could contribute to erosion, depletion of mineral or energy resources, and soil contamination resulting from proposed construction and launch activities. The potential for geologic hazards is also described as relative to each site’s geologic setting. A geologic hazard is a naturally occurring or man-induced geologic condition that presents a risk or a potential danger to life and property. Such hazards could include phenomena such as landslides, flooding, ground subsidence, volcanic activity, faulting, earthquakes, and tsunamis.

3.1.5.1 Region of Influence
The ROI is anticipated to be the locations described in section 2.3.1.1 and shown on figures 2.3.1-1 through 2.3.1-4, and soil areas within each Launch Hazard Area that might be subject to contamination from launch exhaust emissions and/or potential contamination from unburned fuel in the event of a terminated launch.

3.1.5.2 Affected Environment
This section draws heavily from the Subsurface Investigation and Geotechnical Recommendations Report for KLC that was prepared by R&M Consultants, Inc. (Alaska Aerospace Development Corporation, 1995b) and on a series of seismic hazard evaluation studies conducted for the U.S. Coast Guard Loran Station by Carver Geologic, William Lettis and Associates, and International Civil Engineering Consultants, Inc. (U.S. Coast Guard Civil Engineering Unit, 2001; 2002; 2003).

Physiography
KLC is located in northeastern Kodiak Island on a low-lying coastal area that forms a prominent headland at the southeast corner of the site called Narrow Cape. KLC is bounded from the southwest to the east by the Gulf of Alaska. The Marin mountain range fringes the northern boundary of KLC and achieves local elevations of greater than 640 meters (2,100 feet) less than 1.6 kilometers (1 mile) to the northwest (U.S. Geological Survey, 1952). The surface topography of KLC is characterized by a series of gently undulating northeast-southwest trending ridges approximately 43 to 110 meters (140 to 350 feet) in elevation. The ridge tops are broad, and the ground surface on the ridge tops is relatively level. The flanks of the ridges typically have moderate to steep slopes, and there is approximately 15 to 46 meters (50 to 150 feet) of topographic relief between ridge tops and adjacent valleys. The ridges terminate on the southwest end in a near-vertical bluff of exposed silty fine sandstone to a siltstone that meets the beach above the high tide line. The northeast ends of the ridges slope gradually down to the beach and lagoons located along the eastern shore of Narrow Cape (Alaska Aerospace Development Corporation, 1995b).
Geology

Narrow Cape is underlain by folded, faulted, thickly bedded to massive course clastic sediments of the Sitkalidak and Narrow Cape formations (U.S. Coast Guard Civil Engineering Unit, 2002). Lithologies include siltstone, fine and medium lithic sandstone, pebbly sandstone and conglomerate. The sediments are thickly bedded to massive and in many places contain large concretions up to 2 meters (7 feet) in diameter (U.S. Coast Guard Civil Engineering Unit, 2002). Weathered bedrock has a field textural classification of sand with traces of some silt, grading to highly weathered bedrock with a textural classification of sand with trace silt and gravel, with particles of sandstone core stones making up the gravel fraction. The thickness of the completely weathered bedrock is about 0.3 to 2 meters (1 to 7 feet), with the thicker weathered zones occurring in topographically low areas (Alaska Aerospace Development Corporation, 1995b).

Soils

The upland soils that compose the bulk of KLC are described by the U.S. Department of Agriculture (1960) as being of the Kodiak soils series. These soils developed from the weathered bedrock (sandstone) and were covered by volcanic ash from a 1912 eruption about 140 kilometers (90 miles) west of Kodiak Island. A surface litter 10 centimeters (4 inches) thick of partly decayed vegetation has accumulated on the volcanic ash. These upland soils are well-drained but are usually moist due to frequent rains (Alaska Aerospace Development Corporation 1995). Erosion of the upland soils located on slopes of less than 7 percent is not considered to be a problem. As the slopes of upland areas increase toward the adjacent valleys (i.e., greater than 7 percent), the erosion hazard may become serious (U.S. Department of Agriculture, 1960).

The soils in the valleys near KLC are a combination of Saltery peat and Ugak silt loam soils (Alaska Aerospace Development Corporation, 1995b). The Saltery soils have developed where the water table is always at or near the surface and consist of a deep layer of peat 76 centimeters (30 inches) or more in depth overlain by about a 30-centimeter (12-inch) layer of ash and a new 8- to 10-centimeter (3- to 4-inch) layer of peat at the surface. The Ugak soils associated with these valley soils have only a 2.5-centimeter (1-inch) layer of peaty material beneath the layer of volcanic ash. These soils occur in poorly drained areas and are very strongly acidic to strongly acidic (U.S. Department of Agriculture, 1960).

Geologic Hazards

Kodiak Island is located on the upper plate of the Aleutian subduction zone, the convergent boundary between the Pacific and North American plates. The Aleutian megathrust (the fault between the two plates) is one of the earth’s largest active faults and has produced three of the world’s six largest magnitude earthquakes of the last 100 years, including the great (moment magnitude [Mw] 9.2) 1964 “Good Friday” or Great Alaska earthquake. (U.S. Coast Guard Civil Engineering Unit, 2001) In addition to the megathrust, the subduction zone also includes several other active fault systems. Numerous faults with high levels of historical activity are contained at depth and within the subducting Pacific plate. In the Kodiak Island region since 1999 these “slab” earthquakes include several in the magnitude range of 6.5 to 7+. A second system of active faults is present in the upper plate (North American plate) of the subduction zone. These faults comprise a wide fold and thrust belt that extends along the eastern side of Kodiak Island and continues to the northeast into the Prince William Sound region. These faults also produce frequent earthquakes. During the 1964 “Good Friday” earthquake, two of the fold and thrust belt faults produced large surface displacements on Montague Island in Prince
William Sound and others probably also ruptured the sea floor offshore of Kodiak, contributing to the generation of the destructive tsunami. (U.S. Coast Guard Civil Engineering Unit, 2001)

In addition to the Aleutian megathrust (and the subducting Pacific plate), there are several significant fault sources in the Kodiak region that could generate large earthquakes. The U.S. Coast Guard Civil Engineering Unit (2002) identified four active faults or zones of faults capable of generating large magnitude earthquakes at Narrow Cape. These include the Albatross Bank fault zone, the Kodiak Shelf fault zone, the Narrow Cape fault and the Kodiak Island fault (figure 3.1.5-1). Each of these faults includes several individual faults or fault segments that are seismogenic; however, the characteristics of the earthquake sources are poorly known (U.S. Coast Guard Civil Engineering Unit, 2001). In support of probabilistic and deterministic seismic hazard evaluations for the U.S. Coast Guard Loran Station (U.S. Coast Guard Civil Engineering Unit, 2002), a table characterizing the seismic sources for Narrow Cape was prepared, including maximum earthquake magnitude and recurrence interval estimates (table 3.1.5-1). Based on the source models selected for the probabilistic seismic hazard analysis, the potential maximum magnitude ($M_{max}$) events (judged to generate the largest ground motions at the site) were a $M_{7.5-8.0}$ on the Narrow Cape fault zone and $M_{8.5}$ on the Kodiak Interplate Subduction Segment. (U.S. Coast Guard Civil Engineering Unit, 2003)

The Narrow Cape fault also poses a surface rupture potential at KLC. The U.S. Geological Survey mapped the Narrow Cape fault off-shore for a proposed off-shore oil lease. The U.S. Geological Survey concluded that the fault was active and provisional maps projected the main trace and several subsidiary branches on-shore at Narrow Cape within a 6-kilometer (3.7-mile) zone. The main trace is about 2 kilometers (1.2 miles) west of the Loran site and one of the subsidiary branches was demonstrated to traverse the Loran site. Paleoseismic investigations concluded that the scarps were tectonic in origin and that there may have been three to four episodes of Holocene displacement on each of three trenched branch faults of the Narrow Cape fault. Topographic scarps, offset drainages, and other geomorphic evidence of youthful deformation to the marine terrace were also mapped at Narrow Cape (U.S. Coast Guard Civil Engineering Unit, 2002). Detailed fault studies have not been performed for the entire KLC site.

Great earthquakes generated in the Gulf of Alaska often generate tsunamis (seismic sea waves). In southern Alaska, 37 significant historical earthquakes of $M_{7.0}$ or greater have generated evidence of 14 tsunamis (U.S. Coast Guard Civil Engineering Unit, 2002). The tsunami resulting from the 1964 earthquake was reported by a Narrow Cape rancher to have inundated low-lying areas along the eastern shore (Alaska Aerospace Development Corporation, 1995b). KLC facilities are located above the 30-meter (100-foot) elevation above sea level recommended by the City of Kodiak for safe refuge from flooding due to tsunamis (Alaska Aerospace Development Corporation, 1995b).

There are no active volcanoes on Kodiak Island. As discussed in the soils section, KLC can be subject to ash falls from active volcanoes in the Aleutian chain. Over 40 volcanoes are active in the Aleutian arc, generating 256 eruptions over recorded history (Ballistic Missile Defense Organization, 2000). Such eruptions could cause nuisance ash falls at the site, create a significant hazard to various types of equipment and electronics, or possibly create atmospheric conditions that would temporarily delay air transport or flight tests.
Principal Faults in the Upper Plate of the Aleutian Subduction Zone Near Kodiak Island

Kodiak Island, Alaska

Figure 3.1.5-1

EXPLANATION

Fault
### Table 3.1.5-1: Seismic Source Model, Kodiak Loran Station, Kodiak Island, Alaska

<table>
<thead>
<tr>
<th>Fault Source Segmentation</th>
<th>Length (kilometers)</th>
<th>Style</th>
<th>Slip Rate (mm/year)</th>
<th>Recurrence (years)</th>
<th>Probability in 50 Years</th>
<th>Max. Magnitude (Mw)</th>
<th>Distance (kilometers)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aleutian Subduction Zone</td>
<td>3,000</td>
<td>Megathrust</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1964 Segment</td>
<td>850</td>
<td>Megathrust</td>
<td>58</td>
<td>400 to 1,300</td>
<td>3.8-11.8%</td>
<td>9.2±1/4</td>
<td>22±3</td>
<td>Last rupture 1964</td>
</tr>
<tr>
<td>Kodiak Segment</td>
<td>400</td>
<td>Megathrust</td>
<td>58</td>
<td>&gt;1,000</td>
<td>4.9%</td>
<td>8.6±1/4</td>
<td>22±3</td>
<td>Last rupture 1964</td>
</tr>
<tr>
<td>Alaska Peninsula Segment</td>
<td>300</td>
<td>Megathrust</td>
<td>56</td>
<td>60 to 150</td>
<td>28.3-56.5%</td>
<td>8.3±1/4</td>
<td>200±50</td>
<td>Last rupture 1938</td>
</tr>
<tr>
<td>Kodiak &quot;Patch&quot;(a)</td>
<td>100±25</td>
<td>Megathrust</td>
<td>58</td>
<td>60</td>
<td>56.5%</td>
<td>7.75±1/4</td>
<td>22±3</td>
<td>Slip &quot;gap&quot; 1964</td>
</tr>
<tr>
<td>Albatross Banks Zone</td>
<td>250</td>
<td>Thrust</td>
<td>–</td>
<td>250</td>
<td>18.1%</td>
<td>7.0/1/4</td>
<td>40±10</td>
<td>Mapping indicates multiple imbricate faults</td>
</tr>
<tr>
<td>Typical Segment</td>
<td>40±5</td>
<td>Thrust</td>
<td>–</td>
<td>2,500</td>
<td>2.0%</td>
<td>7.0±1/4</td>
<td>40±10</td>
<td></td>
</tr>
<tr>
<td>Kodiak Shelf Zone</td>
<td>&gt;800</td>
<td>Thrust</td>
<td>6±2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Segment</td>
<td>75±25</td>
<td>Thrust</td>
<td>2±1</td>
<td>330 to 500</td>
<td>9.5-14.1%</td>
<td>7.25±1/4</td>
<td>21±9</td>
<td>Mapping indicates multiple imbricate faults</td>
</tr>
<tr>
<td>Narrow Cape Zone</td>
<td>&gt;800</td>
<td>LL Strike Slip</td>
<td></td>
<td>1,000 to 1,500</td>
<td>3.3-4.9%</td>
<td>7.25±1/4</td>
<td>21±9</td>
<td></td>
</tr>
<tr>
<td>Narrow Cape Segment</td>
<td>100±25</td>
<td>LL Strike Slip</td>
<td></td>
<td>1,100 to 2,100</td>
<td>2.4-4.4%</td>
<td>7.5±1/4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Kodiak Island Fault</td>
<td>&gt;150</td>
<td>LL Strike Slip</td>
<td></td>
<td>1,500 to 3,500</td>
<td>1.4-3.3%</td>
<td>7.5±1/4</td>
<td>12±3</td>
<td></td>
</tr>
<tr>
<td>Crustal Source</td>
<td>NA</td>
<td>Reverse or strike slip</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150-kilometer radius</td>
<td>NA</td>
<td></td>
<td></td>
<td>36 to 118</td>
<td>34.5-75.1%</td>
<td>7.0±1/4</td>
<td>&lt;150</td>
<td></td>
</tr>
<tr>
<td>Slab Source</td>
<td>NA</td>
<td>Normal or strike slip</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150-kilometer radius</td>
<td>NA</td>
<td></td>
<td></td>
<td>42 to 122</td>
<td>33.6-69.6%</td>
<td>7.25±1/4</td>
<td>&lt;150</td>
<td></td>
</tr>
</tbody>
</table>

Source: U.S. Coast Guard Civil Engineering Unit, 2002

Mw = Moment magnitude
NA = Not Available
A landslide approximately 430 meters (1,400 feet) long is located on slopes of 15 to 35 percent along a valley just north of Ranch Road, where it intersects Pasagshak Point Road just north of KLC. The landslide feature itself may actually extend to within the project site boundaries and was apparently caused by rotational slumping of the poorly indurated sandstone (Alaska Aerospace Development Corporation, 1995b).

3.1.6 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—KODIAK LAUNCH COMPLEX

Appendix B includes a discussion of hazardous materials and hazardous waste resource regulations.

3.1.6.1 Region of Influence

The ROI for potential impacts related to hazardous materials/wastes includes areas of KLC to be used for new construction, pre-launch site preparation, launch, and post-launch activities, and in areas where hazardous materials are stored and handled.

3.1.6.2 Affected Environment

Hazardous Materials Management

Hazardous material use, storage, and disposal are managed in adherence with the KLC Safety Policy, the KLC Emergency Response Plan, KLC Contamination Control Procedures, AADC’s HazCom Program, the Kodiak Area Emergency Operation Plan, and applicable state and federal environmental laws, in such a way as to minimize impacts to the environment.

An AADC point of contact is notified before the arrival of any hazardous materials at KLC and outlines the guidelines for proper handling, storage and disposal. All contractors must provide hazardous materials information (Material Safety Data Sheet [MSDS]), label and warning signs, and a plan indicating material handling/storage procedures, spill/release prevention measures, and emergency response protocol, including cleanup and disposal procedures and first aid/medical treatment procedures. (Alaska Aerospace Development Corporation, 2001)

Table 3.1.6-1 lists hazardous materials that may be used at KLC.

Hazardous Waste Management

AADC is authorized to operate KLC as a Small Quantity Generator according to the Alaska Hazardous Waste Management Regulations (18 Alaska Administrative Code [AAC] 62). With this designation, KLC can produce no more than 998 kilograms (2,220 pounds) of hazardous waste per month, which normally amounts to just under five drums of liquid hazardous waste. The types of hazardous and nonhazardous wastes generated during routine operations at KLC are indicated in table 3.1.6-2.
### Table 3.1.6-1: Potentially Hazardous Materials Used at KLC(1)

<table>
<thead>
<tr>
<th>Material</th>
<th>Use</th>
<th>Location</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LCC(2)</td>
<td>PPF(3)</td>
</tr>
<tr>
<td><strong>Construction Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-freeze</td>
<td>Construction equipment</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hydraulic fluid and lubrication oils</td>
<td>Construction equipment</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Welding gases</td>
<td>Welding building structures</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Launch Activities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number 2 diesel fuel(5)</td>
<td>Fuel for construction vehicles and emergency diesel generator</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Paints, thinners, solvents, cleaning fluids, adhesives, lubricants, batteries, etc.</td>
<td>Groundskeeping and maintenance activities on backup generators, heating and cooling system, communication system, etc.</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HCFCs(6)</td>
<td>Cooling and fire suppression</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Solid rocket fuel</td>
<td>Fuel for launch vehicles</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Compressed gaseous helium and nitrogen</td>
<td>Evacuate atmospheric oxygen during transfer of propellants into payloads</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Isopropyl alcohol</td>
<td>Wipe clean dust-sensitive payloads and for flushing liquid propellant from transfer carts</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hydrazine propellants</td>
<td>Payload propellant for post-launch steering</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>H₂O₂ and Ca(OCl)₂(7)</td>
<td>Neutralizing water mixed with aspirated propellant during payload fueling</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

---

1 Adapted from U.S. Air Force, 1991, 1994; and Halliburton NUS Environmental Corporation, 1993
2 Launch Control Center
3 Payload Processing Facility
4 Launch Area
5 Also present/used during construction phase
6 Hydrochlorofluorocarbons
7 Hydrogen peroxide and calcium hypochlorite
Table 3.1.6-2: Potentially Hazardous Waste Generated at KLC(1)

<table>
<thead>
<tr>
<th>Material</th>
<th>Use</th>
<th>Location</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spent solvents, paper, waste oil, batteries, spill cleanup materials, anti-freeze, and empty containers</strong></td>
<td>From construction, groundskeeping, housekeeping, maintenance, and spill response (if necessary) activities</td>
<td>LCC(2) PPF(3) LA(4)</td>
<td>Removed for appropriate off-site recycling or disposal during construction and after each launch (expected rates of hazardous waste generation range from 91 to 770 kilograms [200 to 1,700] pounds per year).</td>
</tr>
<tr>
<td><strong>Diluted washdown water and isopropanol</strong></td>
<td>Wash down from the transfer of liquid propellants into payloads</td>
<td>X</td>
<td>Removed for appropriate off-site disposal after each launch (expected rates of hazardous waste generation range from 91 to 1,020 kilograms [200 to 2,250 pounds] per year during operations).</td>
</tr>
</tbody>
</table>

---

1 Adapted from U.S. Air Force 1991, 1994; and Halliburton NUS Environmental Corporation, 1993
2 Launch Control Center
3 Payload Processing Facility
4 Launch Area

These wastes are handled, transported, and disposed of in accordance with AADC’s HazCom Program, KLC Safety Policy, KLC Contamination Control Procedures, and applicable state and federal environmental laws. Pollution prevention, waste minimization and recycling procedures are indicated in the KLC Spill Prevention Control and Countermeasures (SPCC), Emergency Response Plan and Contamination Control Procedures.

There are no Installation Restoration Program (IRP) issues associated with KLC, since it is not a DoD installation. No NPL site is listed for Kodiak Island in the EPA’s Comprehensive Environmental Response, Compensation, and Liability Information System database.

KLC has aboveground storage tanks (ASTs) for diesel fuel storage. Diesel is used to fuel generators for backup electrical power with electrical power being used for heating, ventilation, and air conditioning. KLC primary power is from Kodiak Electric Association. Petroleum, oil and lubricant (POL) storage is in accordance with federal (EPA) requirements at 40 CFR 112, and State of Alaska requirements at 18 AAC 75. KLC does not utilize underground storage tanks (USTs).

Because KLC was recently constructed, asbestos or lead-based paint is not present. Likewise, polychlorinated biphenyls (PCBs) should not be present in equipment or machinery.

Fuels are handled and stored in adherence to KLC Safety Policy, KLC Emergency Response Plan, and KLC Contamination Control Procedures. A description of the GBI solid rocket fuel and the EKV propellant system is in section 2.1.1. The propellant consists of a hypergolic fuel (monomethyl hydrazine) and oxidizer (mixed oxides of nitrogen). Monomethyl hydrazine is toxic and extremely reactive. Descriptions of candidate target missiles are in section 2.1.2. These missiles are representative of existing missile types launched from KLC.
3.1.7 HEALTH AND SAFETY—KODIAK LAUNCH COMPLEX

Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect the well-being, safety, or health of workers or members of the general public. Appendix B includes a discussion of health and safety resource regulations. Appendix C includes a detailed discussion of flight test safety.

3.1.7.1 Region of Influence

The ROI for potential impacts to the health and safety of workers includes the immediate work areas of KLC, including new construction areas; those areas associated with missile storage, assembly, and transfer; and the launch sites and areas associated with post-launch activities. If required, debris recovery and emergency operations could also potentially impact worker health and safety.

The ROI for potential impacts to public health and safety includes KLC, as well as off-range areas that may be affected by GMD ETR Program activities involving preflight transport of missile components, missile launch, and missile flight. A launch failure could potentially involve an explosion, missile debris, release of toxic materials into the air or water, high noise levels, and/or fire.

The public population of concern for the Proposed Action consists of people living in the vicinity of KLC, including occupants of Bear Paw Ranch and Burton (Kodiak) Ranch, U.S. Coast Guard personnel who periodically work at the Loran-C Coast Guard Station at Narrow Cape, members of the public who utilize the KLC area for recreation, and residents of eastern Kodiak Island, including the City of Kodiak and the U.S. Coast Guard Station (U.S. Department of the Air Force, 1997a). In general the area surrounding KLC is sparsely populated. The City of Kodiak (approximately 6,334 people according to the 2000 Census) and the U.S. Coast Guard Station, located approximately 48 to 64 kilometers (30 to 40 miles) from KLC, are the only sizable population centers on the island. Additional smaller population centers are located southwest of KLC and include Old Harbor (237) and Akhiok (80). There are also several dozen cabins located along the southeast coast of Kodiak Island that are occupied on a seasonal basis. The Range Safety program will assure that potential impacts will be well within the debris limit corridor and away from these populated areas.

3.1.7.2 Affected Environment

Range Safety

The KLC Safety Policy mandates the establishment of launch safety levels that meet or exceed those of the Range Commanders Council (RCC) Common Risk Criteria for National Test Ranges and Standard 321-02, AFR 127-1, FAA Notice of Proposed Rulemaking (NPRM). In accordance with the KLC Safety Policy, the criteria per year of Range operations for public casualty is limited to 1 in 1 million, and the casualty criteria for personnel involved in the launch is limited to 1 in 300,000.

Standard range safety procedures at KLC are conducted in accordance with RCC 321-02, AFR 127-1, FAA NPRM, etc. These procedures provide for ground safety, flight safety, range clearance and surveillance, sea-surface area clearance and surveillance, and commercial air
traffic control. They include published NOTMARs and NOTAMs, as well as coordination with the U.S. Coast Guard and FAA.

The AADC range organization assures that all aspects of safety are covered, including transport of missile components (i.e., solid propellant boosters), and handling of the booster and EKV (pre-loaded fuel and oxidizer tanks) once they arrive at KLC, operations at the launch site, flight safety, and RF interference. The KLC range organization is responsible for assuring that the test missiles, under any flight condition, will not endanger any life or property. The launch vehicle operator and/or payload operator submits a Ground Safety Plan to AADC for review and approval before launch operations.

During launch preparation, ground safety at KLC is the responsibility of AADC. Hazardous operations will be performed in compliance with mission-specific operating procedures that will provide the requirements and direction for the activities at KLC, including explosives handling safety, hazardous operations control, explosives storage, launch pad operations and launch. Safe operating procedures are followed in accordance with DoD Standard 6055.9.

A hazard potential is present during pre-launch transport, pre-launch processing, and launch of missiles due to the significant amounts of propellant contained in the boosters. The exposure to launch mishaps is greatest within the early portions of the flight after launch. Measures are currently in place to limit the number of personnel involved in the launch operations and to ensure that hazardous operations are performed by highly skilled personnel. Regulations and practices that have been established to minimize or eliminate potential health and safety risks to the general public include, but are not limited to, OSHA and DOT regulations and U.S. Air Force procedures for transporting hazardous materials, DoD procedures for handling explosives, and the DoD Range Safety program for the processing and launch of missiles (U.S. Department of the Air Force, 1997a).

Using standard explosive safety rules, AADC will determine areas that will be evacuated for each launch to assure that the public is not exposed to unacceptable levels of risk, that physical security and safety measures can be enforced, and that adverse environmental effects are minimized. The size of the evacuation area is based upon the potential for variability of the impact due to influences of local weather conditions, and small variances in the missile guidance and engineering systems.

To ensure public safety during launch days, KLC security personnel would close Pasagshak Point Road at the site boundary and ensure that no unauthorized personnel enter the Ground Hazard Area. The safety zone is under constant surveillance during the day of launch and during any hazardous operations. If the safety zone is compromised, the launch is delayed until the area is confirmed clear. Pre-launch notifications to aviators and mariners are issued 24 hours before launches.

Each launch at KLC has an established flight termination line. These lines are established to minimize potential adverse impacts on populated areas. In addition, procedures call for various contingency plans to be in effect. These include, but are not limited to the following:

- **Mishap:** An Explosive Ordnance Disposal Plan will be in place, along with appropriate personnel and equipment.
- **Fire:** There will be a firefighting crew in place during launch countdown.
- **Injury:** An evacuation plan will be in place to transport injured persons to medical facilities.

Previous launches have had no effect related to either public health and safety or range safety issues.

**Regional Safety**

In compliance with Superfund Amendments and Reauthorization Act Title III, AADC/KLC has filed Tier II Community Right-to-Know reports with the State Emergency Response Commission, the Local (Kodiak–Kodiak Island Borough) Emergency Planning Committee, and the City of Kodiak Fire Department. (Nault, 2002) The Local Emergency Planning Committee is a committee appointed by the Alaska State Emergency Response Commission to perform local emergency planning and community right-to-know activities. The *Kodiak Area Emergency Operation Plan* (Kodiak Emergency Services Organization, 2000) is a four-volume plan, assembled in part by the Division of Emergency Services, Alaska Department of Military and Veterans Affairs, to direct preparation for, response to, mitigation of, and recovery from natural and man-caused disaster emergencies within the Kodiak Island Borough, including KLC. The Plan is activated when a disaster emergency significantly threatens human health, property, or the environment. The Chief of the Kodiak Area Fire and Rescue Department is the Kodiak Emergency Services Coordinator.

The City of Kodiak Fire and Rescue Department has three firefighters/emergency medical technicians under the supervision of a lieutenant and two chiefs on duty at all times. During emergencies, on-line firefighters are supported by 15 to 20 volunteer firefighters with various levels of emergency medical technician training. The Kodiak Fire Department does not provide general/routine firefighting service for AADC/KLC, but would respond to wildland fires at AADC/KLC by agreement with the Alaska Department of Natural Resources, Division of Forestry. The Kodiak Fire Department has three ambulances and provides ambulance service and emergency medical response at the advanced and basic life support levels for AADC/KLC. The Kodiak Fire Marshal provides fire code enforcement, fire cause investigation, and other fire prevention services for AADC/KLC and also works with the U.S. Coast Guard Marine Safety Detachment in the planning and oversight for missile component off loading. (Nault, 2002)

The City of Kodiak Fire and Police Departments provide as-needed support for closure and security of the KLC and Kodiak Island road system during missile transport and launch. Support for transportation of missile components, including closure and security of KLC and the Kodiak Island road system, is mostly provided by the U.S. Coast Guard and Alaska State Troopers.

The KLC has a fire truck and a 946-liter (250-gallon) pumper mounted on a 0.9-metric-ton (1-ton) truck to fight any brush fires that may occur during a launch. The KLC also has an ambulance to transport any injured patients. During missions, Emergency Medical Technicians are present at the KLC with the oversight of Northwest Medical. During launch day operations a doctor is in attendance at the KLC.
The closest hospital to the KLC is Providence Kodiak Island Medical Center. The Medical Center is an approximate 25-bed hospital providing emergency, surgical, maternity, general medicine, physical therapy, and diagnostic services for the Kodiak Island Borough, including KLC.

3.1.8 LAND USE—KODIAK LAUNCH COMPLEX

Appendix B includes a definition of land use and the main federal land management responsibilities that apply.

3.1.8.1 Region of Influence
The ROI for land use includes the Narrow Cape region of Kodiak Island within and adjacent to the boundaries of KLC that are potentially affected by the launch of target and GBI missiles and the construction, modification, and operation of support facilities associated with the Proposed Action.

3.1.8.2 Affected Environment

Land Use
Kodiak Island is situated in the northern Gulf of Alaska, just east of the Alaska Peninsula. It has an area of about 890,000 hectares (2.2 million acres), making it the second-largest island in the United States after the island of Hawaii. Its land use generally consists of KLC, Kodiak Harbor and airport, the City of Kodiak and neighboring U.S. Coast Guard Station, and the Kodiak National Wildlife Refuge. The remainder of the island is primarily undeveloped and utilized for an extensive number of recreational activities with small locales of residential and business uses. (U.S. Air Force, 2001)

Approximately 40 kilometers (25 miles) southwest of the City of Kodiak lies Narrow Cape, home to KLC. KLC is located within the Kodiak Island Borough on a 1,504 hectare (3,717 acre) coastal plateau leased and managed by the AADC from the Alaska Department of Natural Resources, Division of Land through an Interagency Land Management Agreement. Land management plans, expressed by the KLC Master Plan, are intended to improve the efficiency of land use by minimizing conflicts and protecting the human and natural environments (BRHP Architects Engineers, Inc., 2002). KLC consists of primary facilities and a number of support facilities which cover approximately 17 hectares (43 acres). Approximately 1 percent of KLC is considered disturbed, leaving the remainder in its natural state. In accordance with the Interagency Land Management Agreement, most undeveloped areas of KLC are made available for ranch animal and wildlife grazing. (Alaska Aerospace Development Corporation, 1995b)

Traditionally used for ranching and recreation, the Narrow Cape area is primarily underdeveloped and very sparsely populated (Kodiak Launch Complex, 1998). KLC is primarily surrounded by state-owned land, which serves as a buffer between the small amounts of privately-owned property. Only a small number of man-made structures exist within the vicinity of KLC that are not directly affiliated with KLC operations. A summer camp to the west of KLC consists of approximately 2.02 hectares (5 acres), and a ranch northeast of KLC consists of approximately 65 hectares (160 acres) adjacent to KLC’s boundary. Approximately 16 hectares (40 acres) of land within the boundaries of KLC are utilized by the U.S. Coast Guard’s 190-meter (625-foot) tall Loran-C navigation transmitter facilities (U.S. Air Force, 2001).
Recreation

Recreational opportunities in the Narrow Cape area are abundant and available year round. Activities include fishing, hunting, hiking, camping, boating, beachcombing, and wildlife and scenic viewing. Recreation activity peaks during the summer months. (Alaska Aerospace Development Corporation, 1995b) The Pasagshak State Recreation Area, located approximately 10 kilometers (6 miles) northwest of KLC, offers campsites, picnic areas, potable water, and latrines accessible for public use. Historic World War II jeep trails, the Narrow Cape Hiking Trail, and Burton Ranch Hiking Trail are in the vicinity of KLC, and are acknowledged by the Alaska Natural History Association. However, the trails are not regularly maintained (Kodiak Launch Complex, 1998). Other activities such as hunting bison and Sitka black-tailed deer and horseback riding are available at a nearby ranch for a fee (Alaska Aerospace Development Corporation, 1995b).

Fossil Beach and East Twin Lake are located on KLC and offer limited access for general beach activities. Beach combing, fossil hunting, and whale watching are the most significant activities available. Limited beach access and evacuations usually occur for a matter of hours. Unstable weather conditions, or any mechanical problems resulting in an abort launch or launch rescheduling, may prolong an evacuation or closure.

According to the 1999 Pasagshak/Narrow Cape Area plan, Fossil Beach/Narrow Cape and Pasagshak Point were the recreational areas most commonly identified for future State Park expansion. Although at this time no park expansion has been proposed, its existing recreational value is acknowledged. (Kodiak Island Borough Community Development Department, 1999)

Coastal Zone Management

The KLC is located in the “zone of direct influence” of the coastal environment (State of Alaska, Office of the Governor, 2001). All federal development projects in a coastal zone and all federal activities which could directly affect a coastal zone must be reviewed to determine their consistency with the local Coastal Zone Management Plan. The initial development of KLC, as examined in the Environmental Assessment of the Kodiak Launch Complex, was reviewed and received a positive determination on 18 January 1996 that the activities were consistent with the state and local standards and policies. Additional actions involving the development of KLC and the launch of missiles in support of the North Pacific Targets Program have also undergone Coastal Consistency Determinations, resulting in positive determinations on 25 September 2001 that the activities are consistent with the state and local standards and policies.

3.1.9 NOISE—KODIAK LAUNCH COMPLEX

Appendix B includes a definition of noise and the main regulations and laws that govern it.

3.1.9.1 Region of Influence

The ROI for noise analysis is the area surrounding KLC within which humans and/or wildlife may suffer annoyance or disturbance from launches and other noise sources at KLC.
3.1.9.2  Affected Environment

Based on the land use of the Narrow Cape area, the most common man-made noise is from occasional traffic on the road from the City of Kodiak to Narrow Cape, from nearby off-road recreational vehicles, intermittently, from standby generators at the nearby U.S. Coast Guard Loran Station, and occasional rocket launches.

Table 3.1.9-1 lists noise levels recorded at Ugak Island, which is a Steller sea lion haulout site and is located approximately 5.6 kilometers (3.5 miles) from the launch site, during four of the five previous rocket launches at KLC. The ait-1 took place November 1998, the ait-2 September 1999, the QRLV March 2001, the Athena-2 September 2001. The Strategic Target System vehicle launch took place in November 2001; however, noise levels could not be recorded due to adverse weather conditions. (Alaska Aerospace Development Corporation, 2002b)

<table>
<thead>
<tr>
<th>Noise Metric (dBA)</th>
<th>Rockets Launched</th>
</tr>
</thead>
<tbody>
<tr>
<td>L_{max}^{(1)}</td>
<td>ait-1  ait-2</td>
</tr>
<tr>
<td>78.2</td>
<td>81.5  73.3</td>
</tr>
</tbody>
</table>

Source: Alaska Aerospace Development Corporation, 2002b.

1 Recorded at Ugak Island (5.6 kilometers [3.5 miles])
L_{max} = Maximum Sound Level

Due to the short duration of launches, an A-weighted scale is used and dBA (A-weighted decibel [dB]) measurements are employed to adequately characterize the operational noise.

Maximum Sound Level (L_{max}) is applied to compare noise levels because of its ability to cover the entire sound spectrum, especially sounds audible to humans.

Sensitive human receptors from activities at KLC are located at Kodiak Ranch (the nearest residence), a distance of 3 kilometers (2 miles); Church Camp (the nearest business), a distance of 5 kilometers (3 miles); and Pasagshak State Recreation Area (the nearest public facility), a distance of 10 kilometers (6 miles) (Federal Aviation Administration, 1996). Figure 3.1.9-1 shows a map of the nearest sensitive human receptors.

Wildlife receptors are located at the shoreline around Narrow Cape and Ugak Island at or near the water surface. Section 3.1.3, Biological Resources, describes wildlife found at KLC.
3.1.10 SOCIOECONOMICS—KODIAK LAUNCH COMPLEX

Appendix B includes a general definition of socioeconomics.

3.1.10.1 Region of Influence

The ROI for socioeconomics is defined as Kodiak Island Borough. The Proposed Action site is situated on Narrow Cape, a relatively remote area of Kodiak Island. The primary areas of analysis will concern both the communities situated adjacent to KLC and key population centers, specifically the City of Kodiak.

3.1.10.2 Affected Environment

The main population center is the City of Kodiak, at the northeastern tip of the island, about 402 kilometers (250 miles) south of Anchorage. Kodiak is a transportation hub for southwest Alaska, and home of the largest U.S. Coast Guard base in the country (Kodiak Chamber of Commerce, 2001). Other, smaller, population centers are situated along the roadway within the northeastern portion of the island. Aside from KLC, the remainder of the island is mostly uninhabited, with roughly two thirds of the western side of the island made up of the Kodiak National Wildlife Reserve (Alaska Aerospace Development Corporation, 1995a).

Population and Housing

In comparison to other Alaskan boroughs and unified municipalities, the Kodiak Island Borough ranks eighth in population. As of 2000, the population of the Kodiak Island Borough was 13,913 people (U.S. Census Bureau, 2001). The Borough has experienced an average annual growth in population of approximately 4 percent from 1980, when the population was 9,939 people. The rate of growth within the borough from 1990-2000 was 4.5 percent annually, much lower than that of the state, at 14.0 percent (U.S. Census Bureau, 2001).

The population of the island is concentrated in the City of Kodiak, where about half of the population resides, and in the smaller population centers of Port Lions, Ouzinkie, Old Harbor, Akhiok, Karluk, and Larsen Bay. As of 2000, the City of Kodiak, at 6,334 people (City of Kodiak and Kodiak Island Borough, 2001), was the seventh largest city in Alaska, in terms of population. The U.S. Coast Guard base also represents a significant proportion of the island’s population, with 1,840 people as of 2000. The closest population center to KLC is Cape Chiniak with a population of 50 people. The population of the borough has shown a high degree of transience given the seasonal nature of the fishing industry, changes in personnel at the U.S. Coast Guard station, and cyclical nature of construction projects (Alaska Aerospace Development Corporation, 1995a).

As of 2000, there were an estimated 5,159 housing units within Kodiak Island Borough (U.S. Census Bureau, 2001), including mobile homes and the U.S. Coast Guard Station housing. During this time, there were 2,255 housing units in the City of Kodiak. Another estimated 670 residential units are found in more remote settings of Kodiak Island (Kodiak Chamber of Commerce, 2003). As of 2002, it was reported that within the City of Kodiak there were five hotels and motels containing a total of approximately 200 rooms, and 30 bed-and-breakfast establishments typically with one or two rooms each. Narrow Cape Lodge, a temporary lodging facility located approximately 4.8 kilometers (3 miles) from KLC, had 56 rooms, and the Coast
Guard maintains a 46-room guest house primarily to support temporary housing needs of personnel moving to or from Kodiak (Ellis, 2002).

While data is not collected on monthly vacancy rates, the Kodiak Convention and Visitors Bureau estimated an annual average vacancy rate of 45 to 50 percent (Federal Aviation Administration, 1996) but given the nature of tourism on the island, much seasonal variance is to be expected. In addition the Bureau of the Census reported vacancy rates of rental housing of 7.7 percent and 8.9 percent for Kodiak Island Borough and City of Kodiak respectively.

Income and Employment

The U.S. Bureau of the Census reported in 2000 that Kodiak Island Borough showed a per capita income of $22,195 (U.S. Census Bureau, 2001), a figure only marginally lower than the statewide average of $22,660. Showing a similar distinction, the City of Kodiak showed a per capita income of $21,552, marginally lower than both the borough and statewide averages. Conversely, Kodiak Island Borough showed a median household income of $54,636 (U.S. Census Bureau, 2001), slightly higher than the statewide average of $51,571. Further, the City of Kodiak showed a median household income of $55,142, higher than both the borough and statewide averages. In 2000, the Alaska Department of Labor reported the annual average monthly wage for workers in the Kodiak Island Borough was $2,469, having marginally increased from $2,364 in 1999.

Employment levels on Kodiak fluctuate throughout the year predominantly due to the seasonal nature of the fishing industry (City of Kodiak and Kodiak Island Borough, 2001). Employment usually peaks during the months of July, August and September when fish harvesting is busiest, and declines in November and December as yearly fishing quotas are reached. Unlike fishing communities that have few fishing seasons and a transient cannery workforce, for the most part those employed in Kodiak’s canneries live within the borough year round and are unemployed between seasons.

For this reason, Kodiak is characterized by large swings in its monthly unemployment rate throughout the year, from as low as 3.4 percent to as high as 16.5 percent. The average annual unemployment rate for the Kodiak Island Borough in 2000 was 8.8 percent (City of Kodiak and Kodiak Island Borough, 2001), significantly higher than the statewide average of 6.6 percent.

Kodiak is the center of fishing activities for the Gulf of Alaska. Its fishery is among the most diverse in the state. Kodiak is consistently one of the top fishing ports in the United States both in terms of quantity and value. In 1998, Kodiak was the nation’s third highest port in seafood volume and value, with 162 million kilograms (358 million pounds) of seafood landed, at a value of $79.7 million (Kodiak Chamber of Commerce, 2001). As such, the seafood industry (including fish harvesting and seafood processing) continues to be the dominant industry on the island, in terms of employment, with nearly one-third of the total employment (table 3.1.10-1). Seafood processors are some of the largest private employers on the island (table 3.1.10-2). In addition to the fish harvesting and processing sectors, there are also several government and educational institutions that operate fisheries-related research facilities in Kodiak. There is also a large recreational fishery in freshwater streams and lakes on Kodiak (Alaskan Command, 1996).
Table 3.1.10-1: Kodiak Island Borough Employment Sectors, 2000

<table>
<thead>
<tr>
<th>Sector</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>138</td>
</tr>
<tr>
<td>Total Manufacturing</td>
<td>1,774</td>
</tr>
<tr>
<td>Seafood Processing</td>
<td>1,678</td>
</tr>
<tr>
<td>Other Manufacturing</td>
<td>96</td>
</tr>
<tr>
<td>Transportation, communications, and utility</td>
<td>266</td>
</tr>
<tr>
<td>Trade (wholesale and retail)</td>
<td>928</td>
</tr>
<tr>
<td>Finance, insurance, and real estate</td>
<td>179</td>
</tr>
<tr>
<td>Services</td>
<td>1,185</td>
</tr>
<tr>
<td>Agriculture, forestry, and fishing</td>
<td>86</td>
</tr>
<tr>
<td>Fish harvesting (estimate)</td>
<td>950</td>
</tr>
<tr>
<td>U.S. Coast Guard</td>
<td>1,380</td>
</tr>
<tr>
<td>Other Government (local, state, and federal)</td>
<td>1,145</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,031</strong></td>
</tr>
</tbody>
</table>

Source: City of Kodiak and Kodiak Island Borough, 2001

Table 3.1.10-2: Top Ten Kodiak Island Borough Employers, 2000

<table>
<thead>
<tr>
<th>Rank</th>
<th>Employer</th>
<th>Avg. Monthly Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kodiak Island Borough School District</td>
<td>425</td>
</tr>
<tr>
<td>2</td>
<td>Ocean Beauty Seafoods</td>
<td>342</td>
</tr>
<tr>
<td>3</td>
<td>Trident Seafood Group, Inc.</td>
<td>248</td>
</tr>
<tr>
<td>4</td>
<td>North Pacific Processors (APS)</td>
<td>222</td>
</tr>
<tr>
<td>5</td>
<td>Polar Equipment (Cook Inlet Process)</td>
<td>191</td>
</tr>
<tr>
<td>6</td>
<td>Providence Kodiak Island Medical Center</td>
<td>178</td>
</tr>
<tr>
<td>7</td>
<td>City of Kodiak</td>
<td>166</td>
</tr>
<tr>
<td>8</td>
<td>Wal-Mart Associates</td>
<td>146</td>
</tr>
<tr>
<td>9</td>
<td>International Seafoods</td>
<td>142</td>
</tr>
<tr>
<td>10</td>
<td>Safeway</td>
<td>133</td>
</tr>
</tbody>
</table>

Source: Kodiak Chamber of Commerce, 2002a.

The U.S. Coast Guard and other government entities are the next largest employment sector. Between the various Coast Guard operating and support commands, there are approximately 1,380 military and civilian personnel (government workers) (City of Kodiak and Kodiak Island Borough, 2001) and 1,600 military dependents. The Coast Guard contributes an estimated total annual payroll of $35 million. Retail and wholesale trade accounted for about 11.6 percent, and the service sector, 14.8 percent (table 3.1.10-1). The remaining 9 percent was made up of construction, transportation, communication, utilities, financial services, insurance, and real estate.
Tourism, like many other Kodiak industries, is based on Kodiak’s natural resources. Visitor spending in fiscal year 2001 was estimated at $19.6 million. As is true elsewhere in Alaska, Kodiak’s visitor industry is seasonal, with approximately 76 percent of all visitors arriving during the summer months.

The University of Alaska Anchorage conducted an evaluation of the economic impacts of the Air Force’s November 1998 launch and September 2001 launch of an Athena 1 missile from KLC (Alaska Aerospace Development Corporation, 2002b). The summary of their findings provides information on the economic benefits from a missile launch as follows:

- Brought $4.4 (Athena 1) and $1.3 (Air Force) million dollars of new money into the Alaska economy
- Increased the Kodiak payroll by approximately $1.3 million (Athena 1) and $450,000 (Air Force)
- Generated jobs in a wide range of industries from food service and hotels to business and health services

### 3.1.11 TRANSPORTATION—KODIAK LAUNCH COMPLEX

Appendix B includes a definition and general discussion of transportation.

#### 3.1.11.1 Region of Influence

The ROI for transportation resources addressed in this EIS includes the ground, ocean, and aviation transport systems within or immediately adjacent to KLC.

#### 3.1.11.2 Affected Environment

Kodiak Island maintains a highly capable industrial and government logistics infrastructure. Kodiak Island is home to the largest U.S. Coast Guard station in the world which currently supports C-130 aircraft and H-60 helicopters as well as a number of fully equipped oceangoing patrol vessels. Personnel and most types of equipment can be transported to Kodiak Island on daily flights offered by Alaska Airlines and ERA Aviation. Rocket motors and other heavy equipment are transported by aircraft, barge, or container ship. (Alaska Aerospace Development Corporation, 2001)

**Aviation Transportation**

The airport at Kodiak is shared with the U.S. Coast Guard and is located approximately 6.4 kilometers (4 miles) southwest of downtown Kodiak. It is served by Alaska Airlines (flying 737 jets) and its affiliated airline, ERA Aviation (flying Convair 580 and Dash 8 propeller aircraft), as well as Peninsula Airways (Alaska Department of Transportation and Public Facilities, 1998). All three are regularly scheduled commercial airlines with published flight schedules. The Kodiak Airport is fully instrumented and operates three runways (2,286 meters [7,500 feet], 1,981.2 meters [6,500 feet], and 1,676.4 meters [5,500 feet]), which can support C-141 and C-5A military cargo aircraft. The airport is approximately 64.4 kilometers (40 miles) north of KLC (Alaska Aerospace Development Corporation, 2001) by road. Kodiak is one of the largest airports in the region, moving over 78,000 passengers in 1996 (Alaska Department of
Transportation and Public Facilities, 1998). As there is no airfield on KLC, boosters to date have predominately been flown into the Kodiak Airport, although in one case, arrival was by barge (Cuccarese and Kelly, 2002). The Municipal Airport, also located in Kodiak, has an 878.7-meter (2,883-foot) paved runway (Kodiak Chamber of Commerce, 2002b).

Ocean Traffic
Kodiak Island offers a full range of dockage and marine services for commercial fishing, cargo, passenger, and recreational vessels. Kodiak was identified as one of only two communities in Alaska that is a Commercial Service Facility (Alaska Department of Transportation and Public Facilities, 1998). The facilities are owned by the City of Kodiak and maintained and operated by the city's Harbor Department. Two harbors provide protected moorings for 650 vessels up to 45.7 meters (150 feet) in length. Large vessels, including the state ferry, cruise ships, and cargo vessels are moored at three deepwater piers. Pier I is a 62-meter (204-foot) general use and ferry facility. Pier II is a 282-meter (925-foot) City Dock used for container and commercial work. Pier III is a 268-meter (880-foot) cargo terminal. Twenty-seven-metric-ton (30-ton) Gantry cranes are available and a 27-metric-ton (30-ton) Paceco container lift is available at Pier III (City of Kodiak, 2002).

Sealift capability includes three facilities: CSX Lines Terminal (Pier III); Lash Marine Terminal, which is privately owned; and the City Dock (Pier II). CSX Lines Terminal provides container and contract stevedore service for general commercial cargo. Lash Marine Terminal provides services to several freight carriers, freight forwarders, and consolidators. Tug and barge service is available to Kodiak Island from Seattle and Anchorage. The Lash Terminal, located south of the U.S. Coast Guard Station on the main road to KLC, is a roll-on, roll-off operation with 136-metric-ton (150-ton) lift capability provided by a mobile crane. The Lash Terminal is licensed for explosive and hazardous materials handling. Seaport Terminal Services operates the terminal and provides all necessary support services. The terminal has 366.8 meters (1,200 feet) of dock space as well as a warehouse. The City Dock is serviced by both containerized ocean shippers and barge carriers (Alaska Aerospace Development Corporation, 2001). Kodiak is one of the leading freight shippers in southwest Alaska with 696 commodity shipments in 1995 (Alaska Department of Transportation and Public Facilities, 1998).

Ferry service is provided to Kodiak Terminal as part of the Alaska Marine Highway System (AMHS) southwest and south central routes. Since 1988, Kodiak has been one of the top two ports-of-call in southwest Alaska in terms of ridership (5,541 boarding in 1996) (Alaska Department of Transportation and Public Facilities, 1998). Both passenger and vehicle services (including commercial and construction equipment vehicles) are available. In June 2002, the AMHS was officially designated as a National Scenic Byway. However, this designation has not altered policies and procedures for shipping, nor introduced any new restrictions (Reeves, 2002).

Road Traffic
From Kodiak, access to KLC is via Rezanof Drive West (also referred to as the Chiniak Highway) and Pasagshak Point Road. This road was previously paved for the first 9.7 kilometers (6 miles) outside of Kodiak, at which point it becomes a gravel surface; activities are currently underway which continue to extend the paved portion (Schoenthal, 2002). This road is narrow and, in some cases, steep. There are switchbacks and 11 bridge crossings before reaching KLC. All launch-related deliveries must be transported over this road, unless the
option is made to utilize barge transport. The Alaska Department of Transportation and Public Facilities has evaluated all of these bridges and made improvements to them to support rocket motors in transport to KLC (Alaska Aerospace Development Corporation, 2001). The average daily traffic (ADT) for Rezanof Drive just south of Kodiak airport was 2,081 in 2000 (Alaska Department of Transportation and Public Facilities, Division of Planning, 2000).

Roadways supporting the individual facilities within KLC are designed to accommodate tractor-trailer transport vehicles as well as passenger vehicles and light trucks. Road grades range from 1 percent to over 15 percent. Access roads within KLC are either improved or paved with asphalt. Access roads from the Launch Control Center to the Payload Processing Facility are 4.9 meters (16 feet) wide with 1-meter (3-foot) shoulders. Access roads from the Payload Processing Facility to the Transportation Center and Payload Processing Facility are 6.1 meters (20 feet) wide with 1.8-meter (6-foot) shoulders. Site roads at the Launch Control Center and Payload Processing Facility are 5.5 meters (18 feet) wide with 1-meter (3-foot) shoulders. Site roads at the Integration and Processing Facility and Launch Pad-1 are 7.6 meters (25 feet) wide with 1.8-meter (6-foot) shoulders. All these roads are paved asphalt.

Roadway design between the Payload Processing Facility, Integration and Processing Facility, and Launch Pad-1 presumes spacecraft are arriving at the Payload Processing Facility horizontally. Roadway design provides a minimum 45.7-meter (150-foot) inside turning radius for areas where transporters will travel (Alaska Aerospace Development Corporation, 2001).

AADC and the Alaska Department of Transportation and Public Facilities have conducted extensive studies of road and bridges and culvert crossing conditions and determined they are adequate for motor loads as heavy as a Castor 120™ (Alaska Aerospace Development Corporation, 2001). These findings have been confirmed through subsequent usage. For example, for the Athena-2 (Federal Aviation Administration, 1996), a Castor 120 motor was successfully barged onto the Lash Dock Terminal and then trucked over the road to KLC.

3.1.12 UTILITIES—KODIAK LAUNCH COMPLEX

Appendix B includes a definition and general discussion of utilities.

3.1.12.1 Region of Influence

The ROI for utilities is the area within or immediately adjacent to the KLC facility and the community in the vicinity of the KLC that serves the facility. The ROI also includes the area/region defined and served by the specific utility purveyors.

3.1.12.2 Affected Environment

Kodiak Island has approximately 14,000 residents, with roughly half living within the City of Kodiak. Kodiak Island maintains a highly capable industrial and governmental logistics infrastructure, and is home to the largest U.S. Coast Guard station in the world.

Energy

Electricity is provided by the Kodiak Electric Association, which has a capacity of 1,050 kW. A cooperative facility, Kodiak Electric Association operates and purchases power from the state-owned Terror Lake Hydroelectric Facility (Vacation Sites, Inc., 1999). Kodiak Electric
Association also operates a Coast Guard-owned plant, and owns three additional diesel-powered plants at Swampy Acres, Kodiak, and Port Lions. (Alaska Department of Community and Economic Development, Division of Community and Business Development, 2002)

A three-phase, 24.9/14.4-kilovolt (kV) overhead electric power line terminates approximately 640 meters (2,100 feet) north of the U.S. Coast Guard Loran Station. This line is a radial feed from a substation located 9.7 kilometers (6 miles) away. A single-phase line extends to serve the Launch Control Center and a three-phase line runs to each main building. The three-phase line to the Launch Control Center and Payload Processing Facility is underground in the Pasagshak Point Road shoulder. The line to the Launch Area is underground to a distance of 670 meters (2,200 feet) south-southeast of the Loran Station.

Each location has a step-down transformer providing 480 volts power for each facility. Each facility has a 277 Y/480-volt main switch-board for distribution to larger items of equipment. A dry-type step-down transformer that provides 120 Y/208-volt power for receptacles and other equipment is also located at each facility (Alaska Aerospace Development Corporation, 2001). The primary transformer capacity for each facility is 500 kVA at the Launch Control Center, 750 kVA at the Payload Processing Facility, 750 kVA at Launch Pad-1, and 750 kVA at the Integration and Processing Facility (Cooper, 2002).

Backup power is provided by diesel-driven standby generators located at the Launch Control Center (with a capacity of 350 kW, 400 horsepower), Payload Processing Facility (with a capacity of 500 kW), and the Launch Pad-1/Integration and Processing Facility (with a capacity of 600 kW) (Cooper, 2002). All generators at the complex have block heaters and are contained in heated enclosures. All generators start automatically upon loss of normal power source and provide backup power for all essential equipment within the facility. Maximum capacity of each generator is 72 hours for normal operations. Each generator has a 9,500-liter (2,500-gallon) storage tank available for No. 2 diesel fuel (Cooper, 2002). The Launch Pad is serviced by the generator for the Integration and Processing Facility. Limited uninterruptible power supply backup power is provided for critical equipment in areas where required for facilities use. Users may bring their own uninterruptible power supply systems for specific equipment, racks, and test sets as appropriate (Alaska Aerospace Development Corporation, 2001).

Peak power demand for KLC to date has been 825 kW (Cooper, 2002).

**Water**

Though the City of Kodiak is the supplier of water services in and around the city, outlying residents rely on private wells, as does KLC, which maintains water supply wells on KLC property.

Three identical packaged domestic water supply systems, each housed in a heated building, provide pressurized domestic water service for the Launch Control Center (26.5 liters [7 gallons] per minute of output and system design capacity of 9,464 liters [2,500 gallons] per day), Payload Processing Facility (11.4 liters [3 gallons] per minute of output and system design capacity of 1,136 liters [300 gallons] per day), and Integration and Processing Facility (well abandoned, system design capacity of 2,461 liters [650 gallons] per day). The Integration and Processing Facility uses a water storage tank with a 624,600-liter (165,000-gallon) capacity. (Cooper, 2002)
Each package consists of a submersible well pump, an automatic chlorinator, a 757-liter (200-gallon) storage tank, and a booster pump to maintain operating pressure. A dirt and rust filter is provided at the Launch Control Center and Integration and Processing Facility. A manual isolation valve bypass is used to fill the fire protection water storage tank from the Payload Processing Facility well.

Water system demand for the Launch Control Center, Payload Processing Facility, and Integration and Processing Facility during a mission has been estimated at 50 percent of the available design capacity of 13,060 liters (3,450 gallons) per day. During non-mission status the demand has been estimated at 5 percent of this available capacity. (Cooper, 2002)

Wastewater
On KLC, sanitary sewerage treatment is provided by elevated septic systems and elevated absorption fields. Individual systems are provided for the Launch Control Center, Payload Processing Facility, and Integration and Processing Facility. The system at the Launch Control Center is an 11,356-liter (3,000-gallon) septic tank with a 306-cubic meter (10,800-cubic foot) mound-type absorption bed, with a total system design capacity of 9,464 liters (2,500 gallons) per day. The system at the Payload Processing Facility is a 4,732-liter (1,250-gallon) septic tank with 82-cubic foot (2,904-cubic foot) mound-type absorption bed, with a total system design capacity of 1,136 liters (300 gallons) per day. The system at the Integration and Processing Facility is a 4,732-liter (1,250-gallon) septic tank with 106.2-cubic meter (3,750-cubic foot) mound-type absorption bed, with a total system design capacity of 2,461 liters (650 gallons) per day. (Cooper, 2002)

Wastewater treatment capacity for the Launch Control Center, Payload Processing Facility, and Integration and Processing Facility during mission status has been estimated at 50 percent demand of available supply, and during non-mission status has been estimated at 5 percent demand of available supply. (Cooper, 2002)

Solid Waste
Refuse collection services in Kodiak are provided by the Kodiak Island Borough, which operates a permitted landfill and baler facility. The Kodiak Island Borough Landfill is located at Monashka Bay, about 9.7 kilometers (6 miles) north of the city. (Alaska Department of Community and Economic Development, Division of Community and Business Development, 2002; Alaska Department of Environmental Conservation, 1999) The capacity of the landfill was reached in 1998; however, in November 1999, the Borough completed a vertical and lateral expansion of the landfill, increasing its available capacity (State of Alaska Online, Department of Environmental Conservation, 1999). Residents within the city have home pickup service, while Borough residents have neighborhood dumpsters. Kodiak Sanitation, a private contractor, provides refuse collection services. Kodiak Island Borough also operates a recycling program.

At the time of the 1999 expansion, KLC negotiated a price for dumpster service with the Kodiak Island Borough and Waste Management, Inc. Due to the launch facility's location outside the normal coverage area, the service provided was limited to an 11.5-cubic meter (15-cubic yard) roll-off. During mission status the service is on a monthly basis, and during non-mission status the service is quarterly. (Cooper, 2002)
3.1.13 VISUAL AND AESTHETIC RESOURCES—KODIAK LAUNCH COMPLEX

3.1.13.1 Region of Influence

The Proposed Action site is on Narrow Cape, which is in a relatively remote area of Kodiak Island. The ROI for visual and aesthetic resources is that area surrounding KLC including land area and adjacent ocean area.

Alternative locations for remote telemetry sites in Alaska would include Pasagshak Point, Kenai, Homer, Soldotna, King Salmon, Adak, Cordova, and Pillar Mountain. Activities at these locations would be short-term and temporary. Sites would consist of several instrumentation trailers and at least two mobile antennas. Because of the portable and temporary nature of the activities, the potential for impacts to visual resources is expected to be minimal and therefore will not be discussed further in this document.

3.1.13.2 Affected Environment

Kodiak Island consists primarily of mountainous terrain, with most mountain peaks ranging from 914 to 1,219 meters (3,000 to 4,000 feet) high. About 40 small cirque glaciers are evident along the main ridge of the mountains, which runs northeast to southwest. Canyons radiate from the central divide, many of which have relatively short, swift streams. Exposed bedrock and shallow soils predominate along the rugged coastline. Northwest Kodiak Island has long, narrow fjords and U-shaped valleys, whereas southwest Kodiak Island has few bays and long, continuous shorelines, some with sandy beaches.

Habitat distribution on Kodiak Island is related to differences in elevation. Unconsolidated material is generally absent at very high elevations. Alpine vegetation occurs in mountainous areas below the peaks. Dense shrub and ground cover occurs on steep slopes below 914 meters (3,000 feet) in elevation. Lower slopes and valley floors are covered by sand, gravel, and volcanic ash.

The Narrow Cape area of Kodiak Island, in the vicinity of KLC, has low, grass-covered mountains that level off into a plateau. The mountains are covered with wild flowers in seasons, with patches of Sitka spruce, alder, and willow. Bedrock beaches border the plateau and include Fossil Beach. Barrier beaches and lagoon systems dominate the eastern shoreline, creating a long strip of sandy beaches.

Vegetation colors in the vicinity of KLC range from green to brown, and snow often covers the ground during the winter, although snow cover normally does not last more than a week. At a distance, the mountainous background appears as a darker brown. The climate at KLC has not been well documented; however, it is expected to be similar to the City of Kodiak, where clouds cover an average of 70 percent of the sky throughout the year and the sky is completely overcast about 50 percent of the time. As a result, the sky is often gray.

The varied terrain, extensive vegetative cover, and generally scenic shorelines all contribute to a high visual quality for much of Kodiak Island. The Narrow Cape area has been previously disturbed by commercial launch facilities, a ranch, and a U.S. Coast Guard facility. KLC has several existing structures that could be used to support the GMD program. Existing facilities include two launch pads, a Payload Processing Facility and Launch Control Center, Spacecraft
Assemblies Transfer Facility, and an Integration and Processing Facility (figures 2.3.1-2 through 2.3.1-4). Aside from the existing buildings and structures associated with KLC, man-made structures in the area include the U.S. Coast Guard’s 190-meter-high (625-foot-high) Loran-C navigation transmitter tower and associated white-colored buildings, a few buildings associated with ranching, a complex of buildings associated with World War II activities, and unimproved roads.

Narrow Cape is in a relatively remote area of Kodiak Island. Potentially concerned persons who may have views of KLC include recreational users (fishers, hunters, hikers, etc.); employees and visitors at the Loran-C station, Kodiak Ranch, and KLC; and passengers on offshore vessels. Pasagshak State Recreation Area, a small park containing seven campsites, is about 10 kilometers (6 miles) northwest of Narrow Cape. Approximately a dozen small vacation homes are located in the Pasagshak Bay area. The Kodiak Island Highway, which runs from Kodiak to Narrow Cape, is primarily undeveloped.

3.1.14 WATER RESOURCES—KODIAK LAUNCH COMPLEX

Potentially affected water resources include freshwater surface and groundwater resources and marine waters in the ROI described in the next section. Potential changes in the availability of water supplies as a result of project water use requirements also are addressed. As required by Executive Order 11988, Floodplain Management, potential effects to floodplains were considered; however, none of the proposed facilities in any of the action alternatives would be constructed in a floodplain and further analysis of such issues is not warranted. Potentially affected wetland resources are described in section 3.1.3.

Appendix B includes a description of the primary laws and regulations regarding water resources.

3.1.14.1 Region of Influence

The water resource ROI includes those surface water bodies (streams, lakes and saltwater-influenced lagoons), drainage areas, and groundwater resources that may be affected by the project’s construction or operations. Figure 3.1.14-1 shows the major water bodies near KLC that could be affected along with related water quality sampling points discussed in section 3.1.14.2. These water bodies include Barry Lagoon, Twin Lakes, Triple Lakes, and a number of unnamed streams near KLC. Interceptors launched from KLC could also affect the Pacific Ocean in areas below target interception points, or in other areas between KLC and the target point if interceptors unexpectedly do not reach their targets.

Remote telemetry sites in Alaska are also being considered for the Proposed Action. Activities in these locations would use existing paved or gravel areas and would be short-term, temporary activities. Therefore, the potential for impacts on water resources is minimal and the affected environment in these areas is not discussed further.
3.1.14.2 Affected Environment

Surface Water and Groundwater Resources

Kodiak Island has a marine climate with many natural streams, lakes, and lagoons. Precipitation is common and typically occurs in all months of the year; average precipitation was reported in the 1995 Environmental Baseline of Narrow Cape as 188.57 centimeters (74.24 inches) per year (Alaska Aerospace Development Corporation, 1995b). Streams near KLC are relatively short (generally less than 3.2 kilometers [2 miles] in length) and steep, and they have an average discharge of less than 1.3 cubic meters (46 cubic feet) per second (Alaska Aerospace Development Corporation, 1995b). The major lakes in the ROI are shown in figure 3.1.14-1; West and East Twin Lakes are shallow, freshwater lakes while Triple Lakes and Barry Lagoon are saltwater-influenced lagoons. While some water-bearing zones have been found in underlying bedrock in the ROI, most of the groundwater in the coastal area near KLC is in an unconfined aquifer composed of sand and gravel. Information concerning potential groundwater yields is not available. (Alaska Aerospace Development Corporation, 1995b)

Water Quality

Water quality in the ROI is generally good, and water quality sampling has shown that water quality in the vicinity of KLC is within historical ranges for Kodiak Island as a whole (Alaska Aerospace Development Corporation, 1995b). Water quality samples were taken at the locations shown in figure 3.1.14-1 during 1994, and the key results of this sampling are shown in table 3.1.14-1. In addition, an analysis of surface water collected at East Twin Lake and Triple Lakes (Alaska Aerospace Development Corporation, 1995b) showed that none of the following contaminants were present: volatile organic compounds, pesticides/herbicides, PCBs, nitrates or nitrites, gross alpha radioactivity, total cyanide, and most metals of concern. However, two metallic elements were found: cadmium and beryllium. Cadmium was found in both East Twin Lake and Triple Lakes at a concentration of 0.1 microgram per liter, and beryllium was detected in Triple Lakes at a concentration of 0.9 microgram per liter (Alaska Aerospace Development Corporation, 1995b). These levels of cadmium and beryllium are both below the EPA’s national water quality criteria for the protection of aquatic organisms (the standards are 0.25 and 5.3 micrograms per liter, respectively and assuming a hardness of 15 milligrams of calcium carbonate per liter for the cadmium criterion) (Federal Aviation Administration, 1996). The cadmium concentrations were both well below the 5.0 micrograms per liter maximum contaminant levels allowed by the EPA and the State of Alaska’s drinking water regulations (Federal Aviation Administration, 1996). In the absence of any human-related sources, it is assumed the cadmium and beryllium are from natural sources. The sampling also found coliform bacteria levels in East Twin Lake and Triple Lakes that exceed the “no detect” criteria of the State of Alaska drinking water regulations; therefore, drinking water would require some treatment before it could be used. The likely sources of the bacteria are the bison, cattle, and horses that are raised on the nearby ranch. (Alaska Aerospace Development Corporation, 1998)

Water Use

The primary potable water sources for existing KLC operations are wells on KLC. West and East Twin Lakes have been used for construction water. The potable water supply system has a designed capacity of about 13,060 liters (3,450 gallons) per day; demand is currently estimated at 50 percent of available supply during mission status and 5 percent of available supply when not in mission status (Cooper, 2002). Section 3.1.12 provides more information about KLC utilities,
Major Water Bodies and Sampling Points

Kodiak Launch Complex, Alaska

Figure 3.1.14-1

EXPLANATION

- **FS**: Freshwater Streams Sampled
- **FL**: Freshwater Lakes Sampled
- **SL**: Saltwater - Influenced Lagoons Sampled
- **#**: Sampled for Fish
- **- - -**: Kodiak Launch Complex Boundary
- **- - -** : Pasagshak Point Road
- **Not to Scale**

Source: Federal Aviation Administration, 1996 (modified).

Index Map

Kodiak Island

Kodiak Launch Complex

Pasagshak Point Road

Barry Lagoon

Triple Lakes

West Twin Lake

East Twin Lake

U.S. Coast Guard Loran C Station

Pasagshak Point Road

Not to Scale
including water and wastewater utilities. KLC is in a fairly remote area, with other nearby water uses limited to a ranch and a local business. The town of Kodiak has its own water supply and treatment system and is located approximately 40 kilometers (25 miles) to the north.

Table 3.1.14-1: Water Quality on Kodiak Island and in the Vicinity of Kodiak Launch Complex

<table>
<thead>
<tr>
<th>Water Quality Parameter</th>
<th>Unit of Measure</th>
<th>Kodiak Island Max</th>
<th>Min</th>
<th>KLC Vicinity Max</th>
<th>Min</th>
<th>Avg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freshwater Streams</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>°Celsius (°Fahrenheit)</td>
<td>--- (a)</td>
<td>---</td>
<td>13 (55)</td>
<td>8 (46)</td>
<td>10 (50)</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Micromhos per centimeter</td>
<td>206.0</td>
<td>24.0</td>
<td>92.8</td>
<td>46.0</td>
<td>55.4</td>
</tr>
<tr>
<td>PH</td>
<td></td>
<td>8.5</td>
<td>6.2</td>
<td>7.5</td>
<td>6.8</td>
<td>7.1</td>
</tr>
<tr>
<td>Dissolved oxygen</td>
<td>Percent saturation</td>
<td>---</td>
<td>---</td>
<td>92.0</td>
<td>65.0</td>
<td>84.0</td>
</tr>
<tr>
<td>Alkalinity</td>
<td>Milligrams calcium carbonate per liter</td>
<td>30.0</td>
<td>10.0</td>
<td>24.0</td>
<td>13.0</td>
<td>19.0</td>
</tr>
<tr>
<td><strong>Freshwater Lakes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>°Celsius (°Fahrenheit)</td>
<td>---</td>
<td>---</td>
<td>12 (53)</td>
<td>11 (52)</td>
<td>12 (53)</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Micromhos per centimeter</td>
<td>165.0</td>
<td>52.0</td>
<td>97.3</td>
<td>76.6</td>
<td>86.2</td>
</tr>
<tr>
<td>PH</td>
<td></td>
<td>8.0</td>
<td>5.8</td>
<td>7.3</td>
<td>7.1</td>
<td>7.2</td>
</tr>
<tr>
<td>Dissolved oxygen</td>
<td>Percent saturation</td>
<td>---</td>
<td>---</td>
<td>93.0</td>
<td>77.0</td>
<td>87.0</td>
</tr>
<tr>
<td>Alkalinity</td>
<td>Milligrams calcium carbonate per liter</td>
<td>---</td>
<td>---</td>
<td>26.0</td>
<td>15.0</td>
<td>20.0</td>
</tr>
<tr>
<td><strong>Saltwater-Influenced Lagoon (Barry Lagoon)</strong>(b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>°Celsius (°Fahrenheit)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>14 (57)</td>
<td>---</td>
</tr>
<tr>
<td>Conductivity</td>
<td>Micromhos per centimeter</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>119.0</td>
<td>---</td>
</tr>
<tr>
<td>PH</td>
<td></td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>7.1</td>
<td>---</td>
</tr>
<tr>
<td>Dissolved oxygen</td>
<td>Percent saturation</td>
<td>---</td>
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<td>---</td>
<td>91.0</td>
<td>---</td>
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<tr>
<td>Alkalinity</td>
<td>Milligrams calcium carbonate per liter</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>14.0</td>
<td>---</td>
</tr>
</tbody>
</table>

Source: Alaska Aerospace Development Corporation, 1995b

Note: Sampling locations are shown on figure 3.1.14-1.

(a) dashed lines: --- indicate no data are available
(b) only one sample was taken from Barry Lagoon

3.1.15 SUBSISTENCE—KODIAK LAUNCH COMPLEX

Many families living in rural areas of Alaska are partially or wholly dependent upon the harvesting of natural resources for food and other living necessities. The Alaska National Interest Lands Conservation Act of 1980 provides for the continued opportunity for customary and traditional uses of fish and wildlife for subsistence.
In rural communities, the harvesting of subsistence resources can be the primary means of support for a family unit. While food is the primary use of subsistence resources, there are many other uses for subsistence products such as clothing, food for work animals, fuel, home crafts, customary trade, ceremonial tools, as well as arts and crafts. In addition to the material importance of subsistence hunting, it also plays a strong role in the social and cultural traditions of many native Alaskan communities. (Ballistic Missile Defense Organization, 2000)

3.1.15.1 Region of Influence
The ROI for subsistence is the area adjacent to and including Narrow Cape.

3.1.15.2 Affected Environment
Major villages found on Kodiak Island include Akhiok, Karluk, Larsen Bay, Old Harbor, Ouzinkie, and Port Lions. These communities are accessible from Kodiak only by air or water. The populations of these communities range from 80 (Akhiok) to 237 (Old Harbor) and all are 63 percent or more native (table 3.1.15-1). The natives are mainly Alutiiq. Section 3.1.4.2 includes a description of native populations and traditional resources. Commercial fishing is the main source of cash income in these communities, and subsistence is another important activity economically as well as culturally. The percentage of households that use subsistence resources is high in all communities, averaging approximately 99 percent (Ballistic Missile Defense Organization, 2000).

<table>
<thead>
<tr>
<th>Geographic Area</th>
<th>Total Population</th>
<th>Percent American Indian and Alaska Native</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kodiak</td>
<td>6,334</td>
<td>10</td>
</tr>
<tr>
<td>Akhiok</td>
<td>80</td>
<td>86</td>
</tr>
<tr>
<td>Karluk</td>
<td>27</td>
<td>96</td>
</tr>
<tr>
<td>Larsen Bay</td>
<td>115</td>
<td>78</td>
</tr>
<tr>
<td>Old Harbor</td>
<td>237</td>
<td>73</td>
</tr>
<tr>
<td>Ouzinkie</td>
<td>225</td>
<td>81</td>
</tr>
<tr>
<td>Port Lions</td>
<td>256</td>
<td>63</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2002

A small number of Old Harbor residents use the coastal and adjacent inland areas around Narrow Cape for subsistence. Salmon, halibut, crab, waterfowl, seal, sea lion, and deer are the primary species harvested by these residents. Other inhabitants of Kodiak Island also engage in subsistence activities. The primary areas for subsistence used by Kodiak residents are the Buskin River, which is adjacent to the Kodiak Airport, and the Afognak and Litnik Rivers, which are both on Afognak Island. The Narrow Cape area is used primarily for harvesting deer and freshwater fish in the vicinity of Twin Lakes. The potential for subsistence use growth of the Narrow Cape area is limited since it is currently being used as a working ranch and as the site of KLC.
3.2 MIDWAY

Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and will not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed.

The proposed GMD ETR activities could have an effect on air quality, biological resources, and hazardous materials and waste at Midway. These resource areas are summarized in the following sections.

Areas that are not expected to be affected sufficiently at Midway to warrant further discussion in this section include airspace, cultural resources, geology and soils, health and safety, land use, noise, socioeconomics, transportation, utilities, visual and aesthetic resources, water resources, and environmental justice. Proposed activities at Midway would not affect controlled and uncontrolled airspace, Special Use Airspace, en route airways and jet routes, or airfields. While many of the islands at Midway Atoll have important historic resources, many of them relating to battles during World War II, there are not expected to be any ground disturbing activities within areas where these resources are located. While proposed construction activities at Sand Island will result in limited clearing and excavation of pad, roadway and cable alignments, it is not expected to create any adverse erosion effects to geology or soils, due primarily to the flat relief and highly permeable nature of the coral soils and artificial (coral rubble) fill. Consequently, this section will not include further analysis of geological resources. Construction and operation activities would follow standard health and safety guidelines. Land use impact would be minimal since the proposed activities would occur in paved areas and would not produce a change in land utilization. No sensitive receptors would be disturbed by the proposed intermittent and short-term activity, and noise levels are expected to be below OSHA workplace standards. As a result of its isolation, limited population, minute local economic activity, and limited GMD ETR activities, socioeconomic impacts would not occur. The few additional personnel would not affect the utilities infrastructure or transportation. Visual and aesthetic resource impacts would be avoided by actions taking place in secure locations that are somewhat hidden by vegetation. The water resources requirements for the proposed activities would result in a minor increase above the existing usage levels, but below past usage levels. An Environmental Justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. No adverse long-term impacts have been identified at Midway. As such, there would be no disproportionately high and adverse human health or environmental effects on the minority or low-income populations.

3.2.1 AIR QUALITY—MIDWAY

Appendix B includes a general description of air quality and the main regulations and laws that govern its protection.
3.2.1.1 Region of Influence

For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to an area extending no more than a few tens of kilometers (miles) downwind from the source.

The ROI for ozone may extend much further downwind than the ROI for inert pollutants; however, as the project area has no heavy industry and very few automobiles, tropospheric ozone and its precursors are not of concern. Consequently, for the air quality analysis, the ROI for project operational activities includes the area surrounding Sand and Eastern Islands of Midway.

3.2.1.2 Affected Environment

Climate

Due to its low topographic profile and small size, Midway Atoll does not affect its own climate. The climate of Midway Atoll is semi-tropical oceanic, consisting of two distinct seasons. The months from December to February tend to be cool, windy and wet, with the temperature dropping into the low 10s °C (60s °F), while May through October tend to be warm and sunny, with most days reaching the high 20s °C (80s °F).

Midway experiences frequent, but modest, rainfall. It rains, on average, approximately 165 days a year, and the mean annual rainfall is 107 centimeters (42 inches). Since 1918, a minimum annual rainfall of 64 centimeters (25 inches) and a maximum annual rainfall of 175 centimeters (69 inches) have been recorded.

East-northeasterly tradewinds, averaging about 19 kilometers per hour (10 knots), are predominate from March through November, and are generally accompanied by fair weather. From November through February, the weather can be quite variable, ranging from southwesterly winds accompanied by rain and squalls, to gale-force northerly winds. Midway is well north of any hurricane areas and has not been struck by a hurricane in recorded history. (Pacific Division, Naval Facilities Engineering Command, 1994)

Regional Air Quality

No ambient air quality monitoring data is available for the Midway Atoll; however, there are no air pollution problems at Midway, due to the lack of air emissions and sources, and given the amount of strong trade winds. These trade winds quickly disperse any local emissions.

Existing Air Emissions

Current facilities that may emit air pollutants include the carpenter shop, spray paint shop, power plant, boilers, open burning of solid waste at landfills, and open burning of waste oil. Other emissions are from automobiles, small motorized equipment, airplanes, and power boats. (U.S. Department of the Interior, Fish and Wildlife Service, 1996)
3.2.2 BIOLOGICAL RESOURCES—MIDWAY

Appendix B includes a definition of biological resources and the main regulations and laws that govern their protection.

3.2.2.1 Region of Influence

The ROI includes areas on Midway Island that may be affected by construction and operation of an IDT and two COMSATCOM terminals.

3.2.2.2 Affected Environment

Vegetation

Over 200 plant species have been introduced to Midway’s islands since the arrival of permanent residents in 1902. The most common of these include ironwood, golden crown-beard, wild poinsettia, Haole koa, sweet alyssum, buffalo grass, peppergrass, and Bermuda grass. Ironwood trees can grow as much as 12 meters (40 feet) in 18 months unless aggressively managed. Efforts have been undertaken to prevent further colonization, especially in beach areas, to preserve the remaining beach strand vegetation (Pacific Division, Naval Facilities Engineering Command, 1994). Golden crown-beard grows so quickly that it can exclude birds from otherwise desirable nesting habitat. (U.S. Fish and Wildlife Service, Midway Atoll National Refuge, 2002)

Plants indigenous or naturalized to Midway Atoll include beach naupaka, tree heliotrope, beach morning glory, lovegrass, sickle grass, ihi, alena, puncture vine (nohu), and ‘ena’ena. Ihi occurs commonly on Eastern and Spit Islands but is much less common on Sand Island. (U.S. Fish and Wildlife Service, 2002a)

Beach naupaka and tree heliotrope are examples of beach strand vegetation, which are dune-binding species. Although once abundant over much of the coastal areas of Sand Island, these plants have been reduced in extent due to grazing by rats and shading by ironwood trees. Frigate Point on Sand Island contains the only large stand of beach naupaka. (Pacific Division, Naval Facilities Engineering Command, 1994)

Threatened and Endangered Plant Species

No threatened or endangered plant species are located on Midway Atoll.

Wildlife

A large variety of wildlife occurs on Midway Atoll, including an abundance of migratory seabirds. Over 100 species of birds have been identified. About 15 species of birds nest on Midway Atoll with a total population of almost 2 million. Midway has the world’s largest colony of Laysan albatross, nearly 400,000 nesting pairs, and the largest colonies of red-tailed tropicbirds, black noddies, and white terns. Additional bird species include short-tailed and black-footed albatross; shearwaters; brown, masked, and red-footed booby; brown noddys; and terns. Birds native or indigenous to Midway include a small variety of arctic nesting shorebirds, such as the bristle-thighed curlew and ruddy turnstone, and vagrant species observed in small numbers. (U.S. Fish and Wildlife Service, Midway Atoll National Wildlife Refuge, 2002)
An introduced species that has had a profound adverse affect on Midway’s wildlife is the black rat. Due to a very aggressive rat control program, rats have been eliminated from Eastern and Spit islands and are probably also absent from Sand Island. (U.S. Fish and Wildlife Service, Midway Atoll National Wildlife Refuge, 2002)

About 250 spinner dolphins inhabit the lagoon during the day and generally leave it each night to feed in deeper waters. The lagoon also supports over 130 species of fish and a variety of marine invertebrates (U.S. Department of the Interior, Fish and Wildlife Service, 1996)

**Threatened and Endangered Wildlife Species**

The endangered short-tailed albatross (*Phoebastria albatrus*) is a visitor to Midway during its migration, and single nests occasionally occur on the island (U.S. Fish and Wildlife Service, Pacific Region, 2002b).

Approximately 45 to 55 endangered Hawaiian monk seals (*Monachus schauinslandi*) live on Midway Atoll. Eastern and Spit islands are the main pupping areas. The monk seal is endemic to the Hawaiian archipelago and is found almost exclusively in the Northwestern Hawaiian Islands. A number of threatened green sea turtles (*Chelonia mydas*) live and forage within Midway’s lagoon. Nesting has not been recorded on Midway Atoll. (U.S. Fish and Wildlife Service, 2002a) The endangered hawksbill sea turtle (*Eretmochelys imbricata*) is a rare visitor to Midway (Pacific Division, Naval Facilities Engineering Command, 1994). Current rules on Midway require that people stay at least 31 meters (100 feet) from monk seals on the beach and from basking sea turtles (U.S. Fish and Wildlife Service, 2002a).

**Environmentally Sensitive Habitat**

All of Midway Atoll, except for Sand Island and its harbor, has been designated as critical habitat for the Hawaiian monk seal. A small (less than 0.2 hectare [0.5 acre]), emergent wetland area has been identified on Sand Island. It is located west of Decatur Avenue, north of the cemetery, and south of Halsey Drive. (Pacific Division, Naval Facilities Engineering Command, 1994)

The *[Coral Reef Ecosystem Fishery Management Plan](#)* for the western Pacific has established Marine Protected Areas. No-take Marine Protected Areas are at 0- to 10-fathom (0- to 18-meter [60-foot]) depths for all the chain. No-take Marine Protected Areas are also located from 10 to 50 fathoms (18 to 91 meters [300 feet]) at French Frigate Shoals, Laysan, and the northern half of Midway. The southern half of Midway is for recreational catch and release only. (American Association for the Advancement of Science, 2002)

### 3.2.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—MIDWAY

Appendix B includes a general description of hazardous materials and waste.

#### 3.2.3.1 Region of Influence

The ROI for potential impacts related to hazardous materials/wastes includes areas of the atoll to be used for communications operations, and in areas where hazardous materials are stored and handled.
3.2.3.2 Affected Environment

The U.S. Navy closed Naval Air Facility Midway in 1993 and turned control of Midway Atoll over to the USFWS in 1997. USFWS manages the location as the Midway Atoll National Wildlife Refuge. Essential facilities services are provided by a contractor.

There is currently no military presence on Midway Atoll. Pollution Prevention/Recycling/Waste Minimization would be practiced in accordance with EPA, DoD, and Army requirements. IRP activities were conducted by the U.S. Navy in the early- to mid-1990s under the Comprehensive Long-Term Environmental Action Navy (CLEAN) program. IRP sites 72, 77, and 79 are at the proposed IDT and COMSATCOM location. These IRP sites were identified as areas where only POL releases had occurred in the past. IRP Site 50 was a formerly contaminated with hazardous material, but all remedial actions were completed. (Naval Facilities Engineering Command, Pacific Division, 1997)

Currently, Midway has two 7.95-million-liter (2.1-million-gallon) jet petroleum #5 (JP-5) storage tanks and five 25,170-liter (66,500-gallon) motor gasoline (MOGAS) tanks. In addition, there are five tank truck refuelers, 2,745 meters (9,000 feet) of fuel spill boom and skimmer/vacuum truck. The USFWS reports an average of approximately 643,520 liters (170,000 gallons) of JP-5 and 11,356 liters (3,000 gallons) of MOGAS usage per month. (U.S. Fish and Wildlife Service, 2002a)

All known USTs and POL pipelines were removed by the U.S. Navy under the CLEAN program. (Naval Facilities Engineering Command, Pacific Division, 1997)

Asbestos remediation/removal was conducted at Midway by a U.S. Navy contractor in the mid-1990s. Lead-based paint was assessed in all buildings and structures on Sand and Eastern Islands. PCB removal activity was initiated by the U.S. Navy in 1984. By September 1996, removal activity was substantially complete. (Naval Facilities Engineering Command, Pacific Division, 1997)

Aviation jet fuel is used for transportation of personnel to and from the atoll, in support of USFWS service activities.

Small quantities of nonhazardous and hazardous wastes generated at Midway may include batteries, waste oil, fuels, paints, cleaners, spill cleanup materials, and empty containers.
3.3 REAGAN TEST SITE

The existing environment at RTS was described in the Final Supplemental EIS for Proposed Actions at USAKA (U.S. Army Space and Strategic Defense Command, 1993a). For the most part, that description is still accurate and will not be repeated in this document. Rather, for resources that may be affected by ETR activities at RTS, the pertinent resource discussions will be summarized and any differences in existing environmental conditions, including new facilities or infrastructure, will be noted. The more detailed discussion in the Final Supplemental EIS is incorporated by reference and will be made available for review by those who wish more information concerning the existing environment at RTS.

The RTS environmental program is governed by the Environmental Standards and Procedures for the U.S. Army Kwajalein Atoll (USAKA) Activities in the Republic of the Marshall Islands, unofficially called the UES. The UES is mandated in the Compact of Free Association between the Republic of the Marshall Islands and the United States as approved by U.S. Public Law 99-239. They became effective 4 December 1995. The UES is a one-of-a-kind regulatory program document with substantively similar U.S. and RMI statutes and regulations. As required in the UES, RTS issues Documents of Environmental Protection, similar to federal and state permits, for conducting activities with potential to affect the environment. The Documents of Environmental Protection are streamlined environmental protection documents for specific environmental activities (e.g., air emissions from major stationary sources; construction and operation of power plants; point source discharges) that specify in detail how UES compliance will be maintained. The Documents of Environmental Protection are tailored specifically for conditions and considerations at RTS (U.S. Army Space and Missile Defense Command, 2001a).

The proposed ETR activities could have an effect on air quality, airspace, biological resources, hazardous materials and waste, health and safety, and utilities at RTS. These resource areas are summarized in the following sections.

Areas that are not expected to be affected sufficiently at RTS to warrant further discussion in this section include cultural resources, geology and soils, land use, noise, socioeconomics, transportation, water resources, visual and aesthetic resources, and environmental justice. While many of the islands at Kwajalein Atoll have important historic resources, many of them relating to battles during World War II, there are not expected to be any ground disturbing activities within areas where these resources are located. Consequently, this section will not include further analysis of cultural resources. While proposed GBI and target launch activities would result in minor soil contamination from rocket emissions in and around the designated Launch Hazard Area at Meck, they are not expected to create adverse effects beyond those previously analyzed in the USAKA Supplemental EIS (U.S. Army Space and Strategic Defense Command, 1993a). Use of existing range radars and minor construction upgrades to GBI and radar facilities will have no adverse effects on site soils. Consequently, this section will not include further analysis of geological resources. Land use at RTS and surrounding areas would not change. Utilization of adjacent lands would be consistent with existing land use agreements. The existing noise levels at RTS would continue, including those associated with proposed missile launches. None of the noise levels outside of the Ground Hazard Area boundary for the proposed launch areas where non-essential personnel and the public are excluded would exceed either DoD or OSHA safety requirements. Personnel within the Ground Hazard Area wear hearing protection devices. Due to RTS’s isolation, and a population
consisting exclusively of RTS employees and support contractors and their families, GMD ETR activities would not produce any adverse socioeconomic impacts. Shipping of project-related materials, as well as transportation of personnel, would utilize air, roadway, and shipping/ferrying routes that are equipped to handle both the loads and frequency of project demands. These actions are considered typical and a routine activity.

Although the visual resources on RTS may be considered significant by some viewers, much of the area is already developed with the types of structures and activities that are being considered in the Proposed Action. Therefore, this section does not include further analysis of visual resources at RTS. An Environmental Justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. No adverse long-term impacts have been identified at the proposed RTS sites. As such, there would be no disproportionately high and adverse human health or environmental effects on the minority or low-income populations that may be present in the vicinity of those locations.

### 3.3.1 AIR QUALITY—REAGAN TEST SITE

The UES regulate air quality at RTS. These standards are based upon the U.S. Clean Air Act and its promulgated regulations, but do not include many of the procedural and technology based requirements. The standards are designed to maintain the current air quality at RTS. Pollutant ambient air concentrations may not increase above the baseline level by more than an increment of 25 percent of the applicable Ambient Air Quality Standards (AAQS). The UES AAQS are set at 80 percent of the NAAQS provided in appendix B. The UES requires a Document of Environmental Protection, similar to an operating permit in the United States, for all new major stationary sources, or sources regulated under the U.S. National Emissions Standards for Hazardous Air Pollutants. Existing sources at RTS are covered by the Air Emissions from Major Sources at USAKA/KMR Document of Environmental Protection, as revised November 2000. This Document of Environmental Protection establishes operational requirements and limitations for sources at RTS.

#### 3.3.1.1 Region of Influence

For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to an area extending no more than a few tens of miles downwind from the source.

The ROI for ozone may extend much further downwind than the ROI for inert pollutants; however, as the project area has no heavy industry and very few automobiles, tropospheric ozone and its precursors are not of concern. For the air quality analysis, the ROI for project operational activities includes Kwajalein, Meck, Eniwetak, and Omelek islands. However, the ROI also includes areas that may potentially be affected by the use of RTS for the SBX, including the mooring sites identified in section 2.3.1.3.

#### 3.3.1.2 Affected Environment

Because of the relatively small numbers and types of air pollution sources, the dispersion caused by trade winds, and the lack of topographic features that inhibit dispersion, air quality at RTS is considered good (i.e., well below the maximum pollution levels established for air quality in the United States). (U.S. Army Space and Missile Defense Command, 2001a)
Kwajalein

Climate

Kwajalein Atoll is located less than 1,000 kilometers (600 miles) north of the equator and has a tropical marine climate characterized by relatively high annual rainfall and warm to hot, humid weather throughout the year. The mean annual temperature at Kwajalein is 28°C (82°F). The average annual precipitation is 256 centimeters (101 inches). The main rainfall season lasts from mid-May to mid-December, with about 30 centimeters (10 inches) of rainfall per month. Kwajalein’s relative humidity averages between 70 and 85 percent throughout the year. Virtually constant cloud cover, light easterly winds, and frequent moderate to heavy rain showers prevail during the wet season.

Trade winds are dominant throughout the year and strongest from November to June. The prevailing winds blow from the east to the northeast with an average speed of 26 kilometers (16 miles) per hour in the winter and 10 kilometers (6 miles) per hour in the summer.

Regional Air Quality

The ambient air on Kwajalein was analyzed in a U.S. Army Environmental Hygiene Agency study completed in 1993. This testing was conducted before the adoption of the UES and its unique UES AAQS. In this study the concentration of criteria pollutants was measured both upwind and downwind of power plants 1A and 1B (table 3.3.1-1). The concentrations of sulfur dioxide, lead, and particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM-10) were found to be below their NAAQS. Since there is no short-term NAAQS for nitrogen dioxide, the study compared the measured concentrations at Kwajalein to the 1-hour California AAQS for nitrogen dioxide; the concentrations at Kwajalein were below this standard. The concentrations measured at Kwajalein were below the 1-hour NAAQS for carbon monoxide, but downwind concentrations were greater than the 8-hour NAAQS for carbon monoxide. (U.S. Army Environmental Hygiene Agency, 1993)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>NAAQS*</th>
<th>Measured Ambient Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Upwind</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>3-hr max.</td>
<td>0.5 ppm</td>
</tr>
<tr>
<td></td>
<td>24-hr max.</td>
<td>0.14 ppm</td>
</tr>
<tr>
<td>Nitrogen dioxide*</td>
<td>1-hr max.</td>
<td>0.25 ppm</td>
</tr>
<tr>
<td>PM-10</td>
<td>24-hr max.</td>
<td>150 μg/m³</td>
</tr>
<tr>
<td>Lead</td>
<td>Quarterly</td>
<td>1.5 μg/m³</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>1-hr max.</td>
<td>35 ppm</td>
</tr>
<tr>
<td></td>
<td>8-hr max.</td>
<td>9 ppm</td>
</tr>
</tbody>
</table>

Source: U.S. Army Environmental Hygiene Agency, 1993

*As no short-term NAAQS exist for nitrogen dioxide, the California Ambient Air Quality Standard was used for comparison.
Existing Emissions Sources
Ambient air quality is generally characterized as good due to the relatively small number of air pollution sources and because of good dispersion produced by the strong, persistent tradewinds and lack of topographic features to inhibit pollution dispersion. The power plants are the primary source of air emissions on Kwajalein. The concentration of the criteria air pollutants was measured both upwind and downwind of power plants 1A and 1B. The concentrations of sulfur dioxide, lead, and PM-10 were found to be below their UES AAQS both upwind and downwind. Since there is no short-term UES AAQS for nitrogen dioxide, the study compared the measured concentrations at Kwajalein to the 1-hour California AAQS for nitrogen dioxide; the concentrations at Kwajalein were below this standard. The concentrations measured at Kwajalein were below the 1-hour UES AAQS for carbon monoxide, but downwind concentrations were greater than the 8-hour UES AAQS for carbon monoxide.

The existing primary pollution sources include power plants (1A and 1B), fuel storage tanks, solid waste incinerators, diesel fired commercial boilers, a concrete batching plant, and transportation. Rocket launches tend to be smaller sources of emissions. USAKA performs an Air Emissions Inventory on a biennial basis in accordance with the UES (table 3.3.1-2).

Table 3.3.1-2: Summary of Emissions of Regulated Air Pollutants on Kwajalein

<table>
<thead>
<tr>
<th></th>
<th>PM-10 (ton/year)</th>
<th>Sulfur Dioxide (ton/year)</th>
<th>Carbon Monoxide (ton/year)</th>
<th>Nitrogen Dioxide (ton/year)</th>
<th>Volatile Organic Compounds (ton/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>72.35 (79.75)</td>
<td>199.98 (220.44)</td>
<td>318.39 (350.96)</td>
<td>1,180.16 (1,300.90)</td>
<td>48.45 (53.41)</td>
</tr>
</tbody>
</table>

Source: Raytheon Range System Engineering, 2002

Meck

Climate
Temperature, rainfall, humidity, and trade winds at Meck are similar to those described for Kwajalein.

Regional Air Quality
The Supplemental EIS for USAKA predicts that Kwajalein Island has far more air pollutant emissions than Meck. Therefore, the ambient air quality is assumed to be comparable to that measured at the upwind location at Kwajalein Island, as listed in table 3.3.1-1.

Existing Emission Sources
Existing pollution sources for Meck are similar to those listed for Kwajalein, including a power plant, a solid waste incinerator, fuel storage tanks, and transportation. Infrequent rocket launches also occur on Meck. Table 3.3.1-3 summarizes air emissions on Meck.
Table 3.3.1-3: Summary of Emissions of Regulated Air Pollutants on Meck

<table>
<thead>
<tr>
<th></th>
<th>PM-10</th>
<th>Sulfur Dioxide</th>
<th>Carbon Monoxide</th>
<th>Nitrogen Dioxide</th>
<th>Volatile Organic Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric tons/year</td>
<td>2.12</td>
<td>18.67</td>
<td>31.42</td>
<td>118.30</td>
<td>5.13</td>
</tr>
<tr>
<td></td>
<td>(2.34)</td>
<td>(20.58)</td>
<td>(34.63)</td>
<td>(130.40)</td>
<td>(5.65)</td>
</tr>
</tbody>
</table>

Source: Raytheon Range System Engineering, 2002

Rocket launch emissions are also considered to be sources of pollutants, which result in short term, temporary increases in pollutants. Table 3.3.1-4 lists the estimated rocket launch emissions per year for a high level of activity according to the Final Supplemental EIS for Proposed Actions at USAKA (U.S. Army Space and Strategic Defense Command, 1993a). For Meck, the estimated number of launches was 28 per year for Strategic Launch Vehicles (assuming the use of SR-19 rocket motors).

Table 3.3.1-4: Estimated Rocket Launch Emissions for a High Level of Activity

<table>
<thead>
<tr>
<th></th>
<th>Carbon Monoxide</th>
<th>Hydrogen Chloride</th>
<th>Aluminum Oxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric tons/launch</td>
<td>7.14 (7.88)</td>
<td>5.18 (5.71)</td>
<td>9.27 (10.22)</td>
</tr>
</tbody>
</table>


Roi-Namur

Climate
The climate of Roi-Namur is similar to that described for Kwajalein.

Regional Air Quality
The Supplemental EIS for USAKA predicts that air pollution emissions on Roi-Namur are comparable to those on Kwajalein; therefore, air quality on Roi-Namur is expected to be comparable to that of Kwajalein Island (table 3.3.1-1).

Existing Emission Sources
Existing pollution sources for Roi-Namur are similar to those listed for Kwajalein and Meck, including a power plant, a solid waste incinerator, fuel storage tanks and transportation on the island. RTS constructed a new power plant on Roi-Namur, bringing it online in 2002. Air quality requirements for the plant were established in a May 1999 Document of Environmental Protection entitled: Construction and Operations of Power Plant Demolition of Existing Power Plant, Roi-Namur. Table 3.3.1-5 summarizes air emissions on Roi-Namur.
Table 3.3.1-5: Summary of Emissions of Regulated Air Pollutants on Roi-Namur

<table>
<thead>
<tr>
<th>PM-10 metric tons (tons)/year</th>
<th>Sulfur Dioxide metric tons (tons)/year</th>
<th>Carbon Monoxide metric tons (tons)/year</th>
<th>Nitrogen Dioxide metric tons (tons)/year</th>
<th>Volatile Organic Compounds metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.69 (7.37)</td>
<td>58.99 (65.03)</td>
<td>98.29 (108.35)</td>
<td>373.79 (412.03)</td>
<td>11.28 (12.43)</td>
</tr>
</tbody>
</table>

Source: Raytheon Range System Engineering, 2002

3.3.2 AIRSPACE—REAGAN TEST SITE

Appendix B includes a general description of airspace.

3.3.2.1 Region of Influence

The ROI for airspace at RTS includes the airspace over and surrounding the potential radiation hazard areas that extend from the mooring location north of Kwajalein in the USAKA lagoon (figure 3.3.2-1).

3.3.2.2 Affected Environment

Controlled and Uncontrolled Airspace

RTS is located in international airspace. Therefore, the procedures of the International Civil Aviation Organization (ICAO) outlined in ICAO Document 4444, *Rules of the Air and Air Traffic Services*, are followed (International Civil Aviation Organization, 1996; 1997). ICAO Document 4444 is the equivalent air traffic control manual to the FAA Handbook 7110.65, *Air Traffic Control*. The ICAO is not an active air traffic control agency and has no authority to allow aircraft into a particular sovereign nation’s Flight Information Region or Air Defense Identification Zone and does not set international boundaries for air traffic control purposes. The ICAO is a specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

The FAA acts as the U.S. agent for aeronautical information to the ICAO, and air traffic in the ROI is managed by the Oakland ARTCC in its Oceanic Control-6 Sector, the boundaries of which are shown in figure 3.3.2-2.

Special Use Airspace

There is no special use airspace in the ROI.

En Route Airways and Jet Routes

Although relatively remote from the majority of jet routes that cross the Pacific, the RTS and vicinity have several jet routes passing nearby, including R-584 and A-222 (figure 3.3.2-1). An accounting of the number of flights using each jet route is not maintained.
EXPLANATION

- Land
- Coral
- SBX Mooring Site
- Low Altitude Air Routes

Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Airspace Over the Potential SBX Site at Reagan Test Site

United States Army
Kwajalein Atoll

Figure 3.3.2-1

Tokyo FIR
Anchorage FIR
Tahiti FIR
Auckland FIR
Nandi FIR
Townsville FIR
Guam
Reagan Test Site
Pacific Missile Range Facility
Wake Island
Midway Atoll
Airspace Managed by the Oakland Oceanic Control Area Administrative Boundaries (Oakland FIR)


EXPLANATION
FIR = Flight Information Region
OC = Oceanic Control Sectors within the Oakland FIR
Oakland FIR Boundary
Sector Boundaries
Radar Control Areas

Figure 3.3.2-2

GMD ETR Final EIS
Although not depicted on either the North Pacific Route Chart, Southwest Area or Composite, there are low altitude airways carrying commercial traffic between the various islands of the RMI, particularly between the Marshall Islands International Airport at Majuro and Bucholz Army Airfield on Kwajalein.

Airports/Airfields

In 1993 Bucholz Army Airfield had a reported 1,674 operations per month, an average of over 55 per day. Many of the 55 flights per day were aircraft and helicopter flights to other USAKA islands. Currently flight activity through Bucholz Army Airfield is reduced. Dyess Army Airfield on Roi-Namur provides service to a variety of aircraft and helicopters.

3.3.3 BIOLOGICAL RESOURCES—REAGAN TEST SITE

Appendix B includes a general definition of biological resources. Regulations governing endangered species and wildlife resources at RTS are specified in UES Section 3-4. Water quality and reef protection standards at RTS are in UES Section 3-2 (U.S. Army Space and Missile Defense Command, 2001a).

3.3.3.1 Region of Influence

The ROI includes areas on RTS that may be affected by interceptor launches from existing silos, target launches from existing and new launch sites, and the use of existing sensors. The ROI for biological resources includes the entire island and near-shore reef area for islands where target and interceptor missiles would be launched. For islands where only sensors would be placed, the ROI would be limited to the sites where program activities are conducted and the EMR hazard area. The ROI for the flight test corridor includes the missile over-flight area and the potential debris impact areas over the BOA or Kwajalein Lagoon within the Mid-atoll Corridor. The ROI also includes areas that may potentially be affected by the use of RTS for the SBX, including the mooring sites identified in section 2.3.1.3.

3.3.3.2 Affected Environment

Vegetation

The types of vegetation currently found on USAKA consist of managed vegetation, herbaceous (green, leaf-like) strand, littoral (relating to the shore) shrubland, littoral forest, and coconut plantation. Managed vegetation is disturbed vegetation dominated by alien weeds and is usually maintained by mowing. Herbaceous strand is a narrow zone of vegetation on upper sandy or rocky beaches dominated by grasses, sedges, and vines. Littoral shrubland consists of vegetation in coastal areas dominated by wide spread shrubs. Littoral forest is usually the most common type of vegetation on tropical islands dominated often by a single tree species. Coconut plantations are dominated by planted coconut palms. (Oak Ridge Institute for Science and Education and U.S. Army Environmental Center, 1999)

Kwajalein

Much of Kwajalein has been cleared and paved, including the large runway occupying the entire center (southern) portion of the island, and very little undisturbed vegetation remains. Non-native grasses and weeds dominate the open areas and are maintained by mowing. The island
has been enlarged over the years with dredged landfill since the 1930s and consequently exhibits vegetation characteristic of heavily disturbed areas. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995)

Most of the managed vegetation on Kwajalein consists of weedy alien plants such as mat grass, coat buttons, temple grass, and Bermuda grass. Some herbaceous strand is found along the coast and is dominated by beach morning glory, hurricane grass, and sickle grass. Tree heliotrope and beach sunflower are examples of littoral shrubland species found on the island. The most common trees on Kwajalein are coconut, screw pine, and ironwood; however, no littoral forest is present. (Oak Ridge Institute for Science and Education and U.S. Army Environmental Center, 1999)

Previously existing lagoon and nearshore marine habitat along the Kwajalein lagoon shoreline has been buried under landfill. However, along the northern edge of the island on the lagoon floor are several small communities of the rare seagrass *Halophila minor*. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995)

**Meck**

Much of Meck has been cleared and paved. Non-native grasses and weeds dominate the open areas and are maintained by mowing. A few native trees still exist on the northern end of the island within the ROI. The island has been enlarged with dredged fill material. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995)

Vegetation on Meck is mainly managed vegetation with some small patches of herbaceous strand and littoral shrubland. Managed vegetation consists of plants such as coat buttons, mat grass, hurricane grass, and garden spurge. Herbaceous strand vegetation such as mat grass, beach morning glory, and sickle grass tends to occur in areas near the ocean that are no longer mowed. No littoral forest occurs on Meck. (Oak Ridge Institute for Science and Education and U.S. Army Environmental Center, 1999)

**Roi-Namur**

All five vegetation types described above are found on Roi-Namur. Non-native grasses and weeds dominate the open areas of the island and are maintained by mowing. Most of the island is maintained (i.e., open grassy areas, golf course, runway, housing areas) and a sizable portion of the island is used for radar operations, has been recently cleared, and/or is used as a repository for plant debris/compost and is overgrown with vines (e.g., beach sunflower and beach morning glory). Herbaceous strand is found in some coastal areas such as the west end of the runway and is dominated by beach sunflower, hurricane grass, and sickle grass. Littoral shrubland is also found along some of the coast and consists mainly of tree heliotrope and beach naupaka. A small patch of disturbed littoral forest is located in the northwest corner of Roi-Namur. Only a small portion (the southeastern tip) of Roi-Namur has been left relatively undisturbed since World War II. A forested area with coconut palm in the overstory has been allowed to recover on the eastern shore since approximately 1945. Coconut plantation vegetation includes some large patches of beach hibiscus and pisonia. Thick strands of small-leafed mangrove surround a small wetland in the center of the island. Although the harbor area on the lagoon side of the island has been dredged, the area supports the largest known community of the rare seagrass *Halophila minor* at Kwajalein Atoll. (Oak Ridge Institute for
Threatened and Endangered Plant Species

No threatened or endangered plant species have been identified on Kwajalein, Meck, or Roi-Namur. (U.S. Army Space and Strategic Defense Command, 1995; U.S. Army Space and Missile Defense Command, 2001a)

Wildlife

Kwajalein

Numerous small parcels of seabird roosting habitat have been identified on the western end of Kwajalein within the ROI. Large numbers of migrating shorebirds have been observed, including the Pacific golden plover and the ruddy turnstone. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995) Since 1996, white terns have been the only seabirds observed breeding on Kwajalein. Black noddies and great crested terns were observed foraging in the main harbor and along the northwestern coastline respectively. (U.S. Department of the Army, 2001)

Five species of giant clam are found at USAKA along the surrounding reef on the lagoon side and ocean side, and between several of the islands. The largest species, the bear's paw or gigas clam (*Tridacna gigas*), which was observed during the 1998 inventory (U.S. Department of the Army, 2001) has been significantly reduced in number, and the Republic of the Marshall Islands (RMI) government and the National Marine Fisheries Service are examining all species for listing as threatened or endangered. (U.S. Army Space and Strategic Defense Command, 1995)

Meck

Seabirds have been observed nesting along the eastern perimeter of the runway on Meck. Habitat for seabird roosting exists to the southwest of the launch site in the fill area at the edge of the ROI. Black-naped terns regularly roost at the southeast corner of the runway. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995) Black-naped terns were observed roosting on the southeastern tip of Meck and in active colonies on the east side of the helicopter pad during the 1998 inventory (U.S. Department of the Army, 2001).

Roi-Namur

Nesting terns use the southern tip of Roi-Namur, and assorted shorebirds roost in the shrubs along the western shore. Reef herons feed in the shore flats and tidepools east of the runway and along the eastern shore. The only seabird that appeared to be nesting during the 1998 inventory was the white tern (U.S. Department of the Army, 2001). The forested area on the east side of Roi-Namur supports habitat for a variety of nesting seabirds. (U.S. Army Space and Strategic Defense Command, 1995) Great-crested terns, golden plovers, ruddy turnstones, whimbrels, and grey-tailed and wandering tattlers were observed during the 1998 inventory (U.S. Department of the Army, 2001).
Coconut crabs occur in the forested area on the east side of Roi-Namur. Additional non-avian fauna includes rodents, lizards, and domestic dogs and cats. (U.S. Army Space and Strategic Defense Command, 1995)

**Essential Fish Habitat**

Hundreds of species of coral, as well as 250 species of reef fish, can be found in the atolls of the Marshall Islands. Food cultivation on these islands is limited; as a result, fish and seafood are staples of the Marshallese diet. (Pacific Island Travel, 2002) The multilateral fisheries agreement between the United States and South Pacific island governments, including the Marshall Islands, seeks to protect the fisheries in the Exclusive Economic Zones. This has contributed to the adoption of the United Nations Agreement on Highly Migratory Fish Stocks and Straddling Fish Stocks, a treaty that promotes the long-term sustainable use of highly migratory species, such as tuna, by balancing the interests of coastal states and states whose vessels fish on the high seas. (U.S. Department of State, 2002)

**Threatened and Endangered Wildlife Species**

**Kwajalein**

Sea turtles frequently enter the lagoon and are commonly seen in the harbors at Kwajalein. Green and hawksbill (*Eretmochelys imbricata*) sea turtles have been observed on Kwajalein, but very little sea turtle nesting activity has been documented in recent years. (U.S. Army Space and Strategic Defense Command, 1995)

**Meck**

Sea turtles frequently enter the lagoon and are commonly seen feeding in the waters surrounding Meck. Although some sandy beaches on the lagoon side of Meck provide potential sea turtle nesting habitat, no evidence of nesting has been observed.

**Roi-Namur**

Sea turtles frequently enter the lagoon and are commonly seen in the harbors at Roi-Namur. Some of the sandy beaches of Roi-Namur provide potential nesting habitat for the green and hawksbill sea turtles. At least two instances of nesting have been reported on Roi-Namur in recent years.

Threatened and endangered marine species that may possibly occur in and around USAKA include the blue whale (*Balaenoptera musculus*), finback whale (*Balaenoptera physalus*), humpback whale, sperm whale (*Physeter macrocephalus*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), olive ridley sea turtle (*Lepidochelys olivacea*), hawksbill sea turtle (*Eretmochelys imbricata*) and green sea turtle (*Chelonia mydas*). These marine mammals and sea turtles are widely distributed, open-water species. (U.S. Army Space and Strategic Defense Command, 1995; U.S. Army Space and Missile Defense Command, 2001a)

**Environmentally Sensitive Habitat**

**Kwajalein**

Extensive dredge and fill activities since the 1930s have degraded the marine habitat surrounding Kwajalein, particularly on the lagoon side. A remnant of the original reef flat is
located just north of Echo Pier, outside the harbor. Despite the lack of natural vegetation, the islet provides limited habitat for several species of birds, particularly migrant shorebirds and waterfowl. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995; U.S. Army Space and Missile Defense Command, 2001a)

Meck
Extensive dredging and the deposition of fill on the lagoon reef flat have greatly altered the marine environment of Meck. Most of the island is surrounded by riprap intended for shoreline protection. The only remaining undisturbed reef flats occur at the north and south tips of the island. Giant clams are found on the reef. (U.S. Army Strategic Defense Command, 1989a; U.S. Army Space and Strategic Defense Command, 1993a; 1995)

Roi-Namur
Marine habitat of importance to biological resources on Roi-Namur includes the lagoon-facing and ocean-facing reef slopes and flats, inter-island reef flat, lagoon floor, seagrass beds, and intertidal zone. The reef flats at the east and west ends of Roi-Namur support coral and giant clams but do not exhibit high coral coverage due to the strong current. More active coral growth was observed on the southwestern corner of the island along the lagoon side. The seagrass beds along the lagoon side may serve as a juvenile fish nursery area. (U.S. Army Space and Strategic Defense Command, 1995)

3.3.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—REAGAN TEST SITE

Appendix B includes a general description of hazardous materials and hazardous waste laws and regulations. Regulations governing hazardous material and hazardous waste management at RTS are specified in UES Section 3-6.

3.3.4.1 Region of Influence
The ROI for potential impacts related to hazardous materials/wastes would be limited to areas of the atoll to be used for missile launch (Meck) and related communications operations, and in areas where hazardous materials are stored and handled (Kwajalein and Meck islands). Some materials may also be stored or trans-shipped via Roi-Namur. All three islands are part of the East Reef of Kwajalein Atoll.

3.3.4.2 Affected Environment
The affected environment at the RTS is the Kwajalein Lagoon (where the SBX would be moored), the island of Kwajalein (where the GBI would be received and temporarily stored), and Meck, where launch would occur.

Hazardous Materials and Waste Management
The use of hazardous materials at RTS, including Kwajalein Island, is limited primarily to materials used in facility infrastructure support and flight operations, with some additional quantities of hazardous materials used by various test operations at the range. Hazardous materials used in base infrastructure support activities include various cleaning solvents
(chlorinated and non-chlorinated), paints, cleaning fluids, pesticides, motor fuels and other petroleum products, freons (for air conditioning), and other materials. A hazardous materials management plan is prepared for all hazardous materials or petroleum products shipped to RTS. The hazardous materials management plan outlines the procedures for storage, use, transportation, and disposal of the hazardous materials or petroleum products. These substances are shipped to RTS by ship or by air (U.S. Army Space and Missile Defense Command, 2001a). Upon arrival at RTS, hazardous materials to be used by RTS assets are distributed, as needed, to various satellite supply facilities, from which they are distributed to the individual users. Distribution is coordinated through the base supply system; however, the issue of such materials requires prior authorization by the RTS Environmental Office to prevent unapproved uses of hazardous materials. An activity-specific Hazardous Materials Procedure must be submitted to the Commander, RTS for approval within 15 days of receipt of any hazardous material or before use, whichever comes first. Hazardous materials to be used by organizations utilizing the test range and its facilities (i.e., range users) are under the direct control of the user organization, which is responsible for ensuring that these materials are stored and used in accordance with local and federal requirements.

Users provide storage of all materials in accordance with established procedures applicable to individual operations. The use of all hazardous materials is subject to ongoing inspection by RTS environmental compliance and safety offices to ensure the safe use of all materials. The majority of these materials are consumed in operational processes (including small losses to the air and water).

Aircraft flight operations conducted at RTS consist primarily of flights between Bucholz Army Airfield on Kwajalein Island and Dyess Army Air Field at Roi-Namur, as well as flights using RTS as a trans-Pacific stopover. Helicopters also operate at RTS. These flight operations involve the use of various grades of jet propellant, which are refined petroleum products (kerosenes). Fuels are stored in ASTs located at several islands in the USAKA. Fuels are transported to RTS by ship (U.S. Army Space and Missile Defense Command, 2001a). Significant quantities of waste fuels are not normally generated since fuels are used up in power generation, flight operations, marine vessels, and vehicle and equipment usage.

Hazardous or toxic waste treatment or disposal is not allowed at RTS under the UES. Hazardous waste, whether generated by RTS activities or range users, is handled in accordance with the procedures specified in the UES Part 3-6.5. Hazardous wastes are collected at individual work sites in waste containers. These containers are labeled in accordance with the waste which they contain and are dated the day that the first waste is collected in the container. Containers are kept at the point of generation accumulation site until full or until a specified time limit is reached. Once full, containers are collected from the generation point within 72 hours and are prepared for transport to the RTS Hazardous Waste 90-Day Storage Facility (Building 1521), located on Kwajalein Island. Each of the point of generation accumulation sites is designed to handle hazardous waste and provide the ability to contain any accidental spills of material, including spills of full containers, until appropriate cleanup can be completed. For the staging area on Roi-Namur, hazardous wastes are transported on the weekly barge to Kwajalein (Department of Defense, Ballistic Missile Defense, U.S. Space and Missile Defense Command, 1999).

At the 90-Day Storage Facility any sampling of waste is performed (for waste from uncharacterized waste streams), and waste is prepared for final off-island shipment for disposal.
Wastes are shipped off-island within 90 days of arrival at Building 1521 to Honolulu on the supply barge, for treatment and disposal in the continental United States. The barge departs Kwajalein every 4 weeks. Therefore, the facility does not need to qualify for long-term storage under the UES (U.S. Army Space and Strategic Defense Command, 1995).

The UES requires preparation and implementation of a Kwajalein Environmental Emergency Plan for responding to releases of oil, hazardous materials, pollutants, and contaminants to the environment. The Kwajalein Environmental Emergency Plan is a contingency plan similar to a spill prevention, control and countermeasure plan, but which incorporates response provisions of a National Contingency Plan. The hazardous materials management plan is incorporated into the Kwajalein Environmental Emergency Plan.

Pollution Prevention/Recycling/Waste Minimization
Pollution Prevention/Recycling/Waste Minimization activities are performed in accordance with the UES and established contractor procedures in place at RTS.

Installation Restoration Program
The IRP is not applicable to RTS, since it is located in a foreign country (the RMI). Remedial action is performed as needed, in accordance with the UES.

Underground and Aboveground Storage Tanks
A number of active ASTs are located on RTS. Bulk fuel capacity (diesel, MOGAS, and JP-5) on Kwajalein is approximately 38 million liters (10 million gallons). Full capacity is rarely used. The few remaining USTs are in the process of being removed. Installation of new USTs is prohibited.

Asbestos, Lead-Based Paint, and Polychlorinated Biphenyls
All areas containing asbestos are identified by signs in English and Marshallese. Asbestos-containing materials are used and maintained in accordance with the provisions of the UES and hazardous materials management plan. Any asbestos abatement activities would be conducted in accordance with the UES. Incineration, landfilling, or disposal of asbestos-containing materials at RTS is prohibited.

Existing areas containing lead-based paint are maintained according to established RTS safety procedures. Lead-base paint abatement activities are also conducted according to established procedures and monitored by the RTS Logistics Contractor Industrial Hygiene staff. Lead-based paint hazardous waste is shipped to the continental United States for disposal at a permitted treatment, storage, or disposal facility.

All existing areas or locations that contain PCBs or PCB equipment are regularly inspected and maintained in accordance with the UES and hazardous materials management plan. New uses of PCBs and the introduction of PCBs, PCB articles, or PCB items are prohibited. Incineration, landfilling, or disposal of PCBs or PCB items is prohibited.
Liquid Propellants and Other Toxic Fuels
Existing procedures assure safe handling of liquid propellants and other toxic materials. Current operations include storage and handling of GBI and EKV propellants.

3.3.5 HEALTH AND SAFETY—REAGAN TEST SITE
Appendix B includes a general description of health and safety.

3.3.5.1 Region of Influence
The ROI for potential impacts to worker health and safety at the RTS is greatest in the areas where missile components are stored and handled (Kwajalein and Meck Islands) and where launch (Meck) and post-launch activities occur.

The worker population of concern for the Proposed Action includes all of RTS, but would predominantly consist of the contractor, military and government civilian personnel directly involved with GMD ETR program operations.

The ROI for potential impact to public health and safety encompasses all 11 USAKA islands and other islands at Kwajalein Atoll and nearby atolls that could be affected by GMD ETR Program activities including pre-launch transport of missile components, missile launch, and missile flight. A launch failure could potentially involve an explosion, missile debris, release of toxic materials into the air or water, high noise levels, and/or fire. The population of concern for the Proposed Action consists of the community living on the various atolls and low-lying islands that comprise the RMI.

The ROI for EMR human health effects includes an area up to 85 meters (280 feet) from the SBX platform. The ROI for certain electronic equipment and civilian aircraft includes an area up to 19 kilometers (11.8 miles) from the SBX platform.

3.3.5.2 Affected Environment
Range Safety
RTS has the unique mission of serving as the target for a wide variety of missile launch operations from Vandenberg AFB, California, and the PMRF, Hawaii. These missions are conducted with the approval of the RTS Commander. A specific procedure is established to ensure that such approval is granted only when the safety of all proposed tests has been adequately addressed.

Range safety is accomplished by compliance with RTS regulations and use of established procedures and safety precautions to prevent injury to people and minimize damage to property. Range safety applies to preparation, testing and execution of RTS programs. Other range safety objectives are the successful completion of mission objectives.

All program operations must receive the approval of the Safety Office. This is accomplished by the user through presentation of the proposed program to the Safety Office. All safety analyses, SOPs, and other safety documentation applicable to those operations affecting RTS must be
Ground Safety

Ground safety is the protection of range personnel and the public from injury when conducting potentially hazardous operations and handling hazardous materials. Several of the islands are affected by building construction, the storage and assembly of explosives and rocket propellants, and the operation of heavy equipment.

Kwajalein Island is the center of RTS operations and has activities that include receiving fuels, propellants and explosives; maintaining aircraft vehicles and other equipment; providing electricity, water and waste disposal services; and conducting specialized testing activities. Kwajalein, Roi-Namur, Meck, Omelek, and Illeginni Islands are, or in the past have been, sites for assembling and launching missiles.

Missile launch programs at RTS typically consist of single or multi-staged solid propellant missiles with payloads that may contain liquid propellants. The solid rocket motors are composed of fuels and oxidizers in a rubber binding material (other chemical compounds are added to modify performance characteristics). While solid rocket motors are classified as explosives, most propellants do not detonate, but are extremely flammable. Payload vehicles have propulsion systems based on gaseous propellants such as helium or nitrogen, or liquid propellants such as monomethyl hydrazine and nitrogen tetroxide. Liquid fuels may be toxic, corrosive, and/or flammable.

Explosives are used at RTS for missile flight programs and for destruction of unexploded ordnance, fireworks, small arms rounds, and flares. Small amounts of explosives are used in missile launches for stage separation and flight termination systems, which destroy in-flight missiles that show abnormal flight characteristics. Explosives are stored on Kwajalein, Roi-Namur, and Meck. Solid rocket motors are stored on Kwajalein and Roi-Namur and moved to the other islands for a limited time before launches.

Launch facilities consist of structures used for the assembly and launch of missiles that contain experimental payloads. The primary buildings are missile assembly buildings, payload assembly buildings, launch control buildings and launch pads. These structures are spaced according to ESQD criteria defined in AR 385-64, "U.S. Army Explosives Safety Program," and other regulations. The buildings at launch areas are designed to protect personnel from explosive pressure and fragments. Launches on smaller islands may be done remotely, when building separation is insufficient to protect personnel. The number of personnel working at launch facilities is limited during missile assembly and other potentially hazardous operations.

The site plans of launch facilities are reviewed and approved by the DoD Explosives Safety Board before construction. This evaluation takes into account the separation between magazines, operations buildings, transportation routes and unrelated inhabited buildings. Waivers for building separation have been obtained for storage magazines adjacent to the Kwajalein and Roi-Namur airfields.
The ground safety plans for programs at RTS contain emergency procedures for response to potential accident scenarios. For example, the emergency procedures for a missile launch program include the response to misfire and hangfire conditions, an explosion or fire on the launch pad, and the impact of an errant missile flight.

Fire protection is provided by fire suppression systems in most operations buildings and by continuously staffed fire stations on Kwajalein, Roi-Namur, and Meck Islands.

** Missile Flight Safety **

Flight safety provides protection to RTS personnel, inhabitants of the Marshall Islands, and ships and aircraft operating in areas potentially affected by these missions. Specific procedures are required for the preparation and execution of missions involving aircraft, missile launches, and reentry payloads. These procedures include regulations, directives, and flight safety plans for individual missions.

The area affected by aircraft and missile operations varies according to the type of mission. Incoming reentry vehicle impacts may affect the Mid-Atoll Corridor or the BOA to the north and east of the atoll. Aircraft operations may affect an area of 289 kilometers (180 miles) around RTS. A larger area is affected by sounding rocket or ballistic missile launches from RTS with trajectories typically to the north-northeast, where the lowest number of inhabited islands are located.

The largest affected areas result from test flights involving the collision of a target missile with an interceptor missile launched from RTS. The collision debris footprint, or area where collision debris could fall, extends for hundreds of miles away from the designated intercept point.

Flight safety activities include the preparation of a flight safety plan that includes evaluating risks to inhabitants and property near the flight, calculating trajectory and debris areas and specifying range clearance and notification procedures.

Flight safety plans are developed for both launch missions and incoming reentry vehicles. Potential hazards exist at RTS when missiles are launched and when reentering payloads are targeted for areas near the islands. Reentry vehicles are typically launched from Vandenberg AFB in California, PMRF in Hawaii, or Wake.

Notification is made to inhabitants near the flight path, and international air and sea traffic in the caution area designated for specific missions. Warning messages are transmitted to appropriate authorities to clear caution areas of this traffic and to inform the public of impending missions. The warning messages contain information describing the time and area affected and safe alternate routes. RMI is informed in advance of launches and reentry payload missions.

In missions that involve the potential for reentry debris near inhabited islands, precautions are taken to protect personnel. In Mid-Atoll hazard areas, where an island has a high probability of impact by debris, personnel are evacuated. In caution areas, where the chance of debris impact is low, precautions may consist of evacuating or sheltering non mission essential personnel. Sheltering is required for reentry vehicle missions impacting the Mid-Atoll Corridor in
Kwajalein Atoll. The Mid-Atoll Corridor is declared a caution area when it contains a point of impact.

Instrumentation is used for range safety by tracking incoming reentry vehicles and terminating missile flights in order to prevent an impact on inhabited islands. The Kwajalein Range Safety System links the RTS radar system to a range safety center on Kwajalein. A missile and payload can be tracked during the entire flight by the range safety center. Missiles launched from RTS are equipped with flight termination systems that allow destruction of the missile if the flight deviates significantly from planned criteria or otherwise poses a threat to the public. For example, a flight would be terminated if the missile path intersects the Marshall Islands protection circle, an artificial boundary around inhabited atolls and islands.

**RTS Sensor Complex**

EMR emitted from RTS radars is a potential hazard to humans and a potential source of interference with other communications and sensing equipment. Radars and RF transmitters emit non-ionizing radiation. Communications emissions are generally of low frequency and low emitted power and pose minimal threat. Radar testing at RTS involves several powerful radar systems and requires safety measures to protect RTS personnel. Sources of EMR at RTS and the mechanisms used to ensure the safety of personnel and to prevent interference are described in the *Final Ground-Based Radar (GBR) Family of Radars Environmental Assessment and Finding of No Significant Impact* (U.S. Army Program Executive Office Missile Defense, 1993).

According to a U.S. Army Space and Missile Defense Command fact sheet, the RTS complex of radar, optical and telemetry sensor instrumentation includes:

- **Radar**—High-resolution radars provide precision metric, signature, and imaging for deep-space operations, satellite observations, strategic reentry missions, and multiple-intercept engagement tracking. RTS’s wide range of radar capability includes S-band, L-band, C-band, Ka-band, and W-band, as well as beacon tracking, passive skin tracking, and impact scoring.
- **Optics**—Precise optical metric data are collected on objects both inside and outside the atmosphere using large-aperture optics equipped with video, infrared, and film sensors. RTS’s optics capability includes 35/70-millimeter cameras with frame rates up to 2,500 frames per second and focal lengths to 1,219 centimeters (480 inches).
- **Telemetry**—Critical onboard missile information transmitted to the ground is collected with nine geographically dispersed telemetry antennas capable of receiving data at frequencies of 1,700 to 2,400 megahertz (MHz). State-of-the-art ground stations receive, record, and display up to 30 megabytes of mission data.

The RTS integrated command and control center provides technical range support with secure fiber optic network and offers the range user calibration, range timing, meteorology, flight/ground safety, logistics, and data reduction/analysis services.

There are currently 22 RF sources at RTS, including 11 radar systems and 11 communication transmitters. Kwajalein has seven major sources of microwave radiation; Roi-Namur has five
sources, four of which are the major radar systems at RTS. There are smaller radar systems on the mid-atoll islands of Legan and Gellinam.

RTS radars are typically operated at a minimum inclination of 2 degrees above horizontal, which allows a hazard free zone from ground surface to at least 5 meters (15 feet). In tests requiring radar beams to go below the horizon, safety procedures require exclusion from hazard zones. Radar systems have mechanical and software stops to prevent the main beam from being directed at the ground or in specified sectors where it may present a hazard. Radars also have the potential to interfere with aircraft instrumentation. More powerful radars, such as TRADEX, have computer-controlled interlocks to reduce power output in the direction of approaching aircraft.

The primary physical reaction to EMR exposure is cellular heating with symptoms such as eye damage as an early consequence. EMR hazard zones provide a safety factor 10 times greater than the Institute of Electrical and Electronics Engineers (IEEE) Maximum Permissible Exposure Limit (MPELs). Per IEEE Standard C95.1-1999, Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, MPELs are capped at 5 milliwatts per square centimeter (mW/cm²) for frequencies greater than 1,500 MHz. General public exposure is typically limited to one-fifth of the occupational limits. These hazard zones are defined in Army guidance and regulations on microwave and RF safety (appendix B). For non-ionizing radiation, OSHA established a radiation protection guide (29 CFR 1910.97, Non-ionizing Radiation) for normal environmental conditions and for incident electromagnetic energy of frequencies from 10 MHz to 100 MHz. This radiation protection guide is 10 mW/cm², as averaged over any possible 1-hour period. DoD Instruction 6055.11, Protection of DoD Personnel from Exposure to Radiofrequency Radiation, established permissible exposure limits (PELs) for controlled and uncontrolled environments and for High Power Microwave narrow-band and Electromagnetic Pulse broad-band simulator systems.

Regional Safety
The Kwajalein Hospital is the primary health care facility for RTS. The approximate 16-bed hospital has a dental clinic and provides emergency treatment, surgical, obstetric, general medical and diagnostic services for the community and range personnel. One medical technician staffs a dispensary located on Roi-Namur. A first aid station on Meck is also staffed by a medical technician. The hospital, dispensary, and first aid station is contractor operated and staffed. Video consultations with Tripler Army Medical Center in Honolulu, Hawaii provide access to medical specialists for those patients requiring supplemental evaluation. Medical specialists such as optometrists schedule periodic visits to Kwajalein. Other health facilities in the RMI include a private clinic on Majuro and a public hospital on Ebeye.

3.3.6 UTILITIES—REAGAN TEST SITE

3.3.6.1 Region of Influence
The ROI includes areas of Kwajalein that may potentially be affected by the use of Kwajalein Lagoon for the SBX activities, as well as the potential construction of an environmentally controlled warehouse. This site has not been determined.
3.3.6.2 Affected Environment

Utilities at USAKA/RTS are operated to meet the needs of the resident population of approximately 2,500 people, including dependants. However, it must be noted that this figure varies depending on mission status and construction activity.

Energy

Kwajalein has one electrical power plant using engine generator sets that burn diesel fuel; the electricity is distributed by underground feeders. In 1993, there were three power plants (PP1, PP2, and PP1A), which had a combined capacity of 26,790 kW. Historical peak loads totaled 13,500 kW over different periods, or 50 percent of capacity (U.S. Army Space and Strategic Defense Command, 1993a). Power distribution is conventional, with underground high-voltage transmission lines and aboveground “user voltage” (110-220 volt alternating current) distribution lines. Generating capacities have not changed in several years. Currently, there are seven generators operating with a total output of 29,200 kW (U.S. Army Space and Missile Defense Command, 2002b). The power plant at Kwajalein is designated Power Plant 1A and 1B.

Power Plant 1A became operational in April 1991 and reached full plant production in June 1991. Power Plant 1A produced 58 percent of Kwajalein’s electrical requirements for June through December 1991 and was expected to produce a higher percentage of the island’s power in future years. Power Plant 1B went online in 1994 with four 4,400-kW units. Once Power Plant 1A and Power Plant 1B became functional, there was no longer a need for Power Plant 1 or Power Plant 2, so they were decommissioned.

Water

Kwajalein has a conventional package filter drinking water system for potable (drinkable) water production. Under normal conditions, Kwajalein’s potable water system can provide an adequate supply of fresh water. In 1993, the daily supply of 1.6 million liters (430,000 gallons) per day from rainwater treatments, and groundwater was more than sufficient to meet the average demand of 1.1 million liters (300,000 gallons) per day. A desalination facility was decommissioned in 2002.

The capacity of the system is 1,703,435 liters (450,000 gallons) per day. Upgrades are in progress to improve this system’s ability to meet USAKA/RTS environmental standards. These upgrades include the addition of reverse osmosis to units for control of total trihalomethanes and haloacetic acids. Drinking water quality is produced to meet the standards of the UES. Drinking water standards are essentially the same as EPA standards for public systems that serve a population of 10,000 people (U.S. Army Space and Missile Defense Command, 2001a).

Raw water is provided primarily by a rainwater catchment system along the runway. During dry seasons, additional water is provided by pumping the freshwater lens that forms an unconfined surficial aquifer beneath the island surface. Portable reverse osmosis water-purifying units are employed to remove organic contaminants from the lens well water. (U.S. Army Space and Missile Defense Command, 2002b)

Kwajalein has twelve 1-million-gallon (3.8-million-liter) reinforced concrete tanks for storage of rainwater collected from the catchments and lens wells. Rain water is pumped from storage to treatment in the package water treatment plant. The treated water receives pH adjustment and
chlorination before being stored in one of two covered concrete tanks. Nine of the 14 existing raw water storage tanks are covered.

**Wastewater**

The wastewater system for Kwajalein consists of a force main and gravity collection system, nine pump stations, a secondary wastewater treatment plant, and an outfall extending into the lagoon. The wastewater treatment plant is now approximately 20 years old. Plant flow for the period September 1992 through August 1993 averaged 1.4 million liters (382,000 gallons) for this period at approximately 560 liters (148 gallons) per capita per day. Wastewater is reclaimed by conventional secondary treatment followed by chemical (chlorine) disinfection. Reclaimed water is used for non-potable uses, including sanitation and irrigation. Excess water is discharged in accordance with the UES. Wastewater sludge is treated and composted per the UES for use as soil amendment for lawns, landscaping, and gardens (U.S. Army Space and Missile Defense Command, 2002b).

**Solid Waste**

Kwajalein Island generates approximately 20.3 to 30.5 metric tons (20 to 30 tons) of municipal solid waste per day. Green waste is collected and taken to a composting area. Food wastes are no longer disposed of in the ocean off Kwajalein. The compost mulch is used for landscaping and in a nursery. Municipal solid waste is incinerated at the incinerator facility. Ash and inert waste solids are buried at an adjacent landfill. Metals are shipped to Honolulu to be recycled (U.S. Army Space and Missile Defense Command, 2002b). Waste batteries are shipped off-island intact. Used oil is collected in 208.2-liter (55-gallon) drums and used for energy reclamation. Glass, concrete rubble, and similar materials are processed for reuse as construction (including shoreline protection) and fill material at USAKA.
3.4 PACIFIC MISSILE RANGE FACILITY

The existing environment at PMRF was described in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998) and the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b). For the most part, those descriptions are still accurate and are not repeated in this document. Rather, for resources that may be affected by ETR activities at PMRF, the pertinent resource discussions are summarized, and any differences in existing environmental conditions, including new facilities or infrastructure, are noted. The more detailed discussion in the Final EA or EIS is incorporated by reference and will be made available for review by those who wish more information concerning the existing environment at PMRF.

The proposed ETR activities could have an effect on air quality, biological resources, hazardous materials and waste, health and safety, and socioeconomics at PMRF. These resource areas are summarized in the following sections.

Areas that are not expected be affected sufficiently at PMRF to warrant further discussion include airspace, cultural resources, geology and soils, land use, noise, transportation, utilities, visual and aesthetic resources, water resources, and environmental justice. The ongoing missile launches and use of transportable radars result in short term temporary impacts to airspace that are mitigated through coordination with the FAA. While many areas of PMRF have important historic resources, many of them relating to native Hawaiian culture, there are not expected to be any ground disturbing activities within areas where these resources are located. Activities proposed in the GMD ETR EIS would adhere to the 1999 Memorandum of Agreement between the U.S. Department of the Navy, PMRF, and the Hawaii State Historic Preservation Officer as shown in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998). While proposed target launch activities will result in minor soil contamination from rocket emissions in and around the designated Launch Hazard Area at KTF, it is not expected to create adverse effects beyond those previously analyzed in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998). Land use at PMRF and surrounding areas would not change. Utilization of adjacent lands would be consistent with existing land use agreements. The existing noise levels at PMRF would continue, including those associated with proposed missile launches. Noise generated during the launches would be anticipated to have minimal impact on off-base areas and would not affect the noise levels estimated in the current PMRF Air Installation Compatible Use Zone report. None of the noise levels outside of the Ground Hazard Area boundary for the proposed launch areas where non-essential personnel and the public are excluded would exceed either DoD or OSHA safety requirements. Personnel within the Ground Hazard Area wear hearing protection devices. Any increase in daily trips by support personnel, including any utilized to support mid-range telemetry functions, would be short term and small, utilizing existing transportation infrastructure. Shared vehicle and/or off-peak hour travel would further serve to minimize effects on transportation levels. The utilities infrastructure and water resources requirements for the proposed activities are included in the existing usage levels and are not expected to be adversely affected by the proposed activities. Although the visual resources on PMRF may be considered significant by some viewers, much of the area is already developed with the types of structures and activities that are being considered in the Proposed Action. Therefore, this section does not include further analysis of visual resources at PMRF. An Environmental Justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. No adverse long-term impacts have been identified at the proposed sites on PMRF. As such, there would be no disproportionately high and adverse
human health or environmental effects on the minority or low-income populations that may be present in the vicinity of those locations.

3.4.1 AIR QUALITY—PACIFIC MISSILE RANGE FACILITY

Appendix B includes a general description of air quality.

3.4.1.1 Region of Influence

For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to an area extending no more than a few tens of miles downwind from the source.

The ROI for ozone may extend much further downwind than the ROI for inert pollutants; however, as the project area has no heavy industry and very few automobiles, tropospheric ozone and its precursors are not of concern. Consequently, for the air quality analysis, the ROI for project operational activities is the existing airshed surrounding the various sites, which encompasses the Mana Plain, including the PMRF/Main Base and Ground Hazard Area restrictive easements.

3.4.1.2 Affected Environment

Climate

PMRF, which is located just south of the Tropic of Cancer, has a mild and semitropical climate with scattered clouds and generally light and variable trade winds from the northeast.

Regional Air Quality

The only sampling station on Kauai is located in Lihue, and monitors for PM-10. The State of Hawaii is in attainment of the NAAQS established for carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, ozone, and lead (40 CFR 81.312 and 52.631(b)).

The major source of air pollution emissions external to, and not associated with, PMRF/Main Base is the seasonal burning of the cane fields east of the base. This burning produces periods of elevated smoke and ash. In addition, the smoke temporarily degrades visibility over an extended area.

Existing Emissions Sources

The main pollution sources at PMRF are diesel-fuel powered generators, aircraft, and rocket launches. PMRF was issued a Title V Covered Source Permit for five diesel generators, which covers all significant stationary emission sources on PMRF. Aircraft emissions and missile exhaust emissions are both considered mobile sources and are thus exempt from permitting requirements. (Pacific Missile Range Facility, Barking Sands, 1998) Table 3.4.1-1 lists the estimated exhaust products from typical launch vehicles at PMRF as presented in the PMRF Enhanced Capability EIS. (Pacific Missile Range Facility, Barking Sands, 1998) No adverse air quality impacts were anticipated from current launches.
Table 3.4.1-1: Estimated Emissions of Typical Missile Launches at PMRF

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Guidance Levels</th>
<th>Hawk (milligrams per cubic meter)</th>
<th>Talos/Zest (milligrams per cubic meter)</th>
<th>Strategic Target System (milligrams per cubic meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>10 (8-hour TLV)</td>
<td>8.46 (4)</td>
<td>5 (8-hour TWA)</td>
<td>0.07(5)</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>40 (1-hour TWA)</td>
<td>0.094</td>
<td>10 (8-hour TWA)</td>
<td>0.096</td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1.5 (1-hour TWA)</td>
<td>0.087</td>
<td>0.051</td>
<td>0.47(6)</td>
</tr>
</tbody>
</table>

Source: Pacific Missile Range Facility, Barking Sands, 1998

(1) Hawk emissions based on EPA approved version of TSCREEN/PUFF model at 1,900 meters (6,200 feet)
(2) Talos/Zest emissions based on commercial version of TSCREEN/PUFF model at 3,000 meters (9,840 feet)
(3) Strategic Target System used Rocket Exhaust Effluent Dispersion Model to model Hydrogen Chloride
(4) At 190 meters (623 feet)
(5) Value is a 1-hour TWA. Due to near-instantaneous nature of emissions, 8-hour TWA would be lower
(6) At 3,000 meters (9,840 feet)

TLV = Threshold Limit Value
TWA = Time-weighted Average

3.4.2 BIOLOGICAL RESOURCES—PACIFIC MISSILE RANGE FACILITY

Appendix B includes a definition of biological resources and the main regulations and laws that govern their protection.

3.4.2.1 Region of Influence

The ROI includes areas on PMRF that may be affected by target launches from existing launch sites and the use of existing sensors.

3.4.2.2 Affected Environment

Vegetation

The vegetation on PMRF/Main Base is composed of two principal habitat types: non-native ruderal vegetation and kiawe/koa haole scrub. Within PMRF/Main Base and the KTF area of the complex, ruderal vegetation is present where man has disturbed the natural vegetation, and much of this vegetation is mowed on a regular basis. The vegetation adjacent to PMRF/Main Base in the Ground Hazard Area is dominated by sugar cane, ruderal vegetation, and wetlands associated with agricultural ponds and drains. Kiawe/koa haole scrub and ruderal vegetation are the dominant vegetation in the undeveloped portions of the PMRF/Main Base ROI. In the south-central part of PMRF/Main Base, mosaic-like patches of vegetation dominated by the indigenous wedge-leaf hop bush are present on a sandy substrate. Coastal dune vegetation covers much of the dunes north of KTF, and a well-developed native strand community exists along the shoreline.

Vegetation at Makaha Ridge is dominated by introduced non-native species. Well-maintained grassy lawns and landscape plantings are located around the existing buildings. A few shrubs of the native false sandalwood or naio and the introduced lantana occur along the makai (coastal) edge of the Makaha Ridge complex. (Pacific Missile Range Facility, 2000)
Threatened and Endangered Plant Species
Table 3.4.2-1 lists threatened and endangered species that could potentially be located within the ROI.

Table 3.4.2-1: Listed Species Known or Expected to Occur in the Vicinity of the Proposed Action

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name (Location)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>State</td>
</tr>
<tr>
<td><strong>Reptiles</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caretta caretta</td>
<td>Loggerhead sea turtle</td>
<td>E</td>
</tr>
<tr>
<td>Chelonia mydas</td>
<td>Green sea turtle</td>
<td>E</td>
</tr>
<tr>
<td>Dermochelys coriacea</td>
<td>Leatherback sea turtle</td>
<td>E</td>
</tr>
<tr>
<td>Eretmochelys imbricata</td>
<td>Hawksbill sea turtle</td>
<td>E</td>
</tr>
<tr>
<td>Lepidochelys olivacea</td>
<td>Olive ridley sea turtle</td>
<td>E</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anas wyvilliana</td>
<td>Hawaiian duck</td>
<td>E</td>
</tr>
<tr>
<td>Fulica americana alai</td>
<td>Hawaiian (American) coot</td>
<td>E</td>
</tr>
<tr>
<td>Gallinula chloropus sandvicensis</td>
<td>Hawaiian common moorhen</td>
<td>E</td>
</tr>
<tr>
<td>Himantopus mexicanus knudseni</td>
<td>Hawaiian black-necked stilt</td>
<td>E</td>
</tr>
<tr>
<td>Nesochen sandvicensis</td>
<td>Hawaiian goose (ne ne) (Makaha Ridge)</td>
<td>E</td>
</tr>
<tr>
<td>Pterodroma phaeopygia sandwichensis</td>
<td>Hawaiian dark-rumped petrel</td>
<td>E</td>
</tr>
<tr>
<td>Puffinus auricularis newelli</td>
<td>Newell's Townsend's shearwater</td>
<td>E</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balaenoptera borealis</td>
<td>Sei whale (Open Ocean)</td>
<td>E</td>
</tr>
<tr>
<td>Balaenoptera musculus</td>
<td>Blue whale (Open Ocean)</td>
<td>E</td>
</tr>
<tr>
<td>Balaenoptera physalus</td>
<td>Fin whale (Open Ocean)</td>
<td>E</td>
</tr>
<tr>
<td>Lasiurus cinereus semotus</td>
<td>Hawaiian hoary bat</td>
<td>E</td>
</tr>
<tr>
<td>Megaptera novaeangliae</td>
<td>Humpback whale (Open Ocean)</td>
<td>E</td>
</tr>
<tr>
<td>Monachus schauinslandi</td>
<td>Hawaiian monk seal</td>
<td>E</td>
</tr>
<tr>
<td>Physeter macrocephalus</td>
<td>Sperm whale (Open Ocean)</td>
<td>E</td>
</tr>
<tr>
<td><strong>Plants</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panicum niihauense</td>
<td>Lau‘ehu</td>
<td>E</td>
</tr>
<tr>
<td>Sesbania tomentosa</td>
<td>Ohai</td>
<td>E</td>
</tr>
<tr>
<td>Wilkesia hobbyi</td>
<td>Dwarf iliau (Makaha Ridge)</td>
<td>E</td>
</tr>
</tbody>
</table>

NOTES:

<table>
<thead>
<tr>
<th>T</th>
<th>Threatened</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Endangered</td>
</tr>
</tbody>
</table>

Two federally listed plant species have been observed north of PMRF. Ohai (Sesbania tomentosa), a spreading shrub, is a federally endangered species that has been observed in the sand dunes to the north of the KTF launch complex and in Polihale State Park and could potentially occur on PMRF/Main Base. Lau‘ehu (Panicum niihauense), a federally endangered species of rare grass, has been observed near Queens Pond north of PMRF/Main Base.
The dwarf iliau (*Wilkesia hobyi*), an endangered member of the daisy or sunflower family, is found on rocky outcrops of the cliff overlooking Makaha Valley to the north of the tracking station on Makaha Ridge (Department of the Navy, Pacific Missile Range Facility, Hawaii, 2001).

**Wildlife**

Forty species of birds have been identified at PMRF/Main Base, including non-native and migratory birds and species endemic to Hawaii. The pueo (*Asio flammeus sandwichensis*) (Hawaiian short-eared owl) is a state listed endangered species. This owl is the only endemic terrestrial bird species that occurs in the region. Non-native bird species on Kauai are usually common field and urban birds such as the ring-necked pheasant. Several species of migratory waterfowl may be present during some portion of the year. The Laysan albatross, a migratory bird protected under the Migratory Bird Treaty Act, uses ruderal vegetation areas for courtship and nesting. PMRF has an ongoing feral dog-trapping program to protect the albatross as well as the wedge-tail shearwater and other birds on base. However, the Laysan albatross is being discouraged from nesting at PMRF/Main Base to prevent interaction between the species and aircraft using the runway. Albatross on the airfield are tagged and released on the north portion of the base or returnees are relocated to Kilauea National Wildlife Refuge in order to prevent bird/aircraft strikes. This action is being accomplished under a USFWS permit. (Pacific Missile Range Facility, Barking Sands, 1998; U.S. Army Space and Missile Defense Command, 2001b)

Feral dogs and cats occur in the region and prey on native and introduced species of birds. Rodents including the Polynesian black rat, Norway or brown rat, and the house mouse are also known to occur in the region. (Pacific Missile Range Facility, Barking Sands, 1998; U.S. Army Space and Missile Defense Command, 2001b)

Three endemic birds, the white-tailed tropicbird, the Pacific golden plover, and the common amakahi, have been observed at Makaha Ridge. Introduced birds commonly found in this area of Kauai include the spotted dove, zebra dove, and the common myna. In addition, two native species that may occur in the area are the short-eared owl and the Hawaiian honeycreeper (*'i'iwi*). It is likely that mice or rats inhabit the Makaha Ridge area. Feral goats have been seen in this general area. (Pacific Missile Range Facility, 2000)

**Essential Fish Habitat**

Essential Fish Habitat occurs and is incorporated within Kauai’s Exclusive Economic Zone, the 322-kilometer (200-mile) limit around the island. Essential Fish Habitat for adult and juvenile bottomfish includes the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (219 fathoms), which encompasses important steep drop-offs and high relief habitats. Shallow-water (0 to 100 meters [0 to 55 fathoms]) bottomfish species include uku, thicklip trevallys, groupers, emperors, amberjack, and taape. Deep-water (100 to 400 meters [55 to 219 fathoms]) species include ehu, onaga, opapaka, gindai, hapupuu, and lehi. (Western Pacific Fishery Management Council, 1998)

Pelagic habitat areas of particular concern are designated as the water column down to 1,000 meters (3,280 feet) from the shoreline to the Exclusive Economic Zone that lies above all seamounts and banks shallower than 2,000 meters (1,100 fathoms). Marketable pelagic species include striped marlin, bluefin tuna, swordfish, albacore, mackerel, skipjack, sailfish, kawakawa, and various sharks. (Western Pacific Fishery Management Council, 1998)
Banks with summits less than 30 meters (98 feet) have been designated as habitat areas of particular concern for crustaceans. Crustacean species include spiny lobster, slipper lobsters, and Kona crabs. (Western Pacific Fishery Management Council, 1998)

*Threatened and Endangered Wildlife Species*

Table 3.4.2-1 lists threatened and endangered species that could potentially be located within the ROI.

Six species of birds that are listed as federally threatened or endangered are potentially present or confirmed in the PMRF area. Kauai provides the majority of the nesting habitat for the federally threatened Newell’s Townsend’s shearwater (*Puffinus auricularis newelli*). The Newell’s shearwater nests from April to November in the interior mountains of Kauai. Nestlings leave the nesting grounds at night in October and November and head for the open ocean. They may become temporarily blinded by lights when flying near brightly lit urban areas or street lights and some may collide with trees, utility lines and light poles, buildings, and automobiles. The most critical period for these collisions is a week before and a week after the new moon in October and November.

The Hawaiian dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*), which is listed as federally endangered, may traverse the area from its nesting grounds to the sea. Fledging of the dark-rumped petrel occurs in October, slightly earlier than that of the Newell’s shearwater.

The Hawaiian (American) coot (*Fulica americana alai*), Hawaiian black-necked stilt (*Himantopus mexicanus knudseni*), Hawaiian common moorhen (*Gallinula chloropus sandvicensis*), and Hawaiian duck (*Anas wyvilliana*) are federal and state endangered birds that have been observed in the drainage ditches and ponds on PMRF.

The federal and state endangered Hawaiian goose (*Nesochen sandvicensis*), or *ne ne*, occurs as a breeding population within the Makaha Ridge facility (Pacific Missile Range Facility, 2000).

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) is listed as a federal and state endangered species. While it has not been recorded as flying over PMRF, it is known to feed offshore and has been observed at the Polihale State Park north of the base. It is likely that the bat also flies over PMRF.

Three marine wildlife species listed as federal and state threatened or endangered commonly occur in the area. The endangered Hawaiian monk seal (*Monachus schauinslandi*) is an indigenous mammal that has been observed at PMRF. The first Hawaiian monk seal birth observed on a Kauai beach since 1993 occurred on PMRF in 1999 on the beach adjacent to the runway (Pacific Missile Range Facility, 1999). Only four other Hawaiian monk seal births had been recorded on Kauai since 1961 (Navy Environmental News, 1999). The fact that humans frequent all beaches on PMRF may generally discourage use by monk seals.

The federal threatened and state endangered green sea turtle (*Chelonia mydas*) basks and nests on PMRF adjacent to the Nohili Ditch (Pacific Missile Range Facility, 1999; Pacific Missile Range Facility, 2001). Ninety percent of the Hawaiian population of the green sea turtle returns to French Frigate Shoals to breed (University of Hawaii, 2002).
The federal and state endangered migratory humpback whale is known to use the channel between Kauai and Niihau. Approximately two-thirds of the North Pacific population of humpback whales winter in Hawaii.

**Environmentally Sensitive Habitat**

**Wetlands**

Wetlands are associated with the Mana base pond, Kawaiele wildlife sanctuaries (a State Waterbird Refuge for Hawaii’s four endangered waterbird species, created at Mana during a sand removal program), and agricultural drains (Nohili and Kawaiele ditches) within PMRF/Main Base.

**Hawaiian Islands Humpback Whale National Marine Sanctuary**

The Hawaiian Islands Humpback Whale National Marine Sanctuary was created by Congress in 1992 (figure 3.4.2-1). A small portion of the sanctuary lies within the ROI. Humpback whales are endangered marine mammals and are therefore protected under provisions of the Endangered Species Act and the Marine Mammal Protection Act wherever they are found. Humpbacks are seen in the winter months in the shallow waters surrounding the Hawaiian Islands where they congregate to mate and calve. The humpback population is growing by an average of 7 percent annually. That means their numbers, which stand at about 5,000, would double in approximately 13 years. The whales travel more than 5,633 kilometers (3,500 miles) from Alaska to Hawaii’s warm waters to mate, give birth, and care for their calves. The estimated 5,000 whales traverse more than a half-million square kilometers (quarter-million square miles) of ocean surrounding Hawaii. The first whales of the season usually arrive around October, with the greatest number seen around Hawaii between 1 December and 15 May. (Star Bulletin, 2002)

**Submerged Barrier Reef Offshore of PMRF**

A submerged barrier reef, roughly 13 kilometers (8 miles) long, lies offshore of PMRF. Coral density is low and is dominated by lobe coral (*Porites lobata*) and small stands of arborescent (branched or tree shaped) corals.

**Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve**

The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve is discussed in the BOA, section 3.11.

**Critical Habitat**

Critical habitat is the term used in the Endangered Species Act to define those areas of habitat that are known to be essential for an endangered or threatened species to recover and that require special management protection. A proposed rule to designate critical habitat for 76 listed plant species on the islands of Kauai and Niihau was published in the Federal Register in November 2000 (Federal Register, 2000b). This proposed rule included land in the northwestern end of PMRF near Polihale Park as critical habitat for the endangered ohai and lau‘ehe‘u. In January 2002, the USFWS proposed critical habitat for additional plant species on Kauai and
EXPLANATION

- State of Hawaii's Areas for Inclusion in Sanctuary Boundary, 1997 (defined as within the 100 fathom isobath)
- Land Area


Hawaiian Islands
Humpback Whale National Marine Sanctuary Boundary

Hawaiian Islands

Figure 3.4.2-1
Niihau, revising the total number of plants to 83, which includes additional land in the southern portion of PMRF for protection of lau’ehu. (U.S. Fish and Wildlife Service, Pacific Region, 2002a; Federal Register, 2002) The USFWS reevaluated the dune habitat on PMRF and the habitat on Navy land at Makaha Ridge and determined that these lands were not essential for the conservation of ohai or dwarf iliau. However, the USFWS has determined that land on PMRF adjacent to Polihale State Park and dune areas along the southern portion of the range contain primary constituents necessary for the recovery of lau’ehu because not enough areas exist outside of PMRF. If the Navy revises its Integrated Natural Resources Management Plan to address the maintenance and improvement and long-term conservation of the lau’ehu, the USFWS will reassess critical habitat boundaries. (Federal Register, 2003)

3.4.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—PACIFIC MISSILE RANGE FACILITY

Appendix B includes a general definition of hazardous materials and hazardous waste and a brief summary of regulations and laws.

3.4.3.1 Region of Influence

The ROI for potential impacts related to hazardous materials/wastes would be limited to areas of the PMRF to be used for launch preparation, launch, and post-launch activities, and in areas where hazardous materials are stored and handled.

3.4.3.2 Affected Environment

Hazardous Materials and Hazardous Waste Management

Hazardous Materials Management

PMRF manages hazardous materials through the U.S. Navy’s Consolidated Hazardous Materials Reutilization and Inventory Management Program (CHRIMP). CHRIMP mandates procedures to control, track, and reduce the variety and quantities of hazardous materials in use at facilities. The CHRIMP concept established Hazardous Materials Minimization Centers as the inventory controllers for U.S. Navy facilities. All departments, tenant commands, and work centers must order hazardous materials from the Hazardous Materials Minimization Centers, where all such transactions are recorded and tracked. The exception to this is KTF, which obtains its hazardous materials through Department of Energy channels. Hazardous materials on PMRF are managed by the operations and maintenance contractor through CHRIMP. Hazardous materials managed through the CHRIMP program other than fuels are stored in Building 338. Typical materials used on PMRF/Main Base and stored at Building 338 include cleaning agents, solvents, and lubricating oils. (Pacific Missile Range Facility, Barking Sands, 1998)

PMRF has management plans for oil and hazardous materials outlined in the PMRF Spill Prevention Control and Countermeasures Plan and the Installation Spill Contingency Plan, both of which also regulate tenant organizations and PMRF associated sites. (Pacific Missile Range Facility, Barking Sands, 1998) Specifically, sites included are KTF, Makaha Ridge, Kokee, Kamokala Magazines, and Port Allen.
PMRF has developed programs to comply with the requirements of the Superfund Amendments and Reauthorization Act Title III and Emergency Planning and Community Right-to-Know Act. This effort has included submission to the state and local emergency planning committees of annual Tier II forms, which are an updated inventory of chemicals or extremely hazardous substances in excess of threshold limits. These chemicals at PMRF include jet fuel, diesel fuel, propane, gasoline, aqueous fire fighting foam, chlorine, used oil, paint/oils, and paint.

**Hazardous Waste Management**

PMRF/Main Base is a large-quantity hazardous waste generator with an EPA number. Hazardous waste on PMRF is not stored beyond the 90-day collection period. In 1996, PMRF/Main Base generated 40,214 kilograms (88,654 pounds) of hazardous waste, which is a significant reduction in the amount of hazardous waste generated when compared to the 88,800 kilograms (195,766 pounds) generated in 1990.

PMRF/Main Base has two accumulation points on base for hazardous wastes: Building 392 and Building 419. Building 392 accumulates all base waste except for otto (torpedo) fuel, a liquid monopropellant. Building 419 is the torpedo repair shop. At present, both buildings are not used at their maximum hazardous waste storage capacity. KTF has one accumulation point.

Makaha Ridge and Kokee generate only used oil, which is recycled. Port Allen generates used oil, paint wastes, and oily bilge water. The oily bilge water is processed through an oil/water separator and then is fed into the nearby sewage treatment plant. (Pacific Missile Range Facility, Barking Sands, 1998)

Under state regulations oil is not regulated as a hazardous waste, but is a hazardous substance subject to notification. (Pacific Missile Range Facility, Barking Sands, 1998) PMRF outlines management and disposal procedures for used oils and fuels in the Hazardous Waste Management Plan. Additionally, degraded jet fuel is used in crash-fire training exercises.

The majority of wastes are collected and containerized at PMRF/Main Base for direct offsite disposal through the Defense Reutilization and Marketing Office (DRMO) at Pearl Harbor within 90 days. (Pacific Missile Range Facility, Barking Sands, 1998) The DRMO provides for the transportation and disposal of the wastes to the final disposal facility. (Pacific Missile Range Facility, Barking Sands, 1998)

KTF on PMRF/Main Base is a small-quantity generator and has an EPA identification number. (U.S. Army Program Executive Office, 1995) KTF has not generated enough hazardous waste for disposal since becoming a small quantity generator in 1994. (Pacific Missile Range Facility, Barking Sands, 1998)

**Pollution Prevention/Recycling/Waste Minimization**

PMRF has a pollution prevention plan in place for the Main Base and all sites on Kauai, which was updated in February 1996 and follows CHRIMP procedures for controlling, tracking and reducing hazardous materials use and waste generation. (Pacific Missile Range Facility, Barking Sands, 1998) In regards to hazardous waste elimination programs, PMRF/Main Base currently has three in place. These involve the recycling of toner cartridges, mercury from mercury lamps, and acid/lead batteries. (Pacific Missile Range Facility, Barking Sands, 1998)
In calendar year 1996, 624 kilograms (1,376 pounds) of fluorescent tubes containing mercury were recycled, as well as 208 kilograms (458 pounds) of acid/lead batteries. (Pacific Missile Range Facility, Barking Sands, 1998) Additionally, all spent toner cartridges were sent to the manufacturer for recycling.

**Installation Restoration Program**

PMRF/Main Base has 16 IRP sites. The two fire fighting training pits, the battery acid disposal pit, and the torpedo post run facility require no further action based on the results of past investigations and approval by the State of Hawaii, Department of Health.

Three former oil change pits and a battery acid neutralization unit are currently being investigated. Three landfills, a tanker truck pod facility, former missile (Regulus) defueling pit, and former oil/fuel pipelines are scheduled to be investigated.

Investigation at a reclamite asphalt rejuvenator burial area and various transformer sites (four each) have been completed and are waiting Department of Health concurrence for no further action. (Miyashiro, 2002)

**Underground and Aboveground Storage Tanks**

PMRF/Main Base has nine 189,270-liter (50,000-gallon) USTs and ten smaller USTs containing petroleum products. All USTs are equipped with a vapor detection system. The tanks were tested approximately 5 years ago, with no leaks detected. (Pacific Missile Range Facility, Barking Sands, 1998) Eight of the smaller USTs are 757-liter (200-gallon), double-walled, fiberglass-reinforced plastic.

**Asbestos, Lead-Based Paint, and Polychlorinated Biphenyls**

PMRF manages asbestos in accordance with the base asbestos management plan. Prior to any construction projects, areas to be disturbed are surveyed for asbestos, and any asbestos is removed, before disturbance, by a certified asbestos contractor.

The handling of hazardous materials and the potential generation and disposal of hazardous wastes follow ongoing, standard, and applicable regulations and procedures at PMRF.

All facilities associated with PMRF follow its lead-based paint management plan. The exception is KTF, which follows Department of Energy plans for the removal of lead-based paint wastes. Components containing PCBs that become waste are labeled according to the Toxic Substances Control Act, 40 CFR 761, requirements for shipping, and are disposed of through the DRMO or a contractor within 1 year of the waste’s initial storage.

**Liquid Fuels and Other Toxic Fuels**

PMRF uses gasoline and diesel fuels to power range trucks and equipment. Aircraft at PMRF utilize jet fuel, JP-10 and Jet-A. Jet-A and JP-10 fuels are available at the fuel farm near the airfield, and are delivered to the flight line in refuelers.
3.4.4 HEALTH AND SAFETY—PACIFIC MISSILE RANGE FACILITY

Appendix B includes a general description of health and safety.

3.4.4.1 Region of Influence

The ROI for potential impact related to the health and safety of workers is limited to work areas associated with transportation of missile components, missile storage and handling areas, missile launch, post-launch activities and radiation hazard areas. The population of concern for the Proposed Action would include the approximate 870 employed at PMRF, but would predominantly encompass the contractor, military, and government civilian personnel directly involved with target launch and launch support operations.

The ROI for potential impact related to public health and safety includes the areas of Kauai County and the island of Kauai affected by preflight transport of missile components, missile launch and missile flight. These areas include the PMRF overwater training areas. The population of concern for the Proposed Action consists of visitors to Kauai and the approximate 56,539 people living in Kauai County (U.S. Census Bureau, 2001).

3.4.4.2 Affected Environment

Range Safety

The U.S. Navy takes every reasonable precaution during the planning and execution of the operations, training exercises, and test and development activities to prevent injury to human life or property. In addition to explosive, physical impact, and electromagnetic hazards, potential hazards from chemical contamination, ionizing and non-ionizing radiation, radioactive materials, and lasers are studied by NAWCWD. (Pacific Missile Range Facility, Barking Sands, 1998)

Range Control is in charge of surveillance, clearance, and real-time range safety. Range Safety Approval and Range Safety Operation Plan documents are required for all weapons systems using PMRF. PMRF sets requirements for minimally acceptable risk criteria to occupational and non-occupational personnel, test facilities, and non-military assets during range operations. The NAWCWD, Point Mugu, is responsible for establishing Ground Hazard Areas and Launch Hazard Areas over water beyond which no debris from early flight termination is expected to fall. Hazard areas are determined by size and flight characteristics of the missile, as well as individual flight profiles of each flight test. Data processed by ground-based or onboard missile computer systems may be used to recognize malfunctions and terminate missile flight. Before an operation is allowed to proceed, the range is determined cleared using input from ship sensors, visual surveillance from aircraft and range safety boats, radar data, and acoustic information. Other safety areas under PMRF’s control include radars, explosives, airspace. All range users must: (1) provide a list of project materials, items, or test conditions that could present hazards to personnel or material through toxicity, combustion, blast, acoustics, fragmentation, EMR, radioactivity, ionization, or other means; (2) describe radiation, toxic, explosive, or ionization problems that could accumulate as a result of their tests; (3) provide warhead information (if any), aerodynamic and flight control information, and destruct system information and parameters; (4) submit plans, specifications, and procedural or functional steps for operations involving explosives to conform to criteria in the NAWCWD instruction; and (5) provide complete operational specifications of any laser to be used and a detailed description of its planned use. (Pacific Missile Range Facility, Barking Sands, 1998)
Missile Flight Analysis

PMRF conducts missile flight safety, which takes into account potential hazards from chemical contamination, ionizing and non-ionizing radiation, radioactive materials, and lasers in accordance with NAWCWD Instruction 5100.2. This includes analysis of missile performance capabilities and limitations, of hazards inherent in missile operations and destruct systems, and of the electronic characteristics of missiles and instrumentation. It also includes computation and review of missile trajectories, launch azimuths, and hazard area dimensions, review and approval of destruct systems proposals, and preparation of the Range Safety Approval and Range Safety Operational Plans required of all programs at PMRF. These plans are prepared by the NAWCWD, Point Mugu, for each program and must be in place before project initiation.

Ground Safety

The Range Control Officer using PMRF assets is solely responsible for determining range status and setting RED (no firing) and GREEN (range is clear and support units are ready to begin the event) range firing conditions. The Range Safety Approval and the Range Safety Operation Plan documents are required for all weapons systems using PMRF (Pacific Missile Range Facility, Barking Sands, 1998). PMRF uses RCC 321-02, Common Risk Criteria for National Test Ranges. RCC 321-02 sets requirements for minimally-acceptable risk criteria to occupational and non-occupational personnel, test facilities, and non-military assets during range operations. Under RCC 321-02, individuals of the general public shall not be exposed to a probability of fatality greater than 1 in 10 million for any single mission and 1 in 1 million on an annual basis. (Range Commanders Council, Range Safety Group, 2002)

Figure 3.4.4-1 shows the PMRF health and safety areas including the Ground Hazard Areas associated with missile launch activities at PMRF. These Ground Hazard Areas consist of Vandals at 1,829 meters (6,000 feet), Strategic Target Systems at a modified 3,048 meters (10,000 feet), and smaller 762-meter (2,500-foot) and 914-meter (3,000-foot) areas used for rail launch rockets.

To ensure the protection of all persons and property, safety procedures have been established and implemented for the Ground Hazard Areas. These SOPs include establishing road control points and clearing the area using vehicles and helicopters (if necessary). The road control points are established 3 hours before launch to allow security forces to monitor traffic as it passes through the Ground Hazard Area. At 20 minutes before launch, the area is determined to be clear of the public to ensure that, in the unlikely event of early flight termination, no injuries or damage to persons or property would occur. After the Range Safety Officer declares the area safe, the security force gives the all-clear signal, and the public is allowed to reenter the area. (Pacific Missile Range Facility, Barking Sands, 1998) No inhabited structures are located within the off-base sections of the Ground Hazard Area. To further minimize the potential for launch associated hazards, PMRF has a Missile Accident Emergency Team assembled for all launches from KTF and on-call status for PMRF launches in accordance with PMRF Instruction 5100.1F.
Figure 3.4.4-1

Pacific Missile Range Facility Health and Safety Areas

Kauai, Hawaii

EXPLANATION

- - - - Existing Ground Hazard Areas
- - - - Pacific Missile Range Facility Boundary
\[ \text{Contour Lines (ft)} \]

ESQD = Explosive Safety Quantity Distance

GHA = Ground Hazard Area


Scale
0 795 1,590 meters
NORTH
0 2,608 5,216 feet
**Ordnance Management and Safety**

Ordnance safety includes procedures to prevent premature, unintentional, or unauthorized detonation of ordnance. Any program using a new type of ordnance device for which proven safety procedures have not been established requires an Explosive Safety Approval before the ordnance is allowed on PMRF or used on a test range. This approval involves a detailed analysis of the explosives and of the proposed operations, procedures, and facilities for surveillance and control, an adequacy analysis of movement and control procedures, and a design review of the facilities where the ordnance items will be handled.

Ordnance management procedures are found in PMRF Instruction (PMRFINST) 8020.5, *Explosive Safety Criteria for Range Users Ordnance Operations*. The Range Control Branch of the Range Programs Division is responsible for: (1) detailed analysis of all proposals concerning missiles or explosives and their proposed operation on the range; (2) establishing procedures for surveillance and control of traffic within and entering hazard areas; (3) reviewing the design of facilities in which ordnance items are to be handled to ensure that safety protection meets the requirements of Naval Sea System Command Publication (NAVSEAOP) -5, *Ammunition and Explosives Ashore, Safety Regulations for Handling, Storing, Production, Renovation, and Shipping*, Chapter 4; (4) training, certifying, and providing Launch Control Officers, Safety Monitors, and Ordnance personnel for operations involving explosive ordnance; (5) assuming responsibility for the control of all emergency facilities, equipment, and personnel required in the event of a hazardous situation from a missile inadvertently impacting on a land area; (6) providing positive control of the ordering, receipt, issue, transport, and storage of all ordnance items; and (7) ensuring that only properly certified handling personnel are employed in any handling of ordnance.

Ordnance is delivered to PMRF/Main Base by aircraft to the on-base airfield and by ship to Nawiliwili Bay, then over land by truck transport along Highway 50 to the base. The barges carrying explosives are met at Nawiliwili Harbor by trained ordnance personnel and special vehicles for transit to and delivery at PMRF. All ordnance is transported in accordance with DOT regulations. Ordnance is stored in caves at the Kamokala Magazine area, except for the Strategic Target System, which is stored in a specially constructed facility on KTF. (Pacific Missile Range Facility, Barking Sands, 1998) No mishaps involving the use or handling of ordnance have occurred at PMRF.

PMRF/Main Base has defined ESQD arcs. The arcs are generated by launch pads, the Kamokala Magazine ordnance storage area, the Interim Ordnance Handling Pad, and the Missile Assembly/Test Buildings 573 and 685. Only the ESQD arcs generated by the Interim Ordnance Handling Pad and Building 573 are covered by a waiver or exemption. The Kokole Point Department of Energy launch site can accommodate a 381-meter (1,250-foot) ESQD arc.

A 381-meter (1,250-foot) ESQD Red Label Area, to handle incoming and outgoing ordnance items, is centered on the airfield taxiway, 381 meters (1,250 feet) from Building 412 (see figure 3.4.4-1). A soft pad in the Red Label recovery area is used by helicopters for setting down targets and weapons recovered from the range. The 244-meter (800-foot) ESQD surrounding the soft pad falls totally within the Red Label ESQD area. (Pacific Missile Range Facility, Barking Sands, 1998)
Ocean Area Clearance

Range Safety officials ensure operational safety for projectiles, targets, missiles, and other hazardous operations into PMRF operational areas. The operational areas consist of two Warning Areas (W-186 and W-188) and one Restricted Area (R-3101) under the local control of PMRF. The Warning Areas are in international waters and are not restricted; however, the surface area of the Warning Areas is listed as “HOT” (actively in use) 24 hours a day. For special operations, multi-participant or hazardous weekend firings, PMRF publishes dedicated warning NOTMARs and NOTAMs 1 week before hazardous operations. In addition, a 24-hour recorded message is updated daily by Range Operations to inform the public when and where hazardous operations will take place.

The range safety clearance procedures at PMRF are some of the most rigorous because of the extra sensors available. Before an operation is allowed to proceed, the range is determined cleared using inputs from ship sensors, visual surveillance of the range from aircraft and range safety boats, radar data, and acoustic information from a comprehensive system of sensors and surveillance from shore.

Transportation Safety

PMRF transports ordnance (e.g., missiles) by truck from Nawiliwili Bay to PMRF along Highway 50. The barges carrying explosives are met at Nawiliwili Bay by trained ordnance personnel and special vehicles for transit to and delivery at PMRF. All ordnance is transported in accordance with DOT regulations. In addition, PMRF has established PMRFINST 8023.G, which covers the handling and transportation of ammunition, explosives, and hazardous materials on the facility.

In addition, liquid fuels (e.g., nitrogen tetroxide and unsymmetrical dimethylhydrazine) are transported to KTF. These fuels are shipped to the site by truck, aircraft or barge, which do not affect transportation routes on the island of Kauai. Transportation of these materials is conducted in accordance with DOT regulations and specific safety procedures developed for the location. (Pacific Missile Range Facility, Barking Sands, 1998)

Range Control and the FAA are in direct communication in real time to ensure the safety of all aircraft using the airways and the Warning Areas. Within the Special Use Airspace, military activities in Warning Areas W-186 and W-188 are under PMRF control. Warning Areas W-189, W-187, and W-190 are scheduled through the Fleet Area Control and Surveillance Facility.

The Warning Areas are located in international airspace. Because they are in international airspace, the procedures of the ICAO are followed. The FAA acts as the U.S. agent for aeronautical information to the ICAO, and air traffic in the ROI is managed by the Honolulu ARTCC.

Fire and Crash Safety

The U.S. Navy has developed standards that dictate the amount of fire/crash equipment and staffing that must be present based on the number and types of aircraft stationed on base, and the types and total square footage of base structures and housing. The PMRF fire department meets these standards by maintaining three P-19 crash trucks (two primary and one backup) with both water and foam delivery capacities. For structural fires, the fire department maintains
two combinations of structural fire trucks (one primary and one backup), and one brush fire truck as required by U.S. Navy standards for an installation the size of PMRF. One centrally located facility houses the equipment for both the flightline and the structure fire protection needs. The positioning of this facility also meets the U.S. Navy time and distance requirements for facility response.

In addition to fire equipment, PMRF has two ambulances and Emergency Medical Technician available 24 hours a day, 7 days a week.

3.4.5 SOCIOECONOMICS—PACIFIC MISSILE RANGE FACILITY

Appendix B includes a general definition of socioeconomics.

3.4.5.1 Region of Influence

The ROI for socioeconomics is defined as the island of Kauai, Hawaii. The Proposed Action site is situated on the western side of the island, and the primary areas of analysis will concern both the community situated adjacent to PMRF, Kekaha, and other main population centers on the island such as Kapaa and Lihue.

3.4.5.2 Affected Environment

Kauai is the fourth-largest Hawaiian island, covering 1,424 square kilometers (550 square miles), and northernmost in the chain. The county seat, Lihue, is the island’s commercial and transportation center. Other population centers include Kapaa, Kalaheo, and Kekaha, the community closest to the Proposed Action. Most of the island’s population lives in towns close to the coast or in the valleys a few miles inland. The island is characterized by both tourism and visitor related development and a certain extent of agricultural production. In 1992, the island was physically and economically decimated by Hurricane Iniki. It has taken almost 10 years to recover from the impacts of the hurricane.

Population and Housing

The population of Kauai County numbered 58,463 people as of 2000, having increased from 51,000 people in 1990 (14.2 percent) (U.S. Census Bureau, 2001). Kauai is the least populous of the major Hawaiian Islands representing, as of 2000, only 4.82 percent of the population of the state (1,211,537 people). The nearest county in size, Maui, had more than twice the number of inhabitants as Kauai as of 2000. Kauai has also exhibited the slowest growth rate of all the neighbor islands, remaining considerably behind the growth rates of Maui (27.6 percent) and Hawaii County (23.6 percent). However, Kauai did exceed the growth rate of the state by 5.0 percent (U.S. Census Bureau, 2001).

Prior to Hurricane Iniki striking the island in 1992, Kauai’s population had been projected to grow from approximately 52,000 (in 1990) to 65,000 by the year 2000. It was estimated in 1993 (Pacific Missile Range Facility, Barking Sands, 1998) that 8,000 to 10,000 of Kauai’s population had emigrated to flee the effects of the hurricane. The latest data shows that the population of Kauai is growing once more, albeit at a markedly slower rate that what was once projected.
As of 2000, there were an estimated 25,331 housing units within Kauai, of which 2,339 housing units were located within Lihue, 3,632 in Kapaa, and 1,162 in Kekaha. In addition, the U.S. Bureau of the Census reported that vacancy rates of rental housing on Kauai averaged 6.1 percent, compared with vacancy rates of 8.1 percent, 4.6 percent, and 6.0 percent, for Lihue, Kapaa and Kekaha respectively.

Visitor serving accommodations are numerous on Kauai, with many different sized hotels and motels. Kauai has approximately 7,200 rooms or 10 percent of the total 72,204 available visitor rooms in the state (eHawaiiGov, 2002).

Income and Employment
The U.S. Bureau of the Census reported that the per capita income in Kauai County, in 2000, was $20,301, 5.7 percent lower than the average per capita income of the state at $21,525. Similarly, as of 2000 the Median Household Income in Kauai county, at $45,020 was 9.6 percent lower than that of the state at $49,820. Kauai experienced an annual unemployment level of 7.0 percent in 2001, having increased from 6.5 percent in 2000. These rates contrast markedly with that of the state with rates of 4.6 percent in 2001 and 4.6 percent in 2000.

Table 3.4.5-1 shows the number of individuals employed within the main sectors of the economy of Kauai. Retail and service industries dominate the profile, employing more than 60 percent of the workforce at the county level. Tourism, tourism-related services, and government have continued to be the main employment generators since the 1992 hurricane. Currently, the three largest employers on Kauai are the County of Kauai, PMRF, and Wilcox Health Systems.

<table>
<thead>
<tr>
<th>Employment Sector</th>
<th>Employees</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing and mining</td>
<td>1,227</td>
<td>4.6</td>
</tr>
<tr>
<td>Construction</td>
<td>2,083</td>
<td>7.8</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>652</td>
<td>2.4</td>
</tr>
<tr>
<td>Transportation and public utilities</td>
<td>1,497</td>
<td>5.6</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>456</td>
<td>1.7</td>
</tr>
<tr>
<td>Retail trade</td>
<td>3,341</td>
<td>12.5</td>
</tr>
<tr>
<td>Finance insurance and real estate</td>
<td>1,667</td>
<td>6.2</td>
</tr>
<tr>
<td>Information</td>
<td>426</td>
<td>1.6</td>
</tr>
<tr>
<td>Public administration</td>
<td>1,598</td>
<td>6.0</td>
</tr>
<tr>
<td>Services</td>
<td>27,684</td>
<td>51.7</td>
</tr>
<tr>
<td>Professional, managerial, scientific, administrative</td>
<td>2,505</td>
<td>9.4</td>
</tr>
<tr>
<td>Education, health, and social services</td>
<td>4,372</td>
<td>16.3</td>
</tr>
</tbody>
</table>

The visitor industry is of high importance to the economy of Kauai. During 2001, Kauai attracted approximately 1 million visitors. Kauai's share of the Hawaii visitor market was 13.9 percent in 1995 representing a relatively rapid recovery from 1992, when the impact of Hurricane Iniki reduced Kauai's share to 3 percent. Hotel jobs are the heart of the visitor industry. The average monthly employee count for hotel workers numbered 3,693 in 2001 (Hawaii Data Books, 2003a). The local economy also continues to benefit from feature film, television, and commercial production. Since 1992, the film and television industry has contributed an average of $7 million dollars annually to the island's economy. In 2001 the total was $11 million (Hawaii Data Books, 2003b).

Government is the largest single employer on the island, and has remained the least affected by natural disasters or by physical or economic pressures (Hawaii Data Books, 2003a). The number of government employees has grown relatively evenly since 1991. Between 1991 and 2000, the number of federal, state, and local government employees on Kauai grew from 3,450 to 4,100. Of that growth, 77 percent consisted of state employees.

PMRF is the largest federal government employer on Kauai. In September 1997, it employed a total of 870 personnel. Of those, 290 worked directly for PMRF, while the remaining were employed by tenant organizations and subcontractors. The PMRF workforce is composed of 183 DoD civilian personnel, 107 military personnel, 477 contractor personnel, and 103 tenants. The direct economic impact on Hawaii of PMRF, its tenant organizations, contractors and visitors, was $116.6 million in 1996. The PMRF operating budget in 1996 was $109 million, of which $45 million was payroll. PMRF expenditures in 1996 included $8.2 million for construction projects throughout the Hawaiian Islands and $56 million for other purchases. Visitors to PMRF were estimated to have spent $7.5 million in the Kauai economy in 1996.

The major shift in agricultural land use over the last 10 years has been a marked reduction in the cultivation of sugarcane fields across Hawaii, mainly as a result of lowered world prices from foreign sources. On Kauai, the sugarcane downturn resulted in the closure of several significant local operations. In 1994, over 28 percent of Hawaii's sugar cane acreage was located in the five sugar cane plantations of Kauai County. By early 1998, the number of plantations had been reduced to two, and as a result, Kauai has been pursuing a policy of increasing agricultural diversification.
3.5 VANDENBERG AIR FORCE BASE

The existing environment at Vandenberg AFB was described in the Theater Ballistic Missile Targets EA (U.S. Department of the Air Force, 1997b), Booster Verification EA (U.S. Department of the Air Force, 1999), the Evolved Expendable Launch Vehicle Program Supplemental EIS (U.S. Department of the Air Force, 2000), and the Alternate Boost Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c). For the most part, those descriptions are still accurate and are not repeated in this document. Rather, for resources that may be affected by ETR activities at Vandenberg AFB, the pertinent resource discussions are summarized and any differences in existing environmental conditions, including new facilities or infrastructure, are noted. The more detailed discussion in the Final EAs and EIS are incorporated by reference and will be made available for review by those who wish more information concerning the existing environment at Vandenberg AFB.

The proposed ETR activities could have an effect on air quality, biological resources, cultural resources, geology and soils, hazardous materials and waste, health and safety, land use, noise, socioeconomics, transportation, and water resources at Vandenberg AFB. These resource areas are summarized below.

Areas that are not expected to be affected sufficiently at Vandenberg AFB to warrant further discussion in this section include airspace, utilities, visual and aesthetic resources, and environmental justice. Airspace impacts would be minimal as described and analyzed in the earlier EAs and EIS cited above. These documents concluded that close coordination with the FAA would result in no adverse effects to airspace from missile flight tests. The use of the required scheduling and coordination process for international airspace and adherence to applicable DoD directives, U.S. Air Force and U.S. Army regulations concerning issuance of NOTAMs, and selection of missile firing areas and trajectories reduces the potential for impacts to airspace. Utility requirements are minimal and would not exceed existing commercial power supplies.

Although the visual resources on Vandenberg AFB may be considered significant by some viewers, much of the area is already developed with the types of structures and activities that are being considered in the Proposed Action. The construction of the IDT along with the supporting infrastructure (fencing, lighting, etc.) would occupy a very small area within the base. In addition, the facilities would be located in areas with a limited number of viewers. The Proposed Action would result in a minor incremental impact to the overall aesthetic value of the potential Proposed Action locations on Vandenberg AFB. Therefore, visual and aesthetic resources will not be analyzed further for Vandenberg AFB. Vandenberg AFB personnel suggested that Environmental Justice could be an issue if the potential exists for disproportionate effects on local Native Americans from the proposed project. However, initial analysis of the Environmental Justice issues, with respect to Chumash Indian uses of cultural areas in the vicinity of the proposed project locations, indicate that there should be no disproportionate impacts. Chumash use of the areas in question should be affected no more than that of other groups who access the base for recreation, fishing, etc. Furthermore, the proposed project requires only infrequent closures of the areas in question. Therefore, Environmental Justice is not an issue warranting in-depth analysis at Vandenberg AFB.
3.5.1 AIR QUALITY—VANDENBERG AIR FORCE BASE

Appendix B includes a definition of air quality and the main regulations and laws that govern it.

3.5.1.1 Region of Influence

For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to an area extending no more than a few kilometers downwind from the source.

The ROI for ozone may extend much further downwind than the ROI for inert pollutants: however, as the project area has no heavy industry and very few automobiles, tropospheric ozone and its precursors are not of concern. Consequently, for the air quality analysis, the ROI for project operational activities is the Santa Barbara Air Basin, which is part of the South Central Coast Air Basin.

Remote telemetry sites in California would include the use of mobile telemetry support equipment in central California. Activities at these locations would utilize existing paved or graveled areas and be short-term temporary activities. The potential for impacts to air quality is minimal and, therefore, is not discussed further in this document.

3.5.1.2 Affected Environment

Climate

Vandenberg AFB experiences moderate seasonal and daily variation in temperature and humidity due to its coastal location. The temperatures range from 4°C to 24°C (39°F to 75°F) with an annual mean temperature of 14°C (58°F). The rainy season extends from November to April. Average annual precipitation is 33 centimeters (13 inches).

Regional Air Quality

The California Air Resources Board classifies areas of the state in attainment or nonattainment of the California AAQS. In California, air quality is assessed on a county and regional basis. Vandenberg AFB is in Santa Barbara County, which is part of the South Central Coast Air Basin. Santa Barbara County is considered to be in attainment for all AAQS except for state ozone and PM-10 standards. Santa Barbara County has recently met the federal standard for ozone and is in the process of being redesignated by the EPA as being in attainment. Vandenberg AFB has been designated by the EPA to be unclassified for PM-10 but has been designated by California Air Resources Board to be in nonattainment for California AAQS for PM-10. (Santa Barbra County Air Pollution Control District, 2003)

The Santa Barbara County Air Pollution Control District administers regulations for nonvehicular air pollution sources, and is required to monitor air pollution levels to ensure federal and state AAQS are met or develop a plan to meet them (Air Force Center for Environmental Excellence, 1999). The air monitoring station located on Vandenberg AFB is in the south portion of the base.

The ROI for lower-atmosphere air quality resources may extend beyond the project boundaries to include those areas significantly affected by air dispersion and/or commuter traffic. This could include an area as large as the regional air quality basin (South Central Coast Air Basin)
and may affect the maintenance of the NAAQS and the California AAQS for the Vandenberg AFB area.

**Existing Emission Sources**

Prior Vandenberg AFB emission inventory results show that missile launch missions account for less than 1 percent of the total PM-10 and total of carbon monoxide. Since 1991, all new stationary sources of emissions (and modifications) at Vandenberg AFB have applied best available current technology and offset emissions at a 1.2 to 1.0 ratio. Table 3.5.1-1 lists emissions from Vandenberg AFB and Santa Barbara County.

<table>
<thead>
<tr>
<th>Table 3.5.1-1: Vandenberg AFB and Santa Barbara County Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volatile Organic Compounds</strong></td>
</tr>
<tr>
<td>metric tons (tons)/year</td>
</tr>
<tr>
<td>Estimated 2001 Emissions from Vandenberg AFB</td>
</tr>
<tr>
<td>1996 Santa Barbara County Annual</td>
</tr>
</tbody>
</table>

Source: U.S. Department of the Air Force, 2000

**3.5.2 BIOLOGICAL RESOURCES—VANDENBERG AIR FORCE BASE**

A definition of biological resources and the main regulations and laws that govern their protection are provided in appendix B.

**3.5.2.1 Region of Influence**

The ROI includes areas on Vandenberg AFB and offshore that may be affected by target and interceptor launches from existing and upgraded launch sites, the use of existing sensors, and construction and operation of an IDT site.

Activities at remote telemetry sites in California, such as Pillar Point, would utilize existing paved or graveled areas and be short-term temporary activities. The potential for impacts to biological resources is minimal and therefore will not be discussed further in this document.

**3.5.2.2 Affected Environment**

**Vegetation**

Fourteen major vegetation and habitat types have been described and mapped on Vandenberg AFB. Among these vegetation types, coastal sage scrub and native and non-native grasslands are the major communities found in the proposed project area.
Threatened and Endangered Plant Species

Threatened and endangered plant species with the potential to occur within the ROI are listed in table 3.5.2-1.

Table 3.5.2-1: Listed Species Known or Expected to Occur in the Vicinity of the Proposed Action

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>State</th>
<th>Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eriodictyon capitatum</em></td>
<td>Lompoc yerba santa</td>
<td>R</td>
<td>E</td>
</tr>
<tr>
<td><em>Hemizonia increscens ssp. villosa</em></td>
<td>Gaviota tarplant</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eucyclogobius newberryi</em></td>
<td>Tidewater goby</td>
<td>--</td>
<td>E</td>
</tr>
<tr>
<td><em>Gasterosteus aculeatus williamsoni</em></td>
<td>Unarmored threespine stickleback</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Amphibians</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Rana aurora draytoni</em></td>
<td>California red-legged frog</td>
<td>CSC</td>
<td>T</td>
</tr>
<tr>
<td><strong>Birds</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Charadrius alexandrinus nivosus</em></td>
<td>Western snowy plover</td>
<td>CSC</td>
<td>T</td>
</tr>
<tr>
<td><em>Pelecanus occidentalis californicus</em></td>
<td>California brown pelican</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><em>Sternula antillarum browni</em></td>
<td>California least tern</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Mammals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Enhydra lutris nereis</em></td>
<td>Southern sea otter</td>
<td>Fully Protected</td>
<td>T</td>
</tr>
</tbody>
</table>


CSC California Species of Concern
R Rare
T Threatened

The four known locations of Lompoc yerba santa (*Eriodictyon capitatum*), a federal endangered plant species, occur in western Santa Barbara County. Two of these locations, composed of three groups, are on Vandenberg AFB approximately 12 kilometers (7 miles) south of LF-21 and LF-23. This plant is associated with the central maritime (Burton Mesa) chaparral and bishop pine forest, which are threatened habitat types with limited distribution. (U.S. Environmental Protection Agency, 2001a)

The USFWS has listed the Gaviota tarplant (*Hemizonia increscens ssp. villosa*) as endangered. It occurs within a narrow band of coastal terrace grassland between Gaviota and Santa Barbara (U.S. Environmental Protection Agency, 2001a), southeast of LF-06 (Vandenberg Air Force Base, 2000). It has recently been identified as occurring in two locations on Vandenberg AFB south of and along Point Sal Road (U.S. Department of the Air Force, 1999).

Wildlife

Vandenberg AFB plant communities provide habitat for many resident and migratory animals. The Western fence lizard, garter snake, pocket gopher, California ground squirrel, and deer mouse are typical examples of smaller wildlife species. Also common are brush rabbit, badger, and mule deer. Birds such as ring-billed, Heerman’s, and glaucous-winged gulls, as well as the western wood-pewee, rhinoceros auklet, red-winged blackbird, red-tailed hawk, great horned...
owl, and golden eagle have also been sighted. (U.S. Department of the Air Force, 1997b; Vandenberg Air Force Base, 2000)

Because Vandenberg AFB is near the southern limit of the breeding ranges for many seabird species, a long-term program was begun in 1999 to annually monitor population dynamics and breeding biology of seabirds breeding on Vandenberg AFB. An estimated total of 1,200 seabirds were identified that year. (Point Reyes Bird Observatory, 1999)

The loggerhead shrike (Lanius ludovicianus) and the western burrowing owl (Speotyto cunicularia hypugea) could potentially be present in the project area. Both species are listed as federal and California Species of Concern.

The Pacific harbor seal (Phoca vitulina) is a resident species of Lion’s Head and Point Sal. Counts of harbor seals performed at nine main haul out sites along the coast of Vandenberg AFB average 327 seals. Lion’s Head, the closest site to the proposed project launch sites (figure 3.5.2-1), has been documented as a haul out area and recently as a pupping area for a small number of Pacific harbor seals. The largest number of harbor seals are found at Lion’s Head between September and January. Most harbor seal pupping occurs in March with a 4- to 6-week weaning period. (U.S. Department of the Air Force, 1999)

The California sea lion (Zalophus californianus californianus) does not breed on Vandenberg AFB, but is found along the coastline during the summer (U.S. Department of the Air Force, 1999). Point Sal, which is north of the Base boundary, is the closest area used as a haulout by the California sea lion. Other pinnipeds such as the elephant seal and northern fur seal are observed periodically on the base and can be found in nearby haulout/rookery areas, preferring undisturbed sections of mainland coast and offshore islands or rocks. One such area is just south of Minuteman Beach, which is approximately 3 kilometers (2 miles) from the proposed launch site.

Essential Fish Habitat

Essential Fish Habitat includes those waters and substrate (sediment, hard bottom) necessary to the complete life cycle of fish, from spawning to maturity. The east-west boundary for coastal pelagic species (Pacific sardine and mackerel, northern anchovy, jack mackerel, and squid), groundfish (including species of rockfish, shark, and cod), and highly migratory fish (tunas, marlin, and swordfish) includes all marine and estuary waters from the coast of California to the limits of the Exclusive Economic Zone (the 322-kilometer [200-mile] limit) where the United States has exclusive authority over management of fisheries. Fishing regulations are enforced by Vandenberg AFB security police game wardens.

Threatened and Endangered Wildlife Species

Vandenberg AFB’s diverse habitats support a wide variety of listed species. Those with the potential to occur within the ROI are shown in figure 3.5.2-1 and table 3.5.2-1. A resident population of the federally threatened southern sea otter (Enhydra lutris nereis) has been observed off Purisima Point, typically foraging and rafting in kelp beds; however, semi-migratory individuals may be found all along the coastline. Otters found near the Point Sal area (Friends of the Sea Otter, 2002) are the nearest to the proposed launch site.
Figure 3.5.2-1


**EXPLANATION**

- **Nesting Location of California Least Tern/ Western Snowy Plover** (Least Terns Have Nested Only at Purisima Point in Recent Years)
- **Haulout Location of California Sea Lion, Northern Elephant Seal, and Pacific Harbor Seal**
- **Roosting Location of California Brown Pelican**
- **Tidewater Goby**
- **Unarmored Threespined Stickleback**
- **Steelhead Trout**
- **Mountain Plover (Winters Only)**
- **Southern Sea Otters**
- **Building**
- **Foraging Areas**
- **California Red-legged Frog (Wide Distribution Also Includes Ponds and Vernal Pools)**
- **Unarmored Threespined Stickleback Roosting Location of California Brown Pelican**
- **Haulout Location of California Sea Lion, Northern Elephant Seal, and Pacific Harbor Seal**

**Sensitive Habitat for Listed Wildlife Species on Vandenberg AFB**

Northern Vandenberg Air Force Base, California

**Source:** U.S. Department of the Air Force, 1997b (modified).
The California brown pelican (*Pelecanus occidentalis californicus*), a federal and state endangered subspecies, and the western snowy plover (*Charadrius alexandrinus nivosus*), a federal threatened shorebird, are commonly observed in the Vandenberg AFB area, which provides roosting for the former and nesting and roosting sites for the latter (U.S. Department of the Air Force, 1991). The pelicans roost at Point Sal, northwest of the proposed project launch sites. LF-23 is approximately 1 kilometer (0.6 mile) east of the nearest snowy plover nesting habitat on Minuteman Beach. Other launch sites identified as potential sites for the program are within 1.4 to 5.6 kilometers (0.9 to 3.5 miles) northwest (LF-06), northeast (LF-21), and east (LF-03) of snowy plover nesting habitat. (Wiskowski and Francine, 2002) California brown pelicans and western snowy plovers are also known to use areas near Purisima Point.

Shuman Creek is the main water body closest to the proposed project launch sites. It offers foraging areas for the federally and state endangered California least tern (*Sterna antillarum browni*). The beach at the mouth of Shuman Creek is also occasionally used by the California brown pelican (Vandenberg Air Force Base, 2003). The federally endangered tidewater goby (*Eucyclogobius newberry*) occurs in Shuman Creek. The federally threatened California red-legged frog (*Rana aurora draytoni*) is found in riparian wetland areas in the northwestern Vandenberg AFB portion. It prefers freshwater pools and ponds associated with arroyo willow, cattails, and other thickets of emergent aquatic vegetation. (U.S. Department of the Air Force, 1997b)

San Antonio Creek, located south of Building 1819, is one of the largest streams on base. Several freshwater marshes have been recorded along the San Antonio that, along with the creek itself and the lagoon at its mouth, support both common and rare Vandenberg species (U.S. Department of the Air Force, 1991); the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) and the tidewater goby, federal and state endangered fish, can be found there. This may represent the northern limit for the unarmored threespine stickleback, which uses adjoining feeder streams during the wet season (Pacific Pipeline System, Inc., 1996).

The federally threatened California red-legged frog occurs in the San Antonio Creek and the man-made Mod III Lake located south of Building 1819 on the southern edge of San Antonio Terrace. This lake’s fish, such as gambusia, are all introduced species. The California red-legged frog is found in surrounding riparian areas, as well as in freshwater ponds neighboring the area and Barka Slough. The California red-legged frog is also found in riparian wetland areas in the northwestern Vandenberg AFB portion near Minuteman Beach, and shows a preference for freshwater pools and ponds associated with arroyo willow, cattails, and other thickets of emergent aquatic vegetation. (U.S. Department of the Air Force, 1997b) In March 2001, the USFWS designated 1.6 million hectares (4.1 million acres) in 28 California counties as critical habitat for the threatened California red-legged frog, but excluded Vandenberg AFB since its integrated natural resource management plan provided adequate management for the on-base population (Jumping Frog Research Institute, 2001).

Historical sightings of the recently federally delisted and state endangered American peregrine falcon (*Falco peregrinus*) in the Point Sal area have been reported (U.S. Department of the Air Force, 1999). This raptor has been the subject of an active state reintroduction program since the 1970s (U.S. Department of the Air Force, 1990a).
Environmentally Sensitive Habitat

Dune Systems
The installation envelops one of the major southern California coastal dune systems, with areas still resembling their original condition, and occupies one of the state’s six remaining coastal dune systems. Extensive central foredunes and coastal dune scrub are located on the North Vandenberg coast (U.S. Department of the Air Force, 1991).

Wetlands
Along with a network of swales, several wetlands (including two man-made) occur near Building 1819; the closest is approximately 1.6 kilometers (1 mile) to the northwest. These wetlands, ranging between 0.8 and 2.8 hectares (2 and 7 acres) in size, support such typical species as arroyo willow, wide-leaf cattail, California bulrush, water smartweed, and bog rush.

Critical Habitat
The USFWS recently designated approximately 2,590 hectares (6,401 acres) and 3,929 hectares (9,709 acres) of critical habitat for the Lompoc yerba santa and the Gaviota tarplant, respectively. These endangered plants are only found in coastal areas of Santa Barbara County. Approximately 2,126 hectares (5,253 acres) of critical habitat for these two plants at Vandenberg AFB was excluded. The decision was based on the commitment of Vandenberg AFB to develop and implement protective measures agreed to in its Integrated Natural Resources Management Plan. These measures include establishing Sensitive Resource Protection Areas for the plants in the areas proposed for critical habitat designation and monitoring, survey, enhancement, and restoration activities. (U.S. Fish and Wildlife Service, 2002c)

The USFWS has also designated critical habitat for nesting snowy plovers along the beaches of Vandenberg AFB. Vandenberg AFB is developing a management plan in coordination with USFWS for beach closures during the snowy plover nesting season (1 March through 30 September).

Channel Islands National Marine Sanctuary
In 1980, a 4,294-square kilometer (1,252-square nautical mile) portion of the Santa Barbara Channel was designated as the Channel Islands National Marine Sanctuary. The sanctuary is an area of national significance that encompasses the waters that surround Anacapa, Santa Cruz, Santa Rosa, San Miguel and Santa Barbara Islands and extends from mean high tide to 11 kilometers (6 nautical miles) offshore around each of the five islands. The sanctuary's primary goal is the protection of natural and cultural resources contained within its boundaries. The National Oceanographic and Atmospheric Administration plans to expand the Channel Islands National Marine Sanctuary off the coast of Vandenberg AFB. The study area for this expansion includes an area off the coast of California from south of Point Mugu to north of Point Sal. (National Oceanic and Atmospheric Administration, Channel Islands National Marine Sanctuary, 2002)
3.5.3 CULTURAL RESOURCES—VANDENBERG AIR FORCE BASE

Appendix B includes a definition of cultural resources and the laws and regulations protecting them.

3.5.3.1 Region of Influence

In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility or utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. At Vandenberg AFB this includes the use of existing target launch facilities from existing sites; the use of existing Minuteman launch facilities from existing sites as modified to GBI booster verification test requirements; single and dual launches of GBIs and targets; construction and operation of one IDT; and upgrade of existing facilities, all utilities, and infrastructure to support operations.

Remote telemetry sites in California would include the use of mobile telemetry support equipment in central California. Activities at these locations would utilize existing paved or graveled areas and be short-term temporary activities. The potential for impacts to cultural resources is minimal and, therefore, is not discussed further in this document.

3.5.3.2 Affected Environment

The Integrated Cultural Resources Management Plan (U.S. Air Force, 1997) for Vandenberg AFB is used in part to support the management of the cultural resources found at Vandenberg AFB. This document is used to assist in the preservation of historic buildings, structures, objects, landscapes, and archaeological resources for Vandenberg AFB.

Prehistoric and Historic Archaeological Resources

Numerous archaeological surveys at Vandenberg AFB have identified approximately 2,200 prehistoric and historic cultural sites (Carucci, 2002). Prehistoric sites include dense shell middens, stone tools, village sites, stone quarries, and temporary encampments. Historic artifacts include those typically used in mission establishment, ranching, and military activities. Cultural resource sites located in this area include the site of the former Rancho Guadalupe, which dates from the mission period.

Historic Buildings and Structures

In 1941, the U.S. Army in support of the World War II effort acquired much of the area. Named Camp Cooke, the area served as a training area for armored and infantry units. In 1950 the base was re-activated in support of the Korean War. In 1957, the U.S. Air Force took over the northern 26,305 hectares (65,000 acres) of Camp Cooke and renamed it Cooke AFB. In 1958, the Strategic Air Command took control of the base and renamed it Vandenberg AFB.

Vandenberg AFB has primarily been used to develop several types of intermediate and long-range ballistic missiles and has been largely associated with the launch of military and civilian payloads since the mid-1950s. The 30th Space Wing (30 SW) is currently the host command at Vandenberg AFB and controls the Western Test Range, which conducts military and civilian space and missile launch operations.
Vandenberg AFB currently manages 110 early historic structures and 77 historic Cold War-era facilities. The latter Cold War sites have been determined eligible for listing on the National Register of Historic Places as the result of a recently concluded consultation with the State Historic Preservation Officer. (Carucci, 2002)

**Native Populations/Traditional Resources**

At the time of European contact, the Vandenberg AFB area was occupied by inhabitants who spoke one of the major languages of the Chumashan branch of the Hokan language family. Villages were numerous and typically consisted of domed houses, granaries, ceremonial areas, game fields, and a burial ground. Several villages were located in the area that is now northern Vandenberg AFB.

Even after the first Europeans made contact, the Chumash life and culture continued without the explorers’ influence. It was not until the mid-1700s that the Spanish began to colonize the area and establish missions. In 1901, the Chumash received 30 hectares (75 acres) of reserved land from the U.S. Government, which is presently the only land held by the Chumash people. This reservation is located approximately 32 kilometers (20 miles) east of Vandenberg AFB. The base has maintained a cooperative relationship with the Chumash reservation for several years.

Vandenberg AFB manages approximately 140 Native American traditional cultural properties (Carucci, 2002). Several Chumash-related traditional resources sites have been identified at Vandenberg AFB including villages and campsites, rock art panels, and burial grounds. Among these is Joe’s Pond on the San Antonio Terrace, which is considered to be a traditional resource area by the Santa Ynez Band of Mission Indians (Chumash).

**Paleontological Resources**

The Miocene Monterey Formation and Later Miocene (13 to 25 million years before present) deposits identified at northern Vandenberg AFB have yielded imprints of algae, fish fragments, coprolite, and whalebone. Fossils of both vertebrate and invertebrate animals have been found in the vicinity of Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a).

### 3.5.4 GEOLOGY AND SOILS—VANDENBERG AIR FORCE BASE

Appendix B includes a definition of geology and soils and the main regulations and laws that govern them.

#### 3.5.4.1 Region of Influence

The ROI is the footprint of the target and GBI launch pads, and soil areas encompassed by each LHA that might be subject to contamination from launch exhaust emissions and/or potential contamination from unburned fuel in the event of a terminated launch. Construction areas for an IDT and associated trenching for a connecting fiber optic cable are also areas within the ROI.

Remote telemetry sites in California would include Pillar Point. Activities at this location would utilize existing paved or graveled areas and would be a short-term temporary activity. The potential for impacts to geology and soils at this location is expected to be minimal.
3.5.4.2 Affected Environment

Physiography

Vandenberg AFB is located in the Santa Maria Basin, which is bounded on the northeast by the San Rafael Mountains of the Southern Coast Ranges, on the south by the Santa Ynez Mountains of the Western Transverse Ranges, and on the west by the Pacific Ocean. Most proposed system elements are located in the northern portion of Vandenberg. Major physiographic features on the base include, from north to south, the Casmalia and Purisima Hills, San Antonio Terrace, Barka Slough, Lompoc Valley, and Burton Mesa, as well as beaches, rocky headlands, and points. (U.S. Department of the Air Force, 2000)

Geology

Vandenberg AFB is underlain by marine sedimentary rocks of Late Mesozoic age and Cenozoic age. The basal unit underlying the entire area is the Franciscan Assemblage of upper Jurassic age (Dibblee, 1950). The Franciscan Assemblage consists of pervasively sheared marine sedimentary rock and metamorphosed igneous rock with numerous serpentine intrusions (Dibblee, 1988). Extensive folding and faulting throughout the Vandenberg AFB area has created four structural regions; the Santa Ynez Range, the Lompoc lowland, the Los Alamos syncline, and the San Rafael Mountain uplift. (U.S. Department of the Air Force, 1999)

Soils

Surficial deposits at the proposed and alternate facility sites are highly variable and range from weathered bedrock to stream terrace, alluvial fan, and aeolian sheet sands.

Geologic Hazards

Numerous onshore and offshore faults have been mapped within the vicinity of Vandenberg AFB; most are inactive and not capable of surface fault rupture or of generating earthquakes (U.S. Department of the Air Force, 1998a). Four potentially active faults have been mapped on Vandenberg AFB: the Lion’s Head, Hosgri, Santa Ynez River, and Honda (Jennings, 1994) (figure 3.5.4-1). The Lion’s Head fault runs through North Vandenberg AFB, and the Hosgri, Santa Ynez, and Honda faults transect or run adjacent to South Vandenberg AFB. The Lion’s Head, Santa Ynez, and Honda faults show evidence of displacement during the late Quaternary (cut strata of Pleistocene age), and the Hosgri fault has shown evidence of Holocene displacement (less than 10,000 years). (California Department of Conservation, Division of Mines and Geology, 1996)

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<td>6.5</td>
</tr>
</tbody>
</table>

Source: California Division of Mines and Geology, Open File Report 96-08
Principal Faults in Vandenberg Air Force Base Area

Vandenberg Air Force Base, California

Figure 3.5.4-1

EXPLANATION

- Base Boundary
- Fault Trace
- U.S. Highway
- Approximate Fault Location
- State Route
- Concealed Fault
- Railroad

The secondary effects of fault rupture are earthquake ground motions, or seismicity. The Western Transverse Ranges, inclusive of the continental borderlands, have historically been in a moderately high seismic region. Within a 32-kilometer (20-mile) radius of the project area, there have been over 90 earthquakes with magnitudes ranging from 3.0 to 7.3 since 1900 (U.S. Department of the Air Force 1998a). Two earthquakes were notable, one in 1812 (M7.1), most likely epicentered in the Santa Barbara Channel, and the other in 1927 (M7.3), offshore near Point Arguello. The 1927 event may have occurred approximately 40 kilometers (24.8 miles) west of Lompoc. (California Department of Conservation, California Geological Survey, 2003) The Hosgri, Lion’s Head, Santa Ynez, and Honda faults are considered by California Geologic Survey to be class B faults, or those lacking paleoseismic data necessary to constrain the recurrence intervals of large events. (California Department of Conservation, Division of Mines and Geology, 1996) Vandenberg AFB is located in a Seismic Zone IV, as defined by the Uniform Building Code (International Conference of Building Officials, 1991), characterized by areas likely to sustain major damage from earthquakes, and corresponds to intensities of VIII or higher on the Modified Mercalli Scale. (U.S. Department of the Air Force, 1998a)

3.5.5 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—VANDENBERG AIR FORCE BASE

The relevant aspects of hazardous materials/waste management include the applicable regulations and procedures for hazardous materials usage and hazardous waste generation, and management programs for existing hazardous waste-contaminated sites within the ROIs.

Appendix B includes a general description of hazardous materials and waste.

3.5.5.1 Region of Influence

The ROI for potential impacts related to hazardous materials/wastes includes areas of north Vandenberg AFB to be used for launch activities, pre-launch site preparation, and in areas where liquid propellant would be stored and handled.

3.5.5.2 Affected Environment

Hazardous Materials and Hazardous Waste

In 1991, the State of California developed a state EPA called Cal/EPA. This agency regulates air, water, pesticides, integrated wastes, toxic substances and environmental health hazard assessments. Although the federal regulations still are enforced, California has developed far more stringent environmental regulations than has been promulgated federally.

Hazardous Materials Management

Hazardous materials use at Vandenberg AFB must conform to applicable federal, state and local laws and regulations. Hazardous materials obtained from off base suppliers are coordinated through Vandenberg AFB’s Hazmart Pharmacy. A base supply contractor runs the Hazmart Pharmacy and (in accordance with U.S. Air Force Instructions) inventories all hazardous materials, whether purchased by the U.S. Air Force or its contractors. Hazardous materials are tracked using Environmental Management System software. These procedures are in accordance with the 30 SW Hazardous Materials Management Plan.
Most hazardous materials fall into two use categories: materials used in base maintenance activities and those used in various launch operations. Numerous types of hazardous materials are used to support the various missions and general maintenance operations at Vandenberg AFB. Categories of hazardous materials used during current launch activities include POL, volatile organic compounds, corrosives, refrigerants, adhesives, sealants, epoxies, and propellants.

Spills of hazardous materials are covered under the Hazardous Materials Emergency Response Plan. This plan ensures that adequate and appropriate guidance, policies, and protocols regarding hazardous material incidents and associated emergency response are available to all installation personnel.

**Hazardous Waste Management**

Hazardous wastes at Vandenberg AFB are regulated by the Resource Conservation and Recovery Act (RCRA) (Title 40 CFR 260-280) and the California EPA Department of Toxic Substances Control, under the California Health and Safety Code, Title 22, Division 20, Chapter 6.5, Sections 25100 through 25159, and the California Administrative Code, Sections 25100 through 67188. These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled.

The Vandenberg AFB Hazardous Waste Management Plan (dated 15 November 2000), describes procedures for packaging, handling, transporting, and disposing of hazardous waste. Hazardous wastes generated during Vandenberg AFB activities are initially collected at the point of generation and, if not reused or recycled, transported to the collection-accumulation point managed by the base Environmental Flight. Here it is containerized and segregated by type. Following initial containerization, waste may remain at the collection-accumulation point for up to 90 days, at which point all hazardous waste must be transported to the off-site Treatment, Storage, and Disposal Facility (Vandenberg Air Force Base, 2001).

**Pollution Prevention/Recycling/Waste Minimization**


**Installation Restoration Program**

Vandenberg AFB is not listed on the National Priorities List. IRP sites at Vandenberg AFB are being addressed in a manner generally consistent with the Comprehensive Environmental Response, Compensation, and Liability Act process. As of the end of 1996, 36 IRP sites were in the remedial investigation/feasibility study stage including those undergoing Interim Remedial Actions. In addition, 40 sites are in the Remedial Action phase. Sixty sites have been recommended for No Further Remedial Action Planned, with state concurrence.
Underground and Aboveground Storage Tanks

USTs and ASTs at Vandenberg AFB are installed and maintained in compliance with appropriate local, state, and federal standards and regulatory requirements.

Any installation, modification or removal of USTs or ASTs must be approved by the base Storage Tank Manager in the Environmental Flight.

Asbestos, Lead-Based Paint, and Polychlorinated Biphenyls

Disposal of friable asbestos is not permitted on Vandenberg AFB. Asbestos management and abatement at Vandenberg AFB is in compliance with appropriate local, state, and federal standards and regulatory requirements.

The Vandenberg AFB Hazardous Waste Management Plan (dated 15 November 2000), specify all procedures for sampling, handling and disposing of lead-based paint and PCBs.

Liquid Propellants and Other Toxic Fuels

Existing procedures assure safe handling of liquid propellants and other toxic materials. Current operations include storage and handling of GBI and EKV propellants.

3.5.6 HEALTH AND SAFETY—VANDENBERG AIR FORCE BASE

Appendix B includes a general description of health and safety.

3.5.6.1 Region of Influence

The ROI for potential impact related to the health and safety of workers includes the work areas associated with transportation of missile components, pre-launch storage and handling, missile launch, and post-launch activities. The population of concern would predominantly consist of the contractor, military, and government civilian personnel directly involved with GMD ETR program operations.

The ROI for potential impact related to public health and safety includes any areas affected by transport of missile components and immediately bordering Vandenberg AFB that may be affected by launch hazard areas.

Remote telemetry sites in California would include Pillar Point. Activities at this location would utilize existing paved or graveled areas and be short-term temporary activities. Because of the type of emissions and the limited power output, the potential for impacts to health and safety is expected to be minimal and, therefore, is not discussed further in this document.

3.5.6.2 Affected Environment

Range Safety

Vandenberg AFB is involved in the ongoing test and evaluation of various missiles and space launch vehicles, with safe procedural practices as a primary objective. To accomplish this, an
aggressive safety evaluation and control system has been implemented, based on more than 40 years experience in test and evaluation.

Proposed on-base program operations must receive prior approval, accomplished by the user through presentation of the program to Space Wing/Safety Office (30 SW/SE). All safety analyses, SOPs, and other safety documentation applicable to those operations affecting Vandenberg AFB, or the Western Range Area and its controlled range space, must be provided, along with an overview of mission objectives, support requirements, and schedule. The 30 SW/SE evaluates this information, ensuring that all Western Range Area safety requirements are met.

Vandenberg AFB possesses significant emergency response capabilities that include its own Fire Department, Disaster Control Group, and Security Police Force, in addition to contracted support for handling accidental releases of regulated, hypergolic propellants and other hazardous substances. The Readiness Flight (30 CES/CEX) manages the overall base emergency response program and is responsible for developing and updating the Vandenberg AFB Hazardous Material Emergency Response Plan. Additionally, the 30 CES/CEX chairs the Hazardous Materials Planning Team, ensures that follow-on elements of the Disaster Control Group are assembled as required by the On-Scene Commander in the event of a release response, and maintains training certificates for spill response team members. (U.S. Department of the Air Force, 1999)

According to the Santa Barbara County Integrated Hazardous Materials Management System Operation Agreement, the base Fire Department approves and maintains the business plans and hazardous material inventories prescribed by the California Health and Safety Code, which are developed by organizations assigned to or doing business on the base. This information can be retrieved electronically in the event of an emergency. Additionally, the base Fire Department conducts onsite facility inspections, as required, to identify potentially hazardous conditions that could lead to an accidental release. It should be noted that the Vandenberg AFB Fire Department is advised of all operations involving the transfer of hypergolic propellants on the base. During launch operations, Fire Department response elements are pre-positioned to expedite response in the event of an anomaly. (U.S. Department of the Air Force, 1999)

Preceding operations that may involve ground impact of objects within the range, an evaluation is made to ensure that populated areas, critical range assets, and civilian property susceptible to damage are outside potential impacts limits. A NOTMAR and a NOTAM are published and circulated in accordance with established procedures to provide warning to mariners and pilots (including recreational users of the range space and controlled sea areas) concerning any potential impact areas that should be avoided. Radar and visual sweeps of hazard areas are accomplished immediately before operations to ensure evacuation of non-critical personnel. Before missile flight operations, the performance of all target missiles will be evaluated by 30 SW/SE to determine whether or not a Flight Termination System is warranted; if so, its use must be in accordance with Eastern and Western Range (EWR) 127-1, Range Safety Requirements. In addition, proposed trajectories are analyzed and a permissible flight corridor is established. A missile that strays outside its corridor is considered to be malfunctioning and to constitute an imminent safety hazard.
As stated earlier, test mishaps for target missiles are defined in terms of three scenarios: missile failure on the launch pad, termination of a flight shortly after liftoff, and termination of a flight after the missile has exited the vicinity of the launch site.

Termination of a flight on the launch pad is characterized by either detonation of the booster or a conflagration in which the propellant burns but does not explode. An ESQD surrounding the launch pad would be calculated based on the equivalent explosive force of all propellant and pyrotechnic materials contained in the flight vehicle. For the current target systems, the ESQD is 381 meters (1,250 feet). During all launch activities, provisions will be made in accordance with EWR 127-1 to maintain a stand-by emergency response team near the launch site to ensure immediate response and rapid control in the event of an accident.

Termination of a flight on the launch pad or shortly after liftoff would result in all hazardous debris being contained within the Flight Hazard Area (FHA). Non-essential mission personnel are excluded from this area during launch operations; personnel required to work within FHA boundaries will be protected in hardened shelters, such as bunkers or blockhouses. The FHA is based on a risk of $1 \times 10^{-5}$ to a single individual on the FHA boundary during a launch. The Flight Caution Area (FCA) is the area outside the FHA where personal injury could occur because of early flight failure or termination. The FCA is based on a risk of $1 \times 10^{-6}$ to single person on the FCA boundary during a launch. Access to the FCA is also limited to mission-essential personnel.

In accordance with existing Vandenberg SOPs, 30 SW/SE will ensure that the debris from the termination of a flight will fall into areas verified clear before the launch (U.S. Army Space and Strategic Defense Command, 1994).

The launch scenario will be planned to ensure debris will not fall within a 4.8-kilometer (3-mile) distance of the California coast (U.S. Department of the Air Force, 1997b). Any debris falling on Vandenberg AFB land will be handled in accordance with Vandenberg emergency response plans, based upon the 1996 *North American Emergency Response Guidebook* (U.S. Department of the Air Force, 1997b).

Launch vehicle mishaps (i.e., accidents involving any launch vehicle operation) are handled by various emergency support teams on base. Some of these procedures include authorization to enter an accident area, control procedures for monitoring trains, and salvage procedures. Several distinct teams of qualified individuals are available to respond to emergencies that might occur during a launch. These teams include the Specialized Operation Support Team, the On-Scene Disaster Group, the Missile Potential Hazard Team, and the Launch Support Team. The Southern Pacific Transportation Company railroad crosses Vandenberg AFB and owns the railroad property. Most launches fly over the railroad. The 30 SW has procedures for train protection and subsequent "hold" or "proceed" decisions during launch operations.

**Management of Risks due to Rocket Propellant and Motor Exhaust Constituents Exposures**

The exposure criteria used in EWR Safety Programs are used to fulfill toxic hazard and risk management requirements and policies. The objective of these programs is to maximize range operability without compromising public and worker safety. The Headquarters Air Force Space Command Surgeon General (HQ AFSPC/SG) has recommended exposure criteria for some of
the current solid- and liquid-rocket propellants and their combustion by-products. HQ AFSPC/SG has also recommended that the EWRs use a risk-management based approach for developing toxic launch commit criteria consistent with current human toxic exposure criteria and coordinated with Local Emergency Planning Committees and local agencies, as needed. In an effort to comply with this recommendation, the EWR Safety offices developed a toxic risk-management based approach designed to maintain an exposure criteria less than or equal to $30 \times 10^{-6}$ with an individual risk of $1 \times 10^{-6}$ over the varying population densities. This approach takes into account probability of catastrophic failure, concentration, direction, dwell time, and emergency preparedness procedures. This risk level presents no greater risk to the general public for launch and flight of launch vehicles and payloads than that imposed by overflight of conventional aircraft.


Vandenberg AFB has safety procedures in place, which are described below, to protect the public and sensitive receptors from potential toxic emissions.

The Western Range has a three-tiered, three-zone deterministic approach plus a probabilistic approach to protecting against harmful toxic exposures of hydrogen chloride. The Western Range implements safety measures that are designed to protect mission essential and non-mission essential persons. Before launch, the Rocket Exhaust Effluent Diffusion Model is used to locate toxic zones.

There are three zones for assessing an individual’s proximity to toxic combustion products, including those that could result from a launch failure. Zone 1 is an area where airborne concentrations of any toxic product are equal to or exceed Tier 1 levels but are less than Tier 2 levels. Zone 2 is an area where airborne concentrations of any toxic product are equal to or exceed Tier 2 levels but are less than Tier 3 levels. Zone 3 is an area where airborne concentrations of any toxic product range from a low defined by Tier 3 to an unknown high. Table 3.5.6-1 describes the Tier levels.

Before launch, the Rocket Exhaust Effluent Diffusion Model is run to ensure that any mission essential persons within a Zone 2 (having predicted hydrogen chloride concentrations exceeding the Tier 2 level [see 30 SWI 91-106, 1998]) are aware of being in a Zone 2, have personnel protection equipment, and have a pre-determined route of departure. If mission essential personnel do not meet these requirements, then they are relocated out of the zone. Any non-mission essential people on-base are also moved, if feasible. If they cannot be moved, or if they are off-base and not subject to being moved, then their locations and exposure are taken into account in the risk assessment procedure.
Table 3.5.6-1: HQ AFSPC/SG-Recommended and Endorsed Exposure Criteria for Constituents in Rocket Propellant or Motor Exhaust

<table>
<thead>
<tr>
<th>Constituent</th>
<th>Tier 1 (^{(1)})</th>
<th>Tier 2 (^{(2)})</th>
<th>Tier 3 (^{(3)})</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCl(^{(6)})</td>
<td>2 ppm (60 min)(^{(4)})</td>
<td>10 ppm(^{(5)})</td>
<td>50 ppm(^{(5)})</td>
</tr>
<tr>
<td>N(_2)H(_4)(^{(7)})</td>
<td>NR</td>
<td>2 ppm (60 min)(^{(4)})</td>
<td>40 ppm(^{(5)})</td>
</tr>
<tr>
<td>UDMH(^{(7)})</td>
<td>NR</td>
<td>5 ppm(^{(5)})</td>
<td>25 ppm(^{(5)})</td>
</tr>
<tr>
<td>A-50(^{(7)})</td>
<td>NR</td>
<td>5 ppm(^{(5)})</td>
<td>25 ppm(^{(5)})</td>
</tr>
<tr>
<td>MMH(^{(7)})</td>
<td>NR</td>
<td>0.52 ppm (60 min)(^{(4)})</td>
<td>25 ppm(^{(5)})</td>
</tr>
<tr>
<td>NO(_2)(^{(6)})</td>
<td>0.2 ppm (60 min)(^{(4)})</td>
<td>2 ppm (60 min)(^{(4)})</td>
<td>20 ppm (30 min)(^{(4)})</td>
</tr>
<tr>
<td></td>
<td>2 ppm(^{(5)})</td>
<td>4 ppm(^{(5)})</td>
<td></td>
</tr>
<tr>
<td>HNO(_3)(^{(6)})</td>
<td>0.3 ppm(^{(5)})</td>
<td>2.5 ppm (60 min)(^{(4)})</td>
<td>25 ppm (30 min)(^{(4)})</td>
</tr>
<tr>
<td></td>
<td>4 ppm(^{(5)})</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


NOTES:

1 Tier 1 – This exposure level and above is defined as the discomfort or mild-effect level. There is little risk to the average person. This exposure poses no hazard to normal and healthy individuals. Sensitive individuals (i.e., asthmatics and bronchitics) may experience some adverse effects, which are reversible. Tier 1 represents exposure guidelines for sensitive members of the general public (off-base) who may involuntarily and unknowingly be exposed. Recommended action, if this tier is exceeded, is similar to a Stage 3 air pollution alert: Notify the public of the release through an advertised announcement particular to an event or a published annual notice that sensitive populations should be advised that there is a possibility of exposure to the effluent and advise of mitigating precautions.

2 Tier 2 – This exposure level and above is defined as the disability or serious-effect level. All effects are reversible. There are no serious impacts on personnel’s ability to complete the mission identified. There is some risk to an average individual. Military and employees voluntarily accept exposure up to Tier 2 concentrations. The consent implies knowledge of the exposure concentrations and the consequences of possible exposure. Tier 2 represents personnel who have knowledge of the event and understand the possibility and consequences of possible exposure (on-base personnel). Personnel are advised to seek immediate protection (shelter in place) or evacuate for concentrations exceeding the Tier 2 limit.

3 Tier 3 – This exposure level and above is defined as a life-threatening-effect level. Irreversible harm may occur with possible impact on a person’s ability to complete the mission. Personnel in an area (event personnel) where Tier 3 exposure may occur have given informed consent and are trained regarding the possible life-threatening situations. Exposures up to Tier 3 concentrations permit an individual to seek shelter or don respiratory protection. Concentrations predicted in excess of Tier 3 concentrations require immediate evacuation to prevent exposure.

4 Time-weighted average exposure concentration. The time period indicated in parentheses is the time over which the concentration measurements will be measured and averaged.

5 Ceiling limit. A peak concentration that must not be exceeded during the exposure period.

6 Exposure criteria recommended by HQ AFSPC/SG.

7 Exposure criteria recommended by AL/OE and endorsed by HQ AFSPC/SG.

A-50 = Aerozine-50 (50 percent by weight unsymmetrical dimethylhydrazine and anhydrous hydrazine)

HCl = hydrochloric acid

HNO\(_3\) = nitric acid

HQ AFSPC/SG = Headquarters Air Force Space Command/Surgeon General

min = minutes

MMH = monomethyl hydrazine

NR = no recommendation

N\(_2\)H\(_4\) = anhydrous hydrazine

NO\(_2\) = nitrogen dioxide

ppm = parts per million

UDMH = unsymmetrical dimethylhydrazine

The Western Range toxic risk-assessment-based recommendation to launch or not to launch is based on the results of the Launch Area Toxic Risk Analysis (LATRA) program (i.e., risk assessment program) that evaluates the risk to people, regardless of whether they are mission essential or non-mission essential. Among other criteria in determining whether to launch, the
LATRA accounts for (1) whether people are sheltered or unsheltered; (2) whether they are healthy or sensitive individuals; and (3) the probability of a catastrophic launch failure.

Regional Safety

Regionally, Santa Barbara County prepared a Hazardous Material Response Plan that is used for countywide disaster response. Cities and communities in the county are required to have their own emergency response plans that were incorporated by the county into a comprehensive Multihazard Functional Plan, which specifies actions to be taken in case of a local disaster. The city of Lompoc adopted its Multihazard Functional Plan in 1989 and amended it in 1994. Because of the potential for Vandenberg AFB operations to affect off-base areas, Vandenberg AFB plays a prime role in regional emergency planning (U.S. Department of the Air Force, 1997b).

The city of Lompoc and Vandenberg AFB have entered into a mutual aid agreement, which allows emergency units from either Lompoc or Vandenberg AFB to provide each other with assistance in the event of an emergency. A "hotline" exists between the city of Lompoc and Vandenberg AFB in order to immediately notify the city in case of a major accident on the base. In the event of an emergency involving a launch mishap in Lompoc, Vandenberg AFB would assume control and could set up a national defense area if protected material were involved in the accident.

In the event of a launch vehicle impacting other areas outside Vandenberg AFB, the On-Scene Disaster Control Group from Vandenberg AFB would respond to the accident upon request of the county. County agencies would be used to help in the evacuation and possible fire control for such an incident. Military personnel would assume responsibility for disaster control in the immediate impact area.

Impact debris corridors have been established off the Santa Barbara County coast between Point Sal and Point Conception. These corridors were established to meet security requirements and reduce the hazard to persons and property during a launch-related activity. Impact debris corridors are established through the designation of debris impact areas for each specific launch as discussed in range safety procedures. These corridors are plotted for all launches. Figure 3.5.6-1 presents example impact debris corridors for a typical launch from LF-06 and LF-21.

Zone closures are announced daily over various radio frequencies and posted in harbors along the coast. The 30 SW Flight Analysis notifies the 30 Range Squadron of areas that are hazardous to aircraft (i.e., impact debris corridors) for all normally jettisoned and impacting stages by 30 working days before launch. The 30 Range Squadron notifies the FAA, Los Angeles Center or Oakland Center, so that the information can be disseminated through a NOTAM. Restricted airspace areas are active and controlled according to EWR 127-1 Range Safety Requirements, Safety Operating Instructions, 30 SW regulations, and FAA directives and regulations. Control of air traffic in FAA-designated areas around the launch head are maintained and coordinated between the Aeronautical Control Officer and FAA to ensure that aircraft shall not be endangered by launches. The Air Route Surveillance Radar surveys the restricted airspace beginning 15 minutes before the scheduled launch time and until the launch is complete.
Figure 3.5.6-1

Impact Debris Corridors for a Typical Launch from LF-06 and LF-21

Vandenberg Air Force Base, California

Source: Vandenberg Air Force Base, 2002b (modified).

EXPLANATION
- Vandenberg Air Force Base
- Water
- Santa Barbara County
- Santa Barbara County Urban Areas
- LF-6 Debris Corridor
- LF-21 Debris Corridor

Scale
- 0 3 6 kilometers
- 0 1.85 3.7 miles

GMD ETR Final EIS
The 30 SW also ensures that a NOTMAR within the impact debris corridor is disseminated beginning 30 working days before launch. Information regarding impact debris corridors is distributed to surface vessels when the 30 SW sends written notification of impact debris corridors to be published weekly in the U.S. Coast Guard Long Beach Broadcast to Mariners. Broadcasts by U.S. Coast Guard Long Beach provide the latest available hazard information to offshore surface vessels. 30 SW has developed procedures related to evacuating or sheltering personnel on offshore oil rigs during launch operations. These procedures pertain to offshore platforms located west of 120 degrees 15 minutes longitude. The 30 SW Chief of Safety notifies 30 Range Squadron of future launches, and 30 Range Squadron notifies the Minerals Management Service, Department of the Interior, to notify oil rig personnel of a future launch. The Minerals Management Service will first notify the oil rig operator 10 to 15 days before a launch to prepare for possible sheltering or evacuation. The second notice is given 24 to 36 hours before the launch confirming the requirement to shelter or evacuate. The third notice is given by Frontier Control to provide final notice before, during, and after securing the operation. Additional notices are sent as required. Oil rig operators are notified to shelter or evacuate personnel according to the Rocket Exhaust Effluent Diffusion Model of toxic vapor plumes and potential impact of launch debris.

There are two public beaches in the ROI: Point Sal Beach State Park to the north and Ocean Beach County Park at the terminus of SR 246 near the division between North and South Vandenberg AFB.

Point Sal Beach State Park and Ocean Beach County Park are within the ROI for Minuteman and Delta missile launches from North Vandenberg. Ocean Beach County Park is also closed for Atlas and Titan launches. Access roads to both parks can be closed and visitors can be evacuated under an agreement between Vandenberg AFB and Santa Barbara County. Currently closure procedures occur an average of 9 to 10 times per year. All closure and evacuation agreements have been consolidated under an Evacuation Agreement, giving Vandenberg AFB the right to evacuate and close the beaches up to 48 hours before a launch. (U.S. Department of Air Force, 1997b)

Base flight safety requires that there be no overflight of civilian property on the coastline, and that there be no overflight of any of the Channel Islands, except San Miguel Island. Although direct overflight of the beaches does not occur, there is the possibility of debris from a launch anomaly impacting the beaches. In order to protect park visitors, Vandenberg AFB, the County Parks Department, the County Sheriff, and the California Highway Patrol have agreed to close the parks upon request during launches affecting the beaches.

3.5.7 LAND USE—VANDENBERG AIR FORCE BASE

Appendix B includes a definition of land use and the main federal land management responsibilities that govern its protection.

3.5.7.1 Region of Influence

The ROI for the land use generally includes Northern Santa Barbara County region within and adjacent to the boundaries of Vandenberg AFB that are potentially affected by the launch of target and GBI missiles and the construction, modification, and operation of support facilities associated with the Proposed Action.
Remote telemetry sites in California would include Pillar Point. Activities at this location would utilize existing paved or graveled areas and would be a short-term temporary activity. The potential for impacts to land use at Pillar Point is expected to be minimal and, therefore, is not discussed further in this document.

3.5.7.2 Affected Environment

Vandenberg AFB, located in western Santa Barbara County in south central California, is approximately 88 kilometers (55 miles) northwest of Santa Barbara, and 225 kilometers (140 miles) northwest of Los Angeles. The base’s 39,821 hectares (98,400 acres) are approximately 6 percent of the total land area of Santa Barbara County. Numerous communities are located within 16 kilometers (10 miles) of the base but are separated by wide buffers of agricultural areas. These buffer lands are the result of efforts between the nearby cities of Lompoc and Santa Maria and the Santa Barbara County functioning as local planning authorities for lands adjoining the base. (U.S. Department of the Air Force, 1997b) Their general plans include the designation of compatible land uses between adjacent lands and Vandenberg AFB. Neither the county nor neighboring cities have any land use authority over Vandenberg AFB land because of its federal land status. Furthermore, Vandenberg AFB determines its own land use and zoning regulations. (U.S. Department of the Air Force, 1998a)

Approximately 5 percent of the base has been disturbed, leaving the remainder in its natural state (U.S. Department of the Air Force, 1997b). According to Vandenberg AFB’s Comprehensive Plan, the base has allocated the following land use areas: airfield operations and maintenance/space and missile launch, industrial, outdoor recreation, open space, airfield, and cantonment. The cantonment area includes residential, administrative, industrial, recreational, open space, airfield, and community land uses. Approximately 90 percent of the land use on Vandenberg AFB is open space, followed by industrial (approximately 6 percent) and airfield operations and maintenance/space and missile launch (approximately 2 percent). (U.S. Department of the Air Force, 1998a)

Vandenberg AFB is divided into northern and southern regions by the Santa Ynez River and West Ocean Avenue. Development has occurred primarily on the northern region of the base whereas the southern portions remain primarily undeveloped. (U.S. Department of the Air Force, 1998a) The primary ROI for the proposed activities is North Vandenberg AFB.

Vandenberg AFB’s 56 kilometers (35 miles) of undeveloped coastline exist as a fraction the 840 mile long California Coastal National Monument composed of small, federally owned islands, rocks, and exposed reefs. Currently the Bureau of Land Management has begun the process to prepare a Resource Management Plan for the California Coastal National Monument (U.S. Environmental Protection Agency, 2002).

As of November of 1999 Congress directed the National Park Service to conduct a resource feasibility study to determine whether the Gaviota Coast or any portion of it is eligible and/or suitable to be managed as an entity of the National Park System (National Park Service, 2002). The Gaviota Coast is composed of 80,937 hectares (200,000 acres) from Coal Oil Point on the University of California Santa Barbara campus in Isla Vista to Point Sal at the northern boundary of Vandenberg AFB. The Park Service study focuses on private lands, four state parks, parts of Los Padres National Forest, and all of Vandenberg AFB. (U.S. Air Force Headquarters, 2002)
The feasibility study, its release for public review and recommendation to the U.S. Congress are expected in early 2003 (National Park Service, 2002).

Limited public access to North Vandenberg AFB’s shoreline provides various opportunities for recreational activities in the vicinity. Two public access parks that exist on or immediately adjacent to the base include Point Sal Beach State Park, which borders the northern most boundaries, and Ocean Beach County Park located approximately midway along the coast edge of Vandenberg AFB. Both provide opportunities for picnicking, surf fishing, and general beach activities (U.S. Department of the Air Force, 1998a).

All public access closures and evacuation agreements allow the base the right to evacuate and close the beaches days before launch (U.S. Department of the Air Force, 1997b). Most park closures only occur for 3 to 4 hours. However, unstable weather conditions, or any mechanical problems, resulting in an abort launch or launch rescheduling may prolong a closure (U.S. Department of the Air Force, 1998a).

Coastal Zone Management

A federal activity in or affecting a coastal zone requires preparation of a Coastal Zone Consistency Determination by the proponent in coordination with the Vandenberg AFB Environmental Division. The area along the western coast of Vandenberg AFB is within the North Coast Planning Area. The base’s coastal zone extends inland from about 1.2 kilometers (0.75 mile) at the northern boundary to 7.2 kilometers (4.5 miles) at the southern end. The widest portion of the coastal zone occurs at San Antonio Creek and south of Cañada Honda Creek to the southern boundary. (U.S. Department of the Air Force, 1998)

3.5.8 NOISE—VANDENBERG AIR FORCE BASE

Appendix B includes a definition of noise and the main regulations and laws that govern it.

3.5.8.1 Region of Influence

The area immediately surrounding Vandenberg AFB is mainly undeveloped and rural, with some unincorporated residential areas within the Lompoc and Santa Maria valleys. The two urban areas in the region are the cities of Lompoc and Santa Maria, which support a few localized industrial areas. Sound levels measured for most of the region are normally low, with higher levels appearing in industrial areas and along transportation corridors. The minimum ROI for noise analysis is the area within the maximum sound level (Lmax) = 85 dB contours generated by program activities.

Remote telemetry sites in California would include Pillar Point. Activities at this location would be short-term temporary activities that include the operation of generators as primary or backup power. Although specific locations have not been identified, the noise from the generators would dissipate to minimal levels. The potential for noise impacts is expected to be minimal and, therefore, is not discussed further in this document.
3.5.8.2 Affected Environment

The immediate area surrounding Vandenberg AFB is largely composed of undeveloped and rural land, with some unincorporated residential areas in the Lompoc and Santa Maria valleys and Northern Santa Barbara County. The cities of Lompoc and Santa Maria, which make up the two urban areas in the region, support a small number of localized industrial areas. Sound levels measured for the area are typically low, except for higher levels in the industrial areas and along transportation corridors. The rural areas of the Lompoc and Santa Maria valleys typically have a low over all noise levels, 40 to 45 dBA. Infrequent aircraft flyovers and missile launches from Vandenberg AFB increase noise levels for a short period of time (U.S. Army Space and Missile Defense Command, 2002a).

Noise at Vandenberg AFB is typically produced by automobile and truck traffic, aircraft landings and takeoffs, and space vehicle launches. Railroad traffic is also a significant source of noise. Existing noise levels on Vandenberg AFB are typically low; the higher levels occur near industrial facilities and transportation routes. Vandenberg AFB follows state regulations concerning noise, and maintains a Community Noise Equivalent Level (CNEL) equivalent to 65 dBA for off-base areas (U.S. Army Space and Missile Defense Command, 2002a).

Missile launches from Vandenberg AFB produce less frequent but more intense sources of noise in the region. Current launches include Minuteman missiles and Delta II rockets launched from the North Base and Titan and Atlas missiles from the South Base. Typical noise levels for familiar sources and Vandenberg AFB launch vehicles, such as the Minuteman, are summarized in table 3.5.8-1 and discussed below (U.S. Army Space and Missile Defense Command, 2002a).

Table 3.5.8-1: Typical Noise Levels at Vandenberg AFB

<table>
<thead>
<tr>
<th>Source</th>
<th>Noise Level (dBA)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonic Boom</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Minuteman launch</td>
<td>Approx. 125</td>
<td>At 3 kilometers (1.8 miles)</td>
</tr>
<tr>
<td>Air raid siren</td>
<td>120</td>
<td>At 15.2 meters (50 feet) (threshold of pain)</td>
</tr>
<tr>
<td>Minuteman launch</td>
<td>98</td>
<td>At 4.2 kilometers (2.6 miles)</td>
</tr>
<tr>
<td>Airplane, 747</td>
<td>102.5</td>
<td>At 304.3 meters (1,000 feet)</td>
</tr>
<tr>
<td>Minuteman launch</td>
<td>80</td>
<td>At 12.7 kilometers (7.9 miles)</td>
</tr>
<tr>
<td>Long range airplane</td>
<td>80–70</td>
<td>Inside</td>
</tr>
<tr>
<td>Typical aircraft traffic</td>
<td>70</td>
<td>Maximum any location in flight path</td>
</tr>
</tbody>
</table>

Source: U.S. Army Space and Missile Defense Command, 2002a

Noise levels in Lompoc and Santa Maria from Minutemen missile launches would be expected to be a maximum of 49 dBA and 74 dBA, respectively. Noise from a Titan IV launched from Space Launch Complex (SLC)-4 in August 1993 was measured at six locations. The Titan IV is the largest launch vehicle in the U.S. military inventory and has the greatest potential for noise impacts. Measurement sites were located downrange at nominal distances from the launch pad. Data were tape recorded at all sites and processed into appropriate sound levels. Direct sound level meter measurements were made as shown in table 3.5.8-2. Of interest is the measurement at the 13,146-meter (43,129-foot) site in the city of Lompoc: A-weighted sound pressure level was 88.0 dB, A-weighted sound exposure level was 93.7 dB, and output sound pressure level was 112.8 dB. Because launches from all of these facilities would occur
intermittently, the resulting noise would not cause an increase in the average (equivalent sound level $L_{eq}$, day-night average sound level $L_{dn}$, or CNEL) noise levels in nearby areas. The cumulative quantities $L_{dn}$ and CNEL are based on sounds that occur on a regular basis, at least every day, and usually many times per day. Missile launches are relatively infrequent, at rates well below those needed for $L_{dn}$ or CNEL to be meaningful (U.S. Department of the Air Force, 1998a).

<table>
<thead>
<tr>
<th>Distance from Pad (meters [feet])</th>
<th>Measured Maximum Output Sound Pressure Level</th>
<th>Sound Level Meter Measured Output Sound Pressure Level</th>
<th>Measured Maximum A-Weighted Sound Pressure Level</th>
<th>Measured A-weighted Sound Exposure Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>823 (2,700)</td>
<td>141.7</td>
<td>141</td>
<td>124.4</td>
<td>133</td>
</tr>
<tr>
<td>2,036 (6,680)</td>
<td>131.4</td>
<td>-</td>
<td>112.4</td>
<td>121.9</td>
</tr>
<tr>
<td>3,414 (11,200)</td>
<td>129</td>
<td>129.9</td>
<td>110.6</td>
<td>116.2</td>
</tr>
<tr>
<td>5,791 (19,000)</td>
<td>122.1</td>
<td>127.6</td>
<td>99</td>
<td>109</td>
</tr>
<tr>
<td>13,146 (43,129)</td>
<td>112.8</td>
<td>-</td>
<td>88</td>
<td>93.7</td>
</tr>
</tbody>
</table>

Source: U.S. Department of the Air Force, 1998a

3.5.9 SOCIOECONOMICS—VANDENBERG AIR FORCE BASE

Appendix B includes a general definition of socioeconomics.

3.5.9.1 Region of Influence

The ROI for socioeconomics is defined as the communities and areas surrounding Vandenberg AFB. Primary areas of analysis will concern the larger, more populous communities, including the cities of Lompoc and Santa Maria, as well as wider Santa Barbara County.

3.5.9.2 Affected Environment

Vandenberg AFB is in the western part of unincorporated Santa Barbara County, California. The Santa Ynez River and State Route (SR)-246 divide the base into North and South Vandenberg AFB. North Vandenberg AFB generally includes the developed portions of the base, whereas South Vandenberg AFB includes primarily open space. The city of Lompoc lies to the east, the city of Santa Maria to the northeast, and the city of Guadalupe to the north. Two unincorporated communities, Vandenberg Village and Mission Hills, are north of the city of Lompoc. Also, Vandenberg AFB is considered a Census Designated Place and data regarding Vandenberg AFB via the 2000 census has been examined.

Population and Housing

The total population of Santa Barbara County increased from 369,608 persons in 1990 to 399,347 persons as of 2000 (8.04 percent) (U.S. Census Bureau, 2003b). The city of Santa Barbara, with a population of 92,325 people as of 2000, was the largest city in the county and contained 23.1 percent of the county population. Of the communities adjacent to Vandenberg
AFB, the city of Santa Maria, with 77,423 persons is the most populous, followed by the city of Lompoc with 41,103 people. (County of Santa Barbara, 2003) Casmalia is a much smaller community with less than 200 people as of 2000. Vandenberg AFB itself showed a larger population than the unincorporated communities immediately adjacent to the base (County of Santa Barbara, 2003).

As of 2000, there were an estimated 142,901 housing units within Santa Barbara County (U.S. Census Bureau, 2003b) of which 37,076 housing units were located within the City of Santa Barbara and 22,847 and 13,621 units were located in Santa Maria and Lompoc respectively (County of Santa Barbara, Department of Planning and Development, 2003). As of 2000, 1,992 units were located within Vandenberg AFB and 2,366 and 1,072 units were located in the communities of Vandenberg Village and Mission Hills respectively.

In addition, the Bureau of the Census reported that vacancy rates of rental housing within Santa Barbara County and city averaged 2.8 percent and 2.3 percent respectively during 2000 (U.S. Census Bureau, 2003b). These were marginally lower than the average vacancy rates of 4.0 percent and 3.1 percent for the cities of Lompoc and Santa Maria respectively. While Vandenberg Village showed a 3.6 percent vacancy rate, vacancy rates within Vandenberg AFB and Mission Hills, at 2.2 percent, and 2.1 percent respectively, more closely resembled the county average levels.

Income and Employment

The U.S. Bureau of the Census reported that the per capita income in Santa Barbara County, as of 2000, was $23,059, only slightly higher (1.5 percent) than the average per capita income of the state at $22,711 (U.S. Census Bureau, 2003c). Conversely, as of 2000 the median household income in Santa Barbara County, at $46,677 was only slightly lower (1.6 percent) than that of the state, at $47,443 (U.S. Census Bureau, 2003c). Table 3.5.9-1 shows the number of individuals employed within the main sectors of the economy of Santa Barbara County. Retail and service industries dominate the profile, employing approximately 60 percent of the workforce within the county.

Santa Barbara County’s economic growth has been driven by the expansion of local telecommunications, computer and software, medical devices, and electronics firms (Cumulus Media, Inc., 1999). Major employers include the University of California, Vandenberg AFB, Lockheed Martin, Vons/Williams Brothers Stores, and Raytheon Systems (Cumulus Media, Inc., 1999). The University of California, Santa Barbara has an enrollment of 19,000 students and is the area’s largest employer with 8,660 employees. The University of California, Santa Barbara has an annual budget of $400 million, with $240 million being spent locally. In addition, the student population adds over $131 million annually to the local economy. Vandenberg AFB employs over 1,500 civilian workers and has a military population of 3,600. (Cumulus Media, Inc., 1999)
### Table 3.5.9-1: Employment By Sector, Santa Barbara County, 2000

<table>
<thead>
<tr>
<th>Employment Sector</th>
<th>Employees</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry, fishing and hunting, and mining</td>
<td>12,094</td>
<td>6.7</td>
</tr>
<tr>
<td>Construction</td>
<td>10,773</td>
<td>6.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>17,482</td>
<td>9.7</td>
</tr>
<tr>
<td>Transportation and warehousing, and utilities</td>
<td>5,214</td>
<td>2.9</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>5,912</td>
<td>3.3</td>
</tr>
<tr>
<td>Retail trade</td>
<td>20,347</td>
<td>11.3</td>
</tr>
<tr>
<td>Finance, insurance, real estate, and rental and leasing</td>
<td>9,755</td>
<td>5.4</td>
</tr>
<tr>
<td>Information</td>
<td>5,347</td>
<td>3.0</td>
</tr>
<tr>
<td>Public administration</td>
<td>7,647</td>
<td>4.2</td>
</tr>
<tr>
<td>Other services (except public administration)</td>
<td>9,823</td>
<td>5.4</td>
</tr>
<tr>
<td>Arts, entertainment, recreation, and accommodation and food services</td>
<td>18,409</td>
<td>10.2</td>
</tr>
<tr>
<td>Professional, managerial, scientific, administrative, and waste management services</td>
<td>19,514</td>
<td>10.8</td>
</tr>
<tr>
<td>Education, health, and social services</td>
<td>38,399</td>
<td>21.2</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2003c.

### 3.5.10 TRANSPORTATION—VANDENBERG AIR FORCE BASE

Appendix B includes a general description of transportation.

#### 3.5.10.1 Region of Influence

The ROI for the resources addressed in this EIS is the ground, ocean, and aviation transport systems within or immediately adjacent to Vandenberg AFB and the flight test corridor that has been established.

#### 3.5.10.2 Affected Environment

**Aviation Transportation**

There are four airports within the surrounding area of Vandenberg AFB. These include Santa Barbara Municipal, Santa Ynez, Lompoc, and Santa Maria Public airports. Vandenberg AFB also maintains its own runway, which is capable of handling large aircraft (U.S. Army Space and Missile Defense Command, 2002a).

**Ground Transportation**

*Regional*

Vandenberg AFB is accessible by U.S. 101, which connects the base with San Francisco to the north and Santa Barbara to the south. SR-1, SR-135, and SR-246 provide access to the base from U.S. 101. (U.S. Department of the Air Force, 1998a)
Local
The majority of the workers and other related support services providers for Vandenberg AFB reside within the unincorporated areas of Santa Barbara County and in the cities of Lompoc, Santa Maria, Guadalupe, Buellton, Solvang, and Santa Barbara. The key local roads providing access to Vandenberg AFB include SR-1, SR-135, Santa Lucia Canyon Road, SR-246, U.S. 101, and Central Avenue (U.S. Department of the Air Force, 1998a).

Peak-Hour Volumes and existing Level of Service for key roads on Vandenberg AFB are presented in table 3.5.10-1 (U.S. Department of the Air Force, 1998a).

Table 3.5.10-1: Peak-Hour Traffic Volumes and Levels of Service on Key Roads—Vandenberg AFB

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Segment/No. of Lanes</th>
<th>Capacity Vehicles Per Hour</th>
<th>1996 Peak-Hour Volume</th>
<th>Level of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coast Road</td>
<td>Between LLC-6 and Bear Creek Road; two-lane</td>
<td>2,800</td>
<td>350</td>
<td>A</td>
</tr>
<tr>
<td>Bear Creek Road</td>
<td>Between Coast Road and Ocean Avenue; two-lane</td>
<td>2,800</td>
<td>350</td>
<td>A</td>
</tr>
<tr>
<td>13th Street</td>
<td>Between Ocean Avenue and Santa Maria Gate; two-lane</td>
<td>2,800</td>
<td>1,550</td>
<td>D</td>
</tr>
<tr>
<td>Ocean Avenue</td>
<td>Between Bear Creek Road and SR 1; 4-lane</td>
<td>8,000</td>
<td>250</td>
<td>A</td>
</tr>
<tr>
<td>SR 1</td>
<td>Between Santa Maria Gate and SR 135; 4-lane</td>
<td>8,000</td>
<td>1,550</td>
<td>B</td>
</tr>
</tbody>
</table>


On-Site
The major roads on Vandenberg AFB that provide access to the project sites are Coast Road, Bear Creek Road, 13th Street, and Ocean Avenue (figure 3.5.10-1). Coast Road is a two-lane undivided roadway providing access to SLC-6. Coast Road connects to Bear Creek Road, north of SLC-6. Bear Creek Road is a two-lane arterial that provides access to the launch site location SLC-3W. Bear Creek Road is accessible through 13th Street from the north or Ocean Avenue from the east. The Solvang Gate, Santa Maria Gate, and El Rancho Gate are connected to 13th Street, a two-lane arterial that runs north south on the base. Ocean Avenue is an east-west road that bisects Vandenberg AFB and connects with Bear Creek and Coast roads. The Solvang and South Vandenberg AFB gates are located just north and south, respectively, of Ocean Avenue (U.S. Department of the Air Force, 1998a).

Rail Lines
The ROI for railways includes the Southern Pacific, Santa Maria Valley, and the Ventura County Railroad companies, which provide services to the cities of Santa Maria, Lompoc, Santa Barbara, San Luis Obispo, and Ventura. Three branch lines connect Vandenberg AFB to the Southern Pacific Railroad main line. Approximately four passenger trains and eight freight trains pass through Vandenberg AFB daily. The railroad tracks pass between the Pacific Ocean and the launch facilities and must be overflown during launches; however, trains are never overflown during launches due to the potential risk to people and property. An electronic surveillance system, posted railroad schedules, and close coordination, including radio
EXPLANATION
- Base Boundary
- U.S. Highway
- State Route
- Railroad


Regional and Local Road System

Vandenberg Air Force Base, California

Figure 3.5.10-1

GMD ETR Final EIS
communication, between train engineers and Vandenberg AFB launch personnel, are used to minimize the possibility of an overflight.

3.5.11 WATER RESOURCES—VANDENBERG AIR FORCE BASE

Appendix B includes a brief overview of water resources and the related federal regulatory framework.

3.5.11.1 Region of Influence

The water resource ROI for the Vandenberg AFB study area includes those freshwater and saltwater resources that could be affected by the construction and operation of launching and support facilities. These resources are within, and adjacent to, the boundaries of Vandenberg AFB and are further described in the next section. The affected environment related to remote telemetry sites is not addressed because activities at these locations would be limited to the use of existing paved and gravel areas. Therefore, the potential for adverse water resource impacts is minimal.

3.5.11.2 Affected Environment

Surface Water and Groundwater Resources

Rainfall at Vandenberg AFB is relatively light, ranging from approximately 29 centimeters (11.5 inches) per year along the coast to about 32 centimeters (12.5 inches) per year further inland near Lompoc (U.S. Department of the Air Force, 1997b). Seven drainages are found in the Vandenberg AFB region, with the major streams being the Santa Ynez River and San Antonio Creek. Smaller streams include Cañada Tortuga, Shuman, Cañada Honda, Bear and Jalama Creeks. These streams and their smaller tributaries drain large areas, with many of the streams only having flows during or shortly after rain storms. Numerous ponds and man-made lakes are found on Vandenberg AFB including MOD III and Pine Canyon Lakes along with Lompoc Casmalia Pond, Joe’s Pond, ABRES-A Lake, and El Rancho Pond (figure 3.5.11-1).

Groundwater in the vicinity of Vandenberg AFB is found in three different groundwater basins. The southern portion of the Vandenberg AFB includes a portion of the Lompoc Terrace Basin and the Lompoc Plain Basin. The San Antonio Creek groundwater basin underlies the northern portion of Vandenberg AFB. Smaller, isolated aquifers are found beneath alluvial fans on the base or in perched aquifers at higher elevations.

Water Quality

Some surface water quality sampling was conducted on the base by the U.S. Air Force in 1991. As reported in the 1998 Final EIS Evolved Expendable Launch Vehicle (U.S. Department of the Air Force, 1998a), this sampling determined that off-base agricultural runoff has led to elevated total dissolved solids, phosphates, and nitrates. Water quality is maintained through adherence to the 30 SW Water Quality Plan, Wastewater Management Plan, and Stormwater Pollution Prevention Plan, all updated in August 2000.

Water Use

The Vandenberg AFB water supply primarily comes from surface water purchased from the California Department of Water Resource’s State Water Project. Four wells that tap the San Antonio Creek groundwater basin are only used as a supplemental supply.
Figure 3.5.11-1

Major Streams and Ponds

Vandenberg Air Force Base, California


EXPLANATION

- Land Area
- Water Area
- Vandenberg Air Force Base Boundary
- Road
- River / Creek
- Wetlands

Scale

0 3.42 6.84 kilometers

0 2.13 4.25 miles

GMD ETR Final EIS
3.6 PEARL HARBOR—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

The proposed GMD ETR activities could have an effect on air quality, airspace, biological resources, hazardous materials and waste, health and safety, utilities, and visual and aesthetic resources at Pearl Harbor. These resource areas are summarized in the following sections.

By nature of its marine mission and use of existing homeport facilities, SBX support and operational activities would not result in any adverse effects to cultural resources, geology and soils, land use, noise, socioeconomics, transportation, and water resources. Consequently, this section will not include further analysis of these resources other than the summary in the following paragraphs.

Cultural

There are not expected to be any ground disturbing activities within areas where cultural resources are located. While some mooring locations may have traditional importance, such as native fishing grounds, the SBX would occupy a very small area on a temporary basis. The remaining time the area would remain open.

Geology

While potential warehouse and administration facility construction activities could result in limited clearing and excavation for building foundations, it is not expected to create any adverse erosion effects to geology or soils. Construction activities would follow standard guidelines.

Land Use

Land use impact would be minimal since the proposed activities would occur on the water at the pier or near an existing mooring location and would not produce a change in the type of utilization. Land utilization in surrounding areas would not change.

Noise

No sensitive receptors would be disturbed by the proposed intermittent and short-term activity, and noise levels would to be below OSHA workplace standards.

Socioeconomics

As a result of its isolation, limited population, and local economic activity, only minor positive socioeconomic impacts would occur.

Transportation

The few additional personnel would not affect transportation. Shipping of project-related materials, as well as transportation of personnel, would utilize air, roadway, and shipping/ferrying routes that are equipped to handle both the loads and frequency of project demands. Any increase in daily trips by support personnel would utilize existing transportation infrastructure. Shared vehicle and/or off-peak hour travel would further serve to minimize effects on transportation levels.
Water Resources
Impacts to water resources would be negligible, similar to other large marine vessels.

3.6.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

3.6.1.1 Region of Influence
The ROI areas that may potentially be affected by the use of Pearl Harbor for the SBX include Pier Victor 3 and the mooring sites as identified in section 2.3.1.6.

3.6.1.2 Affected Environment
Climate
Temperatures in the Pearl Harbor region vary greatly season to season and during a 24-hour period. Highs of 30.5 to 32°C (87 to 89°F) are not unusual during midsummer afternoons, while temperatures of 22 to 24°C (72 to 76°F) are typical night temperatures during the same season. Winter and early spring temperatures range from 22 to 26°C (76 to 78°F) during the day to the mid-teens °C (low 60's °F) during the evenings. Relative humidity varies between lows of 58 to 60 percent to highs of over 80 percent.

Rainfall is typically light. However, occasional heavy rains can be caused by times of southerly winds. Monthly median peak rainfall occurs between November and February, with the lowest occurring between March and September. The mean annual rainfall for the region lies between 100 to 230 centimeters (40 to 90 inches) per year.

Prevalent for approximately nine months of the year, the prevailing winds tend to be northeast tradewinds. The remainder of the year sees south to southwest winds and mild offshore breezes prevailing. Winds up to 64 kilometers per hour (40 miles per hour) may occasionally strike from the north or northeast, but seldom reach gale velocities. (Department of the Navy Pacific Missile Range Facility, Hawaii, 2001)

Regional Air Quality
The state of Hawaii is in attainment of the NAAQS established for carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matters, ozone, and lead. (State of Hawaii Department of Health, Clean Air Branch, 2001)

Existing Emissions
According to the 2001 Annual Summary of Hawaii Air Quality Data, the entire state of Hawaii is in attainment. Table 3.6.1-1 lists the emissions recorded at two points near Barbers Point; West Beach, which is approximately 43 kilometers (27 miles) west of downtown Honolulu and Kapolei, approximately 40 kilometers (25 miles) west of downtown Honolulu. All levels recorded were well within the NAAQS and state AAQS. (State of Hawaii Department of Health, Clean Air Branch, 2001)
Table 3.6.1-1: Emissions Recorded Near Barbers Point

<table>
<thead>
<tr>
<th>Averaging Time</th>
<th>Hawaii Standards (μg/m³)</th>
<th>Federal Primary Standards (μg/m³)</th>
<th>West Beach Monitoring Station (μg/m³)</th>
<th>Kapolei Monitoring Station (μg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-hour</td>
<td>150</td>
<td>150</td>
<td>21</td>
<td>121</td>
</tr>
<tr>
<td>Annual</td>
<td>50</td>
<td>50</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-hour</td>
<td>1,300</td>
<td>-</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>24-hour</td>
<td>365</td>
<td>365</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Annual</td>
<td>80</td>
<td>80</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-hour</td>
<td>10,000</td>
<td>40,000</td>
<td>1,026</td>
<td>2,280</td>
</tr>
<tr>
<td>8-hour</td>
<td>5,000</td>
<td>10,000</td>
<td>456</td>
<td>1,596</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual</td>
<td>70</td>
<td>100</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: State of Hawaii Department of Health, Clean Air Branch, 2001

3.6.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

Appendix B includes a general description of airspace.

3.6.2.1 Region of Influence

The ROI for airspace at Pearl Harbor includes the airspace over and surrounding the potential SBX interference areas that extend from the mooring location off the coast of Barbers Point, Hawaii (figure 3.6.2-1).

3.6.2.2 Affected Environment

Controlled and Uncontrolled Airspace

The Honolulu ARTCC regulates air traffic in the Hawaiian Islands. Class B airspace is in effect at Honolulu International Airport and above the Kalaeloa (Rodgers) Airport. Class D airspace surrounds the Kalaeola Airport.

Special Use Airspace

Special use airspace is located north of the ROI (Schofield—Makua and Wheeler AFB restricted areas) and south of the ROI (Warning Areas W192 and W193).
Airspace Over the Potential SBX Mooring Area at Barbers Point, Hawaii

Oahu, Hawaii

Figure 3.6.2-1

En Route Airways and Jet Routes

Several low altitude airways are located within the ROI. V15 and V12 are in the north central part of the ROI, V4 crosses through the missile of the ROI, and V16 crosses the southern portion of the ROI. V2, V20, and V21 are located on the eastern edge of the ROI.

Airports/Airfields

Airports include Honolulu International, Kalaeloa (Rodgers) Airport, and Wheeler Army Airfield.

3.6.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

Appendix B contains a general description of biological resources and the main regulations and laws that govern their protection.

3.6.3.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Pearl Harbor for the SBX, including Pier Victor 3 and the mooring sites as identified in section 2.3.1.6.

3.6.3.2 Affected Environment

Terrestrial biological resources are not addressed since those areas (Pier Victor 3) where elements of the Proposed Action would take place onshore are already developed and disturbed.

Nine marine wildlife species listed as federal and state threatened or endangered species are known or suspected to occur in Hawaiian waters. These species, which are listed in table 3.4.2-1, include the Hawaiian monk seal, whales, and sea turtles. More than 20 species of dolphins and toothed whales are known to exist around the islands. On Oahu, whales are normally sighted consistently beginning in January, and are moderately abundant in adjacent waters until April (Hawaii State Department of Transportation, Harbors Division, 2001). Coral coverage in the area ranges from 80 to 90 percent at depths between 18 and 24 meters (58 and 78 feet) to less than 1 percent in water depths from 24 to 36 meters (78 to 120 feet). Lobe corals, cauliflower corals, and finger corals dominate the coral community. Diverse and abundant fish species are associated with areas greater than 40 meters (120 feet) in depth with vertical relief that contain coral coverage. Fifty-nine species of fish have been identified in the vicinity of Barbers Point. The most common species include sturgeon fish, butterfly fish, damselfish, wrass, and triggerfish. A commercial net pen cage aquaculture site is located north of the proposed site. (U.S. Department of the Navy, 2002a)

Of the 18 whale pods observed during recent surveys associated with proposed Kalaeloa Barbers Point Harbor, 12, or 67 percent, were seen near Barbers Point. The two species of cetaceans most frequently observed during daytime surveys are humpback whales and spinner dolphins. (Hawaii State Department of Transportation, Harbors Division, 2001)
3.6.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

3.6.4.1 Region of Influence
The ROI for hazardous materials and hazardous waste includes those areas that may potentially be affected by the proposed deployment of the SBX to Pearl Harbor. The ROI includes fueling areas, support and maintenance operations and waste storage and disposal. Appendix B includes a detailed discussion of maritime and other laws, regulations and standards concerning hazardous materials and hazardous waste.

3.6.4.2 Affected Environment
The Coast Guard 14th District Marine Safety Office (MSO) Honolulu is responsible for the enforcement of hazardous material and hazardous waste regulations and policies for navigable waterways and adjoining shorelines and for response to spills and releases. An Area Committee composed of industry, federal, state, and local regulatory representatives serves as a regional spill preparedness and planning group. In compliance with the National Contingency Plan (40 CFR Part 300) and the Oil Pollution Act of 1990, the Committee, with assistance and oversight from the Coast Guard, developed an Area Contingency Plan outlining regional spill response procedures.

Shipboard Hazardous Materials Management
Environmental compliance policies and procedures applicable to shipboard operations are defined in OPNAVINST 5090.1B (1999), Chapter 19. These instructions reinforce the Clean Water Act’s prohibition against discharge of harmful quantities of hazardous substances into or upon U.S. waters out to 370 kilometers (200 nautical miles). Navy ships are required to conduct operations at sea in such a manner as to minimize or eliminate any adverse impacts on the marine environment. This includes stringent hazardous waste discharge, storage, dumping, and pollution prevention requirements. Table 3.6.4-1 summarizes pollution control discharge restrictions for U.S. Navy vessels at sea.

<table>
<thead>
<tr>
<th>Area</th>
<th>Type of Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blackwater (Sewage)</td>
</tr>
<tr>
<td>U.S. Waters (0 to 5.5 kilometers [0 to 3 nautical miles])</td>
<td>No discharge</td>
</tr>
<tr>
<td>U.S. Contiguous Zone (5.5 to 22 kilometers [3 to 12 nautical miles])</td>
<td>Direct discharge permitted</td>
</tr>
<tr>
<td>22 to 46.3 kilometers (12 to 25 nautical miles) from shore</td>
<td>Direct discharge permitted</td>
</tr>
</tbody>
</table>
Table 3.6.4-1: Pollution Control Discharge Restrictions for Navy Ships (Continued)

<table>
<thead>
<tr>
<th>Area</th>
<th>Garbage (Non-plastic)</th>
<th>Garbage (Plastic) (Non-food Contaminated)</th>
<th>Garbage (Plastic) (Food contaminant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;46.3 kilometers (25 nautical miles) from shore</td>
<td>Direct discharge permitted</td>
<td>Direct discharge permitted</td>
<td>Same as 22 to 46.3 kilometers (12 to 25 nautical miles)</td>
</tr>
<tr>
<td>&gt;92.6 kilometers (50 nautical miles) from shore</td>
<td>Direct discharge permitted</td>
<td>Direct discharge permitted</td>
<td>Same as 22 to 46.3 kilometers (12 to 25 nautical miles)</td>
</tr>
<tr>
<td>U.S. Waters (0 to 5.5 kilometers [0 to 3 nautical miles])</td>
<td>No discharge</td>
<td>No discharge</td>
<td>No discharge</td>
</tr>
<tr>
<td>U.S. Contiguous Zone (5.5 to 22 kilometers [3 to 12 nautical miles])</td>
<td>Pulped garbage may be discharged</td>
<td>No discharge</td>
<td>No discharge</td>
</tr>
<tr>
<td>22 to 46.3 kilometers (12 to 25 nautical miles) from shore</td>
<td>Bagged shredded glass and metal waste may be discharged &gt;22 kilometers (12 nautical miles)</td>
<td>No discharge</td>
<td>No discharge</td>
</tr>
<tr>
<td>&gt;46.3 kilometers (25 nautical miles) from shore</td>
<td>Direct discharge permitted</td>
<td>No discharge</td>
<td>No discharge</td>
</tr>
<tr>
<td>&gt;92.6 kilometers (50 nautical miles) from shore</td>
<td>Direct discharge permitted</td>
<td>No discharge</td>
<td>No discharge</td>
</tr>
</tbody>
</table>

**Hazardous Materials**

| U.S. Waters (0 to 5.5 kilometers [0 to 3 nautical miles]) | No discharge | No discharge |
| U.S. Contiguous Zone (5.5 to 22 kilometers [3 to 12 nautical miles]) | No discharge | No discharge |
| 22 to 46.3 kilometers (12 to 25 nautical miles) from shore | No discharge | No discharge |
| >46.3 kilometers (25 nautical miles) from shore | No discharge | No discharge |
| >92.6 kilometers (50 nautical miles) from shore | No discharge | If health and safety is threatened, discharge of negatively buoyant sterilized waste packages is permitted |
| >370.4 kilometers (200 nautical miles) from shore | Discharge permitted under certain circumstances; however, to the maximum extent practicable, ships shall retain hazardous materials onboard for shore disposal | Same as Hazardous Materials restrictions |

Source: Department of the Navy, Office of the Chief of Naval Operations, 1999.
Hazardous Waste Management
Hazardous waste and nonhazardous waste generated during routine operations at Pearl Harbor may include contaminated jet fuel, waste rags, paint, spent solvents, spill residues and absorbent materials, corrosion prevention compound in aerosol cans, ethylene glycol, batteries, antifreeze, hydraulic fluid, waste oil, photo processing waste materials, cleaning compounds, spill cleanup materials, and empty containers.

Naval Station Pearl Harbor Victor Pier 3
Hazardous material use and disposal are managed in such a way as to minimize impacts to the environment.

Barbers Point Mooring Location
The mooring location is located approximately 5 kilometers (3 miles) south of Barbers Point. Barbers Point Deep Draft Harbor is one of three commercial harbors on the island of Oahu and the State’s second busiest harbor. The approximately 37-hectare (92-acre) inshore harbor basin includes ship berthing areas, an approximately 12-hectare (30-acre) cargo handling yard, a 488-meter (1,600-foot) pier and petroleum product pipelines. Containment booms are located on site. Initial spill/emergency response equipment is stored at Tesoro Hawaii Corporation with additional equipment available from Honolulu Harbor. (U.S. Coast Guard, Marine Safety Office, Honolulu, 2002)

An explosive anchorage is located east/southeast of Barbers Point, approximately 2.4 kilometers (1.5 miles) from the Kalihi Channel along the 11-fathom line.

3.6.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

3.6.5.1 Region of Influence
The ROI for health and safety includes those areas that may potentially be affected by the proposed deployment of the SBX to Pearl Harbor. The ROI for health and safety is based on the area where effects to human exposure, navigation and communication facilities/equipment (military and nonmilitary), fuels and any existing EMR at Pearl Harbor may occur by the use of an XBR. Table 2.1.4-2 lists the maximum potential interference distances that define the ROI based on various subjects that could interact with the radar. Appendix B includes a general description of the health and safety resource area and a detailed discussion of the laws, regulations and standards concerning maritime safety and EMR.

3.6.5.2 Affected Environment
Regional
The Coast Guard enforces marine safety regulations implemented to reduce or eliminate death, injury, economic loss, and environmental damage associated with commercial marine and military vessels. MSO responsibilities include inspecting commercial vessels and marine facilities, supervising the transfer of oil, hazardous materials and explosive and military cargoes, investigating and remediating oil spills and hazardous materials releases, investigating vessel casualties and licensing of merchant vessels.
Coast Guard/MSO areas of responsibility include the following safety and operating areas:

- Oahu’s Anchorage Grounds, as defined and listed in 33 CFR Parts 110.235, 110.236 and 110.237, including Barbers Point Deep Draft Harbor and Offshore of Barbers Point. Nonanchorage Areas have also been established offshore of Barbers Point to protect submerged pipelines.
- Pearl Harbor Naval Defensive Sea Area as established by Executive Order 8681 in 1941. MSO coordinates with the military Commanding Officer who is given authority, as defined by 33 CFR Part 761.7(a)(1), to control boating activity in the Naval Defensive Sea Area.
- Oahu’s Restricted Areas and Danger Zones, as defined and listed in 33 CFR Parts 334.1340 to 334.1400 and 334.1410, to protect public from hazardous activities occurring in designated areas such as weapons training and missile launches.
- Submerged Submarine Operating Areas off the southwest coast of Oahu, off of Diamond Head Crater and Ala Moana Beach Park.
- Navy Small Arms Firing Area located west of the entrance channel to Pearl Harbor.
- Temporary Safety, Permanent Safety and Security Zones – Subsequent to 11 September 2001, the Coast Guard established temporary security zones in designated waters adjacent to the islands of Oahu, Maui, Hawaii, and Kauai, Hawaii. These security zones extend from the surface of the water to the ocean floor and were determined necessary by the Coast Guard to protect personnel, vessels and facilities from acts of sabotage or other subversive acts, accidents, or other causes of a similar nature during port and waterway operations.
- The Kaiwi Channel Voluntary Tanker Avoidance Zone established in response to OPA 90 to reduce the potential of a worst-case oil spill disaster. The maritime industry has voluntarily agreed that all tankers will use the Kauai Channel.

MSO facilitated the establishment of the Hawaii Operational Safety Team (HOST) in 1997. HOST is a non-regulatory group represented by the marine industry, public, state and federal agencies concerned with operational safety in the state’s ports and waterways. HOST has developed SOPs for vessel maintenance and repair, voluntary commercial towing vessel examinations, minimal under-keel clearance (in commercial ports), commercial VHF/FM communication procedures, explosive handling in Oahu ports, and Submerged Submarine Operating Areas (Diamond Head Crater and Ala Moana Beach Park), among others. Once approved, SOPs are listed in the HOST Handbook and posted on the MSO website.

The Coast Guard is also responsible for developing and issuing local NOTMARs.

The World-Wide Navigational Warning Service also provides long range and coastal warning messages as well as special warnings of potential political or military hazards that may affect safety of U.S. shipping lanes to U.S. Navy and merchant ships through a worldwide radio and satellite broadcast system.

The Navy, Barbers Point Deep Draft Harbor, Offshore Barbers Point, and tenants of Campbell Industrial Park have entered into a mutual aid agreement to provide assistance, equipment and manpower, in the event of fire or other emergencies (U.S. Coast Guard, Marine Safety Office, Honolulu, 2002).
Pier Victor 3 and Barbers Point
A Navy point of contact outlines the guidelines for safety procedures at Pearl Harbor.

Electromagnetic Radiation Environment
Radiation is regulated under 11 Hawaii Administrative Rules 41, 42, 44, and 45.

Communications—Electronics Frequency Related Interference. Section 3.6.2 provides an overview of the airspace and airports in the Pier Victor 3 and Barbers Point ROI.

3.6.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

3.6.6.1 Region of Influence
The ROI areas that may potentially be affected by the use of Pearl Harbor for the SBX include Pier Victor 3 and the potential mooring locations as previously identified off Barbers Point.

3.6.6.2 Affected Environment
At Pearl Harbor, the Utilities Department provides electricity, potable water distribution and wastewater collection/treatment as well as steam, salt water, boiler feedwater and compressed air. It also offers operating, maintenance and repair services for customer-owned utility systems on a cost-reimbursable basis. In addition, the department provides ship services which connect utilities systems to ships berthed at Pearl Harbor piers. (Navy Public Works Center, Pearl Harbor, 2002b)

Energy
The Utilities Department provides electricity at Pearl Harbor. Although there is no shore power (dock outlets), power lines run near Pier Victor 3, allowing for relatively easy modifications to provide the platform with power. Power is typically provided by linking to nearby buildings; however, tying a temporary transformer into a primary line is another option (Noborikawa, 2002).

Water
The Utilities Department provides potable water as well as salt water. Pier Victor 3, on Pearl City Peninsula, is currently supplied with potable water via a 15-centimeter (6-inch) water line (Noborikawa, 2002).

Wastewater
The Utilities Department provides wastewater collection/treatment. Additionally, the department services such as the Ship Wastewater Collection Ashore Abatement System (Navy Public Works Center, Pearl Harbor, 2002b). The Bilge Water Branch of Environmental Services provides treatment/disposal of bilge water (with less than 5 percent oil) from ships and submarines. Currently, the waste is collected by tank trucks, but an ongoing construction project will allow ships to discharge directly into risers at the pier. (Navy Public Works Center, Pearl Harbor, 2002a) Current regulations prevent running a wastewater line at Pier Victor 3,
due to the possibility of cross-contamination (Noborikawa, 2002), and wastewater at the pier would be containerized, requiring that arrangements be made for disposal.

**Solid Waste**

Solid wastes are handled by the Solid Waste Branch of the Navy Public Works Center. It operates a biosolids (sewage sludge) composting facility which converts military-generated sewage sludge and green waste into a reusable topsoil; the branch also remediates petroleum-contaminated soil and oily waste (Navy Public Works Center, Pearl Harbor, 2002a). The industrial waste facility treats a variety of hazardous and nonhazardous liquids (Navy Public Works Center, Pearl Harbor, 2002a).

3.6.7 **VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR**

Appendix B includes a description of visual and aesthetic resources and the analysis of the potential impacts from the Proposed Action.

3.6.7.1 **Region of Influence**

The Proposed site is offshore of Barbers Point near Pearl Harbor on the island of Oahu in Hawaii. The ROI for visual and aesthetic resources includes the beach at Barbers Point, which consists of the James Campbell Industrial Park, Kalaeloa (Rodgers) Airport, and state- and city-maintained land.

3.6.7.2 **Affected Environment**

Primarily, Barbers Point is occupied by the James Campbell Industrial Park, which consists of several industrial corporations along with Hawaii State- and Honolulu City-owned properties. The industrial park consists of conventional industrial buildings including smokestacks, office areas, parking lots, etc. The state- and city-owned properties are typically sandy beaches sparsely vegetated with tropical flora and primarily used for recreational purposes. The area also includes a lighthouse. The remainder of Barbers Point consists of the Kalaeloa (Rodgers) Airport, the Barbers Point Beach Park, and a small area owned and maintained by the State of Hawaii. This area also consists of several resorts and golf courses.

The ocean area adjacent to Barbers Point generally has a sea state of 3 to 4, small waves with frequent whitecaps to larger than moderate waves with many whitecaps. This area is primarily used as a recreation site for surfing, fishing, swimming, and other beach activities.

The ROI is frequented by workers from the industrial park, boaters, surfers, fishermen, and other beachgoers. Visitors that would be considered sensitive among these groups would be tourists and other recreational visitors, as well as everyday users.
3.7 NBVC PORT HUENEME—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

The proposed GMD ETR activities could have an effect on air quality, airspace, biological resources, hazardous materials and waste, health and safety, and utilities at Port Hueneme. These resource areas are summarized in the following sections.

By nature of its marine mission and use of existing homeport facilities, SBX support and operational activities will not result in any adverse effects to cultural resources, geology and soils, land use, noise, socioeconomics, transportation, visual and aesthetic resources, and water resources. Consequently, this section will not include further analysis of these resources other than the summary in the following paragraphs.

Cultural
There are not expected to be any ground disturbing activities within areas where cultural resources are located. While some mooring locations may have traditional importance, such as native fishing grounds, the SBX would occupy a very small area on a temporary basis.

Geology
While potential warehouse and administration facility construction activities could result in limited clearing and excavation for building foundations, it is not expected to create any adverse erosion effects to geology or soils. Construction activities would follow standard guidelines.

Land Use
Land use impact would be minimal since the proposed activities would occur on the water at the pier or near an existing mooring location and would not produce a change in the type of utilization. Land utilization in surrounding areas would not change.

Noise
No sensitive receptors would be disturbed by the proposed intermittent and short-term activity, and noise levels would to be below OSHA workplace standards.

Socioeconomics
As a result of its isolation, limited population, and local economic activity, only minor positive socioeconomic impacts would occur.

Transportation
The few additional personnel would not affect transportation. Shipping of project-related materials, as well as transportation of personnel, would utilize air, roadway, and shipping/ferrying routes that are equipped to handle both the loads and frequency of project demands. Any increase in daily trips by support personnel would utilize existing transportation infrastructure. Shared vehicle and/or off-peak hour travel would further serve to minimize effects on transportation levels.
**Visual and Aesthetic Resources**

No effects to visual and aesthetic resources are expected. San Nicolas Island is a military installation and while the visual resources on San Nicolas may be considered significant by some viewers, the proposed action is consistent with that of a military installation. The proposed site is approximately 105 kilometers (65 miles) from the affected population and would not be visible from Port Hueneme.

**Water Resources**

Impacts to water resources would be negligible, similar to other large marine vessels.

### 3.7.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

#### 3.7.1.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of NBVC Port Hueneme/San Nicolas Island for the SBX, including the mooring sites identified in section 2.3.1.7.

#### 3.7.1.2 Affected Environment

**Climate**

NBVC Port Hueneme and San Nicolas Island are located in Ventura County, which is located within the South Central Coast Air Basin. The area experiences the mild Mediterranean climate typical of southern California. For NBVC Port Hueneme temperatures are moderate with average daily summer highs of 21°C (70°F) and average daily winter lows of 4°C (40°F). Most precipitation occurs during the months of November through April, with average annual rainfall ranging from 25 to 46 centimeters (10 to 18 inches) along the coast. Along the coast, prevailing winds come from the west/northwest during the day at about 11 to 19 kilometers (7 to 12 miles) per hour. While evening winds stem from the east.

On San Nicolas Island total annual precipitation averages 21.3 centimeters (8.4 inches). The dry season occurs between May and September, with the rainy season November to March. During the rainy season the island receives about 87 percent of its rainfall. The average mean monthly temperature on land is 15°C (59°F). Prevailing winds tend to come from the northwest, at an average speed of 24.1 kilometers (13.3 miles) per hour. (Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002)

**Regional Air Quality**

Ventura County is considered to be a severe nonattainment area for federal and state 1-hour ozone standards. And while ozone levels have been declining significantly in recent years, the county as a whole still experiences frequent violations of the federal and state ozone standards. Inland areas tend to exceed ozone stands more frequently than the coast areas. Ventura County is also considered to be in nonattainment for the state standard for PM-10. Ambient levels of other pollutants in Ventura County do not violate state or federal standards. (Ventura County Air Pollution Control District, Air Quality Planning and Evaluation Division, 2000)
San Nicolas Island is considered to be in attainment/unclassifiable as to air quality by the EPA. (Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002)

**Existing Emission Sources**

San Nicolas Island is considered to be part of the Point Mugu Sea Range, and within the Sea Range emission sources include aircraft operations, missile and target operations, and marine vessel operations. Table 3.7.1-1 lists a summary of Sea Range Emissions at San Nicolas Island.

### Table 3.7.1-1: Summary of San Nicolas Island Emissions

<table>
<thead>
<tr>
<th>Carbon Monoxide</th>
<th>Oxides of Nitrogen</th>
<th>Reactive Organic Compounds/HC</th>
<th>Oxides of Sulfur</th>
<th>PM-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric tons (tons)/year</td>
<td>metric tons (tons)/year</td>
<td>metric tons (tons)/year</td>
<td>metric tons (tons)/year</td>
<td>metric tons (tons)/year</td>
</tr>
<tr>
<td>30.77 (33.92)</td>
<td>137.67 (151.75)</td>
<td>10.39 (11.45)</td>
<td>4.69 (5.170)</td>
<td>10.57 (11.65)</td>
</tr>
</tbody>
</table>

Source: Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002

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3.7.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

Appendix B includes a general description of airspace.

3.7.2.1 Region of Influence

The ROI for airspace at NBVC Port Hueneme includes the airspace over and surrounding the potential SBX interference areas at San Nicolas Island (figure 3.7.2-1).

3.7.2.2 Affected Environment

Controlled and Uncontrolled Airspace

San Nicolas Island is located in international airspace. Therefore, the procedures of the ICAO (outlined in ICAO Document 444, Rules of the Air and Air Traffic Services) are followed (International Civil Aviation Organization, 1996; 1997). The ICAO is a specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport. The FAA acts as the U.S. agent for aeronautical information to the ICAO, and air traffic in the ROI is managed by the Los Angeles ARTCC.

Special Use Airspace

The airspace over San Nicolas Island is within the Point Mugu Sea Range, which is controlled by NAWCWD. When the Sea Range is not being used, NAWCWD turns over the airspace to the FAA. (NAVAIR) The Point Mugu Sea Range includes warning areas and restricted airspace R-2535 A and B above San Nicolas Island.

En Route Airways and Jet Routes

Aircraft operating on Instrument Flight Rules (IFR) clearances under control of the Los Angeles ARTCC normally fly on formal airway route structures. In the vicinity of NBVC Port Hueneme,

EXPLANATION

<table>
<thead>
<tr>
<th>Color/Line Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Altitude Special Use Airways</td>
<td>- Green</td>
</tr>
<tr>
<td>High Altitude Special Use Airspace</td>
<td>- White</td>
</tr>
<tr>
<td>Major Roads</td>
<td>- Solid</td>
</tr>
<tr>
<td>Port Hueneme</td>
<td>- Solid</td>
</tr>
<tr>
<td>Airports</td>
<td>- Solid</td>
</tr>
<tr>
<td>SBX Mooring Site</td>
<td>- Solid</td>
</tr>
<tr>
<td>Warning Areas</td>
<td>- Solid</td>
</tr>
<tr>
<td>Port Mugu Sea Range</td>
<td>- Solid</td>
</tr>
<tr>
<td>Low Altitude Air Routes (V,J)</td>
<td>- Dotted with open circle</td>
</tr>
<tr>
<td>High Altitude Air Routes (C)</td>
<td>- Dotted with open circle</td>
</tr>
</tbody>
</table>

Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 3.5 km 65% Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Port Hueneme, California

Airspace Over the Potential SBX Mooring Area at San Nicolas Island

Figure 3.7.2-1

GMD ETR Final EIS
these airways run along the coastline and to the east. Special airways, Control Area Extensions (CAEs), cross the Point Mugu Sea Range to the west and can be opened or closed by the FAA at the request of the Navy in order to facilitate activities on the Sea Range. One CAE, 1177, is located south of San Nicolas Island, along the southern border of the Point Mugu Sea Range. CAE 1177 is the most important of the CAEs in the ROI and is rarely closed. Two other CAEs, 1316 and 1318, are located north of San Nicolas Island.

CAEs 1316 and 1318 are closed daily during daylight hours and occasionally on weekends. The FAA does not record the numbers of IFR flights through the Sea Range on the CAEs. However, general estimates of traffic through the Sea Range on all the CAEs are about 20 arrivals and departures daily. This is only IFR traffic and does not include aircraft flying under Visual Flight Rules (VFR).

Memoranda of Agreement exist between NAWCWD and the FAA which address the usage of the Warning Areas and stipulate the conditions under which the CAEs can be closed to civil traffic. Under most circumstances at least one CAE must remain available for use by general aviation and commercial air carriers. NAWCWD has established procedures to minimize the disruption of other air traffic due to operations on the range.

Since most of the Sea Range is over international waters, aircraft operate under VFR or without clearance from Air Traffic Control. Flight under these conditions is conducted under a see-and-avoid concept and flown clear of clouds or other limited-visibility conditions such as rain or fog.

**Airports/Airfields**

There is a runway on San Nicolas Island. Other runways in the ROI include Naval Air Station (NAS) Point Mugu, Oxnard, Camarillo, and Santa Barbara Municipal.

### 3.7.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

Appendix B contains a general description of biological resources and the main regulations and laws that govern their protection.

#### 3.7.3.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of NBVC Port Hueneme/San Nicolas Island for the SBX, including the mooring sites identified in section 2.3.1.7.

#### 3.7.3.2 Affected Environment

Most common southern California seabirds and shorebirds nest or are seasonally present on San Nicolas Island. Western gull, Brandt’s cormorant, double-crested cormorant, western sandpiper, Pacific golden plover, and sooty shearwater are examples of these species. Resident and migratory terrestrial species include the American kestrel, horned lark, rock wren, and house finch. (U.S. Army Space and Strategic Defense Command, 1994)
The Point Mugu Sea Range includes the ocean depths out to 322 kilometers (200 miles), an area including the water offshore of NBVC Port Hueneme and the shallow waters around the Channel Islands. Threatened and endangered species in the water offshore of NBVC Port Hueneme include blue, fin, sei, humpback, sperm, and northern right whales and the southern sea otter. The gray whale migrates from December through April south along the California coast including the area offshore of NBVC Port Hueneme. The waters surrounding San Nicolas Island support species of seals and whales. Approximately 75 percent of the sea lions and seals that inhabit southern California spend some portion of time in the northern Channel Islands. A small number of federally threatened Guadalupe fur seals (*Arctocephalus townsendi*) have been observed on San Nicolas Island (National Marine Fisheries Service, 2002). San Nicolas Island contains significant breeding populations of California sea lions and northern elephant seals. The principal breeding grounds for these species are on the southern and western shoreline of the island. California sea lions can be found throughout the year on Southern California offshore islands, with yearly peaks in summer (breeding). The breeding period for the northern elephant seal is from December to March. Harbor seals, which breed in September, also occur on the island. Killer whales are seen occasionally around the Channel Islands, predominantly during the gray whale migration. The federally threatened sea otter also occurs in the area. The Channel Islands National Marine Sanctuary is discussed above under the environmentally sensitive habitat of Vandenberg AFB. (U.S. Army Space and Strategic Defense Command, 1994)

3.7.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

3.7.4.1 Region of Influence

The ROI for hazardous materials and hazardous waste includes those areas that may potentially be affected by the proposed deployment and use of the SBX to NBVC Port Hueneme/San Nicolas Island for the SBX. The ROI includes fueling areas, support and maintenance operations and waste storage and disposal.

3.7.4.2 Affected Environment

**Hazardous Materials Management**

Hazardous materials are transported to San Nicolas Island by barge or aircraft from NAS Point Mugu. The largest volume of hazardous material transported to and stored at San Nicolas is aviation jet fuel and unleaded gasoline. Approximately 680,000 gallons (2.6 million liters) of jet fuel and 52,000 gallons (198,000 liters) of unleaded gasoline are shipped to San Nicolas yearly. The unleaded gasoline is primarily used by ground vehicles. Various other hazardous materials such as oils and hydraulic fuels are also used to support maintenance of aircraft and vehicles. Minimal quantities of maintenance support materials are ordered and stored in order to reduce risk of leaks/spills and prevent disposal of excess material or waste.

**Hazardous Waste Management**

There are eight satellite hazardous waste storage areas on San Nicolas. Hazardous wastes are stored at these satellite accumulation areas prior to being transported to the less-than-90-day accumulation area on the Island. From the less than 90-day accumulation area, the waste is shipped by barge to Port Hueneme. After arrival at Port Hueneme, the waste is transported to an approved Treatment, Storage, and Disposal facility. Approximately 65,689 pounds (29,813 kilograms) of hazardous waste are shipped yearly from San Nicolas to Port Hueneme.
3.7.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

3.7.5.1 Region of Influence

The ROI for health and safety includes those areas that may potentially be affected by the proposed deployment and use of the SBX to NBVC Port Hueneme/San Nicolas Island. The ROI for health and safety is based on the area where effects to human exposure, navigation and communication facilities/equipment (military and nonmilitary), fuels and any existing EMR at San Nicolas Island may occur by the use of an XBR. Table 2.1.4-2 lists the maximum potential interference distances that define the ROI based on various subjects that could interact with the radar. Appendix B includes a general description of the health and safety resource area and a detailed discussion of the laws, regulations, and standards concerning maritime safety and EMR.

3.7.5.2 Affected Environment

Electromagnetic Radiation

The U.S. Navy operates a variety of equipment and facilities, including radar, communication facilities, and power utility lines, at San Nicolas Island which generate EMR. The on-base hazards of EMR to personnel (HERP), ordnance (HERO), and fuel (HERF) have been determined using information supplied by the NAS Point Mugu Weapons Department. HERF constraints are considered to be negligible and are not depicted. The HERO arcs are large enough to extend beyond base boundaries; however, these arcs only affect ordnance on-base, and strict EMR control procedures are used when HERO-susceptible ordnance is transported or present in the open.

Explosive Safety Quantity–Distance Arcs

Various munitions and targets are stored and maintained at San Nicolas Island that are susceptible to the effects of EMR. These include missile warheads, rocket motors, high explosives and other similar type ordnances which are used in testing or training activities occurring on the Sea Range. Munitions arrive on the Island either by surface ship or by air transport. ESQD arcs for the safety of personnel and equipment have been established around the munitions storage and assembly areas.

Section 3.7.2 provides an overview of the airspace in the NBVC Port Hueneme/San Nicolas Island ROI.

Sea Range

The Sea Range safety policy, procedures, and guidance are covered in NAWCWD Instruction 5100.2 dated 9 July 1993. The safety policy of NAWCWD is to observe every reasonable precaution in the planning and execution of all operations which occur on the Sea Range to prevent injury to people and damage to property. Although the Commander of NAWCWD has the ultimate responsibility for range safety, the authority for execution of these safety programs is delegated to the Sea Range Safety Officer in the Range Safety Office.

Access to San Nicolas Island is strictly controlled and limited to pre-approved military personnel or non-military personnel conducting scientific studies. A scheduled contract aircraft shuttle operates between NAS Point Magu and San Nicolas.
There are three surface restricted areas located around San Nicolas Island and two airspace restricted areas over San Nicolas. Section 3.7.2 provides an overview of the airspace in the NBVC Port Hueneme/San Nicolas Island ROI.

NAWCWD has an extensive surveillance system to implement real-time safety clearance procedures prior to initiation of any operation on the sea range. This system includes the use of land-, sea-, and air-based radar in addition to aircraft surveillance of the range which is necessary to ensure that the public remains clear of designated operational areas where they could be subjected to hazardous conditions. The range uses specially modified P-3 aircraft, the NP-3D, which provides extended Sea Range surveillance. A review of past Range Safety Office records show that accidents involving the public on the Sea Range have never occurred.

When the Sea Range is used for military testing and training operations, the Navy notifies commercial, civilian, and other military aviation through a NOTAM which provides appropriate information to the FAA and its Air Traffic Control agencies to route traffic around these Warning Areas and Restricted Areas when they are active. (Warning Areas are located over non-Territorial Waters of the United States; Restricted Areas are located over land or Territorial Waters.) Although a NOTAM does not preclude uncontrolled air traffic from entering a Warning Area even when the area is active, DoD Directive 4540.1, Use of Airspace by U.S. Military Aircraft and Firings Over the High Seas, provides guidance for operating within Warning Areas: non-participating aircraft are identified by radar, and contact with these aircraft is made by radio; if aircraft remain in a clearance area, even after being requested to leave, the Sea Range will delay, cancel, or move a test to a clear area.

Similar procedures exist for notification of the commercial shipping and recreational boating communities of potentially hazardous activities on the Sea Range. These notifications are made through NOTMAR and daily VHF-FM Marine Radio (Channel 16) broadcasts. The Sea Range has established procedures to ensure that non-participating surface vessels are not exposed to undue risk. The surveillance aircraft survey designated clearance areas to ensure that surface vessels are not present. Any vessels, if present, are warned that they are in an area of an impending hazardous activity and are requested to leave the area. Contact with vessels is made by marine band FM radio; however, loud speakers can be used if the boat is not radio-equipped.

### 3.7.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

#### 3.7.6.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of NBVC Port Hueneme/San Nicolas Island for the SBX, including the mooring sites identified in chapter 2.0, and the area of potential construction of an environmentally controlled warehouse. This site has not been determined.

#### 3.7.6.2 Affected Environment

**Energy**

The Southern California Edison Company provides NBVC Port Hueneme with electricity via a system with a 44,000-kW capacity. The Edison Company has indicated that it would be able to
provide an additional 4.5 million kW with no infrastructure-related costs being passed on to the Navy, allowing for readily available future expansion (Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002).

Currently, San Nicolas Island has the capability to produce approximately 1 MW of electrical power capacity from its own generators. There is limited capacity to support additional personnel, and then only on a limited basis. San Nicolas Island also has a fuel pier available for barge-supported refueling operations.

**Water**

The primary source of potable water for NBVC Port Hueneme is treated groundwater from the Oxnard-Hueneme Water Delivery System under the auspices of the United Water Conservation District in Port Hueneme (United Water Conservation District, 2002). Source water is conveyed through the Oxnard-Hueneme Pipeline (Pringle, 2003) to the Port Hueneme Water Agency Brackish Water Reclamation Treatment Plant. To meet demands, the treated water is then blended with State Water Project water delivered by the Calleguas Municipal Water District (Pringle, 2003). The existing system has a capacity of 22.0 million liters (5.8 million gallons) per day, with an average demand of 20.06 million liters (5.3 million gallons) per day (Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002) overall, and a current demand for NBVC Port Hueneme and NBVC Point Mugu of 6.1 million liters (1.6 million gallons) per day (Pringle, 2003).

**Wastewater**

The City of Oxnard sanitary sewer system serves NBVC Port Hueneme, its collection system conveying the flow to the Oxnard Wastewater Treatment Plant in the southwestern portion of the city. This plant has an average dry weather flow of 120 million liters (31.7 million gallons) per day and an ultimate design capacity of 150.3 million liters (39.7 million gallons) per day (City of Oxnard, 2003).

**Solid Waste**

Solid waste from NBVC Port Hueneme and surrounding communities is collected by a private contractor and taken to an offbase transfer station before being delivered to a landfill. Solid waste from the base is taken to a transfer station in Oxnard and then transported to the 65-hectare (161-acre) Toland Road Landfill, some 24 kilometers (15 miles) from base. Operated by the Ventura Regional Sanitation District, it is expected that this landfill will operate for another 30 years at the present rate of waste generation. The remaining capacity is 4 million cubic meters (30 million cubic yards).
3.8 NAVAL STATION EVERETT—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

The proposed GMD ETR activities could have an effect on air quality, airspace, biological resources, hazardous materials and waste, health and safety, transportation, utilities, and visual and aesthetic resources at Naval Station Everett. These resource areas are summarized in the following sections.

By nature of its marine mission and use of existing homeport facilities, SBX support and operational activities will not result in any adverse effects to cultural resources, geology and soils, land use, noise, and water resources. Consequently, this section will not include further analysis of these resources, other than the summary in the following paragraphs.

Cultural
There are not expected to be any ground disturbing activities within areas where cultural resources are located. The SBX would be located at Pier Alpha or Pier Bravo.

Geology
While potential warehouse and administration facility construction activities could result in limited clearing and excavation for building foundations, it is not expected to create any adverse erosion effects to geology or soils. Construction activities would follow standard guidelines.

Land Use
Land use impact would be minimal since the proposed activities would occur on the water at the pier location and would not produce a change in the type of land utilization in the immediate or surrounding areas. Land utilization in surrounding areas would not change.

Noise
No sensitive receptors would be disturbed by the proposed intermittent and short-term activity, and noise levels would be below OSHA workplace standards.

Water Resources
Impacts to water resources would be negligible, similar to other large marine vessels.

3.8.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

3.8.1.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of Naval Station Everett for the SBX, as identified in section 2.3.1.8.
3.8.1.2 Affected Environment

Climate
Climate at Naval Station Everett can be described as cool marine. Average annual rainfall is about 89 centimeters (35 inches). July and August are the driest months, while December and January are the wettest. Temperatures typically range from 15°C (59°F) to 6.7°C (44°F). Summer is the sunniest season and July is the hottest month with an average high of 24°C (75°F). January tends to be the coldest month with lows averaging 1°C (34°F). Prevailing winds during the summer are typically from the north, while winter winds generally come from the south.

Regional Air Quality
Snohomish County falls under the Puget Sound Clean Air Agency’s jurisdiction. The area was previously designated as nonattainment for ozone and carbon monoxide. In recent years however, Snohomish County has met air quality standards and has also established a 10-year plan for continuing to meet and maintain air quality standards. With this, Snohomish County was redesignated to an attainment area and is now referred to as a maintenance area for both ozone and carbon monoxide. (Puget Sound Clean Air Agency, 1998)

Existing Emissions
The Washington Department of Ecology and the Puget Sound Clean Air Agency maintain a network of air quality and meteorological monitoring stations throughout the Puget Sound region, including Everett, Marysville, Getchell, and Lake Sammamish. Table 3.8.1-1 lists the maximum measured concentrations around Naval Station Everett.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>Standard</th>
<th>Location</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>8-hour</td>
<td>9 ppm</td>
<td>Everett</td>
<td>6.1 ppm</td>
<td>3.9 ppm</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>35 ppm</td>
<td>Everett</td>
<td>10.5 ppm</td>
<td>6.2 ppm</td>
</tr>
<tr>
<td>PM-10</td>
<td>Annual</td>
<td>50 μg/m³</td>
<td>Marysville</td>
<td>19 μg/m³</td>
<td>17.5 μg/m³</td>
</tr>
<tr>
<td>Ozone</td>
<td>Maximum 1-hour</td>
<td>0.12 ppm</td>
<td>Sammamish Lake</td>
<td>0.094 ppm</td>
<td>0.079 ppm</td>
</tr>
<tr>
<td></td>
<td>Maximum 8-hour</td>
<td>0.08 ppm</td>
<td>Sammamish Lake</td>
<td>0.073 ppm</td>
<td>0.065 ppm</td>
</tr>
</tbody>
</table>

Source: Puget Sound Clean Air Agency, 2000, 2001

3.8.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

Appendix B includes a general description of airspace.

3.8.2.1 Region of Influence
The ROI for airspace at Naval Station Everett includes the airspace over and surrounding the potential SBX interference areas at Naval Station Everett (figure 3.8.2-1).
3.8.2.2 Affected Environment

Controlled and Uncontrolled Airspace

The Seattle ARTCC regulates air traffic in the region. Class E airspace is in effect above Naval Station Everett. Seattle International Airport Class B airspace is located above the southern edge of the ROI. The following Temporary Flight Restriction is in effect above Naval Station Everett due to national security:

"2/0451 - WA. FLIGHT RESTRICTIONS EVERETT, WA. EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE. PURSUANT TO 14 CFR SECTION 91.137A(1) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT DUE TO NATIONAL SECURITY. ONLY RELIEF AIRCRAFT OPERATIONS UNDER THE DIRECTION OF DEPARTMENT OF DEFENSE ARE AUTHORIZED IN THE AIRSPACE AT AND BELOW 2000 FEET MSL WITHIN A 3 NAUTICAL MILES RADIUS OF (47 59 N/122 13 W) THE PAINE (PAE) VOR/DME 014 DEGREE RADIAL AT 4.53 NAUTICAL MILES. EXCLUDING THAT AIRSPACE WEST OF THE PAINE FLD RUNWAY 16R ILS LOCALIZER. UNLESS AUTHORIZED BY ATC FOR PURPOSES OF CONDUCTING ARRIVAL/DEPARTURE OPERATIONS. REGIONAL WATCH OFFICER 360-315-5123/FAX 360-315-5305 IS IN CHARGE OF THE OPERATION. SEATTLE /SEA/ AFSS 206-764-6609 IS THE FAA COORDINATION FACILITY. WIE UNTIL UFN"

Special Use Airspace

The nearest special use airspace is located approximately 40 kilometers (25 miles) west of Naval Station Everett and includes the Chinook and B Military Operating Areas, and the Admiralty Inlet Military Operating Area (figure 3.8.2-1).

En Route Airways and Jet Routes

Two Low Altitude air routes enter the ROI and terminate at Paine Field Airport. These include V-23 and V-287.

Airports/Airfields

Seattle-Tacoma International Airport is located approximately 56 kilometers (37 miles) south of Naval Station Everett. Snohomish County (Paine Field) Airport is about 5 miles southwest of Naval Station Everett. Several other airfields are located within the ROI including Harvey, Heineck, Large, Frontier, Arlington, and Whidbey.

3.8.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

Appendix B contains a general description of biological resources and the main regulations and laws that govern their protection.

3.8.3.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Naval Station Everett as a PSB for the SBX.
INDEX MAP

EXPLANATION

Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

Airspace Over the Potential SBX Site at Naval Station Everett

Everett, Washington

Figure 3.8.2-1

GMD ETR Final EIS
Affected Environment

Naval Station Everett is located approximately 40 kilometers (25 miles) north of Seattle, Washington. The primary ship berthing facilities are Pier Alpha, a previously disturbed area that has mooring available on both sides, and Pier Bravo.

Examples of seabirds that occur in northern Puget Sound are glaucous-winged gulls, cormorants, pigeon guillemots, and tufted puffins. A variety of shorebirds and the bald eagle have also been observed in the vicinity. Seventy-two percent of seabirds in Puget Sound nest on Protection Island located at the mouth of Discovery Bay in the Strait of Juan de Fuca. (U.S. Fish and Wildlife Service, Pacific Region, 2002c)

The Puget Sound distinct population segment of bull trout (Salvelinus confluentus) was listed as federally threatened in November 1999. Bull trout are threatened by habitat degradation and fragmentation. The federally threatened Chinook salmon (Oncorhynchus tshawytscha) is also found in the Puget Sound. Threats to the chinook salmon include over-fishing, increased sedimentation, and decrease in water quality. Several threatened and endangered marine species occur in areas off the coast of Washington State. These include humpback, blue, fin, sei, and sperm whales; green, leatherback, and loggerhead sea turtles; and steller sea lions. The humpback whale, steller sea lion, and leatherback sea turtle may also occur in Puget Sound. (Washington State Department of Transportation, 2002)

3.8.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

3.8.4.1 Region of Influence

The ROI for hazardous materials and hazardous waste includes those areas that may potentially be affected by the proposed deployment and use of the SBX to Naval Station Everett. The ROI includes fueling areas, support and maintenance operations and waste storage and disposal. Appendix B includes a detailed discussion of maritime and other laws, regulations, and standards concerning hazardous materials and hazardous waste.

3.8.4.2 Affected Environment

The 47.3-hectare (117-acre) site serves as homeport for a battle carrier group, including a Nimitz-class aircraft carrier, two guided missile destroyers, two destroyers and two guided missile frigates. The waterfront base is very compact and functionally oriented. Most available land is dedicated to ships’ support facilities, including storage areas, maintenance, and administration.

The Fleet and Industrial Supply Center Puget Sound Detachment Everett services the battle group and all organizations/detachments assigned to Naval Station Everett. The detachment is part of the Naval Supply System Command which supplies integrated support and supply chain management to naval operating units. Fleet and Industrial Supply integrated support services include waterfront/flight line husbandry, hazardous materials, repairables management, material handling, equipment management, local purchasing, training for supply business systems tools, supply assistance teams, consultative services and supply chain integration with commodity
pipelines. Supply chain management includes the systematic infrastructure for the specification, requirements definition, acquisition, material transport, inventory management, and logistic placement of materials for each of six main commodity areas. These commodity areas are aviation/ship repair parts and spares, petrol petroleum products, ordnance, subsistence, ship's store merchandise, and postal. All U.S. Navy materials at Naval Station Everett pass through the Fleet and Industrial Supply Detachment.

Hazardous materials are stored at the Hazardous Materials Center located in the Industrial and Logistics Support Zone of the Naval Station Everett Waterfront site. Limited, periodic ordnance handling and storage occurs at three berths at the Waterfront site. ESQD ordnance arcs are established around the berths when in use.

Operations of the carrier group generate considerable quantities of hazardous wastes. Naval Supply System Command protocol and procedures ensures safe handling and disposal of hazardous materials and wastes, and compliance with all pertinent state and federal regulations.

Biohazards and other hazardous wastes generated by the installation or the ships are handled and temporarily stored in the Industrial and Logistics Support Zone of the Naval Station Everett Waterfront site. Wastes are stored for up to 90 days in specific and specially designed areas before being trucked by an appropriately licensed contractor to designated disposal facilities. (U.S. Department of the Navy, Puget Sound Naval Shipyard, 1995)

Operations of the carrier group generate considerable quantities of hazardous wastes. To ensure safe handling and disposal of hazardous materials and wastes, the Navy complies with all pertinent state and federal regulations.

3.8.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

3.8.5.1 Region of Influence
The ROI for health and safety includes those areas that may potentially be affected by the proposed deployment and use of the SBX to Naval Station Everett. The ROI for health and safety is based on the area where effects to human exposure, navigation and communication facilities/equipment (military and nonmilitary), fuels, and any existing EMR at Naval Station Everett may occur by the use of an XBR. Table 2.1.4-2 lists the maximum potential interference distances that define the ROI based on various subjects that could interact with the radar. Appendix B includes a general description of the health and safety resource area, and a detailed discussion of the laws, regulations, and standards concerning maritime safety and EMR.

3.8.5.2 Affected Environment
The Waterfront installation is located on the western limits of the City of Everett within a heavy industrial and manufacturing area. The Kimberly Clark Paper Company mill, timber loading and storage facilities, the U.S. Navy Reserve Center, the Port of Everett, and a Burlington Northern Santa Fe mainline are located east/southeast of the installation. The public Port of Everett Marina is located to the north.
Section 3.8.2 provides an overview of the airspace and airports in the Port Naval Station Everett ROI.

Base security requires that a 6.1- to 9.1-meter (20- to 30-foot) enclosure of open, undeveloped land surround the site perimeter.

Operations, maintenance and support activities at Naval Station Everett are performed in accordance with base SOPs and the Navy’s Safety and Occupational Health Program. Naval Station Everett received the Chief of Naval Operations Safety and Occupational Award in 1999 for the overall quality of base safety and occupation programs, mishap prevention and recording and contributions to the Safety and Occupational Health.

3.8.6 SOCIOECONOMICS—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

General socioeconomic impacts resulting from the proposed action can lead to an economic gain or loss for the community or area. Potential socioeconomic impacts of the project stem from the construction or operational activities, the duration and extent of displacement or modification of existing activities, and the diversion or temporary suspension of access associated with the Proposed Action. Impact analysis will focus on the following broad areas of economic or social impacts: displacement of populations, residences or businesses, housing/accommodation availability, employment/income, growth inducement and potential impacts to locally significant industries such as aerospace, shipping tourism, and retail.

3.8.6.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Naval Station Everett for the SBX. With regard to socioeconomics, this area would primarily include the City of Everett.

3.8.6.2 Affected Environment

Naval Station Everett is situated on 47 hectares (117 acres) adjacent to Port Gardner Bay within the City of Everett in Snohomish County, western Washington State. Everett, the county seat, is the largest city within the county (Puget Sound Regional Council, 2002) both in terms of population and area, covering 10,117 hectares (25,000 acres) of land and 3,884 hectares (9,600 acres) of water. Everett is situated approximately 45 kilometers (28 miles) north of Seattle, between the Cascade Mountains to the east and Puget Sound to the west, and adjacent to the mouth of the Snohomish River.

Historically an industrial city, Everett developed as a lumber and a mill town more than a century ago, and major industries have included mainly lumber, shingle mills, wood products manufacturers, ironworks, shipbuilders, fisheries, and canneries (Puget Sound Regional Council, 2002). The Port of Everett, immediately adjacent to Naval Station Everett, was created in 1918 and remains an important regional and international deep-water port. The Port of Everett Marina, with moorage for over 2000 vessels, is the second largest on the West Coast (Everett Business Journal, 2003). While the majority of the waterfront areas were claimed for industrial uses, other land uses adjacent to Naval Station Everett include commercial areas, a park, and residential areas, some of which overlook the base.
Population and Housing

The U.S. Bureau of the Census reported that the City of Everett, as of 2000, showed a population of 91,488 persons (Puget Sound Regional Council, 2002) and consisted of 15.0 percent of the county’s total population (606,024 persons). Everett has shown significant population growth over the last 2 decades, having risen 30.8 percent from 1990-2000 (69,961 persons) and 28.6 percent from 1980-1990. However, this rate of growth was consistently lower than that shown by Snohomish County, at 30.2 percent between 1990 and 2000 and 37.9 percent between 1980 and 1990. Between 1990 and 2000, the population of Washington state increased by 21.1 percent, with the county comprising 10.3 percent of the state’s population as of 2000.

As is shown in table 3.8.6.1, while remaining predominantly White, Everett is more racially and ethnically diverse than Snohomish County. Though proportionally small, Hispanic and Black/African American populations and persons of “some other race” within Everett are significantly elevated compared to the county. To a lesser extent, this is also the case for Asian, American Indian, and “two or more races” categories.

Table 3.8.6-1: Race and Ethnicity, Everett, Snohomish County and Washington State

<table>
<thead>
<tr>
<th></th>
<th>Everett</th>
<th>Snohomish</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>81.1%</td>
<td>85.6%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>3.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>American Indian</td>
<td>1.6%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Asian</td>
<td>6.3%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Some other race</td>
<td>3.1%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>4.2%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>7.1%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>77.9%</td>
<td>83.4%</td>
</tr>
</tbody>
</table>

Source: U.S. Census Bureau, 2003a.

Income and Employment

The City of Everett shows significantly lower incomes than that of the county. The U.S. Bureau of the Census reported in 2000 that the City of Everett showed a per capita income of $20,557, 12.2 percent lower than the county average of $23,417. Similarly, as of 2000, the median household income of Everett was $40,100, a total of 24.4 percent lower than that of the county, at $53,060 (Puget Sound Regional Center, 2003). Everett also showed a significantly higher poverty rate than that of the county, at 12.9 percent poverty compared with 6.9 percent, respectively, as of 2000. The unemployment rate within Everett, at 5.3 percent as of 2000, was again significantly higher compared with 3.5 percent for the county (Puget Sound Regional Center, 2003).

The economy of Everett has changed significantly over the last 50 years, with a distinct fall in the extent of the lumber industry, the rise of papermaking and related products, and, most significantly, during the 1960s, the entrance of the aerospace industry to the region. Boeing maintains a dominant presence in the economy of Everett and the region today (Snohomish County Economic Development Council, 2002) and is the area’s largest employer (23,700).
There are also numerous other aerospace related companies (Everett Area Chamber of Commerce, 2003).

The Port of Everett, an internationally important deep-water facility containing 8 berths and covering approximately 40.4 hectares (100 acres) of land, handles approximately 907,184.7 metric tons (1 million tons) of cargo annually and is favored due to its proximity to the Far East and Alaska. Primary exports include lumber and agricultural goods. Major imports at the port include alumina ore and specialized aircraft parts. The Port also includes a large marina (Port of Everett, 2003).

Other major employers within Everett include John Fluke (electronic instruments), Verizon (telecommunications), and Kimberly-Clark (paper products), as well as employers in the healthcare, education, and government sectors (Snohomish County Economic Development Council, 2002). Naval Station Everett, with a full allotment of ships, including the naval aircraft carrier the USS Abraham Lincoln, employs approximately 6,087 personnel (Snohomish County Economic Development Council, 2002).

3.8.7 TRANSPORTATION—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

3.8.7.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Naval Station Everett for the SBX, as identified in section 2.3.1.8. No requirements for aviation or railway transportation are anticipated and thus, no impacts to those modes of transport are expected; consequently this section will predominately concern itself with ocean traffic, though roadway transportation is also addressed.

3.8.7.2 Affected Environment

Ocean Traffic

The Naval Station Everett is located next to the marina area of the city of Everett, Washington, about 40 kilometers (25 miles) north of Seattle on the northeast side of Possession Sound. Designed as a homeport for a U.S. Navy Battle Group, it accommodates the USS Abraham Lincoln (Aircraft Carrier, Nuclear-72), a Nimitz-class aircraft carrier, as well as several smaller surface combatants (GlobalSecurity.org, 2002a).

Access to and from Puget Sound berthing sites—including those for Naval Station Everett—is by the charted major ship travel channel, and all marine vessel traffic therein is regulated by the U.S. Coast Guard. Strict control of all shipping is maintained through a common radio channel. Ship traffic to Naval Station Everett requires sailing around the southern end of Whidbey Island and up the island’s eastern side to the Naval Station Everett berthing piers. Other than the CVN and Destroyer Squadron 9 that are homeported at Naval Station Everett, the only other large ship calling there is an occasional log carrier, which calls at the piers directly east of the carrier berth, providing visual contact at all times. (Department of the Navy, 1999)

Transition from the navigation channel to the CVN berthing pier, approximately 1,372 meters (1,500 yards), is executed under pilot advice and with the assistance of tugs (Department of the
Naval Station Everett, itself, has no tugboat complement. Tugs used at the port are primarily commercial because U.S. Navy tugs must travel from Naval Submarine Base Bangor in Washington, a distance of approximately 63 kilometers (34 nautical miles). It is required that requests for tugs be directed to Senior Officer Present Afloat (Admin) Puget Sound at least 72 hours in advance of anticipated time of movement. (GlobalSecurity.org, 2002a)

The primary ship berthing facility at Naval Station Everett is one long pier, designated as Pier Alpha, with mooring available on both its sides. Pier Alpha is 494 meters (1,620 feet) in length, with a 36.5-meter (120-foot) width. Pier Alpha's alongside depths range from 8.8 meters (29 feet) at the northeast end to 19.8 meters (65 feet) at the southwest end on the east side of the pier. (GlobalSecurity.org, 2002a) Since the pier is located close to the channel and deep water is available at the pier end, there is no other shipping traffic of concern during this movement. Recreational boating in the area is unaffected by CVN movements. When the CVN departs the tugs and pilot move the ship into the channel and assist until steerage is available. With the proximity of the piers to the channel and water depth, these vessel movements are easily managed. (Department of the Navy, 1999)

A second pier is Pier Bravo. Pier Bravo's western side is of rip-rap construction and acts as a breakwater. Its eastern, moorage side is slightly shorter than Pier Alpha, with similar width. (GlobalSecurity.org, 2002a)

An exclusion zone around Naval Station Everett was created by rule making with the U.S. Army Corps of Engineers and was published in the Code of Federal Regulations. The exclusion zone varies from a no standoff along the western side of Pier Bravo to a 91 meter (300 foot) standoff along the southern end of Pier Alpha and Pier Bravo, to a 182 meter (600 foot) standoff along the eastern side of Pier Alpha. Naval Station Everett coordinates ship movement and other activities with the Coast Guard, the Port of Everett, and the Tulalip Tribes.

Maritime traffic on Puget Sound is heavy; many large commercial vessels using the Ports of Everett, Seattle, Tacoma and others, enter and depart Puget Sound each day. Additional traffic on the Sound is created by the frequent runs of large Washington State vehicle and passenger ferries as they cross the Sound on generally east-west traffic routes that are perpendicular to normal inbound and outbound maritime traffic channels. Additionally, many recreational and commercial small craft operate throughout Puget Sound and adjacent waters. (GlobalSecurity.org, 2002b)

**Road Traffic**

Roadway transportation includes the local street and regional highway network in and around the City of Everett, which provides access to Naval Station Everett. Regional access is provided by Interstate 5, U.S. Route 2, and SR-529. Local access is provided by a street network within the City of Everett, which is generally arranged in a grid pattern. Key east-west streets accessing the station are Everett, Hewitt, and Pacific avenues, and key north-south streets are West Marine View Drive, Rucker Avenue, Broadway Avenue, and East Marine View Drive, all located between the station and Interstate 5; SR-529 runs along Broadway and Marine View Drive. (Department of the Navy, 1999)
Access onto West Marine View Drive is provided via the station’s two access gates, the Main Gate and the Service Gate. The station generates some 8,520 inbound and outbound vehicle trips per day, and an estimated 400 truck trips (Department of the Navy, 1999).

3.8.8 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

3.8.8.1 Region of Influence
The ROI includes areas of Naval Station Everett that may potentially be affected by the SBX activities, as well as the area of potential construction of a new, environmentally controlled warehouse. This site has not been determined.

3.8.8.2 Affected Environment
All amenities are found on the piers, except for fuel. All fuel is barged in from the nearby Manchester Navy Fuel Depot, part of the Naval Supply Center (Department of the Navy, 1999) and located on the shores of Puget Sound.

Energy
Electrical service to the Naval Station Everett waterfront site is provided by the Snohomish County Public Utility District No. 1, which operates a 115-kV transmission system in the vicinity of the waterfront with dual power redundancy from both north and south. A nearby substation was upgraded to serve the adjacent Kimberly Clark Paper Company plant. A 115-kV dedicated substation has been constructed at the waterfront site and will accommodate a potential 7-ship mix and onshore installation electrical loads. The total available capacity at the site is 80,000 kVA, with a steady load of 36,000 kVA.

Water
The City of Everett, Public Works Department, Water Division serves the Naval Station Everett waterfront site, producing some 116,000 million liters (30,700 million gallons) of water annually for citywide distribution, as well as distribution to nearby cities and water districts. The main water distribution line to the waterfront site runs along Norton Avenue. The distribution system has tested at an estimated peak flow rate of 17 million liters (4.55 million gallons) per day.

Within the installation, the potable water system consists of a looped underground distribution system and supply main serving the berthing piers. To provide ships with potable water, supply mains are located in the “utilidor” (the local utility corridor) and in the pier and wharf utility chase. These lines accommodate a wide variety of ship mixes with a 13,250-liter (3,500-gallon) per minute flow. Total available capacity is 10.2 million liters (2.7 million gallons) per day, with a typical load of 3.4 million liters (900,000 gallons) per day.

Wastewater
The City of Everett Sewer Department provides services to the city and surrounding districts. Two existing sewer and pumping systems, gravity trunk lines ranging from 30.5 to 91.4 centimeters (12 to 36 inches) in diameter, serve the waterfront site and surrounding businesses.
The installation’s sanitary sewer system consists of an underground collection system, pump stations, and an attenuation tank. A main pump and pressure main delivers flows to the City of Everett sewer system. Collection pump stations are required due to the proximity to sea level elevation. The sanitary sewer system is monitored in the Steam and Air Plant, and maintains an available capacity of 11.4 million liters (3 million gallons) per day with a steady load of 3.8 million liters (990,000 gallons) per day.

Solid Waste
Refuse collection in Everett is via private contractor. Solid waste transfer facilities and services are provided by the Snohomish County Department of Public Works, Solid Waste Division. Most area refuse is trucked to the Everett Transfer Station operated by the county, which, along with the Cathcart Landfill, has limited capacity.

Solid waste generated on the waterfront site and by transient Navy ships ranges from less than 1.01 metric tons (1 ton) per day to 7.6 metric tons (7.5 tons) per day, depending on the number of ships at homeport. The average demand is 4.6 metric tons (4.5 tons) per day.

3.8.9 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

Appendix B includes a description of visual and aesthetic resources and a methodology for assessing visual and scenic values.

3.8.9.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of Naval Station Everett for the SBX as identified in section 2.3.1.8.

3.8.9.2 Affected Environment
Primarily the affected environment consists of Naval Station Everett (homeport of the USS Abraham Lincoln) and the surrounding properties which include a paper mill, other industrialized facilities, a park, commercial sites, and residential properties. Immediately adjacent on the south and east to the naval station are the Port of Everett’s log export facility and the Kimberly Clark Paper Company mill. Parking areas, recreational facilities, and support buildings occupy the northern part of the base while the southern end is occupied by industrial facilities, piers, and ships. (U.S. Department of the Navy, Puget Sound Naval Shipyards, 1995)

Those that may be affected by the Proposed Action from a visual aspect include employees of the naval station and the other industrial sites, visitors to the naval station and surrounding areas, and in particular visitors to the park and the homeowners overlooking the site.
3.9 PORT ADAK—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

The proposed GMD ETR activities could have an effect on air quality, airspace, biological resources, hazardous materials and waste, health and safety, utilities, and visual and aesthetic resources at Port Adak. These resource areas are summarized in the following sections.

By nature of its marine mission and use of existing homeport facilities, SBX support and operational activities will not result in any adverse effects to cultural resources, geology and soils, land use, noise, socioeconomics, transportation, and water resources. Consequently, this section will not include further analysis of these resources other than the summary in the following paragraphs.

Cultural
There are not expected to be any ground disturbing activities within areas where cultural resources are located. While some mooring locations may have traditional importance, such as native fishing grounds, the SBX would occupy a very small area on a temporary basis.

Geology
While potential warehouse and administration facility construction activities could result in limited clearing and excavation for building foundations, it is not expected to create any adverse erosion effects to geology or soils. Construction activities would follow standard guidelines.

Land Use
Land use impact would be minimal since the proposed activities would occur on the water at the pier or near an existing mooring location and would not produce a change in the type of land utilization in the immediate or surrounding areas. Land utilization in surrounding areas would not change.

Noise
No sensitive receptors would be disturbed by the proposed intermittent and short-term activity, and noise levels would to be below OSHA workplace standards.

Socioeconomics
As a result of its isolation, limited population, and local economic activity, only minor positive socioeconomic impacts would occur.

Transportation
The few additional personnel would not affect transportation. Shipping of project-related materials, as well as transportation of personnel, would utilize air, roadway, and shipping/ferrying routes that are equipped to handle both the loads and frequency of project demands. Any increase in daily trips by support personnel would utilize existing transportation infrastructure. Shared vehicle and/or off-peak hour travel would further serve to minimize effects on transportation levels.
Water Resources
Impacts to water resources would be negligible, similar to other large marine vessels.

3.9.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

3.9.1.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of Port Adak for the SBX, including the mooring sites identified in section 2.3.1.9.

3.9.1.2 Affected Environment
Climate
Adak Island’s climate is characterized as polar maritime one with persistent overcast skies, high winds, frequent and often violent storms, and a narrow range of temperature fluctuation throughout the year. Weather on the island tends to be localized; fog, low ceilings, precipitation, and clear weather are all possible within a distance of a few miles. (Naval Facilities Engineering Command, Engineering Field Activity, Northwest, 2001)

Local shifts and rapid changes in velocity characterize the wind conditions on Adak. Average wind speed is 18.5 kilometers (11.5 miles) per hour, with gusts reaching 185 kilometers (115 miles) per hour during winter storms. Summer months also experience high winds, with gusts reaching up to 92.6 kilometers (57.5 miles) per hour. Winds tend to be from the southwest.

Monthly temperature varies from a low of 0.5°C (33°F) in February to a high of 11°C (51°F) in August.

Annual precipitation is about 137 centimeters (54 inches), usually in the form of rain. Average monthly precipitation varies from a high of 17.8 to 20.3 centimeters (7 to 8 inches) in November and December to a low of 3 inches in June and July. Approximately 254 centimeters (100 inches) of snow falls each year. However, due to the relatively warm temperature in Adak, snow rarely exceeds 0.31 to 0.62 meter (1 to 2 feet) in depth. (Adak Update.com, 2002)

Regional Air Quality
The entire area in and around the Aleutian chains is designated as an attainment area for ambient concentrations of air pollutants. Although there is little actual ambient air quality monitoring in the Aleutians, the climate of the islands is conducive to good air quality, except in times of very high winds and dry weather when blowing natural dust can occur. The generally wet conditions help to reduce windblown dust. (Naval Facilities Engineering Command, Engineering Field Activity, Northwest, 2001)

Existing Emission Sources
The Alaska Department of Environmental Conservation Division of Air and Water Quality does not maintain air monitoring activities in the area. Existing emissions surrounding Port Adak stem primarily from regional volcanic activity.
3.9.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

Appendix B includes a general description of airspace.

3.9.2.1 Region of Influence

The ROI for airspace at Port Adak includes the airspace over and surrounding the potential SBX interference areas that extend from the mooring location at Finger Bay, east of Port Adak (figure 3.9.2-1).

3.9.2.2 Affected Environment

Controlled and Uncontrolled Airspace

The airspace in the ROI is composed of Class A airspace from 5,486 meters (18,000 feet) mean sea level up to and including FL 600 (18,288 meters or 60,000 feet). Below 5,486 meters (18,000 feet), the airspace is composed largely of Class G (uncontrolled) airspace, except for the area around Adak, which is Class E airspace. The Class E airspace extends upward from 213 meters (700 feet) above the surface within a 11-kilometer (5.9-nautical-mile) radius of Adak, and also includes that airspace extending upward from 366 meters (1,200 feet) above the surface within a 18-kilometer (9.7-nautical-mile) radius of Port Adak (see figure 3.9.2-1). The service times for the Class E airspace is Monday through Friday 1800 to 0300 Greenwich Mean Time. At other times the airspace is Class G. There is no Class B, Class C, or Class D airspace in the ROI. (National Aeronautical Charting Office, 2002)

The airspace ROI lies within the Anchorage Oceanic Control Area/Flight Information Region (CTA/FIR) and within the U.S. Alaskan Air Defense Identification Zone. Aircraft separation and safety advisories are provided by air traffic control, the Anchorage ARTCC.

Special Use Airspace

There is no special use airspace in the ROI.

En Route Airways and Jet Routes

There is one en route low altitude airway (G8) connecting to Shemya Island to the west and Unalaska to the East. A second low altitude airway (G1) connects from Adak to Cold Bay. One high altitude jet route (V 480) runs from Adak to the northeast.

Adak is located on the southern edge of the great circle route from North America to the Far East. One of these routes (J 115) enters Adak from the east, and three routes (J 115, R 451, and R 336) enter Adak from the west.

Airports/Airfields

Adak Airport is the only airport in the ROI. It includes two runways, approximately 2,380 meters (7,800 feet) and 2,315 meters (7,600 feet) in length. The airport is attended continuously. (National Aeronautical Charting Office, 2002)
Airspace Over the Potential SBX Site at Port Adak

Adak, Alaska

Figure 3.9.2-1

Potential Interference Distances

- 22.4 km Full Commercial COMM
- 19 km Full Aircraft - Main Beam
- 15.4 km 65% Commercial COMM
- 12.1 km 65% Aircraft - Main Beam
- 7.5 km Full (Air) - EEDs Presence/Shipping
- 7.1 km Full Military COMM
- 4.8 km 65% (Air) - EEDs Presence/Shipping
- 3.5 km 65% Military COMM
- 2.3 km Full (Ground) - EEDs Handling
- 1.6 km 65% (Ground) - EEDs Handling

Note:
- Full = Fully Populated SBX Radar
- 65% = 65% Populated SBX Radar

3.9.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR
PRIMARY SUPPORT BASE, PORT ADAK

Appendix B contains a general description of biological resources and the main regulations and laws that govern their protection.

3.9.3.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Port Adak for the SBX, including the mooring sites as identified in section 2.3.1.9.

3.9.3.2 Affected Environment

Terrestrial biological resources are not addressed since those areas where elements of the Proposed Action would take place onshore are already developed and disturbed. The Aleutian shield fern (*Polystichum aleuticum*), which is only found on Adak Island, is located outside the ROI.

Adak is located approximately 2,092 kilometers (1,300 miles) southwest of Anchorage in the Aleutian Islands. Adak is part of the Aleutian Islands Unit of the Alaska Maritime Wildlife Refuge and is within one of the world's richest fishing regions. Currently the Adak Fisheries Development Council processes cod, crab, halibut, and other bottom fish (Alaska.net, 2002). Coho salmon, pink salmon, and Dolly Varden are known to spawn in most streams that drain into Kuluk Bay, north of the proposed SBX mooring location (Alaskan Command, 1996).

Various seabirds and water fowl overwinter around Adak Island. A few seabird nesting colonies are located in Clam Lagoon, north of the proposed SBX mooring location. Several bird species that nest on Adak Island are the mallard, pelagic and red-faced cormorant, mallard, common eider, bald eagle, Arctic and Aleutian tern, marbled murrelet, and tufted puffin (U.S. Fish and Wildlife Service, 1987).

Steller sea lions, sea otters, harbor seals, and whales occur around Adak Island. The recently delisted Aleutian Canada goose can occur in the area during migration. A Steller sea lion rookery is located on the southwestern portion of the island and a haulout area is located at Cape Moffett, northwest of the proposed SBX mooring location (Alaskan Command, 1996). Sea otter numbers have declined in Kuluk Bay recently, due perhaps to increased predation by killer whales. The population dropped by 76 percent from 1993 to 1997. (U.S. Geological Survey, 1998)

3.9.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST
X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

3.9.4.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Port Adak for the SBX, including the mooring sites identified in section 2.3.1.9.
3.9.4.2 Affected Environment

Adak Island is approximately 45 kilometers (28 miles) long with a total land area of 725 square kilometers (280 square miles). Adak’s water area totals approximately 13 square kilometers (4.9 square miles). The island’s geographic location makes it a key supply and logistical support center for recreational/private, commercial, and government air and marine transport routes for the western Aleutian Islands, Bering Sea, and Pacific Ocean.

Hazardous Materials Management

The most prevalent hazardous material on Adak is fuel. Adak Fuels operates a fueling terminal on what was a naval base. The underground diesel, gasoline and jet fuel storage system at the Sweeper Cove Terminal has an approximate 83-million-liter (22-million-gallon) holding capacity. Adak Fuels also supplies petroleum lubricants and greases to the marine vessels.

Other hazardous materials support Terminal and Port operations. These materials may include, gasoline for equipment and vehicles, propane, organic solvents, heat transfer fluids, glycol-based coolants, refrigerants, protective coatings, fire suppression chemicals, and cleaning agents.

Hazardous Waste Management

Hazardous waste is generated from various routine and preventative maintenance and repair activities at the Port and Sweeper Cover Terminal. These wastes may include spent thinners, cleaning solvents, flammable paints and coatings, corrosive acids, flammable adhesives, used oils containing chlorinated compounds and spent coolants. Sludge and residues removed from equipment and sumps may also be characterized as hazardous.

3.9.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

3.9.5.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Port Adak for the SBX, including the mooring sites identified in section 2.3.1.9. The ROI for health and safety is based on the area where effects to human exposure, navigation and communication facilities/equipment, fuels and any existing EMR at Port Adak may occur by the use of an XBR. Table 2.1.4-2 lists the maximum potential interference distances that define the ROI based on various subjects that could interact with the radar. Appendix B includes a general description of the health and safety resource area and a detailed discussion of the laws, regulations, and standards concerning maritime safety and EMR.

3.9.5.2 Affected Environment

The Coast Guard 17th District provides marine inspections, casualty investigations, fishing vessel inspections, harbor patrol, pollution response and facility contingency planning for Port Adak.

The Sweeper Cove Terminal maintains an Oil Spill Prevention and Response Plan in compliance with State of Alaska and federal requirements.
3.9.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

3.9.6.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of Port Adak for the SBX, including the mooring site, Finger Bay, identified in section 2.3.1.9.

3.9.6.2 Affected Environment

Energy
Adak Electric Utility, under the auspices of the City of Adak, provides area electricity. The electric system has excess capacity to meet future commercial and industrial development. Adak Electric Utility has the capability of handling 14.5 MW with an average daily demand of only 1 MW per day (Hines, 2002).

Water
Currently and historically, all Adak water supplies (including potable water) have been obtained from surface water. Previously, potable water was available to accommodate as many as 5,000 people via two water systems from three different sources (Naval Facilities Engineering Command, Engineering Field Activity, Northwest, 2002). In March 1997, Naval Complex Adak was closed and ceased to operate as a military facility, reducing the population from 2,500 to less than 500 people. This reduction in population permitted the closure of certain of the public water systems; one of these, Nurses' Creek, is in the process of shutting down (Hines, 2002). Still in use is the Lake Bonnie Rose system, which is operated as a Class A public water system (Adak Update.com, 2002). City water is connected to all buildings and homes. The current system is capable of producing over 3.8 million liters (1.0 million gallons) per day, with an average demand of about 1.14 million liters (300,000 gallons) per day (Hines, 2002).

Wastewater
Adak Wastewater Utility maintains a wastewater treatment system which discharges its treated water through a marine outfall line to Kuluk Bay (I Love Alaska.com, 2002). Up to approximately 3.02 million liters (800,000 gallons) per day runs through this system, of which less than 1 percent is actually wastewater. Wastewater levels are not monitored directly. (Hines, 2002)

Solid Waste
The Class 3 landfill, the Husky Road Landfill, has been in use since approximately 2000, and is not expected to reach capacity until 2010 (Hines, 2002). It is estimated that 20 percent of its capacity has been used thus far. All paper products are burned (Hines, 2002), and refuse is burned or baled before disposal in the landfill.
3.9.7 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

Appendix B includes a description of visual and aesthetic resources and the analysis of the potential impacts from the Proposed Action.

3.9.7.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Port Adak for the SBX, including the mooring site identified in section 2.3.1.9.

3.9.7.2 Affected Environment

The affected environment for Adak, Alaska consists of Port Adak and the surrounding areas; particularly those areas surrounding the potential mooring site at Finger Bay. Until recently, Port Adak has primarily been used as a naval base, and as such, there are many remaining facilities associated with naval activities within the affected environment.

Typically, the Adak climate is wet, foggy, stormy, windy, and overcast. Heavy rains and blowing snow showers inhibit much of the visibility, which usually remains below 1.6 kilometers (1 mile) horizontally.

Vegetation on the island is primarily tundra floral consisting of dwarf willows, alders, grasses, moss, and lichens. Coastal areas support beach wild rye, while offshore the sea water supports kelp and algae.

The port facilities at Adak are located on one of the largest areas of flat land on the island. There is a rolling hill (elevation: 150 meters [492 feet]) situated on the peninsula between Port Adak and the potential mooring site. (State of Alaska, Department of Community and Regional Affairs, 1996)

Although cruise ships do occupy the port occasionally, the only people that ordinarily inhabit Adak are all associated with the port facilities or other small businesses and would not be especially sensitive to scenic quality.
3.10 PORT OF VALDEZ—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

The proposed GMD ETR activities could have an effect on air quality, airspace, biological resources, hazardous materials and waste, health and safety, transportation, utilities, and visual and aesthetic resources at Port of Valdez. These resource areas are summarized in the following sections.

By nature of its marine mission and use of existing homeport facilities, SBX support and operational activities will not result in any adverse effects to cultural resources, geology and soils, land use, noise, socioeconomics, and water resources. Consequently, this section will not include further analysis of these resources other than the summary in the following paragraphs.

Cultural

There are not expected to be any ground disturbing activities within areas where cultural resources are located. While some mooring locations may have traditional importance, such as native fishing grounds, the SBX would occupy a very small area on a temporary basis.

Geology

While potential warehouse and administration facility construction activities could result in limited clearing and excavation for building foundations, it is not expected to create any adverse erosion effects to geology or soils. Construction activities would follow standard guidelines.

Land Use

Land use impact would be minimal since the proposed activities would occur on the water at the pier or near an existing mooring location and would not produce a change in the type of land utilization in the immediate or surrounding areas. Land utilization in surrounding areas would not change.

Noise

No sensitive receptors would be disturbed by the proposed intermittent and short-term activity, and noise levels would be below OSHA workplace standards.

Socioeconomics

As a result of its isolation, limited population and local economic activity, only minor positive socioeconomic impacts would occur.

Transportation

The few additional personnel would not affect the transportation. Shipping of project-related materials, as well as transportation of personnel, would utilize air, roadway, and shipping/ferrying routes that are equipped to handle both the loads and frequency of project demands. Any increase in daily trips by support personnel would utilize existing transportation infrastructure. Shared vehicle and/or off-peak hour travel would further serve to minimize effects on transportation levels.
Water Resources
Impacts to water resources would be negligible, similar to other large marine vessels.

3.10.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

3.10.1.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of the Port of Valdez for the SBX, including the mooring sites identified in section 2.3.1.10.

3.10.1.2 Affected Environment
Climate
Climate in Valdez is part of a maritime zone that includes southeastern Alaska, the south coast, and southwestern islands. Annual wind speed averages 10 kilometers (6.2 miles) per hour, typically from the east-northeast. The annual mean temperature is 3°C (38°F), with monthly mean averages ranging from -6°C (21°F) in January to 13°C (55°F) in July.

Annual precipitation at Valdez reaches 162.6 centimeters (64 inches), with annual snowfall of approximately 802 centimeters (316 inches). The average number of days with heavy fogs, with visibility equal to or less than 0.40 kilometer (0.25 mile), for Valdez is 15.8. (U.S. Department of the Interior, Bureau of Land Management, 2002)

Regional Air Quality
The Port of Valdez is located within the South Central Intrastate Air Quality Control Region. The area is designated as being in attainment for all NAAQS.

Existing Emission Sources
The Valdez Marine Terminal is the dominant emission source in the Valdez area; it contributes 90 percent or more of each criteria pollutant and volatile organic compound to the total emissions. Table 3.10.1-1 lists the Valdez Marine Terminal’s annual emissions, as well as annual emissions for adjacent facilities.

| Table 3.10.1-1: Summary of Emissions of Regulated Air Pollutants in the Port of Valdez |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                | PM-10           | Sulfur Dioxide  | Carbon Monoxide | Nitrogen Dioxide | Volatile Organic |
|                                | metric tons     | metric tons     | metric tons     | metric tons     | Compounds       |
|                                | (tons)/year     | (tons)/year     | (tons)/year     | (tons)/year     | metric tons     |
| Valdez Marine Terminal         | 252.2 (278)     | 1,593.9 (1,757) | 124.3 (137)     | 1,431.5 (1,578) | 3,142.5 (3,464) |
| Adjacent Facilities*           | 27.2 (30)       | 116.1 (128)     | NA              | 100.7 (111)     | NA              |


a = includes the Petro Star Refinery, the City of Valdez, and the Valdez Airport
NA = Not available
3.10.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

Appendix B includes a general description of airspace.

3.10.2.1 Region of Influence

The ROI for airspace at Port of Valdez includes the airspace over and surrounding the potential SBX interference areas that extend from the mooring location south of the City of Valdez, Alaska (figure 3.10.2-1).

3.10.2.2 Affected Environment

Controlled and Uncontrolled Airspace

The airspace in the ROI is composed of Class A airspace from 5,486 meters (18,000 feet) mean sea level up to and including FL 600 (18,288 meters or 60,000 feet). Below 5,486 meters (18,000 feet), the airspace is composed largely of Class G (uncontrolled) airspace, except for the area around Valdez Pioneer Airport, which is Class E airspace. The Class E airspace extends upward from 213 meters (700 feet) above the surface within a 11-kilometer (5.9-nautical-mile) radius of Valdez Pioneer Airport (see figure 3.10.2-1). There is no Class B, Class C, or Class D airspace in the ROI. (U.S. Department of Transportation, 2002i)

The airspace ROI lies within the Anchorage Oceanic CTA/FIR and within the U.S. Alaskan Air Defense Identification Zone. Aircraft separation and safety advisories are provided by air traffic control, the Anchorage ARTCC.

Temporary flight restrictions (as of May 2003) include the following:

"1109 - PART 1 OF 2 FLIGHT RESTRICTIONS VALDEZ CLASS E AREA EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE, PURSUANT TO 14 CFR SECTION 91.137A(2), TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT FOR THE VALDEZ CLASS E AREA. THE VALDEZ CLASS E AREA IS DEPICTED AS THE ENCLOSED AREA BOUNDED BY THE MAGENTA 700 FEET BORDER ON THE ANCHORAGE AERONAUTICAL SECTIONAL CHART AND IS DEFINED AS THE 6.6 NM RADIUS OF THE VALDEZ AIRPORT AND WITHIN 3.1 NM EACH SIDE OF THE VALDEZ LOCALIZER FRONT COURSE EXTENDING FROM THE 6.6 NM RADIUS TO 21.6 NM SOUTHWEST OF THE AIRPORT. ALTITUDES: SURFACE UP TO AND INCLUDING 8,000 FEET MSL. TIMES: 24 HOURS/7 DAYS A WEEK ALL AIRCRAFT ENTERING OR DEPARTING THE VALDEZ CLASS E AREA SHALL CONTACT JUNEAU AFSS VHF 122.2, 122.4 OR 122.55 WITH THEIR CALLSIGN, POSITION, ALTITUDE, AND ROUTE OF FLIGHT. END PART 1 OF 2 WIE UNTIL UFN"

"PART 2 OF 2 FLIGHT RESTRICTIONS VALDEZ CLASS E AREA IN RESPONSE TO THE TERRORIST ATROCITIES OF SEPTEMBER 11, 2001, THIS FLIGHT RESTRICTION IS REQUIRED TO ESTABLISH A COMMUNICATION REQUIREMENT TO MONITOR ALL AIRCRAFT AROUND THE VALDEZ OIL TERMINAL AND TO ESTABLISH A NO FLY AREA OVER THE OIL TERMINAL AND DOCKS. THE NO FLY AREA IS DEFINED AS ONE (1) NM RADIUS CIRCLE CENTERED ON THE 651 FEET MSL (300 FEET AGL) RADIO TOWER LOCATED AT THE VALDEZ OIL TERMINAL. THIS TOWER IS DEPICTED ON THE ANCHORAGE AERONAUTICAL SECTIONAL CHART AND IS LOCATED AT LAT. 61 05" 06 N LONG. 146 23"19" W. AIRCRAFT WITH NO RADIO CAPABILITY: PRECOORDINATE WITH JUNEAU AFSS ON TIMES, ALTITUDES, AND ROUTE OF FLIGHT. THE FAA COORDINATION FACILITY IS JUNEAU AFSS, PHONE 907-586-7382. END PART 2 OF 2 WIE UNTIL UFN "

GMD ETR Final EIS 3-163
Figure 3.10.2-1

Airspace Over the Potential SBX Site at Port of Valdez

Valdez, Alaska

Special Use Airspace
There is no special use airspace in the ROI.

En Route Airways and Jet Routes
There is one en route low altitude airway (A7) connecting to Anchorage to the west. One low altitude airway (V 481) crosses the ROI approximately 3 kilometers (1.6 nautical miles) east of the Valdez Pioneer airport. One high altitude jet route (J167) is located directly above V481.

Valdez is located on the southern edge of the great circle route from North America to the Far East. Two of these routes (NCA 13 and NCA 20) run east–west across the ROI above Valdez. The ground trace of these routes is about 6 kilometers (3.2 nautical miles) south and 6 kilometers (3.2 nautical miles) north of Valdez Pioneer Airport, respectively.

Airports/Airfields
Valdez Pioneer Airport is the only airport in the ROI. It includes one runway, approximately 2,380 meters (6,500 feet) in length. The airport is attended from 6:00 a.m. to 8:00 p.m. (U.S. Department of Transportation, 2002j)

3.10.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

Appendix B contains a general description of biological resources and the main regulations and laws that govern their protection.

3.10.3.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of the Port of Valdez for the SBX, including the mooring sites as identified in section 2.3.1.10.

3.10.3.2 Affected Environment
Terrestrial biological resources are not addressed since those areas where elements of the Proposed Action would take place onshore are already developed and disturbed.

The Port of Valdez is located in a deepwater fjord in northeast Prince William Sound. It lies 193 kilometers (120 air miles) east of Anchorage, or 490 kilometers (305 miles) by the Richardson and Glenn Highways. Large populations of marine and anadromous fish occur in Prince William Sound such as sockeye, pink, coho, Chinook, and chum salmon, Pacific herring, Pacific halibut, and sablefish. All estuarine and marine areas out to the Economic Exclusion Zone of the United States used by Alaskan Pacific salmon are designated as Essential Fish Habitat for salmon fisheries. Salmon occur in the Sound mainly from June through September as they return from the ocean to spawn (National Wildlife Federation, 2001). Essential Fish Habitat has also been designated for scallops and Gulf of Alaska ground fish in Port Valdez. (Bureau of Land Management, 2002)
Prince William Sound is an important overwintering area for sea ducks such as scoters, cormorants, harlequin duck, Barrow’s goldeneye, oldsquaw, and mergansers (Bureau of Land Management, 2002). Some of the more common seabirds occurring in the sound are the murrelet, black-legged kittiwake, glaucous-winged gull, fork-tailed petrel, and mew gull (National Wildlife Federation, 2001; Alaska.net, 2002). Small groups of threatened Steller’s eiders are occasionally found in Prince William Sound during the winter (Bureau of Land Management, 2002).

Prince William Sound provides habitat for humpback, killer, and minke whales, sea otters, Steller sea lions, harbor seals, and Dall and harbor porpoise. Killer and minke whales are observed year round. Humpback whales are the most abundant whale species in Prince William Sound and feed there in the summer. However, they are found primarily in the southwestern portion of the Sound, away from Port Valdez. Most of the humpback whales migrate to Hawaii and Mexico for calving in the winter (National Wildlife Federation, 2001). The population of sea otters affected by earthquakes and the Exxon Valdez oil spill appeared to be recovering by 1993. The overall population of sea otters in Prince William Sound increased during the 1990s. The Steller sea lions in Prince William Sound are part of the endangered western stock. None of the critical habitat designated for the Steller sea lion occurs in Port Valdez. Although harbor seals are abundant in Prince William Sound year round, their long-term decline there (since 1970s) has not ended. Dall and harbor porpoises are both abundant (more abundant in summer) and widespread in Prince William Sound. (Bureau of Land Management, 2002)

3.10.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

3.10.4.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of the Port of Valdez for the SBX, including the mooring sites as identified in section 2.3.1.10.

3.10.4.2 Affected Environment

Prince William Sound includes approximately 28,490 square kilometers (11,000 square miles) of shoreline, islands, and open water. The Port of Valdez is located in a northern deepwater fjord of Prince William Sound. Within the Port, the Valdez Container Terminal consists of a 213-meter (700-foot) floating concrete dock tied to an 8.5-hectare (21-acre) marshalling yard by two 61-meter (200-foot) ramps. The terminal is designed as a multi-purpose berth to accommodate the commercial fishing industry, seafood processing plants, a grain terminal and tourist industry.

The port also serves as the southern terminal of the Trans-Alaska Pipeline System (TAPS). The TAPS terminal occupies approximately 404.7 hectares (1,000 acres) of land owned by the Alyeska Pipeline Service Company (APSC). The TAPS Terminal serves to store and load crude oil and houses the Operations Control Center (OCC) for the TAPS. The total holding capacity in the crude oil tanks at the Valdez Terminal is approximately 9.18 billion barrels. The average working inventory of the tanks is approximately 7.8 billion barrels, or approximately 85 percent of maximum capacity. The OCC monitors and controls the movement of oil through the pipeline via a series of satellite, cable, and terrestrial microwave radio systems.
Hazardous Materials Management

The most prevalent hazardous material at the TAPS Terminal is diesel fuel, with approximately 30 million liters (8 million gallons) nominally being stored at any given time. Other hazardous materials used at the Terminal support Terminal and TAPS operations. These materials include gasoline for equipment and vehicles, propane, organic solvents, heat transfer fluids, glycol-based coolants, refrigerants, protective coatings, fire suppression chemicals, and cleaning agents.

The APSC Hazardous Materials Business Model defines the appropriate administrative procedures for management of hazardous materials at the Terminal and other locations in the APSC system. Procedures for implementing the Hazardous Materials Business Model are provided in the TAPS Environmental Protection Manual, EN-43-1. Purchase and use of hazardous materials by APSC personnel and TAPS contractors are centrally controlled through the APSC systemwide Hazardous Materials Consolidation and Redistribution (HAZCORE) Program. In addition to procurement and inventory management, HAZCORE databases allow access to MSDS and ensure that employee hazardous material training is current and compliant with OSHA and State of Alaska requirements.

Hazardous materials are typically delivered to a central APSC warehouse in Anchorage, Alaska and shipped by truck (commercial carrier or APSC vehicle) to the terminal, maintenance or equipment yards, or pump station. Hazardous materials delivered to the terminal are stored in dedicated areas within designated buildings. Fuels are delivered in bulk by commercial carriers and transferred to above ground storage tanks at the terminal or other appropriate location. Limited quantities of hazardous materials and fuels may occasionally be stored in temporary facilities or portable tanks at a designated location for specific jobs.

APSC submits annual Emergency Planning and Community Right-to-Know Act Tier II reports to state and federal authorities. The terminal has an SPCC Plan and works with local emergency planning authorities in developing site specific contingency plans for hazardous material storage and usage locations.

Hazardous Waste Management

The Valdez Marine Terminal is considered a large quantity generator. Hazardous waste is generated from various routine and preventative maintenance and repair activities at the terminal. These wastes include spent thinners, cleaning solvents, flammable paints and coatings, corrosive acids, flammable adhesives, used oils containing chlorinated compounds, spent coolants, spent aerosol cans and crushed fluorescent lights. Sludge and residues removed from equipment and sumps may also be characterized as hazardous. The largest quantity of potentially hazardous waste is from tank bottoms and “materials in process” that are periodically removed from equipment and storage tanks. Some spill debris and containment media may also be characterized as hazardous.

The TAPS Environmental Protection Manual, EN-43-2 also establishes procedures for management of hazardous waste. Hazardous waste generated at the terminal is accumulated in a designated waste accumulation area within dedicated buildings. All hazardous waste accumulation areas have secondary containment features. A licensed contractor collects and transports the waste via truck to a terminal in Anchorage, Alaska where the waste is then shipped via barge or rail to permitted Treatment, Storage, Disposal, and Recycling Facilities outside of Alaska. All wastes are transported in accordance with appropriate DOT and state specifications.
Limited quantities of special wastes could potentially be generated from TAPS operations. Such wastes would include PCB wastes (contained in the dielectric fluids of electrical equipment), asbestos wastes, pesticide wastes, drag reducing agent wastes, spent glycols, tanker garbage, asphalt, spent sandblast media, naturally occurring radioactive material, spill debris and remediation waste. Handling procedures are waste specific and in accordance with applicable state and federal specifications.

3.10.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

3.10.5.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of the Port of Valdez for the SBX, including the mooring sites as identified in section 2.3.1.10. The ROI for health and safety is based on the area where effects to human exposure, navigation and communication facilities/equipment, fuels and any existing EMR at the Port of Valdez may occur by the use of an XBR. Table 2.1.4-2 lists the maximum potential interference distances that define the ROI based on various subjects that could interact with the radar. Appendix B includes a general description of the health and safety resource area and a detailed discussion of the laws, regulations and standards concerning maritime safety and EMR.

3.10.5.2 Affected Environment

The Coast Guard 17th District MSO Valdez provides marine inspections, casualty investigations, fishing vessel inspections, harbor patrol, pollution response and facility contingency planning for Port Valdez and Prince William Sound. The MSO is composed of the Vessel Traffic Center and Public Works Department. The Vessel Traffic Center is staffed 24 hours per day, 7 days per week and tracks/coordinates marine traffic in Prince William Sound. The Vessel Traffic Center’s Vessel Traffic System utilizes radar, an Automated Dependent Surveillance Shipboard System, radio and other to obtain and disseminate information regarding vessel movement. The Center is supported by Vessel Traffic Center radar at Hinchinbrook Island, Naked Island, Potato Point and the Valdez Spit. The MSO Public Works Department oversees and maintains Coast Guard owned equipment and facilities, including the remote Vessel Traffic Center radar sites.

In accordance with State of Alaska and Federal oil spill prevention and response agreements and plans, every laden tanker is escorted from the Port to Hinchinbrook Entrance by an ocean going tug and an APSC Ship Escort/Response Vessel. One of the escort vessels serves as ice scout, keeping approximately one-half mile ahead of outbound tankers to assess ice hazards. Escort is also provided for empty inbound tankers during low visibility conditions, when ice is reported or when it has been 6 hours since an ice report was issued. Radar is one of the means by which the Ship Escort/Response Vessels assess ice conditions in the Sound. Ship Escort/Response Vessel personnel are trained in advanced spill response.

The Valdez Terminal maintains an Oil Spill Contingency Plan. Tankers are surrounded with containment booms as soon as they are berthed and are inspected hourly during the 18-hour loading for any sign of a leak or spill. Loading is monitored and controlled by the OCC via a series of satellite, cable and terrestrial microwave radio systems. The terminal is equipped with workboats, self-propelled skimmers, and containment booms and an oil spill response team is on duty at all times. Spills from a tanker not at berth or transiting from the terminal are covered
under the Prince William Sound Tanker Spill Prevention and Response Plan. All transiting tankers must have individual oil spill contingency plans that incorporates the Prince William Sound Tanker Spill Prevention and Response Plan. APSC provides initial response to any spill from a transiting tanker.


A commuter airline serves the Port of Valdez. Section 3.10.2 provides an overview of the airspace and airports in the Port of Valdez ROI.

### 3.10.6 TRANSPORTATION—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

#### 3.10.6.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of the Port of Valdez for the SBX, including the mooring sites as identified in section 2.3.1.10. Pier-side operations can be carried out for the SBX during limited time periods. Valdez does not maintain the pier capacity to commit pier-space year round for the SBX, which would yield to cruise ships. However, there are numerous mooring locations near the container dock for long-term operations. No requirements for aviation or railway transportation are anticipated and no impacts to those modes of transport are expected; consequently this section will predominately concern itself with ocean traffic, though roadway transportation is also addressed.

#### 3.10.6.2 Affected Environment

**Ocean Traffic**

Marine transportation plays an important role in the Prince William Sound area, including its role in shipping petroleum products from the Valdez Marine Terminal. The Port of Valdez is equipped with the highest level of marine infrastructure, accommodating interstate and international cargo receipt and shipment, while providing a minimum draft of 6 meters (20 feet). The Port of Valdez is an ice-free port with access to Interior Alaska, the U.S. Pacific Northwest, Northern Canada, and Pacific Rim trade routes. This deepwater port has containerized storage and containerized roll-on/roll-off and lift-on/lift-off capabilities, as well as access to the Richardson Highway, the Valdez Airport, and the AMHS. The Port of Valdez is among those in the Prince William Sound area providing facilities for the AMHS, which provides scheduled service to the City of Valdez, as well as Cordova, Seward, Whittier, and “whistlestop” service to Chenega Bay and the renowned Tatitlek. (U.S. Department of the Interior, Bureau of Land Management, 2002) The Port of Valdez is the southern terminus of the trans-Alaska oil
pipeline; supertankers navigate the deep, ice-free waters of Valdez Arm each day, handling more than 1.5 million barrels of crude oil (City of Valdez, 2002a).

The Valdez City Dock is a 183-meter (600-foot) wharf. The Valdez Container Terminal Dock is a 213-meter (700-foot) concrete floating dock; water depth at mean low tide is 15 meters (50 feet). This dock is designed as a multi-purpose berth to handle containerized, roll on/roll off, and lift on/lift off operations. (City of Valdez, 2002a)

Road Traffic
In Fairbanks, the Richardson Highway connects to the Steese Highway that follows the pipeline for 18 kilometers (11 miles) until the intersection with the Elliot Highway. In addition, approximately 284 secondary roads provide private access to the pipeline, pump stations, and airstrips. These highways, with the exception of the Dalton Highway, are typically asphalt-paved two-lane roads. In a populated center such as Fairbanks, more than two lanes may exist.

Except near Valdez and Fairbanks, traffic congestion is not a problem, although road maintenance activities may cause traffic delays. Annual ADT counts along the Richardson Highway vary significantly between Valdez and Fairbanks from approximately 300 to 22,400 vehicles per day, depending on location (see table 3.10.6-1). Traffic during the summer can be double the annual averages and is typically higher near the communities of Valdez, Glennallen, Delta Junction, and Fairbanks. (U.S. Department of the Interior, Bureau of Land Management, 2002)

Table 3.10.6-1: Average Daily Traffic Counts on the Richardson Highway for the Year 2000

<table>
<thead>
<tr>
<th>Richardson Highway Milepost</th>
<th>Annual ADTa</th>
<th>Mid-Summer ADTb</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP 3 (Valdez)</td>
<td>5,540</td>
<td>7,500</td>
</tr>
<tr>
<td>MP 62 (Ernestine Creek, near PS 12)</td>
<td>450</td>
<td>1,125</td>
</tr>
<tr>
<td>MP 118 (Gulkana Airport)</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>MP 218 (Trims Creek, near PS 10)</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>MP 345 (Moose Creek/Fairbanks)</td>
<td>9,100</td>
<td>11,000</td>
</tr>
<tr>
<td>MP 359 (Fairbanks)</td>
<td>22,400</td>
<td>26,400</td>
</tr>
</tbody>
</table>


3.10.7 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

3.10.7.1 Region of Influence
The ROI includes areas that may potentially be affected by the use of the Port of Valdez for the SBX, including the mooring sites as identified in section 2.3.1.10. Pier-side operations can be carried out for the SBX during limited time periods. Valdez does not maintain the pier capacity to commit pier-space year round for the SBX, which would yield to cruise ships. However, there are numerous mooring locations near the container dock for long-term operations.
3.10.7.2  Affected Environment

Energy

Copper Valley Electric Association, which provides electricity to the City of Valdez, derives much of its power from the 13-MW Solomon Gulch Hydroelectric Facility, owned by the Four Dam Pool Power Agency, and owns diesel plants in Glennallen and Valdez. Copper Valley Electric Association operates the hydroelectric plant, which is located in Valdez on Daysville Road; from here, units at all three generation facilities can be controlled. (Copper Valley Electric Association, Inc, 2003; Vacation Alaska.com, 2002) The Glennallen and Valdez plants are used for backup energy. The Valdez Diesel Plant houses three Fairbanks Morse 38D8 1/8 opposed piston units, three Enterprise DSR 46 units, and a trailer-mounted Solar Centaur turbine unit. The available generation capacity of this plant is 9.25 MW. (Copper Valley Electric Association, 2002) Currently, there is no electrical hookup at either of the two docks at Port of Valdez (Kinney, 2002).

Water

Valdez water is derived from four primary wells and is stored in two 2.8-million-liter (750,000-gallon) reservoirs before being piped for distribution throughout Valdez; over 95 percent of homes are fully plumbed, though many utilize individual wells. Water storage capacity is 8.48 million liters (2.24 million gallons). (Vacation Alaska.com, 2002) Over 6.8 million liters (1.8 million gallons) of water is provided daily to city residents (City of Valdez, 2002a). Water hookups are available at the Port of Valdez docks, which charge per 3,785-liter (1,000-gallon) units. This system is capable of servicing cruise ships of variable sizes, with records of typical demands ranging from 174,128 liters to 245,185 liters (46,000 gallons to 64,771 gallons). (Kinney, 2002)

Wastewater

The City of Valdez Wastewater Treatment Plant located on South Sawmill Road is capable of processing over 4.73 million liters (1.25 million gallons) of wastewater per day, with sewage deposited in a secondary treatment lagoon. Over 95 percent of homes are fully plumbed, though many utilize septic tanks. (Vacation Alaska.com, 2002) The average daily flow in 2001 was 3.56 million liters (0.94 million gallons) per day (U.S. Environmental Protection Agency, 2001b), but the Public Works Department of the City of Valdez cites current levels at the slightly lower rate of 3.3 million liters (0.87 million gallons) per day (City of Valdez, 2002b). Wastewater requirements at the Port of Valdez docks are handled by private contractor, and wastewater is trucked out as required, with levels on a case-by-case basis (Kinney, 2002).

Solid Waste

The Valdez Landfill, a Class 2 landfill operated by the City of Valdez on Glacier Haul Road, utilizes a bale fill system (Vacation Alaska.com, 2002). At the Port of Valdez docks, the City provides dumpsters to handle solid waste removal (Kinney, 2002).
3.10.8 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

Appendix B includes a description of visual and aesthetic resources and the analysis of the potential impacts from the Proposed Action.

3.10.8.1 Region of Influence

The ROI includes areas that may potentially be affected by the use of Port of Valdez for the SBX, including the mooring site identified in section 2.3.1.10.

3.10.8.2 Affected Environment

Essentially, the affected environment for Valdez, Alaska consists of the Port of Valdez and the surrounding areas of Prince William Sound. The Port of Valdez is primarily used to support the Trans-Alaska Pipeline which terminates at the Port of Valdez.

The average weather for Valdez consists of an annual temperature of 3°C (38°F), an annual precipitation of 163 centimeters (64 inches), an annual snowfall of 802 centimeters (316 inches), and approximately 16 days per year of heavy fog where visibility is less than 0.4 kilometer (0.25 mile).

Valdez is nestled among high mountain ranges that surround Prince William Sound. These ranges have an elevation of up to and exceeding 1,400 meters (4,600 feet).

Vegetation in and surrounding Valdez is classified as coastal forest which predominantly consists of evergreen forests coupled with deciduous forests in along the waterways and in disturbed areas. (Bureau of Land Management, 2002)

Facilities located in and around the Port of Valdez are primarily associated with the Trans-Alaska Pipeline. The city of Valdez maintains two hotels, two bed and breakfasts, a bank, and three recreational vehicle parks.

Those which may be affected by the Proposed Action visually include the sightseers and tourists, residents of Valdez and the surrounding areas, and those associated with the Trans-Alaska Pipeline.
3.11 BROAD OCEAN AREA (EXECUTIVE ORDER 12114)

Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, represents the U.S. Government's exclusive and complete determination of the procedural and other actions to be taken by federal agencies to further the purpose of the NEPA, with respect to the environment outside the United States, its territories and possessions. This Executive Order enables responsible officials of federal agencies to be informed of pertinent environmental considerations and to take such considerations into account, with other pertinent considerations of national policy in making decisions regarding proposed actions. While based on independent authority, it furthers the purpose of the NEPA and the Marine Protection Research and Sanctuaries Act of 1972 (33 USC §§ 1401 et seq.; 16 USC 1431 et seq.) and the Deepwater Port Act of 1974, as amended (33 USC §§ 1501-1524) consistent with the foreign policy and national security policy of the United States.

This section describes the baseline conditions within the BOA that may be affected by the GMD ETR activities. The information contained in this section is summarized from the Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement-Eglin Gulf Test Range (U.S. Department of the Air Force, 1998b), Pacific Missile Range Facility Enhanced Capability Final Environmental Impact Statement (Pacific Missile Range Facility, Barking Sands, 1998), North Pacific Targets Program Environmental Assessment (U.S. Army Space and Missile Defense Command, 2001b), and the Long Range Air Launch Target Environmental Assessment (U.S. Department of Defense, Missile Defense Agency, 2002). These documents included environmental analysis of potential impacts from missile launches and other military actions in the Gulf of Mexico and the Central and North Pacific. As appropriate, additional information used to develop this section is referenced accordingly.

Airspace, biological resources, health and safety, and transportation were identified as resource areas with potential impacts in the BOA. Water quality and noise are included in the analysis, from the standpoint of potential impacts on marine life.

With the BOA being the ROI, there is no potential for impacts to air quality, cultural resources, land use, geology and soils, hazardous materials and hazardous waste, socioeconomics, utilities, visual and aesthetic resources, water resources, and environmental justice. Similarly, since the BOA is well removed from islands and population centers, no impacts to the human noise environment, socioeconomics, and utilities are anticipated. Impacts to air quality from similar missiles and mobile sources have been determined to be insignificant.

Region of Influence

The ROI includes all areas that would be potentially affected by GMD test activities beyond the territorial limits of the United States. This includes areas within the Gulf of Mexico, the Atlantic Ocean, and the Pacific Ocean that may be affected by the SBX travel and operations. The Gulf of Mexico ROI would be limited to areas for sea trials and initial full power testing of the SBX. The enroute ROI, from the Gulf of Mexico to the Pacific Ocean, would most likely follow the coast of South America toward Cape Horn, and include full power calibration and tracking along the route. The Pacific Ocean Area ROI occupies approximately 7.1 million square kilometers (2.1 million square nautical miles) in the central north Pacific Ocean, or approximately 4 percent of the Pacific Ocean’s total area. The average depth of the Ocean Area ROI is 3,932 meters (12,900 feet).
3.11.1 AIRSPACE—BROAD OCEAN AREA

Appendix B includes a general description of airspace.

3.11.1.1 Affected Environment

Controlled and Uncontrolled Airspace

The airspace beyond the 22.2-kilometer (12-nautical-mile) limit is in international airspace. For this reason, the procedures of the ICAO, outlined in ICAO Document 4444-RAC/501, Rules of the Air and Air Traffic Services, are followed in this airspace (International Civil Aviation Organization, 1996; 1997). ICAO Document 4444-RAC/501 is the equivalent air traffic control manual to the FAA Handbook 7110.65, Air Traffic Control. However, the ICAO is not an active air traffic control agency, and has no authority to allow aircraft into a particular sovereign nation’s Flight Information Region or Air Defense Identification Zone, and does not set international boundaries for air traffic control purposes. Rather, the ICAO is a specialized agency of the United Nations, whose objective is to develop the principles and techniques of international air navigation, and to foster planning and development of international air transport. FAA Air Traffic Service outside U.S. airspace is provided in accordance with Article 12, Rules of the Air, and Annex 11, Air Traffic Regulations and Air Traffic Services, of the ICAO Convention. The FAA acts as the United States’ agent for aeronautical information to the ICAO.

3.11.1.1.1 Gulf of Mexico

The Gulf of Mexico ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace over the Gulf of Mexico. This includes the entire northern Gulf of Mexico within the Houston, Jacksonville, and Miami ARTCCs, and the Houston and Miami Oceanic CTA/FIR (figure 3.11.1–1).

Special Use Airspace

Special use airspace occupies a significant portion of the Gulf of Mexico ROI. Much of the eastern part of the Gulf of Mexico ROI is occupied by the Eglin Water Test Area (EWTA) (figure 3.11.1-1). The Letter of Agreement between Jacksonville ARTCC, Miami ARTCC, Houston ARTCC, U.S. Navy Training Wing 6, and the Air Force Development Test Center defines the EWTA as “... all airspace in Warning Areas W-151, W-155B, W-168, W-174, W-470, and the airspace divided into five (5) areas ...” These are described in annexes to the agreement (U.S. Department of the Air Force, 1998b). EWTA 6 was added in 1996. The six EWTAs serve a similar function as Warning Areas, via the NOTAM system, providing airspace for hazardous aircraft flying operations including air-to-surface, air-to-air, and surface-to-air activities. Almost all of the EWTAs lie outside the 22.2-kilometer (12-nautical-mile) limit of the National Airspace System and include EWTAs 1, 2, 3, 4, 5, and 6. Other special use airspace in the eastern part of the ROI includes the Tortugas Military Operations Area, due west of Key West.

Special use airspace areas in the western part of the Gulf of Mexico ROI include Warning Area W-453 south of Mobile, Alabama; Warning Areas W-92, W-59, and W-147A/B south and southwest of New Orleans, Louisiana; and Warning Areas W-147C/D/E, W-228, and W-602 off the Texas coast (figure 3.11.1-1).
Special Use Airspace Over the Gulf of Mexico

Figure 3.11.1-1
En Route Airways and Jet Routes

The Gulf of Mexico ROI airspace is crossed by numerous airways and jet routes, especially the important Gulf Route 26 and J-58-86 jet route (figure 3.11.1-2). An airway is a control area, or portion thereof, established in the form of a corridor up to but not including 5,486.4 meters (18,000 feet) mean sea level, the centerline of which is defined by radio navigational aids. The routes are referred to as Colored Federal Airways, or very high frequency omni-directional range airways over land, and A routes, or low frequency/medium frequency airways over water, with numbering to identify the designated route. A jet route is a route designed to serve aircraft operations from 5,486.4 meters (18,000 feet) mean sea level up to and including FL 450. The jet routes are referred to as J routes with numbering to identify the designated route.

Figure 3.11.1-3 presents an Aircraft Situation Display of the Gulf of Mexico ROI on Tuesday, 7 October 1997, at 9:30 a.m. (Martin, 1997). It represents a snapshot of all aircraft in the air at that time, taken from the radar at Jacksonville ARTCC. Clearly, the number of aircraft actually en route would vary by time of day, and also by week, month, or season, but the snapshot does give a representative account of the number of aircraft in the air over the Gulf of Mexico at a moment in time. Some 32 aircraft are in the overwater ROI. The snapshot also illustrates the relative low density of en route air traffic over the Gulf of Mexico, compared to the much higher density of air traffic over the mainland, and even along the Atlantic coast. Even so, most of the ROI air traffic in this snapshot is between the central and south Florida and New Orleans, Louisiana, area (figure 3.11.1-2). Approximately 500 aircraft each day use J58-86 or GR26 to transit the Gulf of Mexico between St. Petersburg/Sarasota, Florida, and New Orleans/Leesville, Louisiana. Of these, approximately 325, or 65 percent, operate during daylight hours (7:00 a.m. to 9:00 p.m. Eastern Daylight Time) (U.S. Department of the Air Force, 1998b). This translates into a nominal average of 23 aircraft per hour, assuming an even hourly distribution.

A new jet route across the northeastern Gulf of Mexico has been proposed by the FAA and agreed to by the U.S. Air Force. Although it has not yet been formalized, the route would accommodate the increased traffic across the Gulf of Mexico that is expected with the full implementation of the North American Free Trade Agreement. It would be an extension of the existing A-758 jet route northeast directly into Tampa Bay. This new route would cut across the northwest corner of W-168A. West of the new route, W-168A would still be used at 8,534.4 meters (28,000 feet) above ground level and below. Commercial aircraft would be assigned 8,839.2 meters (29,000 feet) above ground level and above (U.S. Department of the Air Force, 1998b).

Air traffic in the ROI is managed by the Houston, Jacksonville, and Miami ARTCCs and the Houston and Miami Oceanic CTA/FIRs.

The special use airspace areas in the Gulf of Mexico ROI are managed or scheduled by several organizations. The EWTA, the largest special use airspace complex in the ROI, is managed by Eglin AFB under a letter of agreement among Jacksonville ARTCC, Miami ARTCC, Houston ARTCC, U.S. Navy Training Wing 6, and the Air Force Development Test Center (U.S. Department of the Air Force, 1998b). There are some overlaps in airspace assignment, notably that Warning Area W-155B occupies some of Eglin AFB EWTA-1, and is used on a coordinated basis. Additionally, several portions of airspace adjacent to or overlapping these areas are used by Eglin AFB assigned units, but are managed by other organizations. Fleet area control and surveillance facility, NAS Pensacola, functions as the controller for the airspace assigned to their units.
En Route Airways and Jet Routes over the Gulf of Mexico

EXPLANATION

--- En Route High Altitude Jet Routes

En Route Low Altitude Airways and High Altitude Jet Routes


Scale

0 140 280 kilometers

0 87 174 miles

Gulf of Mexico

Figure 3.11.1-2

GMD ETR Final EIS

3-177
EXPLANATION

- Aircraft

Aircraft Situation Display of the Gulf of Mexico

Scale

0 140 280 kilometers

0 87 174 miles

When a requirement exists for use of airspace beyond the Warning Areas and above FL 240 (7,315.2 meters [24,000 feet]) that would impact Gulf Route 26, the airspace may not be scheduled for longer than a 4-hour block of time when the requirement is for a hazardous use of the airspace (such as missiles or drones). At FL 240 and below, it may not be scheduled for longer than 12 hours. There must be a 3-hour period between blocks of scheduled airspace (U.S. Department of the Air Force, 1998b).

3.11.1.1.2 En Route Gulf to Pacific

Special Use Airspace

Warning Areas are established in international airspace to contain activity that may be hazardous, and to alert pilots of nonparticipating aircraft to the potential danger. Warning areas along the route to the Pacific are shown on figure 3.11.1-4.

En Route Airways and Jet Routes

En route high altitude jet routes are shown on figure 3.11.1-4.

3.11.1.3 Pacific Ocean

The Pacific Ocean ROI includes the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace over the northern Pacific Ocean. This area includes the Los Angeles, Oakland, Anchorage, and Seattle ARTCCs.

Special Use Airspace

Domestic Warning Areas and Warning Areas are established in international airspace to contain activity that may be hazardous, and to alert pilots of nonparticipating aircraft to the potential danger (figure 3.11.1-5). The special use airspace PMRF includes Warning Area W-188 north of Kauai, and Warning Areas W-189 and W-190 north of Oahu. A Temporary Operating Area extends north and west of PMRF approximately 2,200 kilometers (1,367 miles). There are also numerous warning areas along the U.S. Pacific coastline.

En Route Airways and Jet Routes

Figure 3.11.1-6 shows en route high altitude jet routes.

The overseas high-altitude jet routes cross the southern part of the airspace ROI via nine CAE corridors off the California coast. These corridors can be opened or closed at the request of a user in coordination with the FAA. A Military Operations Area exists between users and the FAA to stipulate the conditions under which the CAEs can be closed to civil traffic. Under most circumstances, at least one CAE must remain available for use by general aviation and commercial air carriers.

The overseas high-altitude jet routes cross the northern part of the airspace ROI via five corridors off the California coast (see figure 3.11.1-6). These corridors and associated jet routes continue northwest to Alaska and then southwest to the orient.
EXPLANATION

- **Low Altitude Airway Routes**
- **High Altitude Airway Routes**
- **Low Altitude Special Use Airspace (Includes Warning Areas)**
- **High Altitude Special Use Airspace (Includes Warning Areas)**

**Special Use Airspace and Air Routes - Gulf of Mexico to Pacific Ocean**

**Source:** National Imagery and Mapping Agency, 2002

**Scale**

0 270 540 kilometers

0 168 336 miles

Figure 3.11.1-4
Figure 3.11.1-5

EXPLANATION

- Temporary Operating Areas
- Existing Warning Areas and Special Use Airspace

Source: Pacific Missile Range Facility, Barking Sands, 1998 (Modified).

Special Use Airspace

Pacific Ocean

Scale

0 675 kilometers
0 420 miles

GMD ETR Final EIS
Figure 3.11.1-6

High Altitude Jet Routes

As an alternative to aircraft flying above 8,839 meters (29,000 feet) following the published jet routes (figure 3.11.1-6), the FAA is gradually permitting aircraft to select their own routes as alternatives. This Free Flight program is an innovative concept designed to enhance the safety and efficiency of the National Airspace System. The concept moves the National Airspace System from a centralized command-and-control system between pilots and air traffic controllers to a distributed system that allows pilots, whenever practical, to choose their own route, and file a flight plan that follows the most efficient and economical route (Federal Aviation Administration, 1998).

Free Flight is already underway, and the plan for full implementation will occur as procedures are modified, and technologies become available and are acquired by users and service providers. This incremental approach balances the needs of the aviation community and the expected resources of both the FAA and the users. Advanced satellite voice and data communications are being used to provide faster and more reliable transmission to enable reductions in vertical, lateral, and longitudinal separation, more direct flights and tracks, and faster altitude clearances (Federal Aviation Administration, 1998). With full implementation of this program, the amount of airspace in the ROI that is likely to be clear of traffic will decrease as pilots, whenever practical, choose their own route and file a flight plan that follows the most efficient and economical route, rather than following the published jet routes.

In addition to the IFR high-altitude jet routes and low-altitude airways used by commercial aircraft, general aviation aircraft fly unrestricted in accordance with VFR within the Military Operations Areas below FL 180.

3.11.2 BIOLOGICAL RESOURCES—BROAD OCEAN AREA

Marine biology of the BOA consists of the animal and plant life that lives in and just above the surface waters of the sea and its fringes, the salient physical and chemical properties of the ocean, biological diversity, and the characteristics of its different ecosystems or communities.

3.11.2.1 Affected Environment

3.11.2.1.1 Gulf of Mexico

Vegetation

Marine vegetation such as seagrasses and benthic (bottom-dwelling) algae are attached to the bottom and are dependent on light. Therefore, they generally are found in shallow, sunlit depths of less than 18 meters (60 feet). Within the eastern Gulf of Mexico, the most common seagrasses are turtle grass, shoal grass, and manatee grass. Less common species include stargrass and paddle grass. Seagrass communities are further discussed below under sensitive habitats. (U.S. Department of the Air Force, 1998b)

Wildlife

The bottlenose dolphin is the most common marine mammal in south Florida waters and feeds on fish in seagrass beds. Fish representative of species common to the Gulf of Mexico along the north Florida shore include skipjack herring, sea catfish, spotfin mojarra, Atlantic croaker, Gulf flounder, bluefish, and Florida pompano. Fish species that are representative of species common to the Gulf of Mexico along the south Florida shore include dolphin, red grouper,
hogfish, red snapper, black grouper, cobia, king mackerel, Spanish mackerel, and greater amberjack. (U.S. Department of the Air Force, 1998b)

Pelagic seabirds can be found in the Gulf of Mexico throughout the year. Numerous migratory or nonresident birds cross the Gulf of Mexico during summer and fall migrations. Approximately two thirds of the breeding birds of the eastern United States migrate to Central and South America, Mexico, and the Caribbean. The migratory route for many of these species includes the Gulf of Mexico. Fall migration occurs between September and October; spring migration peaks in late April. Some of the commonly observed migratory birds within the eastern Gulf of Mexico are blue-winged teal, ruby-throated hummingbird, upland sandpiper, cattle egret, black tern, storm petrel, and mourning dove. (U.S. Department of the Air Force, 1998b)

**Threatened and Endangered Species**

*Species with Federal Status Known to Occur in the Gulf of Mexico*

The Florida manatee (*Trichechus manatus*) is a federal and state endangered species. Most of the manatees are located along the Atlantic shore of Florida, with smaller numbers occurring in the Florida Keys and along the Gulf of Mexico.

The Gulf sturgeon (*Acipenser oxyrhinchus desotoi*) is a federally threatened fish that migrates from saltwater into large coastal rivers to spawn and spend the warm months. It is found predominately in the northeastern Gulf of Mexico from the Mississippi Delta east to Tampa Bay. This species is almost depleted throughout most of its range. Analysis of stomach contents of the sturgeon suggests that this species could feed as far as 32 kilometers (20 miles) offshore. (U.S. Department of the Air Force, 1998b)

Five species of sea turtles occur in the Gulf of Mexico (table 3.11.2-1). The hawksbill is seen regularly in the waters near the Florida Keys. The loggerhead is the most commonly seen sea turtle in the southeastern United States and may be found near underwater structures and reefs. Adult Kemp’s Ridley sea turtles (*Lepidochelys kempii*) are usually confined to the Gulf of Mexico and have the most restricted distribution of any sea turtle. Green sea turtles occur throughout the Gulf of Mexico, but appear to be particularly common in the southern Gulf of Mexico region. Green sea turtles are frequently found in the Gulf of Mexico in areas where there is an abundance of seagrass. The leatherback sea turtle, a migratory species that nests in the tropics, has a world-wide distribution (U.S. Department of the Air Force, 1996). Loggerhead and leatherback sea turtles are the most frequently sighted species.

Most sea turtles in the Gulf of Mexico typically occur in relatively shallow nearshore waters close to coastal feeding and nesting areas. Exceptions are hatchlings that are likely to be found near Sargassum rafts and the leatherback that is known to prefer deeper water (U.S. Department of the Air Force, 1998b).
Table 3.11.2-1: Species with Federal Status Known to Occur in the Gulf of Mexico

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>State</th>
<th>Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marine Mammals</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balaenoptera borealis</td>
<td>Sei whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Balaenoptera musculus</td>
<td>Blue whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Balaenoptera physalus</td>
<td>Fin whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Eubalaena glacialis</td>
<td>Right whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Megaptera novaeangliae</td>
<td>Humpback whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Physeter catodon</td>
<td>Sperm whale</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Trichechus manatus</td>
<td>Florida manatee</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Turtles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caretta caretta</td>
<td>Atlantic loggerhead turtle</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>Chelonia mydas</td>
<td>Atlantic green turtle</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Dermochelys coriacea</td>
<td>Leatherback turtle</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Eretmochelys imbricata</td>
<td>Atlantic hawksbill turtle</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Lepidochelys kempii</td>
<td>Kemp's Ridley turtle</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acipenser oxyrinchus desotoi</td>
<td>Gulf sturgeon</td>
<td>SC</td>
<td>T</td>
</tr>
</tbody>
</table>

E – Endangered  
T – Threatened  
SC – Species of Concern  

Six endangered species of whales have the potential to occur in the Gulf of Mexico: the fin whale, Sei whale (*Balaenoptera borealis*), right whale (*Eubalaena glacialis*), humpback whale, blue whale (*Balaenoptera musculus*), and sperm whale.

**Sensitive Habitats**

Seagrass habitats have been declining, according to recent studies, mainly in highly developed, industrialized, or populated areas. Most causes of decline are related to habitat alteration, such as dredging, wetland filling, and removal of submergent vegetation. Boating has also contributed to the direct destruction of seagrass habitat. Much of the seafood consumed in this country is dependent on seagrass community food chains. Seagrass beds serve as nurseries for juveniles of a variety of fin and shellfish. Seagrasses also stabilize sediments by reducing water velocity and forming a complex matrix that binds sediments and retards erosion (U.S. Department of the Air Force, 1998b).

Extensive coral reefs occur offshore of the Florida Keys archipelago. Coral reefs also extend into the Gulf of Mexico from Key West to the Content Keys. Coral reefs thrive in relatively warm, clear waters with normal marine salinities. Corals derive nutrition from algae that require light. Most reef corals are colonial organisms. Two species of fire corals, or branching corals, occur on Florida reefs: the bladed fire coral and the crenulated fire coral. (U.S. Department of the Air Force, 1998b)
Octocorals, which include sea whips, sea plumes, sea fans, gorgonians, and soft corals, are found on most Florida Keys reefs. Sixty-three species of stony corals have been identified in the Florida Keys. Stony corals with octocorals form the reef canopy. Branching corals along with the reef framework provide shelter for fish. The coral canopy provides shelter from larger predators that occur along the reef margin. (U.S. Department of the Air Force, 1998b)

Several areas or habitats in the Gulf of Mexico are afforded special protection or recognition. Aquatic preserves are state-owned submerged lands with outstanding biological or scientific features. These lands are managed to ensure that development activities are compatible with goals of resource protection. The Gulf Islands National Seashore was established in 1971 to preserve and maintain historic and natural features. It is composed of three mainland tracts in Pensacola and Gulf Breeze, Florida, and Ocean Springs, Mississippi, and 241.4 kilometers (150 miles) of islands from Ship Island, Mississippi, to Santa Rosa Island. (U.S. Department of the Air Force, 1998b)

The Florida Keys National Marine Sanctuary consists of 7,251 square kilometers (2,800 square miles) of nearshore waters extending from just south of Miami to the Dry Tortugas. The Dry Tortugas were declared a National Park in 1992 and have the least disturbed coral reef system in the continental United States. The Florida Middle Grounds contains the principal hard-bottom in the United States and is the northernmost extent of coral reefs in the Gulf of Mexico. This live bottom area supports a variety of species similar to typical Caribbean reef communities. The Florida Middle Grounds are sensitive to environmental change. (U.S. Department of the Air Force, 1998b)

3.11.2.1.2 En Route Gulf of Mexico to Pacific Ocean

The route from the Gulf of Mexico to the Pacific Ocean would most likely follow the coast of South America toward Cape Horn since the vessel would not be able to pass through the Panama Canal. The Atlantic Ocean, the second largest of the world’s five oceans after the Pacific Ocean, covers an area of approximately 77 million square kilometers (30 million square miles). The equator divides the Atlantic into the North Atlantic Ocean and the South Atlantic Ocean. The southern Atlantic has a counterclockwise warm water current system. Natural resources in this region include oil and gas fields, fish, marine mammals (seals and whales), and sand and gravel aggregates. Endangered marine species include the manatee, seals, sea lions, sea turtles, and whales. (Central Intelligence Agency, Directorate of Intelligence, 2002a)

3.11.2.1.3 Pacific Ocean

The general composition of the ocean includes water, sodium chloride, dissolved gases, minerals, and nutrients. These characteristics determine and direct the interactions between the seawater and its inhabitants. The most important physical and chemical properties are salinity, density, temperature, pH, and dissolved gases. For oceanic waters, the salinity is approximately 35 parts of salt per 1,000 parts of seawater.

Most organisms have a distinct range of temperatures in which they may thrive. A greater number of species live within the moderate temperature zones, with fewer species tolerant of extremes in temperature. Most areas of the Pacific maintain a temperature of 4°C (39.2°F).
Surface seawater often has a pH between 8.1 and 8.3 (slightly basic), but generally is very stable with a neutral pH. The amount of oxygen present in seawater will vary with the rate of production by plants, consumption by animals and plants, bacterial decomposition, and surface interactions with the atmosphere. Most organisms require oxygen for their life processes. Carbon dioxide is a gas required by plants for photosynthetic production of new organic matter. Carbon dioxide is 60 times more concentrated in seawater than it is in the atmosphere.

Coastal Zone
The coastal zone is defined as that area which typically extends from the high tide mark on the land to the gently sloping, relatively shallow edge of the continental shelf, the submerged part of the continents. This may differ from the way the term coastal zone is defined in the Hawaii Revised Statutes, Chapter 205A, Coastal Zone Management.

Although it makes up less than 10 percent of the ocean’s area, the coastal zone contains 90 percent of all marine species. The sharp increase in water depth at the edge of the continental shelf separates the coastal zone from the offshore zone. (Pacific Missile Range Facility, Barking Sands, 1998)

The coastal zone includes several different ecosystems including coral reefs, estuaries, and coastal wetlands. There are no estuaries or coastal wetlands in the BOA ROI. Coral reefs are the world’s oldest and most diverse and productive ecosystems—the marine equivalent of tropical rain forests. Species diversity associated among reef communities is probably the highest of all biological habitats in the sea. (Pacific Missile Range Facility, Barking Sands, 1998)

Ocean Zones
Classification of the Pacific Ocean zones is based upon depth and proximity to land. Using this methodology, there are four major divisions or zones in the ocean: the littoral zone, the coastal zone, the offshore zone, and the pelagic zone. Spanning across all zones is the benthic environment, or sea floor. This section discusses the pelagic zone and the benthic environment.

The pelagic zone is commonly referred to as the open ocean. The organisms that inhabit the open ocean typically do not come near land, continental shelves, or the seabed. Approximately 2 percent of marine species live in the open ocean.

The bottom of the sea floor is known as the benthic area. It comprises 98 percent of the species of animals and plants in the ocean. Less than 1 percent of benthic species live in the deep ocean below 2,000 meters (6,562 feet).

Biological Diversity
Marine life ranges from microscopic one-celled organisms to the world’s largest animal, the blue whale. Marine plants and plant-like organisms can live only in the sunlit surface waters of the ocean, the photic zone, which extends to only about 101 meters (330 feet) below the surface. Beyond the photic zone, the light is insufficient to support plants and plant-like organisms. Animals, however, live throughout the ocean from the surface to the greatest depths.
The organisms living in pelagic communities may be drifters (plankton) or swimmers (nekton). The plankton consists of plant-like organisms and animals that drift with the ocean currents, with little ability to move through the water on their own. The nekton consists of animals that can swim freely in the ocean, such as fish, squids, and marine mammals. Benthic communities are made up of marine organisms, such as kelp, sea grass, clams, and other species that live on or near the sea floor.

**Threatened and Endangered Species**

Species identified as threatened or endangered that exist in the Ocean Area ROI, listed in table 3.4.2-1 include the sei whale, blue whale, fin whale, humpback whale, sperm whale, Hawaiian monk seal, loggerhead sea turtle, green sea turtle, leatherback sea turtle, hawksbill sea turtle, and olive ridley sea turtle.

**Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve**

In order to “ensure the comprehensive, strong, and lasting protection of the coral reef ecosystem and related marine resources and species (resources) of the Northwestern Hawaiian Islands,” Executive Order 13178, *Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve*, created the reserve so named in December 2000. Executive Order 13196, *Final Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve*, amended Executive Order 13178 by finalizing several of its provisions.

The reserve lies to the northwest of the main islands of the Hawaiian chain. The Reserve includes submerged lands and waters of the Northwestern Hawaiian Islands, extending approximately 2,220 kilometers (1,200 nautical miles) long and 185 kilometers (100 nautical miles) wide. The Reserve is adjacent to and seaward of the seaward boundaries of the State of Hawaii and the Midway Atoll National Wildlife Refuge. The Reserve also includes the Hawaiian Islands National Wildlife Refuge to the extent that it expands beyond the seaward boundaries of the State of Hawaii. The seaward boundary of the Reserve is 93 kilometers (50 nautical miles) from the approximate geographical centerline of Nihoa, Necker, French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan, Lisianski, Pearl and Hermes Reef, Midway Atoll, and Kure (figure 3.11.2-1). (Federal Register, 2000a)

**3.11.3 HEALTH AND SAFETY—BROAD OCEAN AREA**

**3.11.3.1 Affected Environment**

The U.S. marine transportation system encompasses a national and global network of navigable ocean, lake, river, and inland waterway routes; the vessels that carry waterborne commerce; a complex of ports and terminals serving as intermodal points of transfer between the water system and the land-based transportation modes; ship operators; an extensive supplier base; and shipboard, shipyard, and longshore labor forces.

The International Maritime Organization (IMO) is a specialized agency of the United Nations, whose objective is to develop and facilitate the general adoption of the highest practicable standards in matters of ship safety, training, operation, construction, certification, efficiency of navigation, and pollution prevention and control. The Maritime Safety Committee is IMO’s senior technical body on safety-related matters.
Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve

EXPLANATION

PMRF = Pacific Missile Range Facility


Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve

Open Ocean

Figure 3.11.2-1

GMD ETR Final EIS
IMO has also developed and adopted international collision regulations and global standards for seafarers, as well as international conventions and codes relating to search and rescue, the facilitation of international maritime traffic, load lines, the carriage of dangerous goods, pollution and tonnage measurement.

The Act to Prevent Pollution from Ships (33 USC §§ 1901 et seq.) was amended by the Marine Plastic Pollution Research and Control Act of 1987, which implemented the provisions of Annex V, Special Areas, of Garbage Discharges for Navy Ships into the International Maritime Convention for the Prevention of Pollution From Ships (relating to garbage and plastics). Annex V and the regulations implementing it apply to all vessels, whether seagoing or not, regardless of flag, on the navigable waters of the United States and in the exclusive economic zone of the United States. It applies to U.S. flag vessels wherever they are located.

Under the regulations implementing the Act to Prevent Pollution from Ships as amended by the Marine Plastic Pollution Research and Control Act, the discharge of plastics, including synthetic ropes, fishing nets, plastic bags, and biodegradable plastics, into the water is prohibited. Discharge of floating dunnage, lining, and packing materials is prohibited in the navigable waters and in areas offshore less than 46.3 kilometers (25 nautical miles) from the nearest land. Food waste or paper, rags, glass, metal, bottles, crockery and similar refuse cannot be discharged in the navigable waters or in waters offshore inside 22.2 kilometers (12 nautical miles) from the nearest land. Finally, food waste, paper, rags, glass, and similar refuse cannot be discharged in the navigable waters or in waters offshore inside 5.6 kilometers (3 nautical miles) from the nearest land. There are some exceptions for emergencies. Under the Act to Prevent Pollution from Ships, the definition of ship includes fixed or floating platforms. There are separate garbage discharge provisions applicable to these units. For these platforms, and for any ship within 500 meters (1,640 feet) of these platforms, disposal of all types of garbage is prohibited. Additionally, all manned, oceangoing U.S. flag vessels of 12.2 meters (40 feet) or more in length engaged in commerce, and all manned fixed or floating platforms subject to the jurisdiction of the United States, are required to keep records of garbage discharges and disposals (International Year of the Ocean, 1998a). Appendix B provides additional the laws, regulations and standards concerning maritime safety and EMR.

The WorldWide Navigational Warning Service is a worldwide radio and satellite broadcast system for the dissemination of Maritime Safety Information to U.S. Navy and merchant ships. The WorldWide Navigational Warning Service provides timely and accurate long range and coastal warning messages promoting the safety of life and property at sea and Special Warnings that inform mariners of potential political or military hazards that may affect safety of U.S. shipping. The world is divided into 16 Navigational Areas (NAVAREAs) for global dissemination of Maritime Safety Information. National Imagery and Mapping Agency is the coordinator of NAVAREAs IV and XII and is staffed 24 hours a day, 365 days a year. NAVAREA IV broadcasts cover the waters contiguous to North America from the Atlantic coast eastward to 35°W and between latitudes 7°N and 67°N, whereas NAVAREA XII broadcasts cover the waters contiguous to North America extending westward to the International Date Line and from 67°N to the equator east of 120°W, south to 3°25’S, then east to the coast.

Management of U.S. ports and its waterways system is spread among various federal agencies and stakeholders exercising specific authorities (International Year of the Ocean, 1998b). For example, the Department of Transportation Act (49 USC 101, et seq.) gives the DOT the responsibility to oversee the national transportation system. Other authorities relevant to marine
transportation can be found in USC 14, 16, 19, 33, 46 and 49 (International Year of the Ocean, 1998b). The primary maritime organizations within the DOT are the U.S. Coast Guard and the Maritime Administration.

The U.S. Coast Guard serves as Vice Chair to the National Response Team which chaired by the EPA. The National Response Center serves as the sole national point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories. The National Response Team, along with Regional Response Teams, is the federal component of the National Response System, which responds to emergency discharges of oil and releases of chemicals.

The U.S. Coast Guard also acts as the United States’ agent for maritime information to the IMO.

3.11.3.1.1 Gulf of Mexico

The Gulf of Mexico ROI is defined as the overwaters, as well as the areas extending from the sea surface to the ocean floor that could be potentially affected by the Proposed Action, including the deployment/use of an XBR. The ROI includes the entire northern Gulf of Mexico within the ports of Tampa, Florida; Mobile, Alabama; New Orleans and Lake Charles, Louisiana; and Beaumont, Houston, Galveston, and Corpus Christi, Texas. The ROI for health and safety is based on the area where effects to human exposure, navigation and communication facilities/equipment (military and nonmilitary), fuels, and any existing EMR using portions of the international waters off the Gulf of Mexico could occur.

The ROI for EMR human health effects includes an area up to 85 meters (280 feet) from the SBX platform. Potential interference distances for certain electronic equipment and civilian aircraft includes an area up to 9.5 kilometers (5.9 miles) from the SBX platform for a half populated array and 19 kilometers (11.8 miles) for a fully populated array. Appendix B includes a general description of the health and safety resource area and a detailed discussion of the laws, regulations, and standards concerning maritime safety and EMR.

Section 3.11.1 provides a discussion of potentially affected special use airspace occupying the Gulf of Mexico. Section 3.11.4 provides a detailed discussion of seaports, shipping lanes and transportation issues. There are approximately 4,021 producing oil platforms located within the ROI. (Mineral Management Services, 2001)

The U.S. Coast Guard Atlantic Area Districts 7 (Florida) and 8 (Louisiana) serve the Gulf of Mexico ROI. The U.S. Coast Guard coordinates with and is supported by numerous organizations and authorities utilizing the Gulf Coast ROI including, but not limited to, Eglin AFB, NAS Pensacola, and the Military Sealift Command (U.S. Navy).

3.11.3.1.2 En Route Gulf of Mexico to Pacific Ocean

Warning Areas are established in international airspace and waters to contain activity that may be hazardous, and to alert pilots and captains of nonparticipating vessels to the potential danger. Specific Use Airspace and Air Routes over the Gulf of Mexico and the Pacific Ocean are shown on figure 3.11.1-4.
3.11.3.1.3 Pacific Ocean

The affected health and safety environment for the Pacific Ocean Area is described in detail within each potential range or PSB location in terms of its principal attributes, namely, range control procedures and verification of Ocean Area clearance procedures.

The Pacific Ocean ROI is defined as the overwaters, as well as the areas extending from the sea surface to the ocean floor that could be potentially affected by the Proposed Action, including the deployment/use of an XBR. The ROI occupies the central north Pacific Ocean. A detailed discussion of airspace, jet routes, seaports and shipping lanes occupying the Pacific Ocean is provided in section 3.11.1.1.3.

The U.S. Coast Guard Pacific Area Districts 11 (California), 14 (Hawaii) and 17 (Alaska) serve the Pacific Ocean ROI. Warning Areas are established in international airspace and waters to contain activity that may be hazardous, and to alert pilots and captains of nonparticipating vessels to the potential danger.

3.11.4 TRANSPORTATION—BROAD OCEAN AREA

Appendix B includes a general description of transportation.

The potential transportation issue related to the proposed activities is that of marine shipping. Marine shipping refers to the conveyance of freight, commodities, and passengers via mercantile vessels.

3.11.4.1 Affected Environment

3.11.4.1.1 Gulf of Mexico

Intracoastal Waterway

A substantial amount of domestic waterborne commerce along the Gulf Coast does not use open Gulf of Mexico waters. For transportation commodities, the Gulf Coast Intracoastal Waterway is the primary route; it is estimated that 40 percent of the world’s commerce passes within 1.5 days’ sailing time of the port of Key West (U.S. Department of the Air Force, 1998b).

Primary canals in the Gulf Coast Intracoastal Waterway include the New Orleans-Rigolet Cut, the Port-Arthur-Corpus Christi Channel, and the Inner Harbor Navigational Canal at New Orleans (U.S. Department of the Air Force, 1998b).

Commerce in the Gulf Coast Intracoastal Waterway has grown appreciably over the years, from 5.978 billion kilograms (6.59 million tons) in 1938 to 91.625 kilograms (101 million tons) in 1985 (U.S. Department of the Air Force, 1998b).

Within the ROI, 1995 total tonnage (including domestic coastwise tonnage) for the Gulf Coast Intracoastal Waterway was 107.05 billion kilograms (118.0 million tons); this was an increase of 0.3 percent over 1994 (U.S. Department of the Air Force, 1998b). For this same period, 3.688 billion kilograms (4.065 million tons) were transported between Apalachee Bay and Panama City; 6.94 billion kilograms (7.651 million tons) were transported from Panama City to
Pensacola; and 10.002 billion kilograms (11.025 million tons) were transported from Pensacola to Mobile Bay, Alabama (U.S. Department of the Air Force, 1998b). Commodities shipped included coal, petroleum, chemical products, fuels, and manufactured goods.

Based upon March 1997 estimates, this total decreased slightly by 1.8 percent to 105.051 billion kilograms (115.8 million tons) in 1996. This averages to approximately 10.9 percent of the internal U.S. waterways’ national domestic total for the 2 years. (U.S. Department of the Air Force, 1998b)

Gulf Shipping Lanes

Figure 3.11.4-1 represents a graphical representation of ships’ location within the Gulf of Mexico at a single point in time during 1997 (4,786 locations are presented). The major shipping lanes will normally have two or more vessels track to its next port of call throughout the day.

Table 3.11.4-1 provides the average number of ships in the Gulf of Mexico ports during 1994-1995.

<table>
<thead>
<tr>
<th>Port</th>
<th>Number of Ships</th>
<th>Number of Ship Movements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. New Orleans, Louisiana</td>
<td>2,894</td>
<td>13,539</td>
</tr>
<tr>
<td>2. Houston, Texas</td>
<td>1,842</td>
<td>12,022</td>
</tr>
<tr>
<td>3. Tampa, Florida</td>
<td>759</td>
<td>3,723</td>
</tr>
<tr>
<td>4. Mobile, Alabama</td>
<td>704</td>
<td>2,377</td>
</tr>
<tr>
<td>5. Corpus Christi, Texas</td>
<td>589</td>
<td>3,256</td>
</tr>
<tr>
<td>6. Galveston, Texas</td>
<td>559</td>
<td>1,847</td>
</tr>
<tr>
<td>7. Texas City, Texas</td>
<td>491</td>
<td>2,449</td>
</tr>
<tr>
<td>8. Lake Charles, Louisiana</td>
<td>453</td>
<td>1,991</td>
</tr>
<tr>
<td>9. Beaumont, Texas</td>
<td>410</td>
<td>1,611</td>
</tr>
<tr>
<td>10. Port Arthur, Texas</td>
<td>392</td>
<td>1,380</td>
</tr>
<tr>
<td>TOTAL</td>
<td>9,093</td>
<td>44,195</td>
</tr>
</tbody>
</table>


Port to port travel within the Gulf of Mexico accounts for approximately 31 percent of the tank ships and 36 percent of the cargo ships leaving American ports. About 80 percent of the tank ships and 70 percent of the cargo ships leaving Mexican ports travel to other ports in the region. Major commodities shipped between ports in the region include crude oil, iron and steel products, iron ore, industrial and agricultural chemicals, coal, marine shells, sand, gravel, containerized cargo (such as processes food and equipment), and refined petroleum products (U.S. Department of the Air Force, 1998b).

Some 61 percent of the vessels entering and leaving the region move through the Florida Straits (U.S. Department of the Air Force, 1998b). This traffic passes back and forth under EWTAs 1, 2, 3, 4, 5, and 6 before converging under Warning Area 174 (Navy) to enter or exit the Gulf of Mexico. The remaining vessels travel through the Yucatan Channel and pass under EWTAs 1, 2, and 4.
EXPLANATION

- Ship

Density of Shipping - Single Point in Time


Figure 3.11.4-1
The Gulf of Mexico has 490 public and private seaports with a total of 787 berths, accounting for 25.6 percent of the Nation’s total. Seven of the top ten U.S. ports are located in the Gulf region, testament to its importance in U.S. commerce. For 1995, the Port of South Louisiana (ranked first in U.S. port tonnage) handled 26.2 billion kilograms (28.87 million tons) of imported goods and 62.3 billion kilograms (68.64 million tons) of exports (table 3.11.4-2) (U.S. Department of the Air Force, 1998b).

<table>
<thead>
<tr>
<th>State</th>
<th>Shipping to Domestic in kilograms (tons)</th>
<th>Shipping to Foreign in kilograms (tons)</th>
<th>Receiving - Domestic in kilograms (tons)</th>
<th>Receiving - Foreign in kilograms (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>8.28 billion (9.12 million)</td>
<td>13.34 billion (14.18 million)</td>
<td>15.94 billion (17.57 million)</td>
<td>10.62 billion (11.71 million)</td>
</tr>
<tr>
<td>Florida</td>
<td>12.4 billion (13.67 million)</td>
<td>20.68 billion (22.8 million)</td>
<td>50.13 billion (55.26 million)</td>
<td>20.35 billion (22.432)</td>
</tr>
<tr>
<td>Georgia</td>
<td>701.25 million (773,000)</td>
<td>7.39 billion (8.15 million)</td>
<td>2.90 billion (3.19 million)</td>
<td>6.74 billion (7.44 million)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>88.68 billion (97.76 million)</td>
<td>111.02 billion (122.38 million)</td>
<td>127.42 billion (140.47 million)</td>
<td>97.76 billion (107.76 million)</td>
</tr>
<tr>
<td>Mississippi</td>
<td>11.98 billion (13.21 million)</td>
<td>3.13 billion (3.46 million)</td>
<td>7.75 billion (8.54 million)</td>
<td>14.51 billion (16 million)</td>
</tr>
<tr>
<td>Texas</td>
<td>43.9 billion (48.39 million)</td>
<td>47.66 billion (52.54 million)</td>
<td>24.25 billion (26.73 million)</td>
<td>156.85 billion (172.88 million)</td>
</tr>
</tbody>
</table>

Note: Data does not allow differentiation between Gulf and Atlantic shipping for Georgia and Florida
Source: U.S. Department of the Air Force, 1998b

Fifteen of the top 50 U.S. ports for non-containerized materials such as coal, petroleum, food, and farm products are in the Gulf of Mexico.

3.11.4.1.2 En Route from Gulf of Mexico to the Pacific Ocean

The enroute ROI, from the Gulf of Mexico to the Pacific Ocean, would most likely follow the coast of South America toward Cape Horn.

The transit period would permit opportunities for testing, including full power calibration and tracking along the route. For periodic testing, the SBX would stop at predetermined locations during transit. The appropriate NOTMARs and NOTAMs would be issued and testing would ensue.

The SBX with retractable thrusters would have a 15.2-meter (50-foot) draft (during transit) and a 26- to 28-meter (85.3- to 91.8-foot) draft during operations. Because most harbors do not have the necessary depth to accommodate the SBX, even with retractable thrusters, it may not enter any port facilities after it leaves its assembly point in the Gulf of Mexico. More than one escort ship may accompany the SBX during its transit around South America and during testing.

Established shipping routes would be utilized during this 7-month test trip.
3.11.4.1.3 Pacific Ocean

The northern Pacific is an important commercial seaway, carrying a substantial proportion of the United States’ trade in raw materials and finishing products. In 1996, about 21 percent of all commercial vessels importing and exporting goods to and from the United States to 30 ports departed from, or were bound for, ports on the U.S. Pacific seaboard (Pacific Missile Range Facility, Barking Sands, 1998). The large majority of these vessels crossed the northern Pacific Ocean, to and from the large trading ports of Asia.

There are no regulations or directions obliging commercial vessels to ply specific cross-ocean lanes. Once it has left the navigation lanes leading out to the open sea, the majority of shipping will follow the course of least distance between two ports.

A composite “snapshot” of shipping in the Pacific, generated from satellite data for the busiest months of the year, is shown in figure 3.11.4-2. It shows the number of ships traveling across the northern Pacific in August 1997, with each ship identified and located once. The figure includes cargo vessels, tankers, passenger ships, and fishing vessels, and characterizes the random nature of commercial shipping movements in the northern Pacific.

The data shows that, while there is a general adherence to particular routes (such as the great circles of latitude between the United States to Asian ports), commercial vessels plot a diverse range of courses across the northern Pacific. This was confirmed by the National Imagery and Mapping Agency, which stated that it no longer published shipping routes for the northern Pacific for precisely this reason.
Composite Snapshot of Ship Locations in the Northern Pacific

EXPLANATION

- Ship

3.12 ENVIRONMENTAL JUSTICE

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued by President Clinton on 11 February 1994. Objectives of the Executive Order as it pertains to this EIS include development of federal agency implementation strategies; identification of minority and low-income populations where proposed federal actions have disproportionately high and adverse human health and environmental effects; and participation of minority and low-income populations. Accompanying Executive Order 12898 was a Presidential Transmittal Memorandum, which referenced existing Federal statutes and regulations to be used in conjunction with the Order. The memorandum addressed the use of the policies and procedures of NEPA. Specifically, the memorandum indicated that “each Federal agency shall analyze the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 USC Section 4321 et. seq.”

An Environmental Justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. No adverse long-term impacts have been identified at any of the locations analyzed in this EIS. As such, there would be no disproportionately high and adverse human health or environmental effects on the minority or low-income populations that may be present in the vicinity of those locations. Thus, no Environmental Justice impacts are anticipated and additional Environmental Justice analysis will not be presented in this document.

Vandenberg AFB personnel suggested that Environmental Justice could be an issue if the potential exists for disproportionate effects on local Native Americans from the proposed project. However, initial analysis of the Environmental Justice issues, with respect to Chumash Indian uses of cultural areas in the vicinity of the proposed project locations, indicate that there should be no disproportionate impacts. Chumash use of the areas in question should be affected no more than that of other groups who access the base for recreation, fishing, etc. Furthermore, the proposed project requires only infrequent closures of the areas in question. Therefore, Environmental Justice is not an issue warranting in-depth analysis at Vandenberg AFB.
4.0 ENVIRONMENTAL CONSEQUENCES

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This chapter describes the potential environmental consequences associated with each location that may be affected by the Proposed Action, action alternatives, and the No Action Alternative along with the identification of potential cumulative impacts and mitigation measures. To assess the potential for and significance of environmental impacts from the proposed program activities, a list of activities was developed (chapters 1.0 and 2.0) and the environmental setting was described, with emphasis placed on any special environmental sensitivities (chapter 3.0). Program activities were then compared with the potentially affected environmental components to determine the environmental impacts of the proposed activities. To help define the affected environment and determine the significance of program-related effects, personal, written, and telephone contacts were made with applicable agencies.

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. For this EIS, potential cumulative impacts are addressed for past, present, and future actions. Future actions were identified based on review of installation and regional land use plans and discussions with installation and regional planners.

Consistent with CEQ regulations, the scope of the analysis presented in this section was defined by the range of potential environmental impacts that could result. Resources that have a potential for impacts were considered in the analysis to provide the decision makers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 14 resource areas, which are discussed as applicable for each location.

Sections 4.1 through 4.11 provide discussions of the potential environmental consequences of the proposed GMD ETR program activities and the No Action Alternative. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.12 through 4.18 provide discussions of the following with regard to proposed program activities: conflicts with federal, state, and local land use plans, policies, and controls for the area concerned; energy requirements and conservation potential; natural or depletable resource requirements and conservation potential; adverse environmental effects that cannot be avoided; relationship between short-term use of the human environment and the maintenance and enhancement of long-term productivity; irreversible or irretrievable commitment of resources; Executive Order 13045, Federal Actions to Address Protection of Children from Environmental Health Risks and Safety Risks; and a summary of unresolved issues.
4.1 KODIAK LAUNCH COMPLEX

4.1.1 AIR QUALITY—KODIAK LAUNCH COMPLEX

This section addresses potential environmental impacts from changes in the air quality environment due to the proposed construction and operation of the GBI, target, IDT, and sensor elements of the GMD ETR at KLC, as well as the identification of potential cumulative impacts and mitigation measures. Impacts considered include potential effects from ongoing or planned activities at this site. Potential impacts were determined using the following criteria:

- Operations within attainment areas that could cause a detrimental change in attainment status of the area.
- Increases in ambient air pollutant concentration that could cause exceedances of the NAAQS or state AAQS.
- The U.S. Air Force standard for hydrogen chloride is 2 parts per million (ppm) for 60 minutes and 10 ppm for a maximum instantaneous level. These standards are based upon measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches (National Research Council, Commission of Life Sciences, Board of Environmental Studies and Toxicology, Committee on Toxicology, Subcommittee on Rocket Emission Toxicants, 1998).
- The standard used for aluminum oxide is 150 micrograms per cubic meter (µg/m³) is based upon the maximum NAAQS level of PM-10 concentrations over a 24-hour period.
- Increases in air pollutant concentrations greater than 1 µg/m³ (averaged over 24 hours) from new or modified major stationary sources within 10 kilometers (6 miles) of a Class I area.

Appendix B includes a detailed description of these air quality standards.

4.1.1.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches of all types covered by the launch site operator’s license would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. Missile propellant information for previous and predicted launches at KLC is shown in table 4.1.1-1.

The KLC EA predicted, under worst-case meteorological conditions, that NAAQS, Alaska AAQS, and U.S. Air Force and Non-criteria Pollutant guidance levels would not be exceeded during up to nine launches per year of the Athena-2, using Castor 120™ motors for propulsion (Federal Aviation Administration, 1996).
Table 4.1.1-1: Missile Propellant Information for Previous and Predicted Launches at KLC

<table>
<thead>
<tr>
<th>Missile</th>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ait</td>
<td>Stage I</td>
<td>6,296 (13,880)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>1,658 (3,655)</td>
</tr>
<tr>
<td>QRLV-1</td>
<td>Single Stage</td>
<td>4,705 (10,372)</td>
</tr>
<tr>
<td>QRLV-2</td>
<td>Single Stage</td>
<td>6,235 (13,748)</td>
</tr>
<tr>
<td>Athena-1</td>
<td>Stage I</td>
<td>48,876 (107,754)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>48,876 (107,754)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>9,766 (21,530)</td>
</tr>
<tr>
<td>Athena-2</td>
<td>Stage I</td>
<td>48,876 (107,754)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>9,766 (21,530)</td>
</tr>
<tr>
<td>Strategic Target System</td>
<td>Stage I</td>
<td>9,422 (20,772)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>4,025 (8,874)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>414 (913)</td>
</tr>
</tbody>
</table>


Operational emissions predicted at KLC include existing stationary sources. These stationary sources include three standby diesel generators operating at a maximum of 5 hours during launches, 1 hour per week for testing during non-launch periods and during commercial power outages (approximately 240 hours per year). Air quality impacts from these sources are considered to be temporary. (Federal Aviation Administration, 1996) Table 4.1.1-2 lists the estimated emissions generated by the four standby generators at KLC. KLC currently maintains a Pre-approved Limit Permit for these generators.

Table 4.1.1-2: Existing Generator Emissions at KLC

<table>
<thead>
<tr>
<th>Emissions (240 hours/year)</th>
<th>Oxides of Nitrogen metric tons (tons)/year</th>
<th>Hydrogen Chloride metric tons (tons)/year</th>
<th>Carbon Monoxide metric tons (tons)/year</th>
<th>PM-10 metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.76 (3.04)</td>
<td>0.37 (0.41)</td>
<td>3.46 (3.81)</td>
<td>0.14 (0.15)</td>
</tr>
</tbody>
</table>

Upper Atmosphere

According to the KLC EA, potential contributions to the upper atmosphere include emissions from ground-level operations and exhaust emissions from launch vehicles. Up to nine launches per year of the Athena-2, using the Castor 120™ motors for propulsion, were determined by the KLC EA to have a small impact on the levels of ozone found in the stratosphere; however, the release of chlorine (from the chemical reaction from the release of hydrogen chloride) and alumina (from the chemical reaction from the release of aluminum oxide) into the stratosphere would make a minimal contribution to the overall impact of ozone depletion. (Federal Aviation Administration, 1996)
Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, no impacts to air quality would occur from launches at KLC.

4.1.1.2 Alternative 1

4.1.1.2.1 Ground-Based Interceptors

Construction

Construction at KLC, as described in section 2.3.1.1, would disturb approximately 14.4 hectares (35.5 acres). The majority of the ground disturbance would occur within 1 year, and it is projected that construction would take up to 15 months to complete. Construction emissions vary from day to day and activity to activity, with each activity having its own potential to release emissions. Because of the variability in timing and intensity of construction, estimating construction-phase pollutant emissions is difficult. Nevertheless, it is assumed that there would be PM-10 impacts from ground disturbance and other pollutants (carbon monoxide, oxides of nitrogen, volatile organic compounds, and oxides of sulfur) primarily emitted from construction equipment exhaust. Potential construction emissions were determined by using emission factors from various sources including the EPA. Conservative estimates are based on building square footage, acreage disturbed, and duration of construction, as well as general meteorological and soil information. For purposes of determining the level of fugitive dust generated, it was assumed all grading would be accomplished during the first year. Potential fugitive dust amounts were estimated using Air Quality Thresholds of Significance spreadsheets. Table 4.1.1-3 lists estimated carbon monoxide, oxides of nitrogen, volatile organic compounds, oxides of sulfur, and PM-10 emissions from construction equipment, earth moving and commuting workers anticipated during 15 months of construction of GBI facilities. Best Management Practices including proper tuning and preventative maintenance of construction vehicles would serve to minimize exhaust emissions and maximize vehicle performance.

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 (metric tons)</th>
<th>Year 2 (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>9.0 (10.5)</td>
<td>3.4 (3.8)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>13.7 (15.1)</td>
<td>3.0 (3.3)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>1.76 (1.94)</td>
<td>0.58 (0.64)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.78 (0.86)</td>
<td>0.14 (0.15)</td>
</tr>
<tr>
<td>PM-10</td>
<td>34 (37.5)</td>
<td>-</td>
</tr>
</tbody>
</table>

Approximately 68 metric tons (75 tons) of PM-10 could be produced during the construction of the facilities. Best Management Practices would be used to reduced PM-10 emissions by half to approximately 34 metric tons (37.5 tons) using dust suppression measures such as periodically watering the areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near
the work areas, and wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas.

For conservative analytical purposes, it is assumed that 50 of the 100 additional construction personnel would utilize an existing mancamp located approximately 4 kilometers (3 miles) from the construction site. The remaining 50 were assumed to commute to and from the City of Kodiak or to and from accommodations in the area surrounding KLC. Commuting emission levels were based upon federal primary exhaust emission standards for vehicles for an entire day of commuting (to KLC and back). If either the additional mancamp was constructed or the existing mancamp was added to, then all 100 construction personnel would be housed in close proximity to KLC, greatly reducing the potential commuting emissions.

Construction emission levels are below \textit{de minimis} levels set by the federal government for non-attainment areas. The \textit{de minimis} thresholds are federal limits listed in 40 CFR 51.583(b)(1). Federal actions with emissions below the \textit{de minimis} levels are presumed to conform, that is, not cause or contribute to new violations of NAAQS, in areas that are in non-attainment. For the least severe nonattainment areas, the \textit{de minimis} level for each criteria pollutant (and their precursors, in the case of ozone) is 90.7 metric tons (100 tons) per year.

Construction would be conducted in accordance with applicable federal and state regulations and permits. While the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former level. Since the area is currently in attainment for all federal standards and construction emissions would be within \textit{de minimis} levels for non-attainment areas, it is anticipated that the proposed construction would not cause exceedances of the NAAQS or Alaska AAQS and would not have a long-term impact to air quality in the area.

\textbf{Operation}

\textit{Pre-Launch Activities}

The manufacturing of GBI vehicle components would occur offsite in existing facilities that normally perform this type of production, and emissions at these locations have not been included in the scope of this EIS. The components would arrive complete, requiring only final onsite safety and quality checks before assembly.

Pre-launch activities would include the transportation of the interceptor missile boosters, payloads, and support equipment by either air or ship. This transportation would result in some mobile exhaust emission, but these emissions would be intermittent and would not have a measurable impact on regional air quality. The interceptor could arrive at KLC with the EKV attached, or the booster may be shipped separately from the EKV. Either way, integration and assembly operations would be performed at KLC.

Onsite fueling of the interceptor or EKV would not be required; the interceptor motor would utilize pre-loaded solid propellants. Each EKV would contain pre-loaded liquid propellant and oxidizer. The propellants would be delivered to the launch site in pre-filled and sealed tanks that would be ready to be installed onto the vehicle. Installation would only require mechanical tubing connections.
During nominal propellant tank installation, the propellants remain sealed inside their tanks. The likelihood of an accidental release of the liquid fuel or oxidizer would be low. However, if such an accident were to occur, it would most likely occur during missile assembly. Table 4.1.1-4 indicates the results of analysis using the U.S. Air Force Toxic Corridor Model computer model to determine distances at which the Immediately Dangerous to Life and Health (IDLH) health standard could be exceeded assuming all 7.5 liters (2 gallons) of fuel and 5.5 liters (1.5 gallons) of oxidizer were released to the atmosphere during an accident. The IDLH is the level of exposure (not time-weighted) above which it is thought a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment. The IDLH level was the only level of concern as others are based on time weighted averages over prolonged exposures.

<table>
<thead>
<tr>
<th>Propellant</th>
<th>Health Standard</th>
<th>Standard Limit</th>
<th>Exceedance Distance b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine</td>
<td>NIOSH IDLH a</td>
<td>50 ppm (66.5 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Methyl Hydrazine</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (38.4 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (liquid)</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (36 mg/m³)</td>
<td>60 meters (197 feet)</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (gas)</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (36 mg/m³)</td>
<td>30 meters (98 feet)</td>
</tr>
</tbody>
</table>

Source: Center for Disease Control and Prevention, 2002a, b; Asia Pacific Space Launch Centre EIS Site, 2002.

a The National Institute for Occupational Safety and Health (NIOSH) Immediately Dangerous to Life and Health (IDLH) is the level of exposure (not time-weighted) above which it is anticipated a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment.

b Exceedance Distance—Average of U.S. Air Force Toxic Corridor model results for 15-minute and 30-minute averaging time and multiple stability classes.

ppm = parts per million by volume.
mg/m³ = milligrams per cubic meter.

Actual hazard distances would depend on the propellant released, the amount released, meteorological conditions, and emergency response measures taken. AADC's approved SOPs would be implemented and would include personal protection equipment procedures. Establishment of and adherence to these SOPs would minimize the potential hazards to personnel in the unlikely event of an unplanned propellant release. The low likelihood of such an event and the implementation of approved emergency response plans would limit the impact of such a release.

Personnel would include a combination of contractor, military, and government civilian. The largest manpower buildup at KLC would be 55 the first month, 120 the second month, and 235 the third month to support a dual interceptor launch. It is assumed that approximately 50 personnel would be housed at the existing mancamp on Kodiak Ranch. If the additional mancamp is not constructed on KLC or the existing mancamp is not added on to, then it is conservatively estimated that the remaining 185 personnel would commute daily to KLC from accommodations in the surrounding areas and within the City of Kodiak during a peak month. Commuting emission levels were based upon federal primary exhaust emission standards for vehicles for an entire day of commuting (to and from KLC) and estimated to be 2.0 metric tons (2.2 tons) of carbon monoxide and 0.24 metric tons (0.26 tons) of oxides of nitrogen.
Offsite power sources are planned for primary use, with emergency generators supplying backup power. The emergency backup generators would be operated under appropriate permits and restrictions. In addition to the generators themselves, appropriate ASTs would be installed adjacent to each generator. Table 4.1.1-5 lists the generator and AST sizes for each facility. Table 4.1.1-6 lists the possible emissions associated with each generator.

### Table 4.1.1-5: Potential Generator and Aboveground Storage Tanks for GBI Facilities at KLC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Generator</th>
<th>Aboveground Storage Tanks</th>
<th>Operation hours/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile Assembly Building</td>
<td>500 kW</td>
<td>9,464 (2,500)</td>
<td>250</td>
</tr>
<tr>
<td>Oxidizer Storage</td>
<td>60 kW</td>
<td>2,082 (550)</td>
<td>250</td>
</tr>
<tr>
<td>Mechanical/Electrical</td>
<td>1,650 kW</td>
<td>1,893 (500)</td>
<td>250</td>
</tr>
<tr>
<td>Entry Control</td>
<td>60 kW</td>
<td>2,082 (550)</td>
<td>250</td>
</tr>
</tbody>
</table>

### Table 4.1.1-6: Potential Generator Emissions at KLC

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen (tons)/year</th>
<th>Hydrogen Chloride (tons)/year</th>
<th>Carbon Monoxide (tons)/year</th>
<th>PM-10 (metric tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBI Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 kW Diesel Generator</td>
<td>1.2 (1.3)</td>
<td>0.16 (0.18)</td>
<td>1.5 (1.6)</td>
<td>0.06 (0.07)</td>
</tr>
<tr>
<td>60 kW Diesel Generator</td>
<td>0.14 (0.15)</td>
<td>0.020 (0.021)</td>
<td>0.17 (0.19)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>1,650 kW Diesel Generator</td>
<td>3.8 (4.2)</td>
<td>0.54 (0.59)</td>
<td>4.7 (5.2)</td>
<td>0.23 (0.25)</td>
</tr>
<tr>
<td>60 kW Diesel Generator</td>
<td>0.14 (0.15)</td>
<td>0.020 (0.021)</td>
<td>0.17 (0.19)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>Target Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 kW Diesel Generator</td>
<td>0.14 (0.15)</td>
<td>0.020 (0.021)</td>
<td>0.17 (0.19)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>500 kW Diesel Generator</td>
<td>1.2 (1.3)</td>
<td>0.16 (0.18)</td>
<td>1.5 (1.6)</td>
<td>0.06 (0.07)</td>
</tr>
<tr>
<td>IDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>275 kW Diesel Generator</td>
<td>0.60 (0.70)</td>
<td>0.09 (0.10)</td>
<td>0.80 (0.90)</td>
<td>0.03 (0.04)</td>
</tr>
<tr>
<td>Sensors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 kW Diesel Generator</td>
<td>0.077 (0.085)</td>
<td>0.011 (0.012)</td>
<td>0.096 (0.106)</td>
<td>0.0045 (0.0050)</td>
</tr>
<tr>
<td>10 kW Diesel Generator</td>
<td>0.077 (0.085)</td>
<td>0.011 (0.012)</td>
<td>0.096 (0.106)</td>
<td>0.0045 (0.0050)</td>
</tr>
<tr>
<td>TPS-X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 MW Diesel Generator</td>
<td>34.8 (38.3)</td>
<td>4.19 (4.62)</td>
<td>43.1 (47.5)</td>
<td>2.04 (2.25)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>42.17 (46.42)</td>
<td>5.22 (5.75)</td>
<td>52.30 (57.58)</td>
<td>2.45 (2.71)</td>
</tr>
</tbody>
</table>

The generators would operate as backup during launches, weekly for testing during non-launch periods, and during commercial outages. The total operating time is estimated at a maximum of 250 hours per year. Use of these generators would require an amendment to the existing Pre-approved Limit Permit.
Table 4.1.1-6 also shows the total emissions from GBI, target, IDT, sensors, and TPS-X at KLC. Although not in a non-attainment area, these totals are below the de minimis thresholds and therefore would not cause exceedances of the NAAQS or Alaska AAQS.

Launch Activities

Alternative 1 includes up to a total of five missile launches (GBI and target combined) per year at KLC over the duration of the test program. Table 4.1.1-7 lists propellant information for the proposed GBI. Table 4.1.1-8 lists possible emissions from stage one of the proposed single GBI launch.

Table 4.1.1-7: Propellant Information for Proposed GBI at KLC

<table>
<thead>
<tr>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>15,069 (33,221)</td>
</tr>
<tr>
<td>Stage II</td>
<td>3,926 (8,655)</td>
</tr>
<tr>
<td>Stage III</td>
<td>772 (1,701)</td>
</tr>
</tbody>
</table>

Table 4.1.1-8: Potential GBI Stage 1 Exhaust Emissions (Single Launch) at KLC

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Stage 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide metric tons (tons)</td>
<td>3.01 (3.32)</td>
<td></td>
</tr>
<tr>
<td>Carbon Monoxide metric tons (tons)</td>
<td>0.98 (1.08)</td>
<td></td>
</tr>
<tr>
<td>Carbon Dioxide metric tons (tons)</td>
<td>1.47 (1.62)</td>
<td></td>
</tr>
<tr>
<td>Nitrogen metric tons (tons)</td>
<td>5.77 (6.36)</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride metric tons (tons)</td>
<td>1.77 (1.95)</td>
<td></td>
</tr>
<tr>
<td>Water metric tons (tons)</td>
<td>1.93 (2.13)</td>
<td></td>
</tr>
<tr>
<td>Other metric tons (tons)</td>
<td>0.16 (0.18)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Nyman, 2003

Dual GBI launches were analyzed using Open Burn/Open Detonation Dispersion Model (OBODM) to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. Table 4.1.1-9 lists emission concentrations and standards. As shown on table 4.1.1-9, concentrations produced by dual launches of a dual GBI would remain within NAAQS, Alaska AAQS, and U.S. Air Force standards. It is anticipated that a nominal single launch would also remain within NAAQS and U.S. Air Force standards as fewer emissions would be released during a single launch.

While the area KLC is located in is in attainment for all federal emission standards, federal de minimis threshold limits listed in 40 CFR were used to compare oxides of nitrogen and carbon monoxide. In the event that five GBIs were launched in a year, the conservatively estimated annual emissions for oxides of nitrogen were determined to be 28.8 metric tons (31.8 tons), below the 45.4-metric-ton (50-ton) standard. Carbon monoxide was calculated at 4.9 metric tons (5.4 tons) for five launches, which is well below the 90.7-metric-ton (100-ton) annual standard.
### Table 4.1.1-9: Potential GBI Exhaust Emissions (Dual Launch) at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Averaging Period</th>
<th>Dual Launch Emissions</th>
<th>On-Pad Dual Accident Emissions</th>
<th>Emissions Standards level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>0.25 ppm</td>
<td>0.009 ppm</td>
<td>35 ppm (1)</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour</td>
<td>3 μg/m³</td>
<td>0.2 mg/m³</td>
<td>150 μg/m³ (2)</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour</td>
<td>0.3 ppm</td>
<td>3 ppm</td>
<td>2 ppm (3)</td>
</tr>
<tr>
<td></td>
<td>Peak</td>
<td>5 ppm</td>
<td>36 ppm</td>
<td>10 ppm (3)</td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS
(2) Based upon the maximum NAAQS level of PM-10 concentrations over a 24-hour period
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

Personnel would be evacuated to a safe distance before a launch according to established launch procedures as stated in section 3.1.7, Health and Safety. Due to the mobile nature of the interceptor itself, only a small portion of the launch exhaust would be emitted near the ground. With typical meteorological conditions, prevailing winds from the northwest, the ground-cloud of exhaust would be carried to the ocean. In all cases of weather conditions, significant air quality impacts due to missile launches are not anticipated.

If flight termination becomes necessary, the potential resulting fire would cause short-term impacts to air quality in the form of combustion byproducts and potentially hazardous fumes. Most or all of the solid propellant fuel would likely burn up before being extinguished. These combustion byproducts would be similar to those previously described for a nominal launch.

Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of an on-pad accident involving dual GBIs. The modeling showed that both the 1-hour and peak hydrogen chloride Air Force standards would be exceeded (table 4.1.1-9). The 8-hour, 24-hour, and IDLH hydrogen chloride standards were not exceeded. All other standards would continue to be within NAAQS and Alaska AAQS. The consequences to regional air quality would be localized for both the 1-hour and peak hydrogen chloride Air Force standard (exceedance out to 1 kilometer [0.6 mile] and 3.7 kilometers [2.3 miles], respectively beyond the KLC boundary) and would be of a short duration. The modeling included both day and nighttime meteorological data. The nighttime data is generally very calm wind conditions which results in higher emission concentrations. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and the conservative nature of the modeling data inputs, the impact to regional air quality is considered minor.

**Post-Launch Activities**

Post-launch activities would include the removal of all mobile equipment and assets brought to KLC. A negligible impact would be anticipated to air quality resulting from slightly increased vehicular emissions and localized amounts of fugitive dust (PM-10).
4.1.1.2.2 Targets

Construction

Approximately 10.5 hectares (26 acres) of land would be disturbed during the construction of target facilities. Calculation of construction emissions followed the same methodology as described in section 4.1.1.2.1. Table 4.1.1-10 lists estimated carbon monoxide, oxides of nitrogen, volatile organic compounds, and oxides of sulfur emissions anticipated during up to 15 months of construction of target missile facilities. Best Management Practices, including proper tuning and preventive maintenance of construction vehicles, would serve to minimize exhaust emissions and maximize vehicle performance.

Table 4.1.1-10: Potential Construction Emissions for Target Facilities at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 metric tons (tons)</th>
<th>Year 2 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>9.0 (10.3)</td>
<td>3.4 (3.5)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>13.7 (15.1)</td>
<td>3.0 (3.3)</td>
</tr>
<tr>
<td>Volatile Organic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compounds</td>
<td>1.76 (1.94)</td>
<td>0.58 (0.64)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.78 (0.86)</td>
<td>0.14 (0.15)</td>
</tr>
<tr>
<td>PM-10</td>
<td>25 (27.5)</td>
<td></td>
</tr>
</tbody>
</table>

Approximately 50 metric tons (55 tons) of PM-10 could be produced during the construction of the facilities. The use of Best Management Practices would reduce this number by half to approximately 25 metric tons (27.5 tons) using dust suppression measures such as periodically watering the areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near the work areas, and wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas. Impacts due to personnel at KLC for construction of target facilities would be the same as those described in section 4.1.1.2.1 for construction of GBI facilities.

Operation

Pre-Launch Activities

Pre-launch activities include the transportation of the target to KLC and assembly of the target at KLC. The mobile exhaust emissions resulting from transportation of the target would be intermittent and would not have a measurable impact to regional air quality. The targets would be assembled and stored in the Missile Assembly Building until launch.

If used as a target, the fourth stage of a Peacekeeper target would utilize a single liquid propellant (hydrazine), and onsite fueling would be required. Although total vapor emissions can vary depending on the propellant transfer equipment used and how it is assembled, it is anticipated that only very small amounts (approximately 10 grams [0.4 ounce]) of vapors would be released to the atmosphere during the transfer operation. These normal fueling operations would marginally impact air quality for momentary periods of time.

It is unlikely that a propellant release larger than that described above would occur at KLC. However, if such an accidental release were to occur, it would most likely occur during fueling. A reasonable scenario would involve failure of the transfer equipment or valves. The analysis
assumes a leak contained over a 3-minute period that releases up to 17 liters (4.5 gallons) of hydrazine fuel. Analysis indicated no potential exceedances of the IDLH health standard of 50 ppm. The low likelihood of such an occurrence and the implementation of approved emergency response plans would limit the impact of such a release.

Emergency generators would supply backup power to target facilities with offsite commercial power sources. The emergency backup generators would be operated under appropriate permits and restrictions. In addition to the generators themselves, appropriate ASTs would be installed adjacent to each generator. Table 4.1.1-11 lists the generators and the size of ASTs for each facility.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Generator</th>
<th>Aboveground Storage Tank</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile Assembly Building</td>
<td>500 kW</td>
<td>9,464 (2,500)</td>
<td>250</td>
</tr>
<tr>
<td>Movable Missile Building</td>
<td>500 kW</td>
<td>9,464 (2,500)</td>
<td>250</td>
</tr>
<tr>
<td>Missile Storage</td>
<td>60 kW</td>
<td>2,082 (550)</td>
<td>250</td>
</tr>
</tbody>
</table>

The generators would operate as backup during launches, weekly for testing during non-launch periods, and during commercial outages. The total time of operation is estimated at a maximum of 250 hours per year. Emissions produced during the generators’ expected limited operation are listed in table 4.1.1-6. Use of these generators would require an amendment to the existing Pre-approved Limit Permit. These levels of emissions would not be expected to impact regional air quality.

**Launch Activities**

Proposed target launches would be similar to previous target launches at KLC. These land launched target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. Table 4.1.1-12 lists missile propellant information, and table 4.1.1-13 lists potential emission constituents during Stage I for each proposed missile. A total of five missile launches (GBI and/or target) per year would be anticipated at KLC over the duration of the program.

Each launch is a discrete event. The logistics of the launch would allow sufficient time between launches so that no exhaust from one launch would impact the ambient air quality of another launch. The conclusion presented in the KLC EA was that overall impacts to regional air quality are not expected to be adverse and would remain within NAAQS and state AAQS for a single launch of the Athena 2 missile with the Castor 120™ motor. (Federal Aviation Administration, 1996) The nominal launch of a single Peacekeeper Target is anticipated to remain within NAAQS, Alaska AAQS, and Air Force standards as, the first stage of a Peacekeeper Target is a military version of the Castor 120 motor used in the Athena 2 missile.
Dual Peacekeeper Target launches were analyzed using OBODM to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. Dual emissions were modeled using the Peacekeeper Target as it is the largest of the proposed target vehicles. Emission concentrations and standards are listed in table 4.1.1-14. As shown in table 4.1.1-14, the level of hydrogen chloride would be below the 1-hour Air Force standard, but would exceed the peak hydrogen chloride standard for a short duration (out to a distance of 400 meters (1312 feet) beyond the KLC boundary). The 8-hour, 24-hour, and IDLH hydrogen chloride standards were not exceeded. Other emissions are shown to be within NAAQS standards.
Table 4.1.1-14: Potential Peacekeeper Target Exhaust Emissions (Dual Launches) at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Averaging Period</th>
<th>Dual Launch</th>
<th>Dual On-Pad Accident</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>1.8 ppm</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.014 ppm</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour</td>
<td>16 μg/m³</td>
<td>150 μg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.3 mg/m³</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour</td>
<td>1 ppm</td>
<td>5 ppm</td>
<td>2 ppm</td>
</tr>
<tr>
<td></td>
<td>Peak</td>
<td>13 ppm</td>
<td>67 ppm</td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS  
(2) Based upon the maximum NAAQS level of PM-10 concentrations over a 24-hour period  
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

KLC is considered to be in attainment for all federal emission standards; however, federal de minimis threshold limits listed in 40 CFR were used to compare levels of carbon monoxide and oxides of nitrogen. In the event that five Peacekeeper Target launches occur in a year, the conservative calculation of annual emissions of carbon monoxide would be 48.8 metric tons (53.8 tons), which is below the 90.7-metric-ton (100-ton) annual standard. Emissions of oxides of nitrogen were estimated to be 18.3 metric tons (20.2 tons), also below the de minimis standard of 45.3 metric tons (50 tons).

Personnel would be evacuated to a safe distance before a launch according to established launch procedures as stated in section 3.1.7, Health and Safety. Due to the mobile nature of the target missiles, only a small portion of the launch exhaust would be emitted near the ground. With typical meteorological conditions, prevailing winds from the northwest, the ground-cloud of exhaust would be carried to the ocean. In all cases of weather conditions, significant air quality impacts due to missile launches are not anticipated.

If flight termination becomes necessary, the potential resulting fire would cause short-term impacts to air quality in the form of combustion byproducts and potentially hazardous fumes. Most or all of the solid propellant fuel would likely burn up before being extinguished. These combustion byproducts would be similar to those previously described for a nominal launch.

Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of on-pad accidents involving dual Peacekeeper Targets. The model results show that both the 1-hour and peak hydrogen chloride Air Force standards would be exceeded (table 4.1.1-14). The 8-hour, 24-hour, and IDLH hydrogen chloride standards were not exceeded. All other standards would continue to be within NAAQS and Alaska AAQS. The consequences to regional air quality would be localized for both the 1-hour and peak hydrogen chloride Air Force standard (exceedance out to 6.5 kilometers [4 miles] and 7 kilometers [4.3 miles], respectively beyond the KLC boundary) and would be of a short duration. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and the conservative nature of the modeling data inputs, the impact to regional air quality is considered minor.
Post-Launch Activities

Post launch activities would include the removal of all mobile assets brought to KLC. This removal could result in small localized amounts of PM-10, which would have only minor impacts to air quality.

4.1.1.2.3 In-Flight Interceptor Communication System Data Terminal

Construction

Alternative 1 would require the construction of one IDT (among three alternative sites), one COMSATCOM (among four alternatives), and connecting roads. The greatest emissions would be during site preparation activities that include grubbing and clearing of vegetation, site grading and stockpiling of soil and select fill materials. The largest of the IDT sites would require approximately 5.9 hectares (14.6 acres) of land to be disturbed, and one COMSATCOM site would disturb 2.8 hectares (7.0 acres). Potential construction emissions for both the largest IDT site and one COMSATCOM are listed in table 4.1.1-15.

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.72 (0.79)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>3.30 (3.60)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>0.51 (0.57)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.23 (0.25)</td>
</tr>
<tr>
<td>PM-10</td>
<td>20.5 (23.0)</td>
</tr>
</tbody>
</table>

Construction activities for IDT and COMSATCOM facilities could produce approximately 41 metric tons (46 tons) of PM-10. It is anticipated that this PM-10 volume would be reduced by half to 20.5 metric tons (23 tons) through implementation of Best Management Practices for dust suppression during site preparation activities. Only minor impacts would be anticipated to air quality from construction activities. Site preparation activities would be relatively short in duration affect a relatively small footprint, and would employ a variety of Best Management Practices.

Operation

Operation of the IDT and COMSATCOMs would have little effect on regional air quality. Power would be provided by offsite commercial power sources, however in the event of loss of power a 275 kW diesel generator would be utilized along with the 3,785-liter (1,000-gallon) AST for fuel. Emissions produced during the generator’s limited operation are listed in table 4.1.1-6. These levels of emissions would not be expected to impact regional air quality. The generator would be tested weekly during non-launch periods and during power outages, approximately 250 hours a year. Use of this generator would require an amendment to the existing Pre-approved Limit Permit.
Personnel associated with the IDT and COMSATCOMs would be included in the up to 235 personnel needed to support a dual interceptor launch and would not cause an additional air quality impact.

### 4.1.1.2.4 Sensors

#### Construction

Alternative 1 would utilize an existing gravel pad area for mobile telemetry and would not require new construction; therefore there would be no air quality impacts.

#### Operation

Operation of the mobile telemetry would have a minor impact on the regional air quality. Power would be provided by two 10-kW generators for the mobile telemetry. Anticipated emissions from the use of these generators would be for a 1-week period, up to five times per year. Table 4.1.1-6 lists the possible emissions from use of the generators. Use of these generators would require an amendment to the existing Pre-approved Limit Permit.

### 4.1.1.2.5 TPS-X

#### Construction

The installation of the TPS-X at KLC would require the construction of a pad for the 38- by 58-meter (125- by 190-foot) hardstand and disturbance of approximately 0.3 hectare (0.8 acre). The potential TPS-X location would be the same as for the potential IDT site south of the Loran-C Station. Table 4.1.1-16 lists estimated emission levels of carbon monoxide, oxides of nitrogen, volatile organic compounds, oxides of sulfur and PM-10.

#### Table 4.1.1-16: Potential TPS-X Construction Related Emissions at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.039 (0.043)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>0.18 (0.20)</td>
</tr>
<tr>
<td>Volatile Organic</td>
<td></td>
</tr>
<tr>
<td>Compounds</td>
<td>0.028 (0.031)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.012 (0.013)</td>
</tr>
<tr>
<td>PM-10</td>
<td>0.77 (0.85)</td>
</tr>
</tbody>
</table>

It is anticipated that the volume of PM-10 produced during construction would be reduced by half through the implementation of Best Management Practices for dust suppression during site preparation activities.

#### Operation

The prime power unit for the TPS-X at KLC would be a 1.5-MW generator that would provide power to the radar during testing. The generator is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during launch activities. The total time of operation is estimated at a maximum of 2,520 hours per year. Potential generator emissions for
the TPS-X are listed in table 4.1.1-6. Use of this generator would require an amendment to the existing Pre-approved Limit Permit.

4.1.1.3 Alternative 2

4.1.1.3.1 Targets

Target activities associated with Alternative 2 would be similar to those of Alternative 1.

Construction

Construction would include a total disturbed area of 10.5 hectares (26 acres), the same as identified for Alternative 1. Construction impacts would be as described for Alternative 1.

Operation

Operation impacts from pre-launch, launch, and post-launch activities of target launches in Alternative 2 would be similar to those described for target launches in Alternative 1 in section 4.1.1.2.2.

4.1.1.3.2 Sensors

Effects from construction and operation of a mobile telemetry at KLC for Alternative 2 would be the same as described for the sensors of Alternative 1 in section 4.1.1.2.4.

4.1.1.4 Alternative 3

Alternative 3 would include all aspects of Alternative 1. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and launch impacts for Alternative 3 would be as described for Alternative 1.

4.1.1.5 Cumulative Impacts

Due to the limited industrialization of Kodiak Island and the surrounding environment, the potential cumulative impacts to air quality due to the proposed interceptor and target facility construction and launches would not be substantial. No other construction is anticipated to occur at the same time as the proposed construction activities. The KLC EA indicated no significant impacts to air quality as a result of nine annual launches and that impacts do not accumulate with multiple launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA.

Dual launches of either interceptors or targets would result in increased exhaust emissions compared to a single launch. However, the emissions would disperse quickly and the overall air quality would continue to remain within NAAQS and Alaska AAQS. Proposed activities along with current activities at KLC, including the use of three standby generators, are not anticipated to result in cumulative impacts to air quality.
4.1.1.6 Mitigation Measures

No air quality mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.2 AIRSPACE—KODIAK LAUNCH COMPLEX

Site preparation activities for interceptor, target missiles, IDT, or the TPS-X would have no impact on controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI. Since site preparation activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from the airport air traffic control tower, decrease airport capacity or efficiency, affect future VFR or IFR, or affect the usable length of an existing or planned runway, they would also not constitute an obstruction to air navigation.

Potential impacts from flight test activities are discussed below for each alternative.

4.1.2.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. The use of KLC for flight preparation and launches has been analyzed in the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b), the KLC EA (Federal Aviation Administration, 1996) and two U.S. Air Force documents (U.S. Department of the Air Force, 1997a; 2001). These documents concluded that close coordination with the FAA would result in no adverse effects to airspace from launches at KLC.

Under the MDA’s No Action Alternative, KLC would continue to conduct up to nine launches per year through September 2003 as specified in the current launch site operator license. The current license is scheduled for renewal in September 2003. The new license, if issued would outline the terms under which launches would be conducted at KLC. The renewal period would be for another 5 years.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to airspace from launches at KLC.

4.1.2.2 Alternative 1

Potential airspace impacts from implementation of the Proposed Action include the following activities:

- Potential impacts to controlled and uncontrolled airspace
- Potential impacts to existing special use airspace
- Potential impacts to en route airways and jet routes
- Potential impacts to airports and airfields
Controlled and Uncontrolled Airspace

The ROI, located in international uncontrolled class G airspace, has no formal airspace restrictions governing it. Before launching the GBI or target missile from KLC, NOTAMs would be sent in accordance with FAA protocols and DoD requirements. The U.S. NOTAM System, Sections 3-2n(1)(a) and (b), deals with operations/exercises over the high seas, host nation territory, international airspace, and bare-base locations, and specifies the International NOTAM office coordination requirements and procedures as per U.S. Army Regulation 95-10, *Department of Defense Notice to Airmen (NOTAM) System*, 1 January 1997.

To satisfy airspace safety requirements in accordance with DoD requirements, the KLC Range Safety Officer would obtain approval from the Administrator, FAA. Provision would be made for surveillance of the affected airspace. In addition, safety regulations dictate that launch operations would be suspended when it is known or suspected that any unauthorized aircraft have entered any part of the surface danger zone until the unauthorized entrant has been removed or a thorough check of the suspected area has been performed. When the probability is less than $1 \times 10^{-7}$ that an aircraft would be in an unsafe proximity to the GBI or target missile, the Range Safety Office may establish segmented safety zones to allow for some unrestricted air routes under the flight path during the launch window.

If the TPS-X radar is located at KLC, EMR hazard zones would be established. The potential interference distances are shown in figure 2.3.1-8. The personnel exclusion area would extend for 150 meters (492 feet) in front of the radar. The FAA would be requested to establish a navigation warning advising aircraft to remain at least 1,500 meters (4,900 feet) from the TPS-X radar site during use. EEDs in the presence and shipping phase, such as a missile mounted on an aircraft, would need to be at least 800 meters (2,625 feet) from the radar. EEDs on the ground in the handling phase would need to be at least 400 meters (1,312 feet) from the radar due to potential sidelobe exposure. The interference areas are directional, and would be centered on the launch azimuth, between 135 degrees and 225 degrees.

A visual survey of the area would be conducted to verify that all personnel are outside the hazard zone before startup. Personnel may not enter these hazard zones while the radar is in operation. The radar is prevented from illuminating in a designated cutoff zone, in which operators and all other system elements would be located. Potential safety consequences associated with radar interference with other electronic and emitter units (flight navigation systems, tracking radars, etc.) would also be examined before startup. Adherence to AADC, FAA, and DoD safety procedures relative to radar operations would preclude significant impact to airspace.

Special Use Airspace

There is no special use airspace in the KLC ROI, and as such there would be no impact on airspace from proposed program activities.

En Route Airways and Jet Routes

Coordination between KLC and the controlling airspace agencies (Anchorage and Oakland ARTCC) would minimize potential impacts to the commercial air corridors entering and exiting Kodiak Airport north of KLC (figure 3.1.2-1), and the flexible tracks south of KLC that are used to transition to the North Pacific route system.
Airports and Airfields
The proposed activities in Alternative 1 would not restrict access to, nor affect the use of, existing airfields and airports in the ROI.

4.1.2.3 Alternative 2
The proposed activities at KLC under Alternative 2 would be similar to those described under Alternative 1. Alternative 2 involves launching only target missiles, but the potential impacts to airspace would be the same.

4.1.2.4 Alternative 3
Alternative 3 would include all aspects of Alternatives 1 and 2. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.2.5 Cumulative Impacts
There is no airspace segregation method such as a warning or restricted area to ensure that international airspace would be cleared of nonparticipating aircraft. However, missile launches are short-term, discrete events. The KLC EA concluded there would be no cumulative impact to airspace for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. The use of the required scheduling and coordination process for international airspace and adherence to applicable DoD directives and U.S. Army regulations concerning issuance of NOTAMs and selection of missile firing areas and trajectories further reduce the potential for incremental, additive, cumulative impacts.

4.1.2.6 Mitigation Measures
The required coordination procedures with the FAA and scheduling requirements of KLC minimize any potential impacts so that no mitigation measures have been identified as necessary for the GMD ETR proposed activities. NOTAMs would be sent in accordance with FAA protocols and DoD requirements.

4.1.3 BIOLOGICAL RESOURCES—KODIAK LAUNCH COMPLEX
The biological resources analytical approach involved evaluating the potential impacts of the Proposed Action and alternatives, such as construction, site preparation activities, use of existing and new sensors, and missile launches, on vegetation, wildlife, threatened and endangered species, and sensitive habitat within the ROI. Impacts that could result from construction and other site preparation activities include disturbance and removal of vegetation and disturbance to wildlife from the accompanying noise and presence of personnel. Impacts could also result from launch-related activities such as noise, air emissions, debris impacts, and the use of radar equipment.
Criteria for assessing potential impacts to biological resources are based on (1) the number or amount of the resource that would be impacted relative to its occurrence at the project site, (2) the sensitivity of the resource to proposed activities, and (3) the duration of the impact. Impacts are considered substantial if they have the potential to result in reduction of the population size of federally listed threatened or endangered species, degradation of biologically important unique habitats, substantial long-term loss of vegetation, or reduction in capacity of a habitat to support wildlife.

All transportation of equipment and materials such as fuels would be conducted in accordance with applicable federal (DOT) and state regulations. Hazardous materials would be inspected prior to accepting a shipment. Bulk hazardous materials drums would be stored in approved containers during transportation that meet National Fire Protection Association industrial fire protection codes and required containment systems. Spill response materials such as sorbents, drain covers, mops, brooms, drum repair materials and tools, warning signs and tapes, and personal protective equipment would be readily available for use in the event of an unplanned release of hazardous materials. These SOPs for spill prevention, containment, and control measures while transporting equipment and materials would preclude impacts to biological resources.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought into the installation. These activities would result in impacts similar to, but less than, those caused by site preparation. All mobile assets would be located on existing gravel pads at KLC.

4.1.3.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. KLC would continue to provide ongoing support to single Strategic Target System launches from the GMD Element; however, test scenarios would be severely limited. The KLC EA (Federal Aviation Administration, 1996) indicated no significant impact to biological resources from nine annual missile launches. The North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b) determined that no significant impacts would occur to biological resources as a result of launching a Strategic Target System Missile. The Strategic Target System launches would continue to be managed within the nine launches previously analyzed in the KLC EA (Federal Aviation Administration, 1996) and no additional impacts to biological resources would be expected to occur.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed, and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to biological resources from launches at KLC.
4.1.3.2 Alternative 1

4.1.3.2.1 Ground-Based Interceptors

Construction

Vegetation
The proposed activities under Alternative 1 would require construction as described in section 2.3.1.1. No significant impacts to vegetation are anticipated, since new construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation (approximately 14 hectares [36 acres]) would represent only a small portion of the total vegetation available within KLC boundaries and the adjacent region.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC. Therefore, there would be no impacts to listed plant species.

Wildlife
Impacts from ground disturbance and equipment noise could include loss of habitat, displacement of wildlife, increased stress to wildlife, and disruption of daily or seasonal behavior. As stated above, new construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. Additional habitat for those species that could potentially be displaced is located adjacent to those areas proposed for disturbance. Site preparation activities would not result in impacts to Essential Fish Habitat since no water bodies would be affected.

Noise rather than the sight of machines appears to cause more disturbance to wildlife. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996). Since there are no absolute standards of short-term noise impacts for potentially noise-sensitive species, a short-term maximum noise exposure of 92 dB was suggested as a significant cut-off for impacts in a noise monitoring study for the HEDI I missile (U.S. Army Strategic Defense Command, 1989b; 1990). This noise level is equivalent to being 1 meter (3 feet) from a power lawnmower. This noise level is similar to the range of 80 to 90 dBA defined as known to disturb waterfowl and wildlife in the KLC EA (Federal Aviation Administration, 1996).

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. Wildlife is known to exhibit a startle response when exposed to short-term noise impacts. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, sufficient foraging and feeding habitat occurs in adjacent areas. Studies (U.S. Department of the Air Force, 1997) indicate that birds usually show signs of disturbance, such as fluttering of wings, when a noise event occurs, but quickly return to normal behavior after the event. Although construction activities could cause flushing (birds suddenly flying up), this is a common reaction to sudden natural sounds that only slightly increases the energy expenditure of individual birds. Some wildlife may leave the area permanently, while others may likely
become accustomed to the increased noise and human presence. Construction is therefore not expected to have a long-term significant adverse effect on wildlife.

**Threatened and Endangered Wildlife Species.** Disturbance from site preparation activities would be restricted mainly to areas within 15 meters (50 feet) from the construction site. The closest federally endangered Steller sea lion haulout area, approximately 5 kilometers (3 miles) away on Ugak Island, would not be affected by site preparation noise. Federally threatened Steller’s eiders and endangered short-tailed albatross offshore would also be outside the range of the highest site preparation noise levels and are not anticipated to be affected.

**Environmentally Sensitive Habitat**

Wetlands can be impacted both directly and indirectly. Direct impacts can result from filling, dredging, or flooding. Indirect impacts can be caused by disturbance to adjacent land that results in degradation of water quality from chemical or sedimentary runoff. Given the lack of practicable alternative sites in combination with the measures taken to minimize wetland impacts, compliance with Executive Order 11990, *Protection of Wetlands*; DOT Order 5660.1A, *Order on Preservation of the Nation’s Wetlands*; and FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts* has been demonstrated.

Most new construction required for the Proposed Action would be located in upland areas. Construction of the GBI launch silos or launch pad and perimeter fencing around the launch area could disturb approximately 0.6 hectare (1.6 acres) of palustrine, emergent, persistent, seasonally flooded wetlands and 0.2 hectare (0.4 acre) of palustrine, scrub/shrub, broad-leaved deciduous, saturated wetlands (figure 4.1.3-1). The fence line layout is preliminary and could likely be altered before construction to avoid the wetlands. Indirect disturbance to wetlands would be minimized by implementing appropriate techniques to control runoff and other Best Management Practices discussed below.

The following examples of Best Management Practices for soil erosion control that AADC applies during construction activities would further minimize impacts to wetlands:

- Site preparation—vegetation preservation and protection, topsoil preservation, dust control, and temporary gravel construction entrance and exit
- Surface stabilization—temporary and permanent seeding and use of mulches and fabric and gravel blankets
- Runoff control and conveyance measures—installation of diversions, dikes, grassed waterways, and temporary slope drains
- Sediment barriers—straw bale and rock barriers, sediment fences
- Sediment traps and basins
- Stream protection—temporary stream crossings and streambank stabilization
- Protection of soil and fill storage piles

(Federal Aviation Administration, 1996)
EXPLANATION

1. Closed Sitka Spruce Forest
2. Open Sitka Spruce Forest
3. Closed Alder Shrubland
4. Closed Mixed Alder/Willow Shrubland
5. Low Shrub-Forb Meadow
6. Open Willow-Hairgrass-Mixed Forb Meadow
7. Mixed Dwarf Shrub-Graminoid Meadow
8. Hairgrass-Mixed Forb Meadow
9. Lupine Meadow
10. Disturbed
11. Permanently flooded bodies of water
12. Permanently flooded waterbodies with rooted vascular aquatic vegetation
13. Semipermanently flooded areas, less than 30 percent cover of vegetation
14. Saturated, emergent sedge-forb or sedge-forb-moss meadows
15. Semipermanently flooded emergent sedge marshes
16. Saturated, tall shrub thickets and graminoid-dwarf shrub-moss
17. Saturated, shrub meadows and shrub bogs with semipermanently flooded, emergent sedge
18. Saturated sedge moss
19. Subtidal, low energy, brackish bodies of open water
20. Brackish marsh and beach vegetation flooded irregularly by tidal water
21. Unvegetated beaches
22. Unvegetated upper beaches and rocky coastlines


Wetlands Within the Kodiak Launch Complex and Proposed Facility Locations

Kodiak Island, Alaska

Figure 4.1.3-1
SOPs mentioned above for spill prevention, containment, and control measures while transporting equipment and materials would also preclude impacts to wetlands. Steller sea lion critical habitat is outside the area that could be impacted by site preparation activities.

**Operation**

Dual launch activities could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar, to those analyzed below for single launches.

**Vegetation**

Normal GBI launch activities are not expected to significantly impact vegetation. Blast residue would be contained within the silo or close to the launch site in case of a pad GBI launch, minimizing the potential for impacts on vegetation. Launch exhaust products would include hydrogen, hydrogen chloride, aluminum oxide, carbon dioxide, carbon monoxide, nitrogen, water, and chlorine. Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of this aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited would have little effect. As stated in the air quality section, the concentration levels of exhaust products from a dual launch would be approximately double those of a single launch. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that non-fibrous aluminum oxide as found in solid rocket motor exhaust is nontoxic (U.S. Department of the Air Force, 1997a). Analysis of launch-related deposition of aluminum oxide after six launches from KLC has not shown it to be harmful to vegetation (Alaska Aerospace Development Corporation, 2002b).

The greatest potential for impacts to vegetation comes from hydrogen chloride deposition. Direct effects could include discoloration, foliage loss, and changes in species composition. Rain within 2 hours of a launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid missile launches for very large flight vehicles (such as the Space Shuttle), is known to injure plant leaves and affect wildlife. However, the potential effect on vegetation from the proposed launches of the much smaller GBIs is expected to be slight. Observation of plant communities at other launch sites such as KTF, Cape Canaveral, and Vandenberg AFB indicate that vegetation continues to thrive in the immediate areas within 150 to 240 meters (492 to 787 feet) of the launch pads. Vegetation sampling conducted in the area near active launch pads at KTF has not indicated that hydrogen chloride emissions from launches conducted during the last 20 years resulted in any lasting effects (U.S. Army Space and Strategic Defense Command, 1993a). No obvious additional needle loss or browning of vegetation adjacent to the launch site has been documented through six launches from KLC (Alaska Aerospace Development Corporation, 2002b).

**Threatened and Endangered Plant Species.** No federally listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**

**Noise.** Potential noise effects on wildlife can be categorized as auditory and non-auditory. Auditory impacts to marine mammals would consist of injury effects such as eardrum rupture or behavioral impairments such as temporary threshold shift (TTS). Non-auditory effects could
include stress, behavioral changes, and interference with mating or foraging success. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat. Animals can also be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations. (Larkin, 1996) Informal observation at several launch facilities indicates the increased presence of personnel immediately before a launch tends to cause birds and other mobile species of wildlife to temporarily leave the area that would be subject to the highest level of launch noise. Therefore, no direct physical auditory changes are anticipated.

Wildlife is known to exhibit a startle effect when exposed to short-term noise impacts, such as the launch of a missile. Video camera observations of a wood stork colony located 0.8 kilometer (0.5 mile) south of the Space Shuttle launch pad at Kennedy Space Center showed that birds flew south away from the noise source and started returning within 2 minutes, with a majority of individuals returning within 6 minutes (National Aeronautics and Space Administration, 1997). A rookery at Kennedy Space Center used by wood storks and other species of wading birds located approximately 750 meters (2,461 feet) from a Space Shuttle launch pad continues to be used successfully, even though it has received peak noise levels of up to approximately 138 dB. (American Institute of Aeronautics and Astronautics, 1993) Birds within 250 meters (820 feet) of Titan launch complexes at Cape Canaveral Air Station have shown no mortality or reduction in habitat use. Titan IV vehicles produce noise levels of approximately 170 dB in the immediate vicinity of the launch pad. This attenuates to 125 dB at a distance of 3 kilometers (2 miles) within about 30 seconds following launch. (U.S. Department of the Air Force, 1990b) Noise from Minuteman launches ranges from 98 dBA approximately 4.2 kilometers (2.6 miles) from the launch site to 80 dBA approximately 13 kilometers (8 miles) from the launch site (U.S. Department of the Air Force, 1999). The level of noise for the GBI missile during launch and flight is expected to be less (similar to the 94 dB at 3.0 kilometers [2 miles] from the launch site analyzed in the KLC EA for the Castor 120™) and relatively short in duration.

The KLC EA concluded that, although birds within a 9.7-kilometer (6-mile) radius of the launch pad could be exposed to noise levels above 83 dBA, impacts to birds from launch-related noise would not be severe and would be limited to startle reactions (Federal Aviation Administration, 1996). Peak noise levels in the vicinity of Narrow Cape would be nearly instantaneous, and the entire noise event would last less than 60 seconds. According to monitoring results from the prior six KLC launches, bald eagle habitat use appears to have been unaffected. The Narrow Cape bald eagle nest, which is downrange of the current launch pad, was seasonally occupied and productive during the monitoring period. (Alaska Aerospace Development Corporation, 2002b) Any indication of disturbance to eagle nesting or nesting behavior would be reported immediately to the KLC launch point of contact as specified in the Natural Resources Management Plan (NRMP).

A Biological Opinion (Federal Aviation Administration, 1998) prepared for the FAA and AADC addressed the potential for impacts on the Steller’s eider and short-tailed albatross as a result of operation of the KLC. Interceptor launches would be infrequent, up to five per year over a period of 10 years. Five annual GBI launches would fall within the parameters previously analyzed for KLC and are also not likely to adversely affect listed species. Disturbance to wildlife from single or dual GBI launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Waterfowl driven from preferred feeding areas by aircraft or explosions usually return soon after the
disturbance stops, as long as the disturbance is not severe or repeated (Federal Aviation Administration, 1996).

No evidence has indicated that serious injuries to wildlife have resulted from prior launches, and no long-term adverse effects are anticipated. The brief noise peaks produced by the GBI are comparable to levels produced by close range thunder (120 dB to 140 dB peak). There is no species known to be susceptible to hearing damage following exposure to this noise source (U.S. Department of the Air Force, 2001).

**Emissions.** The KLC area has a high level of rainfall and short steep streams, and small amounts of deposition from launches would be quickly flushed from stream drainages. No long-term impacts to fish in streams or Essential Fish Habitat within the ROI are expected.

Hydrogen chloride, which is emitted during missile launches, is known to affect wildlife. Birds flying through the exhaust plume may be exposed to concentrations that could irritate eye and respiratory systems (Federal Aviation Administration, 1996). However, results of a monitoring program conducted following a Strategic Target System launch from KTF in Hawaii indicated little effect upon wildlife due to the low-level, short-term hydrogen chloride emissions (U.S. Army Space and Strategic Defense Command, 1993a). The program included marine surveys of representative birds and mammals for both pre-launch and post-launch conditions. Studies on representative birds and mammals reviewed in the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992) also indicated that low-level, short-term exposure to hydrogen chloride would not adversely affect threatened or endangered species or other wildlife. Aluminum oxide and hydrogen chloride do not bioaccumulate; therefore, no indirect effects to the food chain are anticipated.

**Debris.** In the unlikely event of a launch mishap during single or dual launches, scattered pieces of burning propellant could enter coastal water and potentially affect seabirds, Essential Fish Habitat, and pinnipeds hauled out along the adjacent coastline. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus, no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water.

The potential impact to Essential Fish Habitat from nominal launch activities (single and dual) would mainly be from missile debris to waters off the coast. Although debris could affect individuals close to the surface, overall species’ population would not be substantially impacted. The Pasagshak River would not be affected by nominal launch activities and is outside the area likely to be affected by a launch anomaly. Anadromous and marine fisheries would not be
affected by proposed launch activities. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. The number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

Debris impact and booster drops in the BOA off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel would be on stand-by status for all launch activities as a protective measure.

**Threatened and Endangered Wildlife Species.** The closest Steller sea lion haul-out sites are at Ugak Island, approximately 5 kilometers (3 miles) southeast of KLC, and Gull Point, approximately 16 kilometers (10 miles) southwest of KLC. Ugak Island is used seasonally by the Steller sea lion during the late summer to early fall postbreeding period (Alaska Aerospace Development Corporation, 1999). As addressed in the KLC EA, studies have indicated that launches are likely to produce some level of alarm response in the sea lions using Ugak Island (Federal Aviation Administration, 1996). These responses could range from a heightened state of alertness to total flight of all sea lions from the haulout site.

According to the U.S. Air Force’s QRLV Program EA (U.S. Department of the Air Force, 2001), while it is expected that Steller sea lions hauled out on Ugak Island would react to a launch by entering the water, there is no biologically significant consequence of this behavior because sea lions routinely spend long hours in the water and have been observed returning to land hours later. Since the sea lions do not breed on Ugak Island, there would be no effect on mother–pup bonding. The National Marine Fisheries Service has concurred with the U.S. Air Force’s opinion that predicted launch and overflight noise would have no significant impact on marine mammals. However, AADC has requested a Letter of Authorization from the National Marine Fisheries Service for the incidental harassment take of marine mammals. The USFWS also concurred that no adverse effects would occur to listed species in the ROI of an ait-2 launch. The predicted launch noise level for the GBI would be similar to or less than the level predicted and measured for ait and QRLV launches and as such, no substantial adverse impacts to listed species are expected.

Foraging shorebirds would be subjected to increased energy demands if flushed by the noise, but this should be a short-term, minimal effect. Waterfowl generally show a pronounced startle effect when exposed to noise levels of 95 to 105 dB. It is unlikely that the short-tailed albatross would be impacted by a GBI missile in flight since the trajectory is almost vertical and the missile would reach an altitude of approximately 3,048 meters (10,000 feet) while still over land, approximately 20 seconds after launch.
Although Steller’s eiders rafting off Narrow Cape may be disturbed by the Proposed Action, since they do not breed within the ROI and the disturbance would be minor and infrequent, GBI launches from KLC are not expected to impact breeding or the nesting success of this species.

According to protocol of the KLC Environmental Monitoring Plan, five pre-launch and five post-launch aerial surveys for Steller’s eiders were supposed to be performed for the first five missile launches at KLC. Inclement weather adversely affected this task during all five KLC launches. However, the data collected were sufficient to show that rocket launches were not adversely affecting either species numbers or habitat use patterns of either the eider or of its designated surrogate for monitoring, the harlequin duck (Environment and Natural Resources Institute and Alaska Aerospace Development Corporation, 2002). Steller’s eiders overwinter in the area from mid-October to March. Since it was not known when the launches would take place and if Steller’s eiders would be in the vicinity, the harlequin duck was used as a surrogate during surveys when the eider was not observed in the area. Steller’s eiders were observed during the 1998 ait-1 and 2001 QRLV launches from KLC. No eiders were observed before the ait-1 launch, but 30 were seen minutes after about 0.40 kilometer (0.25 mile) south of Lone Point. The number fluctuated widely during the QRLV monitoring periods. Harlequin ducks were observed during all monitoring periods with no significant differences between pre- and post-launch time periods. Steller’s eider and harlequin duck numbers and use of habitat appeared unaffected by the six prior launches at KLC. (Alaska Aerospace Development Corporation, 2002b)

Environmentally Sensitive Habitat
Nominal GBI launches are not expected to result in impacts to wetlands on KLC. SOPs for spill prevention, containment, and control measures while transporting equipment and materials would also preclude impacts to wetlands.

4.1.3.2.2 Target Missiles
Construction
Vegetation
Alternative 1 would require construction of additional facilities as discussed in section 2.3.1.1. These new facilities would be located adjacent to the proposed GBI silos or launch pad and included within the same fenced area. Existing facilities, such as the existing launch pad, would be modified. No significant impacts to vegetation are anticipated since new construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation (approximately 10.5 hectares [26 acres]) would represent only a small portion of the total vegetation available within KLC boundaries.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

Wildlife
Impacts to wildlife from site preparation activities described above under vegetation would be the same as those discussed above for the GBI site preparation.
Threatened and Endangered Wildlife Species. Impacts to threatened and endangered wildlife species from site preparation activities would be the same as those discussed above for the GBI site preparation.

Environmentally Sensitive Habitat
Impacts to environmentally sensitive habitat would be the same as those discussed above for GBI site preparation.

Operation
Dual target launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but nonetheless similar, to those analyzed below for single launches.

Vegetation
As discussed above for GBI launches, observation of plant communities at other launch sites such as KTF, Cape Canaveral, and Vandenberg AFB indicate that vegetation continues to thrive in the immediate areas surrounding launch pads. Vegetation sampling conducted in the area near active launch pads at KTF has not indicated that hydrogen chloride emissions from launches conducted during the last 20 years resulted in any lasting effects (U.S. Army Space and Strategic Defense Command, 1993b). Further studies at KLC have shown no adverse effects to sensitive vegetation following the first six launches (Environment and Natural Resources Institute and Alaska Aerospace Development Corporation, 2002).

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

Wildlife
Target missile launches would be infrequent, up to five per year over a period of 10 years. The potential impacts to wildlife from single or dual launches would be similar to those discussed above for GBI launch activities. A Biological Assessment (Federal Aviation Administration, 1998) prepared for the FAA and AADC as part of the construction and operation EA determined that launches of missiles similar to an, QRLV, and Castor 120™ from KLC are not likely to adversely affect listed species, such as the Steller’s eider and short-tailed albatross, or critical habitat. Five annual launches of the proposed target missiles would fall within the parameters analyzed for KLC and are also not likely to adversely affect listed species.

Using noise contours obtained from the monitoring of actual launches at PMRF and superimposing them on the launch site at Kodiak Island, a noise level of 54 dBA at 10,699 meters (35,000 feet) is projected for a Strategic Target System launch. However, this information was obtained by noise monitoring in Hawaii (22 degrees north). Air temperature and humidity affect the propagation of noise. The rate of propagation depends on factors such as distance attenuation, ground attenuation, atmospheric absorption, barrier attenuation, wind effects, and temperature gradient effects. Given atmospheric attenuation with correction for temperature and relative humidity, the actual noise impacts, particularly at the longer distances away from the launch site, might be quite different. Inclement weather precluded the use of a helicopter to set up sound monitors on Ugak Island, and thus no sound data was gathered during the
Strategic Target System launch from KLC in 2001. However, the monitoring report (Alaska Aerospace Development Corporation, 2002b) for the Strategic Target System launch concluded that the noise would likely be similar to ait, QRLV, and Athena missile levels of 80 to 90 dB, which would be audible to pinnipeds. The Peacekeeper missile, which would result in the highest noise levels, uses a military version of the Castor 120™ motor that was analyzed in the KLC EA (Federal Aviation Administration, 1996).

**Threatened and Endangered Wildlife Species.** As addressed in the KLC EA, alarm response in the sea lions using Ugak Island could range from a heightened state of alertness to total flight of all sea lions from the haulout site (Federal Aviation Administration, 1996). Using the noise levels modeled for the Strategic Target System launches at PMRF, the maximum noise levels at the haulout sites on Ugak Island would be approximately 81 dBA, which would be below levels known to disturb waterfowl and wildlife. The monitored noise levels at PMRF indicate a level of 54 dBA at 10,668 meters (35,000 feet). This is significantly less than the 69 dBA indicated by modeling. As such, it is possible, although not assumed that actual sound levels at the haulouts would be less than those indicated by modeling. Using noise levels measured during Peacekeeper missile launches at Vandenberg AFB, the maximum noise levels at the haulout sites on Ugak Island would be approximately 97.7 dBA for a single launch and 100.7 for a dual launch. This would be above the 83 dBA level known to disturb wildlife.

No evidence has indicated that serious injuries would result, and no long-term adverse effects are anticipated. Noise from a recent Athena II launch was measured at 101 dBA at the haul-out sites on Ugak Island. The brief noise peaks produced by the Strategic Target System, Peacekeeper target, and other proposed target missiles are comparable to levels produced by close range thunder (120 dB to 140 dB peak). There is no species known to be susceptible to hearing damage following exposure to this noise (U.S. Department of the Air Force, 2001). The predicted launch noise level for the Strategic Target System of 81 dBA would be less than the level predicted and measured for the QRLV-1 (87.2 dBA at Ugak Island) launch and, as such, no substantial adverse impacts to listed species are expected.

To date, no indications of disturbance to the sea lions from survey activities on Ugak Island, which are done in full view of beached sea lions, have been identified. Safety crews and other personnel are briefed on the survey procedures as well as harassment guidelines established by the National Marine Fisheries Service to minimize harassment. The GMD ETR program would adhere to the terms and conditions of the pending harassment/take permit from the National Marine Fisheries Service.

*Environmentally Sensitive Habitat*

Impacts to environmentally sensitive habitat would be similar to those discussed above for GBI launches.

**4.1.3.2.3 In-Flight Interceptor Communication System Data Terminal Construction**

*Vegetation*

The IDT and road at Sites 1, 2, and 3 would require disturbance of approximately 5.9 hectares (14.6 acres) with a fenced area of approximately 3.2 hectares (8 acres). The COMSATCOM
(figure 2.1.3-2) would require a footprint of approximately 0.10 hectare (0.25 acre) within a fenced area of approximately 2.8 hectares (7 acres) to accommodate the COMSATCOM and equipment. The minimal requirements include a concrete base for the COMSATCOM, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide.

Construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation would represent only a small portion of the total vegetation available within KLC boundaries.

**Threatened and Endangered Plant Species.** No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**
Impacts to wildlife from ground disturbance and equipment noise would be similar to those discussed above for GBI site preparation.

**Threatened and Endangered Wildlife Species.** No impacts to threatened and endangered seabirds or marine mammals are anticipated from construction activities at the inland sites proposed for use for the IDT or COMSATCOM.

**Environmentally Sensitive Habitat**
No wetlands or other sensitive habitat would be disturbed during construction and installation of the IDT.

**Operation**

**Vegetation**
No impacts to vegetation would result from operation of the IDT or COMSATCOM.

**Threatened and Endangered Plant Species.** No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**
During normal operations, the IDT would not transmit except for a few minutes during annual testing of the equipment and during the GBI flight tests. Given the short duration of transmission, no adverse impacts to biological resources are anticipated. Most operational impacts to wildlife from the IDT would come from security lighting and noise from electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities required for backup generators or continuously if no commercial power is available.
COMSATCOM primary power is from a commercial source with backup power provided by generator. Communication cable to the Launch Control Center would be required. Equipment would be housed in a military van, a small building, or an existing adjacent facility if available.

**Threatened and Endangered Wildlife Species.** No adverse impacts to threatened and endangered wildlife species are anticipated. As stated above, most operational impacts to wildlife from the IDT would come from security lighting and noise from electrical generators required for the site. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet), which would not adversely affect species offshore.

*Environmentally Sensitive Habitat*

No adverse impacts to environmentally sensitive habitat are anticipated from security lighting or generator noise due to operation of the IDT and COMSATCOM.

### 4.1.3.2.4 Sensors

There are currently no sensors permanently located at KLC. Proposed sensor use at one location on KLC and at one out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. An existing disturbed area would be used to minimize the potential for impacts. Mobile sensors necessary to support GMD ETR activities would also be located on existing disturbed areas. No impacts to biological resources are anticipated.

### 4.1.3.2.5 TPS-X Radar

**Construction**

*Vegetation*

Installation of the TPS-X radar would require disturbance to 0.3 hectare (0.8 acre) of land on KLC for placement of a concrete pad. Construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation would represent only a small portion of the total hairgrass-mixed forb meadow habitat available within KLC boundaries.

**Threatened and Endangered Plant Species.** No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC. Thus no impacts to threatened or endangered species would result from installation of the TPS-X radar.

*Wildlife*

Impacts from ground disturbance and equipment noise could temporarily displace terrestrial wildlife as discussed for GBI site preparation. Additional similar habitat is available on KLC to accommodate roosting, nesting, and feeding needs.

**Threatened and Endangered Wildlife Species.** No impacts to threatened and endangered seabirds or marine mammals are anticipated from construction activities at the inland site proposed for use for the TPS-X radar.
Environmentally Sensitive Habitat
No wetlands or other sensitive habitat would be disturbed during construction and installation of the TPS-X radar.

Operation
Vegetation
Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations. Spill control procedures would be established using KLC’s approved SOPs, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

The Cooling Equipment Unit is a closed system, and no emissions of the ethylene glycol solution are planned. However, because of the remote potential for leaks or spills during system hook-up, or the possibility of ruptured hoses or accidental disconnection, impermeable ground cover would be in place as was described for the Prime Power Unit.

Operation of the TPS-X radar would not result in impacts to vegetation since impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC. Thus no impacts to threatened or endangered species would result from operation of the TPS-X radar.

Wildlife
The Prime Power Unit is a self-contained trailer with a noise-dampening shroud that would minimize the potential for diesel generator noise impacts.

In terms of the potential for EMR impacts to wildlife, the power densities emitted from the TPS-X radar are unlikely to cause any biological effects in animals or birds. The TPS-X radar is not expected to radiate lower than 5 degrees above horizontal, which would preclude EMR impacts to terrestrial species from either operation of the TPS-X radar during flight tests or later during proposed tactical testing.

The potential for main-beam (airborne) exposure thermal effects to birds exists. In terms of the potential for EMR impacts on wildlife, the Final Ground-Based Radar (GBR) Family of Radars EA (U.S. Army Program Executive Office, Global Protection Against Limited Strikes (GPALS), 1993) analyzed potential impacts on wildlife from EMR. This EA determined that several factors significantly reduce the potential EMR exposure for birds and other wildlife. The radar main beam would normally be located at least 2 degrees above horizontal, which limits the probability of energy absorption by surface-oriented wildlife. The radar beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further
reduces the probability of bird species remaining within this limited region of space, even if the beam were still. (Ballistic Missile Defense Organization, 2000)

The analysis methods used to evaluate potential effects of RF radiation on birds is the MPEL, which defines the maximum time-averaged RF power density allowed for uncontrolled human exposure (and by extrapolation, to birds and other species). The MPEL method is independent of body size or tissue density being exposed. Analysis conducted during preparation of the GBR EA (U.S. Army Program Executive Office, Global Protection Against Limited Strikes (GPALS), 1993) was based on a conservative approach of limiting the microwave energy absorption rate on the Aplomado falcon (*Falco femoralis*), a bird listed as endangered by the USFWS and the State of New Mexico. The energy absorption rate was based on the falcon remaining continuously within the main beam of the ground-based radar. The absorption rate was then compared to the bird’s resting metabolic rate. The analysis indicated power densities would have to exceed 42 mW/cm² to affect the falcon. Power densities of 38 to 61 mW/cm² have been determined necessary to affect other birds weighing up to 3.5 kilograms (7.7 pounds).

The analyses were based on the conservative assumption that the energy absorption rate of a bird’s body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect. Birds in general typically expend energy at up to 20 times their resting metabolic rates during flight. Since birds are not likely to remain continuously within the radar beam and the power density is not expected to exceed levels stated above that could impact birds, the likelihood of harmful exposure is remote. (Ballistic Missile Defense Organization, 2000)

**Threatened and Endangered Wildlife Species.** The potential for impacts to threatened and endangered seabirds would be the same as that discussed above for wildlife. The TPS-X radar is not expected to radiate lower than 5 degrees above horizontal, and since marine mammals would normally be found below the surface of the water, this signal height would be safely above any surfacing mammals. RF radiation does not penetrate the surface of water to any great degree. The power density level just below the surface of the ocean would not exceed the permissible exposure level for uncontrolled environments. (U.S. Department of the Navy, 2002a) No adverse impacts would occur to whales, other marine mammals, or sea turtles at least 1.3 centimeters (0.5 inch) below the surface. It is also highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time within the main beam or side lobe areas when the TPS-X radar would be operating. No impacts to marine mammals offshore are expected as a result of proposed radar operation on KLC since these species would normally be found in the ocean outside the 150-meter (492-foot) personnel exclusion zone. For these reasons, no effects are anticipated on the humpback whale, other marine mammals, or sea turtles that might be present in the vicinity. Therefore, no further action regarding whales is required pursuant to the Endangered Species Act and the Marine Mammal Protection Act.

*Environmentally Sensitive Habitat*

No wetlands or other sensitive habitat would be adversely affected during operation of the TPS-X radar.
4.1.3.3 Alternative 2
No GBI-related construction would be required at KLC under Alternative 2 since GBI launches would occur from Vandenberg AFB and RTS instead of KLC and RTS. Target launch-related impacts would be identical to those described under Alternative 1. As discussed in Alternative 1, proposed sensor use at one location on KLC and at one out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. Mobile sensors necessary to support GMD ETR activities would be located on existing disturbed areas. No impacts to biological resources are anticipated.

4.1.3.4 Alternative 3
For the purposes of the discussion at KLC, the construction and flight impacts for Alternative 3 would be as described above for Alternative 1.

4.1.3.5 Cumulative Impacts
Construction associated with the GMD ETR program would result in the loss of up to approximately 34 hectares (85 acres) of meadow and shrubland within KLC boundaries. When combined with past disturbed areas the total would equal approximately 52 hectares (128 acres). This cumulative total represents approximately 3.5 percent of the total available acreage of KLC. Similar habitat is available adjacent to the proposed locations and no federally threatened or endangered plants have been identified within KLC boundaries. No cumulative changes in plant community composition or structure have been identified at other active launch locations such as Vandenberg AFB and Kennedy Space Center.

The KLC EA indicated no significant impact to biological resources from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. According to the QRLV EA (U.S. Air Force, 2001), multiple failures at the same point in flight during launches would be required to cumulatively affect Essential Fish Habitat or other sensitive biological resources. This scenario is highly unlikely. Combined activities would be performed at different times and locations. No cumulative impacts from launches proposed for the GMD ETR program are anticipated.

4.1.3.6 Mitigation Measures
No biology mitigation measures are proposed for the GMD ETR activities at KLC. GMD ETR proposed activities would adhere to the terms and conditions imposed by the National Marine Fisheries Service on AADC.

4.1.4 CULTURAL RESOURCES—KODIAK LAUNCH COMPLEX
Potential impacts on archaeological and historic resources may result from construction; ground-clearing; off-road traffic activities; sound pressure damage; increased human presence in archaeologically sensitive areas; and/or alteration, modification, renovation, or demolition of existing potentially significant facilities and other activities.
Only those cultural resources determined to be potentially significant under existing legislation are subject to protection from adverse impacts resulting from the Proposed Action or its alternatives. To be considered significant, cultural resources must meet one or more of the criteria established by the National Park Service that would make that resource eligible for inclusion in the National Register. The term eligible for inclusion includes both properties formally determined as such and all other properties that meet the listing criteria. Sites which have not yet been formally evaluated are considered potentially eligible and, as such, are afforded the same consideration as formally nominated properties. Prehistoric (usually referred to as archaeological), historic, or traditional significant cultural resources are referred to as historic properties.

An undertaking is considered to have an effect on a historic property when it may alter characteristics of the property that may otherwise qualify the property for inclusion in the National Register. An effect is considered to be adverse when it diminishes the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include but are not limited to:

- The physical destruction, damage, or alteration of all or part of the property
- Isolation of the property from, or alteration of the character of, the property’s setting when that character contributes to the property’s qualification for the National Register
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
- Neglect of a property resulting in its deterioration or destruction
- Transfer, lease, or sale of the property

4.1.4.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. These launches could include missions in support of the GMD program. KLC would continue to operate as a licensed launch facility, and, as concluded in the KLC EA (Federal Aviation Administration, 1996), no cultural impacts would be anticipated.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to cultural resources from launches at KLC.
4.1.4.2 Alternative 1

4.1.4.2.1 Ground-Based Interceptors

Construction
The proposed activities under Alternative 1 would require construction of numerous facilities as described in section 2.3.1.1. Potential total disturbed areas due to construction are identified in table 2.3.1-3.

Prehistoric and Historic Archaeological Resources
Previous archaeological surveys have indicated that cultural resources are not present in the upland areas occupied by KLC. As project details are further delineated, additional archaeological surveys may be required to verify the absence of sites within the area of potential effect. Should cultural resources be found during the course of any GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided; therefore, no impacts to archaeological resources are anticipated.

Large GBI components may need to be brought into KLC by barge, as described in section 2.3.1. Figure 2.3.1-1 shows the proposed barge landing sites. If it is determined that a barge landing is required, one of the three potential sites would be selected for use. At that time, an archaeological survey would be conducted to verify the presence of the reported sites described in section 3.1.4.2 and to determine if there are previously unreported sites within the area of potential effect.

Historic Buildings and Structures
There are no structures in the area currently occupied by KLC infrastructure that are listed on the National Register of Historic Places. No construction activities or building modifications are expected to have an effect on any historic properties.

Native Populations/Traditional Resources
The 1994 survey of the KLC area showed no signs of traditional resources within the ROI. Therefore, no impacts to traditional resources are anticipated. As mentioned above, should cultural resources be found during the course of any GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided.

Paleontological Resources
There is the potential that shallow-water marine invertebrate fossils would be disturbed during construction of the GBI facilities. However, these fossils are extremely common throughout the areas in and around KLC, and significant impacts to these resources are not anticipated.

Operation
Proposed GBI operations for Alternative 1 at KLC would consist of single and dual interceptor launches.
**Flight Activities**
Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. The only potential impacts to cultural resources would be as a result of debris generated by a test failure. However, the possibility of this occurring is extremely remote.

**Post-Flight Activities**
Debris recovery from unsuccessful launches at KLC is the responsibility of the user and is closely monitored by AADC. If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with KLC procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with KLC range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.

4.1.4.2.2 **Target**

**Construction**
Under Alternative 1, site preparation activities overlap somewhat with GBI facilities. Since no cultural resources have been identified within the construction footprint, there would be no adverse effects to cultural resources due to target facility construction.

**Operation**
Proposed target operations for Alternative 1 at KLC would include single and dual target launches.

**Flight Activities**
Target launches, from a cultural resources standpoint, would be similar to an interceptor launch. Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. The only potential impacts to cultural resources would be as a result of debris generated by a test failure. However, the possibility of this occurring is extremely remote.

**Post-Flight Activities**
If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with KLC procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with KLC range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.
4.1.4.2.3 In-Flight Interceptor Communication System Data Terminal

Construction

Under Alternative 1, proposed construction would include disturbance of 8.7 hectares (21.6 acres) for an IDT and COMSATCOM. Cultural resources have not been identified within the areas and therefore there would be no adverse effects to cultural resources from IDT and COMSATCOM construction.

Operation

Proposed activities for Alternative 1 at KLC include IDT and COMSATCOM operations.

Flight Activities

IDT and COMSATCOM operations are not expected to adversely impact cultural resources. The nature of the operation of these systems combined with the lack of existing cultural resources would result in no impacts.

4.1.4.2.4 Sensors

Proposed sensor use at one location on KLC and at one or more out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. Mobile Systems would likely be parked at pre-existing parking areas and no ground disturbance would be required. Therefore, impacts to cultural resources are not anticipated.

Flight Activities

Operation of sensors of this nature is not expected to produce any short- or long-term effects to cultural resources. Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed.

4.1.4.2.5 TPS-X

Construction

The installation of the TPS-X at KLC would require the construction of a pad for the 38- by 58-meter (125- by 190-foot) hardstand and disturbance of approximately 0.3 hectare (0.8 acre). The potential TPS-X location would be the same as the potential IDT site south of the Loran-C Station. Previous archaeological surveys have indicated that cultural resources are not present within the upland areas occupied by KLC. As project details are further delineated, additional archaeological surveys may be required to verify the absence of sites within the area of potential effect. Should any culturally related resources be found during the construction of the TPS-X radar, all construction activities would cease and the proper authorities would be notified. Therefore, impacts to cultural resources are not anticipated.

Operation

Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations. Spill
control procedures would be established in accordance with KLC’s approved SPCC SOPs, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

The Cooling Equipment Unit is a closed system, and no emissions of the ethylene glycol solution are planned. However, because of the remote potential for leaks or spills during system hook-up, or the possibility of ruptured hoses or accidental disconnection, impermeable ground cover would be in place as was described for the Prime Power Unit.

Because impermeable ground covering and spill containment berms would be employed and due to the lack of located resources in the area, impacts to cultural resources are not anticipated from the refueling of the Prime Power Unit.

In terms of the potential for EMR impacts to cultural resources, the power densities emitted from the TPS-X radar are unlikely to cause any damaging effects to cultural resources. The TPS-X radar is not expected to radiate lower than 5 degrees, which would preclude EMR impacts to terrestrial artifacts from either operation of the TPS-X radar during flight tests or later during proposed tactical testing. Therefore, the operation of the TPS-X radar is not expected to have any adverse impacts to cultural resources.

4.1.4.3 Alternative 2

4.1.4.3.1 Target

Construction
Proposed target construction for Alternative 2 at KLC is identical to that described in Alternative 1.

Operation
Potential impacts from proposed target operations for Alternative 2 at KLC would be identical to that described in Alternative 1.

4.1.4.3.2 Sensors

Construction
The mobilization and setup activities for mobile telemetry systems at remote locations throughout Alaska would be identical to that described for Alternative 1 and would have negligible adverse impacts.

Operation
The operation of mobile telemetry system would be identical to activities described under Alternative 1; however, the system would be operated for target launches only. No operational aspect of the system poses the potential for adverse effects to cultural resources.
4.1.4.4  Alternative 3

Alternative 3 would be identical to Alternative 1 at KLC. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.4.5  Cumulative Impacts

The KLC EA indicated no significant impact to cultural resources for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Approximately 17 hectares (43 acres) or 1.1 percent of KLC’s 1,504 hectares (3,717 acres) have previously been disturbed. The proposed action could potentially affect up to 26 hectares (64.2 acres). The cumulative disturbed acreage of the existing and proposed actions would be approximately 43 hectares (106 acres) or 2.9 percent of the total acreage of KLC. No other activities have been identified at KLC that, when combined with the past and proposed action would result in cumulative impacts to cultural resources.

4.1.4.6  Mitigation Measures

No cultural resources mitigation measures are proposed for the GMD ETR activities at KLC at this time. As project details are further delineated, coordination would occur with the Alaska State Historic Preservation Officer to ensure that cultural resources would be protected.

4.1.5  GEOLOGY AND SOILS—KODIAK LAUNCH COMPLEX

The proposed program activities have the potential to increase soil erosion due to construction and vehicle traffic on unpaved roads. GBI and target missile launches could affect the chemical composition of site soils. Construction activities could have a direct short-term affect on the availability of selected geologic resources, such as aggregate for road base and high-strength concrete. Program support facilities, IDT, sensors, radar, and other critical equipment would be potentially subject to strong vibratory ground motions from earthquakes and volcanic ash falls. Active fault segments could potentially result in surface ruptures during large earthquakes resulting in damaging facilities and infrastructure along the trace.

4.1.5.1  No Action Alternative

Missile Defense Agency

Under the MDA's No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. Maintenance or construction projects proposed by AADC at KLC which would result in ground disturbance would be subject to environmental review by the FAA if that action were a modification to the facilities, facility layout, and operations described in the launch site operator license. KLC is located within a seismically active area, but existing facilities have been designed and constructed to Seismic Zone IV standards (Uniform Building Code, 1994) and should withstand probable levels of vibratory ground motion at the site (appendix D). Further, KLC existing facilities are situated at elevations
that are greater than the limits of maximum wave run-up from a probable tsunami event (seismically generated sea wave).

KLC would continue to conduct launches as specified in the KLC launch site operator license. The KLC EA concluded that there would be no measurable long-term changes in the pH of soils from the exhaust deposition of up to nine launches of the Athena-2, using a Castor 120™ motor for propulsion, per year (Federal Aviation Administration, 1996). Environmental monitoring efforts to date have not indicated any adverse changes in soil chemistry resulting from launches. No adverse changes to soil chemistry would be anticipated under the MDA’s No Action Alternative at KLC.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to geology and soils from launches at KLC.

4.1.5.2 Alternative 1

4.1.5.2.1 Ground-Based Interceptors

Construction

Alternative 1 would require construction of numerous facilities as described in section 2.3.1.1. Fiber optic cable would be pulled through existing conduit in the fiber-optic cable network, however, additional trenching would be required for selected facilities that are proposed outside of the established backbone. The probable area of soil disturbance for all GBI-related facilities and roads would be approximately 14.4 hectares (35.5 acres), owing largely to grubbing and clearing of vegetation within the perimeter fencing, foundation excavation, stockpile, and equipment maneuver areas.

Minor effects to soils are likely to occur because of the proposed site preparation and construction activities. Most proposed facilities and service roads would be situated at or near local topographic highs in mildly sloping terrain, with little potential for sheet flooding or uncontrolled surface water runoff from higher elevations. The upland soils are generally well drained and not considered to be sensitive to erosion on slopes of less than 7 percent (U.S. Department of the Air Force, 2001). AADC would obtain and review necessary definitive information on surface faulting in the vicinity of the proposed GBI facilities. In making final siting and design determinations, AADC would incorporate all appropriate standards specified by its licensed and bonded A&E contractor. The KLC Natural Resource Management Plan (Alaska Aerospace Development Corporation, 1998) would be referred to for managing laydown areas and topsoil piles before construction, and after construction for providing direction on the disposition of excess topsoil and the selection of plants for revegetation. Best Management Practices would be used for erosion and sediment control. Such Best Management Practices could include storm water diversions, sediment barriers, stream protection, dust palliatives, and other stabilization treatments.

Alternative 1 would not significantly deplete sources of construction material in the region. Tertiary bedrock (the Narrow Cape Formation) underlies most of the KLC property and is suitable as general construction fill material and is readily available (Alaska Aerospace
Development Corporation, 1995b). Surface aggregates have previously been hauled from Pasagshak Point to provide surface course materials over the local sandstone. Sources of structural fill material may need to be imported from existing commercial source areas near the City of Kodiak. Indirect short-term impacts could be created from increased dust and traffic.

Operation

Alternative 1 would result in up to five missile launches per year from KLC over the duration of the test program. GBI launch activities may present minor adverse impacts to local soils due primarily to booster stage exhaust emissions during a nominal test launch, or from unburned or partially burned propellant fuels in the event of a terminated flight. Each EKV would contain approximately 7.5 liters (2.0 gallons) of liquid fuel (monomethylhydrazine) and 5.5 liters (1.5 gallons) of liquid oxidizer (nitrogen tetroxide). Preloaded fuel and oxidizer tanks would be installed on the EKV, so there would be no need for onsite fueling of the GBI and thus no anticipated adverse effect from direct contamination of soils from spills at the Missile Assembly Building, GBI silo, or launch pad.

During a nominal launch, the GBI booster would primarily emit hydrogen chloride, aluminum oxide, chlorine, carbon monoxide, carbon dioxide, hydrogen, nitrogen, oxygen, and water. Most hazardous constituents of the propellant would be completely consumed during the launch. Under this scenario, only small amounts of hydrogen chloride and aluminum oxide emissions would be anticipated to directly contact the soil adjacent to the launch pad and downwind of the flight corridor.

No adverse changes to soil chemistry are predicted to occur as a result of hydrogen chloride or aluminum oxide deposition from interceptor launches. As described in section 4.1.1, soil deposition of hydrogen chloride is expected to be minimal because relatively small amounts of hydrogen chloride are released in the booster ground cloud and the emissions disperse rapidly. Because KLC is near the ocean, a significant fraction of the gas phase hydrogen chloride would condense in the marine aerosol (U.S. Air Force, 1997). This would lower the gas phase concentrations, but would also retard the ground deposition and would re-evaporate in several minutes, leaving downwind concentrations unchanged. Deposition of hydrogen chloride was analyzed for the Athena-2 launch vehicle and it was concluded that there would be no measurable increase in soil pH for up to nine launches per year (Federal Aviation Administration, 1996). The Athena-2 (figure 2.1.2-1) uses a Castor 120™ first stage that is larger than the GBI. The proposed GBI configuration (table 4.1.1-10) has less solid rocket fuel capacity than the Athena-2 and, therefore, would likely produce lower exhaust emissions.

Ground deposition of aluminum oxide is expected to be small and result in minor impacts. Soil deposition of measurable levels of aluminum oxide from a moving exhaust cloud is predicted to be negligible (Pacific Missile Range Facility, Barking Sands, 1998). Typically, no solid propellant missile launches would occur during rain, and the launch system would not use a water deluge system for cooling and noise suppression (a deluge system could increase the potential for ground deposition). The EPA has determined that nonfibrous aluminum oxide as found in solid rocket motor exhaust, is nontoxic. (U.S. Army Space and Strategic Defense Command, 1994)

For analysis of dual GBI launches, the exhaust products from a nominal launch are conservatively estimated to be twice the level of a single launch. The analysis of dual launches
under air quality (section 4.1.2.1) concluded that hydrogen chloride emissions would not exceed U.S. Air Force exposure limits and that the level of aluminum oxide would be expected to remain within the non-criteria pollutant level. Therefore, it is not expected that dual launches would result in significant ground deposition of either pollutant.

In the unlikely event of an on-pad fire or catastrophic missile failure over land, most or all of the solid propellant fuel would likely burn up before being extinguished. Any remaining fuel would be collected and disposed of as a hazardous waste. The total quantities of hydrogen chloride and aluminum oxide released in an on-pad failure of a GBI would be equivalent to that released during a nominal launch of an Athena-2. Therefore, an on-pad failure is not expected to result in significant ground deposition of either pollutant.

Small quantities of hydrazine in the EKV could also be released. Hydrazine is heavier than air and, if not oxidized when airborne, would react and/or possibly ignite with the porous earth or would form dimethylamine and oxides of nitrogen. All of these substances are soluble in water. Airborne nitrogen dioxide would return to earth as nitric acid rains in precipitation events. (U.S. Army Space and Strategic Defense Command, 1995)

Likewise, the nitrogen tetroxide that reached the ground would also react with calcium carbonate soil to form calcium nitrates. Calcium nitrate, a strong oxidizer, is a dangerous fire risk in contact with organic materials. Therefore, depending on the amount of the propellant and/or oxidizer released, soils contaminated with these liquid propellants may require removal to prevent subsequent fires or explosions. The relatively small amount of nitrogen tetroxide on the EKV (5.5 liters [1.5 gallons]) would indicate that such a release would pose a relative minor adverse affect on the site and vicinity soils. Calcium nitrate is also water soluble, so it is anticipated that any residual material or unreacted fuel would be washed into surface drainages and directly out to sea.

4.1.5.2.2 Target

Construction

Alternative 1 would require construction of new facilities as described in section 2.3.1.1. In addition, there would be an addition/alteration to an existing launch pad (Launch Pad-1). Most of the adversely affected soil area related to target facilities would be encompassed by GBI site preparation activities.

The environmental considerations and consequences of constructing target facilities at KLC are similar to those discussed for GBI facilities in section 4.1.5.2.1.

Operation

Alternative 1 could result in up to five target missile launches per year from KLC over the duration of the test program. Unlike GBI, target missiles could consist of several different missile types and configurations including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. All target missiles noted use solid propellants for the booster stage and, as such, during nominal launch scenarios would emit exhaust products from solid fuels at the launch pad and along the flight path. The minor effects to KLC soils anticipated from solid fuel emissions are discussed in section 4.1.5.2.1.
The Peacekeeper Target is the largest of these target vehicles and consists of both solid and liquid fueled stages. For purposes of analysis, Peacekeeper Target also represents the most difficult of the target missiles to handle, store, and refuel. Target missiles would be stored and assembled in missile storage facilities, and liquid fuels and oxidizers would be stored in separate fuel storage facilities. Each of these facilities would have the capability to contain unanticipated releases of liquid fuels, as well as procedures for reacting to such spills to ensure that local soils are not contaminated.

In the highly unlikely event of an on-pad fire or terminated launch, the Peacekeeper Target could potentially release 76,848 kilograms (169,420 pounds) of solid propellant, and 1968 liters (520 gallons) of liquid fuel. As discussed in section 4.1.5.2.1, most of the solid propellant would be expected to burn upon impact with the ground. Unburned components of the fuel would be removed and treated as hazardous waste.

The total quantity of aluminum oxide and hydrogen chloride released in an on-pad failure of a Peacekeeper target would be approximately 26,900 kilograms (59,300 pounds) and (12,300 kilograms (27,100 pounds) respectively. This would be equivalent to that released during three nominal launches of an Athena-2 missile. As discussed in section 4.1.1.2.2, the airborne concentrations of the pollutants would be higher than during a nominal launch, but would return to ambient levels within several hours. Modeling results from the testing of much larger Advanced Solid Rocket Motor program vehicles, which output 196,357 kilograms (432,885 pounds) of aluminum oxide and 115,572 kilograms (254,789 pounds) of hydrogen chloride concluded that there would be no significant impacts to soils as a result of aluminum oxide and hydrogen chloride deposition (National Aeronautics and Space Administration, 1990). Most of the aluminum oxide would be suspended in the air and dispersed over extremely large areas, and the amount of aluminum oxide deposited on the ground would not significantly change the soils chemistry. The hydrogen chloride, under the most conservative rain conditions, would be buffered by the soil and would not significantly change the soil’s pH (National Aeronautics and Space Administration, 1990). The soils in the ROI are expected to have similar alkalinity and a similar buffering capability. Due to the much smaller emission quantities of aluminum oxide and hydrogen chloride from a highly unlikely on-pad accident of a Peacekeeper target, impacts are expected to be minor.

In the highly unlikely case of an on-pad accident, the liquid fuel (hydrazine) from the fourth stage of the Peacekeeper target is heavier than air and, if not oxidized when airborne, would react and/or possibly ignite with the porous earth or would form dimethylamine and oxides of nitrogen. All of these substances are soluble in water. Airborne nitrogen dioxide would return to earth as dilute nitric acid rains in precipitation events. (U.S. Army Space and Strategic Defense Command, 1995)

4.1.5.2.3 In-Flight Interceptor Communication System Data Terminal Construction

Alternative 1 would require construction of an IDT (one of three optional sites), COMSATCOMs (one of four optional sites), and connecting roads and cables. The probable disturbed area from site preparation would be approximately 5.9 hectares (14.6 acres). Soil disturbance from site preparation activities would be relatively minor and short in duration. Site preparation and construction activities would follow established procedures and Best Management Practices as previously described in section 4.1.5.2.1. AADC would obtain and review necessary definitive
information on surface faulting in the vicinity of the proposed IDT facilities. In making final siting and design determinations, AADC would incorporate all appropriate design standards specified by its licensed and bonded A&E contractor. All IDT facilities would be constructed outside of existing 100-year floodplains and beyond established limits for tsunami wave run-up for a maximum probable tsunami event. Except for localized soil compaction in the construction area, indirect and long-term impacts to the soils resulting from IDT construction would not be anticipated.

**Operation**

Operation of the IDT would have no direct, short- or long-term effect on surrounding geology or soils. Long-term indirect effects, primarily from vehicle traffic for support and maintenance, would result in very minor soil compaction and dust generation on gravel access roads.

### 4.1.5.2.4 Sensors

**Construction**

Alternative 1 would require a single gravel pad area out of seven alternate locations for mobile telemetry. An existing disturbed area would be utilized, and therefore soil disturbance from site preparation activities would be relatively minor and short in duration. Site preparation activities would follow Best Management Practices for soil management and erosion control (see section 4.1.5.2.1).

**Operation**

Operation of the sensors would have no direct or indirect, short- or long-term effect on surrounding geology or soils. Long-term indirect effects, primarily from vehicle traffic for operational support and maintenance, would result in very minor soil compaction and dust generation on gravel access roads and pads.

### 4.1.5.2.5 TPS-X Radar

The TPS-X construction and operation requirements and potential impacts to geology and soils would be similar to that described above for the IDT. The alternative location is the same as the potential IDT site south of the Loran-C Station, and the potential impacts would be similar.

### 4.1.5.3 Alternative 2

#### 4.1.5.3.1 Target

**Construction**

Under Alternative 2, potential adverse effects to site soils from the construction of new target facilities would be similar to that described for Alternative 1 (see section 4.1.5.2.2).

**Operation**

Under Alternative 2, target launch operations would be the same as Alternative 1 and would not result in any direct adverse effects on geology and soils at KLC over the short- or long-term.
4.1.5.3.2 Sensors

Construction

Under Alternative 2, potential adverse effects to site soils from the construction of new sensor facilities would be identical to that described for Alternative 1 (see section 4.1.5.2.4).

Operation

Under Alternative 2, sensor operations would be the same as Alternative 1 and would not result in any direct adverse effect on geology or soils at KLC over the short- or long-term.

4.1.5.4 Alternative 3

Alternative 3 would include all aspects of Alternatives 1 and 2. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.5.5 Cumulative Impacts

The KLC EA indicated no significant impact to geology and soils from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Missile launches are discrete short-term events. Sampling programs performed during each launch have not shown any accumulation of missile launch exhaust products and therefore, no substantial impacts are anticipated at KLC. Future operations and improvements at KLC would be similar in scope to those described in prior EAs, with the proposed five launches per year being a part of the planned launches at KLC. Minor alteration of soil chemistry and accumulation of contaminants could occur from the exhaust emissions of multiple missile launches at KLC, but such adverse effects would be highly localized and would not pose a hazard to human health. No long-term cumulative impacts are expected from construction and operation at KLC.

4.1.5.6 Mitigation Measures

No specific mitigation measures are proposed. Standard measures for seismic safety would include provision for proper anchoring and/or dampening of missile components and fuel canisters while in storage. Likewise, missile storage buildings and Missile Assembly Buildings would be inspected to ensure structural integrity of foundation, roof, wall connections, and storage racks would be inspected to reduce risk to program personnel during a design seismic event. Before determining the final site layout and design standards for ETR facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.
4.1.6  HAZARDOUS MATERIALS AND HAZARDOUS WASTE—KODIAK LAUNCH COMPLEX

Potential impacts from hazardous materials would involve their transportation, storage and use. Potential impact from hazardous waste would be related to the generation, accumulation, transportation, and disposal of hazardous wastes used or created in program activities. Impacts relative to hazardous materials and waste are considered significant if they would: (1) increase the potential for exposure to hazardous material or waste; (2) increase the likelihood of a release to the environment; (3) result in noncompliance with applicable regulatory guidelines; or (4) increase the quantities of hazardous materials used or wastes generated beyond available management practices.

Transportation, storage, and use of hazardous materials would be conducted according to applicable OSHA, EPA, DOT, DoD and state regulations and requirements as well as established project and launch complex Standard Safety Operating Plans.

Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint and PCBs have been evaluated and no impacts were identified. Potential impacts from launch activities are addressed under each alternative as applicable.

4.1.6.1  No Action Alternative

Missile Defense Agency

Under the No Action Alternative, KLC would continue to operate as a commercial launch facility and provide ongoing support to single Strategic Target System launches. The Strategic Target System launches would be managed within the nine launches previously analyzed in the KLC EA (Federal Aviation Administration, 1996), and no hazardous materials or hazardous wastes impacts would be anticipated.

Federal Aviation Administration

There would be no impacts expected from hazardous materials and hazardous waste from the FAA’s No Action Alternative because there would be no launch events from KLC.

4.1.6.2  Alternative 1

4.1.6.2.1  Ground-Based Interceptors

Construction

Construction activities in support of GBI launch activities at KLC are generally discussed in section 2.3.1.1 and include GBI silo or launch pad and support facility construction as well as the IDT, COMSATCOM, TPS-X radar, mobile telemetry and C-band radar gravel pad construction; maintenance storage building and Launch Control Complex additions; addition to the existing Narrow Cape Lodge; construction of a new mancamp; and utilities/communication installation. Construction activities would be centralized to the greatest extent possible at the selected project site and on specific construction laydown areas and access roads. Hazardous materials and waste management would be performed in accordance with ongoing KLC procedures, as described in the KLC User’s Manual (Alaska Aerospace Development Corporation, 2001) as well as applicable federal, state and local regulations.
The construction of the GBI launch support infrastructure would use small quantities of hazardous materials, which would result in the generation of some hazardous and nonhazardous wastes (Halliburton NUS Environmental Corporation, 1993). The hazardous materials that are expected to be used are common to construction activities and may include diesel fuel, anti-freeze, hydraulic fluid, lubricating oils, welding gases, and small amounts of paints, thinners, and adhesives.

Substantial impacts to the environment are not expected from the presence of potentially hazardous materials and the generation of wastes during the GBI construction activities. Best practices, lessons learned and expectations indicated in the interim guidance DoD 5000.2R would be incorporated into design and construction plans. The following hazardous materials management techniques may be used during the construction period to minimize (1) the amount of hazardous materials stored, (2) the threat of their accidental and unplanned release into the environment, and (3) the quantity of hazardous waste generated.

- Structures may be prefabricated by manufacturers and shipped for final assembly at the site using bolts to minimize the need for welding, painting, and other activities involving hazardous materials.
- No underground tanks exist at KLC and none would be installed as a result of this activity. Diesel fuel would be stored in ASTs with secondary containment and inspected daily in accordance with the provisions of the KLC SPCC Plan (as appropriate). ASTs may be removed after tests are complete or put in standby condition at KLC to support future activities. Fueling would follow existing procedures to minimize the potential for fuel spills.
- Bulk hazardous materials [e.g., 210-liter (55-gallon) drums of anti-freeze, hydraulic fluid, compressed welding gases] would be stored in approved containers that meet National Fire Protection Association industrial fire protection codes and required containment systems.
- Spill response materials (e.g., sorbents, drain covers, mops, brooms, shovels, drum repair materials and tools, warning signs and tapes, and personal protective equipment) would be readily available for use in the event of an unplanned release.
- Storage of hazardous materials would be in protected and controlled areas designed to comply with site-specific SPCC plans.
- Hazardous materials would be inspected before accepting a shipment (e.g., to validate container integrity, expiration date, etc.).
- Hazardous materials would be purchased in appropriately sized containers (e.g., if the material is used by the can, it would be purchased by the can rather than in bulk-sized containers).
- Over-purchasing of hazardous materials would be avoided.
- Hazardous material containers would be appropriately labeled.
- At the completion of the construction period, unused amounts of hazardous materials would be the responsibility of the construction contractors and would be safely removed from the site.

Nonhazardous and hazardous waste generated during construction activities include construction debris, empty containers, spent solvents, waste oil and anti-freeze, spill cleanup
materials (if necessary), and lead-acid batteries from construction equipment. Hazardous waste would be containerized and properly disposed of by individual contractors in accordance with Alaska Administrative Code, Title 18 - Environmental Conservation, Chapter 16 and KLC requirements. No permitted hazardous waste treatment or disposal facilities exist on Kodiak Island; therefore, all hazardous waste would be transferred by licensed hazardous waste transporters to the mainland for appropriate treatment or disposal.

The volume of nonhazardous, construction generated waste is expected to be small based on past experience. Nonhazardous waste would be removed by individual contractors for appropriate disposal at the Kodiak Island Borough landfill or at a landfill on the Alaska mainland. The construction schedule for the facility is approximately 15 months, with approximately 100 individuals involved in the construction process. Buildings may be constructed of prefabricated metal resulting in relatively small volumes of non-recyclable construction waste. Debris resulting from site preparation such as tree stumps would be burned onsite, and soil excavated during construction activities would be stockpiled for later onsite use.

**Operation**

*Pre-Launch Activities*

Missile components would be transported to KLC for temporary storage, pre-launch assembly and checkout, and launch preparation. Like the target missiles, the GBI components would be shipped to KLC as finished products that required only final assembly onsite. The hazardous materials contained within the missiles include solid fuel for the rocket and fuel and oxidizer for the EKV’s Divert and Attitude Control System propellant system. No separate fueling would occur; therefore, the likelihood of release and environmental effect would be small.

The handling and use of hazardous and toxic materials at the launch site during and between launch operations would be limited. Potentially hazardous materials used for maintenance, grounds keeping, and housekeeping activities would normally consist of fuel (external to those preloaded into the missiles) required for emergency power and heat, various solvents and cleaners, paints and primers, adhesives, and lubricants. It is expected that no more than 4 liters (1 gallon) of each of the solvents, cleaners, paints, adhesives, and lubricants would be present at any one time (U.S. Department of the Air Force, 1994b), with no more than 38 liters (10 gallons) in total. Fuel for the emergency generators would be stored in dedicated ASTs with secondary containment. The ASTs would be routinely inspected. The hazardous material and waste management techniques described for construction would also be followed during pre-launch operations. Again, substantial impacts to the environment are not expected from the use of potentially hazardous materials and generation of wastes during launch operations.

*Launch Activities*

GBI launch activity considerations include the Launch Hazard Area, flight corridor clearance, missile launch, and missile impact.

Emergency response would be required in the event of a pre-launch or post-launch event which resulted in the partial destruction of a missile. Such an event could result in the rupture of a rocket engine and exposure of the solid fuel. In the event of such mishap, spillage of the propellants could occur. The incident would be handled as an explosive ordnance event, and remaining potentially hazardous materials would be regarded as hazardous waste for
management purposes. Removal and disposal of nonhazardous and hazardous waste from KLC would be in accordance with applicable state and federal requirements.

One piece of equipment used on the EKV consists of a klystron tube which contains small quantities of beryllium. Beryllium is listed on the Toxic Substance Control Act Inventory. If maintenance were required, a new tube would be brought onsite and the replaced tube would be returned to the manufacturer for repair.

Post-Launch Activities
Following test activities, the GBI facilities would be readied for the next use or placed in standby mode. Post-launch activities would generally occur as discussed under the No Action Alternative target launch operations.

4.1.6.2.2 Targets

Construction
Construction activities would include target access roads, target launch pad, Movable Missile Building, Missile Assembly Building, Motor Storage Building and access road, existing Narrow Cape Lodge expansion, new mancamp construction, and utilities/communications installation. Generation of potential hazardous waste (e.g., corrosion control coatings, adhesives, and sealants) would be minimal. Management of hazardous materials and hazardous waste would be performed in accordance with AADC requirements, and would not significantly impact existing KLC hazardous materials and hazardous waste management procedures.

Operation

Pre-Launch Activities
Potential target missiles are described in section 2.1.2. Pre-launch activities include transportation of target missiles to KLC, temporary storage, pre-launch assembly and checkout and preparation of the missiles for launch. Missiles would be transported to KLC as ready-to-use components and assembled onsite. The launch operator would be responsible for transporting the fuel in accordance with DOT requirements. Because of the sealed nature of this mode of transport, the likelihood of release and environmental effect is small. No separate fuel transportation, onsite storage, or fueling operations would be performed.

The handling and use of potentially hazardous materials at the launch site during and between launch operations would be limited. Hazardous materials used for maintenance, grounds keeping, and housekeeping activities would normally consist of various solvents and cleaners, paints and primers, adhesives, and lubricants. It is expected that no more than 4 liters (1 gallon) of each of these types of materials would be present at any one time (U.S. Department of the Air Force, 1994b), with no more than 38 liters (10 gallons) in total.

Onsite waste management practices would include:

- The containerization of waste to prevent discharges of waste or leachate
- The prevention of litter
- Controlling access by wildlife or disease vectors
- Keeping the premises free of solid waste
- The use of best available management practices for the control and prevention of runoff and erosion

*Launch Activities*

During a normal launch there would be minimal to no hazardous materials or hazardous waste impacts. However, safety procedures would be followed.

Potentially hazardous substances such as hydrogen chloride, aluminum oxide, carbon monoxide, and oxides of nitrogen would be generated from combustion of the solid rocket propellant during launch or in the event of a launch failure or abort. For a nominal launch, propellant would burn to completion. Although unlikely, it is possible that a rocket’s flight could be terminated early. In the event of an on-pad or in-flight launch failure, solid propellant could be expected to scatter over a wide area. The missile debris would impact inside the Launch Hazard Area. In such an impact, the rocket would contain a varying level of propellant that would depend on the flight time. If scattered on the ground, potential pollutant concentrations downwind are expected to be less than with a normal launch, as the solid propellant would burn more slowly in the open air than in a rocket motor. There would be minimal to no impact to mission critical personnel or to the public from such an incident.

There is also the unlikely possibility that an errant missile could impact off target. Should an off-target impact occur, the Range Safety Manager would be notified immediately. The Range Safety Manager would in turn report the incident to the appropriate public officials and initiate appropriate emergency response actions. Emergency response actions would be in accordance with the KLC User’s Manual.

*Post-Launch Activities*

Small amounts of potentially hazardous and nonhazardous wastes are expected to be generated during launch operations. Wastes would be segregated as nonhazardous, hazardous, and possibly special wastes for collection and disposal.

Nonhazardous waste would be removed for appropriate disposal at the Kodiak Island Borough landfill or on the Alaska mainland. Removal and disposal of nonhazardous and hazardous waste from KLC would be done in accordance with applicable state and federal requirements.

Hazardous materials management would be performed in accordance with ongoing KLC procedures, as described in the KLC User’s Manual (Alaska Aerospace Development Corporation, 2001) and the Alaska Hazardous Waste Management Regulations (Alaska Administrative Code, Title 18, *Environmental Conservation*, Chapter 16). Hazardous waste management at KLC would be the responsibility of the generator. Hazardous wastes would be collected for disposal in accordance with applicable federal, State of Alaska, and DoD requirements.
Since no permitted hazardous waste treatment or disposal facilities exist on Kodiak Island, all hazardous waste would be shipped to the mainland for appropriate treatment or disposal. Only licensed hazardous waste transporters would be used to transport hazardous wastes off site.

Post-launch activities would involve the release of Launch Hazard Areas, cleanup, and transportation from KLC. Following test activities, the launch facilities would be readied for the next use or placed in standby mode. Specific restoration actions would be determined on a case-by-case basis in coordination with the procedures of KLC and the Alaska Department of Environmental Conservation.

4.1.6.2.3 In-Flight Interceptor Communications Data Terminal

Construction
Alternative 1 would require the construction of one IDT (among three alternative sites), one COMSATCOM (among four alternatives), and connecting roads. Construction would include a gravel pad, concrete pad, security fencing and utilities/communications installation. Generation of potential hazardous waste (e.g., corrosion control coatings, adhesives, and sealants) would be minimal. Management of hazardous materials and hazardous waste would be performed in accordance with AADC requirements, and would not significantly impact existing KLC hazardous materials and hazardous waste management procedures.

Operation
Operation of the IDT and COMSATCOMs would have little effect on hazardous waste and hazardous materials management. A 3,785-liter (1,000-gallon) AST would be used for diesel fuel for the backup generator.

4.1.6.2.4 Sensors

Construction
Alternative 1 would require several gravel pad areas out of seven alternate locations for mobile telemetry. An existing disturbed area would be utilized, and therefore potential impacts related to hazardous materials and hazardous waste would be minimal.

Operation
Operation of the sensors would have minimal direct or indirect, short- or long-term effect on hazardous materials and hazardous waste.

4.1.6.2.5 TPS-X Radar

The TPS-X construction and operation requirements and potential impacts to hazardous materials and hazardous waste management would be similar to that described above for the IDT. The location would be the same as those described for the potential IDT and COMSAT facilities, and the potential impacts would be similar.
4.1.6.3 Alternative 2

Alternative 2 is similar to Alternative 1, except that GBI and IDT construction and operation activities would not occur and sensor operation would support only target missile launches.

4.1.6.4 Alternative 3

Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and operation impacts for Alternative 3 would be as described for Alternative 1.

4.1.6.5 Cumulative Impacts

Adherence to the existing hazardous materials and waste management systems on KLC would preclude the potential accumulation of hazardous materials or waste. The range has implemented an emergency response procedure that would aid in the evaluation and cleanup of any potentially hazardous materials released. The types of hazardous materials used and waste generated would be similar to those currently used at KLC. It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. The proposed launch of GBI or target missiles is not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at KLC. Therefore, proposed activities would not be expected to result in cumulative hazardous materials and hazardous waste impacts.

4.1.6.6 Mitigation Measures

No hazardous materials/hazardous waste mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.7 HEALTH AND SAFETY—KODIAK LAUNCH COMPLEX

Missile launches by their very nature involve some degree of risk and it is for this reason that DoD and AADC has specific launch and range safety policies and procedures to assure that any potential risk to the public and government assets (launch support facilities) are minimized. Potential issues related to health and safety would include the transportation of missile components, the reliability of components during handling/assembly and launch associated debris and emissions. Appendix B includes a detailed discussion of safety policies and regulations. Appendix C contains a discussion of flight test safety.

4.1.7.1 No Action Alternative

Missile Defense Agency

Under the No Action Alternative, KLC would continue to operate as a commercial launch facility and provide ongoing support to single Strategic Target System launches. The Strategic Target System launches would be managed within the nine launches previously analyzed in the KLC EA (Federal Aviation Administration, 1996). Potential health and safety risks from debris impact, toxic chemical dispersion (exhaust emissions), and noise would be associated with pre-launch, launch, and post-launch activities. Planning and execution of target launches would be in compliance with federal, state, and local health and safety requirements and regulations, as
well as DoD and KLC Safety Policy. Adherence to such requirements ensures that potential risk to
the general public, workers, and the launch areas do not exceed acceptable limits. Therefore, no increase in potential risk to health and safety would be expected as a result of selecting this alternative.

Federal Aviation Administration
There would be no impacts expected to health and safety from the FAA’s No Action Alternative because there would be no launch events from KLC.

4.1.7.2 Alternative 1

4.1.7.2.1 Ground-Based Interceptors

Construction
Construction activities in support of GBI launch activities at KLC are generally discussed in
section 2.3.1.1 and include GBI silo or launch pad and support facility construction as well as the IDT, COMSATCOM, TPS-X radar, mobile telemetry, and C-band radar gravel pad
construction, maintenance storage building and Launch Control Complex additions, addition to
the existing Narrow Cape Lodge, construction of a new mancamp and utilities/communication
installation. Construction activities would be centralized to the greatest extent possible at the
selected project site and on specific construction laydown areas and access roads. All new
construction or structure modification would be accomplished using the same procedures that
AADC used to construct the present KLC infrastructure.

Public access would be restricted in accordance with the KLC’s Interagency Land Management
Agreement that encourages public access except in cases where safety is concerned or
protection of structures is needed. A health and safety plan would be prepared by the contractor
and submitted to KLC/AADC to ensure the health and safety of onsite workers. A formally trained
individual would be appointed to act as safety officer. The appointed individual would be the point
of contact on all problems involving job site safety. During performance of work, the contractor
must comply with all provisions and procedures prescribed for the control and safety of
construction team personnel and visitors to the job site. Compliance with regulations would
ensure that construction or modification of facilities would not impact health and safety of workers
or range personnel. No impact to public health and safety would be expected.

Operation

Pre-Launch Activities
Pre-launch activities would include transportation of boosters, liquid fuel, and liquid oxidizer
tanks for the EKV and missile preparation, assembly, and integration testing. Missile
components and support equipment would be transported to Kodiak Island by sea or air from
Government storage depots or contractor facilities. The interceptor may arrive at Kodiak with
the EKV attached or the booster may be shipped separately from the EKV. All components and
equipment would be handled and shipped in accordance with applicable military, state, and
DOT regulations. Missile components would be packaged in shipping containers designed
according to Alaska, DOT, and military requirements for protection of missile components and
reduction of fire/explosion or risk of hazardous materials release in the event of an accident. All
containers would have proper placards.
Sections 3.1.11 and 4.1.11 provide detailed discussion on Kodiak Island and KLC established air, ocean, and ground transportation systems. The primary hazard related to the transportation of missile components would be the potential for an accident involving the transport vehicle and a resulting explosion/fire of solid fuel motors and/or small explosive actuation devices (used in missile control and Flight Termination System). Operations involving the transport of explosives (including packaging and handling for movement) would require implementation of written procedures, which would be approved by KLC/AADC. Transport operations would be conducted under the supervision of an approved ordnance officer using explosive-certified personnel as necessary. Consequently, minimal health and safety impacts would be expected during transport of missile components.

Missile components transported by barge to the Port of Kodiak would likely arrive at the Lash Terminal. Lash is a privately owned terminal operated and serviced by Seaport Terminal Services, Inc. The Lash Terminal is licensed for explosive and hazardous materials handling. Lash is located south of the U.S. Coast Guard Station on the main road to KLC. Samson Tug & Barge routinely serves the Port of Kodiak from Seattle and Anchorage, and is familiar with aerospace transport requirements. A sealift accident during transport is considered highly unlikely. The potential for a major accident (sinking or total destruction of the seacraft) is minimal.

Once unloaded at Kodiak Island, missile components and support equipment could be shipped by tractor-trailer transport to KLC or barged to one of the following potential beach landing areas, Burton Ranch Beach (mancamp location), Boulder Beach (near Bear Paw Ranch), and Pasagshak Beach (near the Pasagshak Recreation Area). The Narrow Cape Lodge is an example of direct barge delivery to KLC. Temporary beach closure would be necessary, but would be considered routine and of short duration.

In each of the described cases, the accident probability presented reflects only the potential for an accident involving the transport vehicle. Only a small fraction of such accidents would affect missile propellants or explosives being transported due to the use of specialized shipping containers that protect the shipment. Consequently, minimal health and safety impacts would be expected during transport of missile components.

Appropriate safety measures as established by AADC would be instituted at the receiving terminals or airport. These safety measures include specified receiving and parking areas (for transport vehicles), establishment and enforcement of applicable ESQDs around receiving areas, restricting handling and transportation of missile components to specific and properly trained personnel, and using established and permitted transportation routes from the receiving terminal or airport to KLC.

Use of the Kodiak State Airport shared by commercial pilots and the U.S. Coast Guard would be required to support receipt and transportation of missile components and mission personnel (figure 4.1.7-1), just as has been done for previous rocket motor shipments to KLC. The ESQD would be 434 meters (1,425 feet) to any inhabited buildings and 260 meters (855 feet) to public traffic routes. A designated preferred parking/offloading area has been established at Kodiak Airport that would limit impact to the Buskin River State Recreation Site. An alternative parking/offloading area would be the location used during previous U.S. Air Force missile launches. In the event this alternate location is required, the ESQD would encroach on several campsites within Buskin River State Recreation Site and could require closure of the recreation site for one night while the boosters are at the airport. AADC would provide a 30-day advance
Figure 4.1.7-1

Kodiak Joint Tenant Airport and Buskin River State Recreation Site

Kodiak, Alaska


EXPLANATION

- State Park Property
- Restroom
- Picnic Shelter
- Campsite
- Fee Station
- Visitors Center
- Class 1 Explosive, Division 1.1 Inhabited Building ESQD 434 meters (1,425 feet)
- Class 1 Explosive, Division 1.1 Public Transit ESQD 261 meters (855 feet)
- Class 1 Explosive, Division 1.1 Inhabited Building ESQD Alternate Off-loading Point 434 meters (1,425 feet)
- Class 1 Explosive, Division 1.1 Public Transit ESQD Alternate Off-loading Point 261 meters (855 feet)

Kodiak Airport Boundary

Primary Booster Off-loading Point
Alternate Booster Off-loading Point

Scale
0 167 334 Meters
0 548 1,095 Feet

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notice to Alaska State Parks regarding the closure. Once the boosters have been removed from the area, the ESQD would no longer be in effect and the campsites would again be accessible.

There would be no effect on U.S. Coast Guard Air Station search and rescue operations. Handling and transportation of the missile components would stop, or move, to allow the Coast Guard to proceed in the event of a search and rescue operation, and would resume after the all clear is provided.

For analysis purposes, a quantity of 20,410 kilograms (45,000 pounds) of division 1.1 explosive was assumed. An inhabited building ESQD with a radius of 434 meters (1,425 feet) would be established. The public transportation route ESQD would be 261 meters (855 feet). If the propellant is determined to be Division 1.3 explosive (22,700 kilograms [50,000 pounds]) then the ESQDs would be reduced to 74.7 meters (245 feet) for inhabited buildings and 74.7 meters (245 feet) from public transportation routes. The ESQD is based on information provided in Inhabited Building and Public Traffic Route Distances, DoD 6055.9-STD, Ammunition and Explosives Safety Standards. The ESQD determination would be based on the equivalent explosive force of all propellant and pyrotechnic materials contained in the flight vehicle. Establishment of the ESQD zone represents DoD’s determination that areas outside the zone provide acceptable protection, and requires that areas inside the ESQD zone be cleared of non-mission-essential personnel for the entire period during which the explosives are present. The ESQD would keep unauthorized personnel and individuals at a safe distance until the boosters are unloaded and transported by truck to KLC. The transportation route would be in accordance with the permit application submitted to and approved by the State of Alaska Department of Transportation before shipment of missile components. Transport of missile components is not expected to be a hazard to private properties along the transportation route. The same ESQDs would be established and enforced while the missile components are at KLC.

Access to launch support structures and hazardous materials storage areas would be limited to KLC/mission essential personnel. All personnel associated with the Proposed Action would be properly trained in compliance with applicable health and safety procedures and guidelines. All pre-flight hazardous operations would be conducted in accordance with applicable and routine safety regulations and operations plans.

The solid propellant used in the GBI missiles is very stable in the absence of an ignition source. The boosters would be grounded to help protect against lightning and static electricity. Electrostatic discharge ignition of boosters has been associated with low atmospheric moisture levels. Based on the high-moisture atmospheric conditions in Kodiak, it is unlikely that an electrostatic discharge would occur. To prevent a premature activation of the igniters or the Flight Termination System, the boosters would not be armed until just before launch.

The boosters would be processed and prepared for launch in the same manner as previous and ongoing missile launches from KLC. The major system components (boosters, in-flight destruct package, range safety equipment, and missile instrumentation) would be assembled and tested in the Integration and Processing Facility. All preparation activities would be conducted in accordance with applicable safety regulations and operations plans.
The handling and assembly of missile components, accomplished within enclosed buildings, has the potential to affect worker health and safety. RCC Standard 321-02 limits those collective risks to $1 \times 10^{-3}$ for non-mission essential personnel and to $1 \times 10^{-2}$ for mission essential personnel. Due to design of the buildings and implementation of ESQDs, the health and safety of the general public would not be affected. Assembly of missiles is considered routine at KLC. Adherence to appropriate safety regulations and operating plans would serve to maintain health risks to mission personnel within the RCC acceptable levels.

Each GBI missile would have an EKV assumed to contain approximately 7.5 liters (2.0 gallons) of liquid fuel and 5.5 liters (1.5 gallons) of liquid oxidizer (variations of monomethyl hydrazine and nitrogen tetroxide). The transportation of the EKV tanks containing liquid fuels and oxidizers would be conducted in accordance with state and federal regulations (49 CFR 106-180, University of Alaska, Fairbanks [UAF] Policy 902, Bureau of Explosives Tariff No. BOE 6000-1). The tanks would protect against releases in the unlikely event of a transportation accident and therefore would meet DOT requirements. The EKV would have proper placards and only military or commercial carriers licensed to handle or transport hazardous materials would be utilized.

There is the potential of ignition in an accident because the liquid propellants are sensitive to heat. However, the DoD has considerable experience with shipment of missiles and sensitive missile components, including liquid propellants.

On arrival at KLC, the pre-loaded EKV fuel tanks would be stored in the Integration and Processing Facility or would be placed in the existing hypergolic fuel storage building and/or the proposed oxidizer storage building until needed for installation on the EKV. The facility would use appropriate placards, and access would be limited to KLC and authorized mission personnel. All personnel associated with the handling of the tanks and installation on the EKV would be properly trained in compliance with UAF 601 and 29 CFR 1910 procedures and guidelines. Safety zones and personal protective equipment would be available based on the U.S. Air Force Toxic Dispersion Model spill model. Copies of MSDSs would be available. The facility would have fire protection equipment and would be inspected and maintained according to IFC 2000, 40 CFR 264, NSS 1740.12, UAF Document 601 and other applicable standards.

There is the potential of spill or release from damaged or leaking tanks; however, minimal health and safety impacts would be expected due to the small quantity of liquid propellant as well as storage and containment protocol and worker training.

**Launch Activities**

Before each launch at KLC, the Range Integrator and the Missile Flight Safety Officer must approve all flight plans and trajectories and planned impact areas. The Missile Flight Safety Officer would issue range clearance and surveillance for the following designated areas: safety exclusion zone, Launch Hazard Area, flight termination lines and flight safety corridor (figure 4.1.7-2).

**Safety Exclusion Zone.** The duration and size of the actual exclusion zone would be defined for each test and would vary depending on the missile size, altitude and direction and meteorological conditions (wind velocities) at the time of launch.
**EXPLANATION**

- Light gray: Land
- Dark gray: Ground Hazard Area (2,987-meter/9,800-foot Radius)
- Black: Territorial Limit
- Dot-dash: Representative Trajectory
- Dashed: Flight Termination Lines

**Scale**

![Scale](image)

**Source:** U.S. Army Space and Missile Defense Command, 2001b.

**Representative Exclusion and Warning Areas**

**Flight Safety Corridor**

**Warning Area (Outside 12 NM)**

**Safety Exclusion Zone (< 12 NM)**

**Launch Hazard Area**

**Launch Site**

**Narrow Cape**

**Ugak Island**

**Kodiak Island**

**Kodiak Airport**

**Figure 4.1.7-2**

**Kodiak Launch Complex, Alaska**

**GMD ETR Final EIS**
Launch Hazard Area. A launch-site malfunction would potentially result in the scattering of the resulting missile debris anywhere within the Launch Hazard Area. The Launch Hazard Area includes those areas within and adjacent to the site within and up to a 2,743-meter (9,000-foot) radius of the launch pad. The public would be excluded well outside the Launch Hazard Area shown (figure 4.1.7-2).

Flight Termination Line. The flight termination line defines the limit/boundary at which flight termination would be initiated in order to contain the vehicle and its fragments within predetermined hazard and warning areas, such that the risk to personnel and non-mission aircraft and ships is within the RCC Standard 321-02 limits of $1 \times 10^{-7}$, $1 \times 10^{-7}$ and $1 \times 10^{-6}$, respectively. Warning areas are regions along the vehicle flight corridor where a possible hazard to aircraft and sea vessels exists because of missile flight operations. Figure 4.1.7-2 shows a flight termination line, including the representative exclusion and warning areas.

Failure of a missile guidance system that would cause debris to fall outside the termination line would be detected by the Range Safety Officer, who would terminate the missile flight before it could cross the flight hazard area. The range safety program includes redundant airborne command destruct systems that would permit in-flight tracking of the test missile. Remote area safety aircraft would be used for real-time monitoring of missile performance and evaluation of flight termination criteria. The termination system provides a mechanism by which impact lines would not be violated in the unlikely event of a malfunction during flight. Therefore, potential impacts to health and safety would not be significant.

Flight Safety Corridor. A probabilistic risk analysis would be performed before each flight test to determine that the individual risk to the general public is less than the RCC Standard 321-02 criteria of $1 \times 10^{-7}$ per launch. The probabilistic risk assessment would also predict the risk to all areas near the vehicle ground track, both inside and outside the Launch Hazard Area. Debris from booster drops, an in-flight malfunction and termination would potentially impact within the flight corridor footprint shown in figure 4.1.7-3. Additionally, regions within and beyond U.S. territorial waters where the hazard exceeds the limits stipulated in RCC Standard 321-02 (the warning area around KLC and the area along the missile trajectory) would be verified clear of ships and aircraft before launch. KLC would coordinate launch operations with the FAA, U.S. Coast Guard, and the Alaska Department of Fish and Game and issue NOTAMs and NOTMARs before launches.

The proposed launches at KLC would utilize launch azimuths between 125 and 225 degrees. Figure 4.1.7-3 indicates the major inhabited area near the westernmost (225 degree) launch profiles would be Old Harbor. Nominal flight profile data indicates that debris from launches would not reach this area. This risk would be evaluated on a launch-specific basis for each mission and events would be controlled so that the risk would remain below $1 \times 10^{-6}$. Launch azimuths of 125 to 225 degrees were previously analyzed in the KLC EA (Federal Aviation Administration, 1996). This document concluded that KLC takes every reasonable precaution during the planning and execution of these launch operations to prevent injury to human life or property, and no increased risk to health and safety is expected as a result of implementing this alternative.
Old Harbor
Flight Safety Corridor
Through Forty
Seconds of Flight on
Flight Corridor 225 Degrees

Kodiak Island, Alaska

Figure 4.1.7-3

The Range Safety Officer would establish the safety zones around the launch site and along the missile flight path no less than 4 hours before each launch. This area would be cleared of non-mission participating aircraft and ships by establishing warning and restricted areas, publishing NOTMARs and NOTAMs and by maintaining close liaison and coordination with agencies controlling both air and surface traffic. The Range Safety Officer would then ensure the safety exclusion zone is verified clear of non-mission essential personnel and vessels out to the territorial limit approximately 20 minutes before launch.

The area of Kodiak Borough in the vicinity of KLC is sparsely populated. The flight corridor, including the booster drop zone, would be mostly over open water. Therefore, proposed flight activities would pose minimal threat to the general public. Personnel inside the safety exclusion zone would be limited to mission essential personnel. Mission essential personnel (specifically those required to be within the evacuation area to conduct the launch) would remain within facilities, such as the Launch Control and Management Center, rated to provide adequate blast and debris protection and to which positive communications would be maintained at all times.

Flight testing evacuations, clearances, and road closures are expressly intended to ensure both worker and public health and safety. Evacuation includes conducting appropriate ground, open ocean, and air surveillance sweeps to ensure that all areas are evacuated.

The implementation of AADC’s safety programs and practices at KLC before and during launch activities would limit the number of personnel exposed to increased hazards and, as a result, no significant health and safety impacts are expected.

The potential effect of launch emissions and noise are discussed in sections 4.1.1 and 4.1.9 respectively.

Post-Launch Activities
Safety exclusion zones would be released or cleared for re-entering when the Missile Flight Safety Officer is assured that missile flight tests are completed and any residual gases, debris, or similar hazardous concerns are no longer a potential threat to worker or public health and safety. Debris would primarily consist of metal fragments. Much of any hazardous material in the missile would be consumed in the case of launch anomaly. If necessary, debris recovery activities would be conducted in accordance with DoD regulations and KLC safety plans and procedures and would not be expected to effect public health and safety.

Any potentially hazardous concerns remaining after a flight or flight termination would be handled in accordance with the KLC Safety Policy and Explosive Ordnance Disposal Plan. Disposal activities would be in accordance with KLC Explosive Ordnance Disposal Plan, NPD 600.1 Transportation Management Guidelines and applicable state and federal regulations. Implementation of these regulations and procedures would to prevent risks to the general public, KLC and program personnel.

Any necessary launch site restoration and maintenance operations would also be considered routine activities on KLC. Restoration and maintenance activities at the proposed launch sites would not have a significant impact on health and safety at KLC.
4.1.7.2.2 Target

Construction

Construction of several new facilities would occur as described in section 2.3.1.1. All construction and structure/infrastructure modification would be accomplished in accordance with the safety plans and procedures and regulations as described in section 4.1.7.2.1.

Operation

Pre-Launch Activities

Pre-launch activities include the transportation and assembly of the target at KLC. The fourth stage of a Peacekeeper target would utilize a single liquid propellant (hydrazine), and onsite loading would be required. A safety briefing would be held prior to loading and hazardous operations checklist would be completed. All persons performing the loading would wear personal protective suits and all non-essential personnel would leave the loading area. Approximately 236 kilograms (520 pounds) of hydrazine would be transferred at a rate of approximately 5.4 kilograms (12 pounds) per minute during fuel loading operations.

If an accidental release were to occur, it would most likely occur during loading. A reasonable scenario would involve failure of the transfer equipment or valves. Any small leaks/spills would be contained in a drip pan partially filled with water. Water would be added to larger leaks/spills to dilute the hydrazine and moist absorbent pads/booms would be used to contain and isolate the release. As discussed in section 4.1.1.2.2, analysis assumes a leak contained over a 3-minute period that releases up to 17 liters (4.5 gallons) of hydrazine fuel. Analysis indicated no potential exceedances of the IDLH health standard of 50 ppm. The low likelihood of such an occurrence and the implementation of approved emergency response plans would limit the impact of such a release. No impact to the general public would be expected.

Launch Activities

Proposed target launches would be similar to previous target launches at KLC. These land launched target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. Table 4.1.1-12 lists missile propellant information, and table 4.1.1-13 lists potential emission constituents during Stage I for each proposed missile. A total of five missile launches (GBI and/or target) per year would be anticipated at KLC over the duration of the program.

As described under section 4.1.7.2.1, Operations, Launch Activities, before each launch at KLC, the Range Integrator and the Missile Flight Safety Officer must approve all flight plans and trajectories and planned impact areas. The Missile Flight Safety Officer would issue range clearance and surveillance for the following designated areas: safety exclusion zone, Launch Hazard Area, flight termination lines and flight safety corridor (figure 4.1.7-2).

Safety Exclusion Zone. The duration and size of the actual exclusion zone would be defined for each test and would vary depending on the missile size, altitude and direction and meteorological conditions (wind velocities) at the time of launch.

Launch Hazard Area. A launch-site malfunction would potentially result in the scattering of the resulting missile debris anywhere within the Launch Hazard Area. The Launch Hazard Area
includes those areas within and adjacent to the site within and up to a 2,743-meter (9,000-foot) radius of the launch pad. The public would be excluded well outside the Launch Hazard Area shown (figure 4.1.7-2). In defining the launch hazard area for a dual Peacekeeper launch, air quality modeling would be conducted to allow consideration of potential air quality impacts from a launch pad accident.

**Flight Termination Line.** The flight termination line would be as discussed for a GBI launch in section 4.1.7.2.1.

**Flight Safety Corridor.** The flight safety corridor would be as discussed for a GBI launch in section 4.1.7.2.1.

**Post-Launch Activities**

Post-launch activities would be as described for the GBI in section 4.1.7.2.1.

**4.1.7.2.3 In-Flight Interceptor Communication System Data Terminal**

Implementation of Alternative 1 would include modification of existing support facilities and structures to increase current communications capability.

**Construction**

Alternative 1 would require the construction of one IDT (among three alternative sites), one COMSATCOM (among four alternatives), and connecting roads. Construction activities would be accomplished in accordance with the safety plans and procedures described in section 4.1.7.2. No adverse effects to health and safety are expected from IDT and COMSATCOM construction.

**Operation**

For communication link equipment, associated RF emissions are considered to be of sufficiently low power so that there would be no exposure hazard. All sensor systems would be sited before operation to ensure that no occupied structures or accessible travel areas would be within any hazard area necessitated by radio frequency emissions. Through the use of these procedures, it has been previously determined that proper exposure control would be achieved, and that operation of these systems would not present a significant health and safety hazard (U.S. Army Space and Strategic Defense Command, 1993b).

Security measures, such as fencing, would prohibit public access to the IDT site and keep the area free from any equipment that could cause electronic interference with the IDT receiving band.

Maintenance of the IDT would require occasional testing of the diesel powered electrical generators and replacement of the Klystron tube, which contains small quantities of beryllium. No hazardous materials or wastes would be generated as a result of generator testing. Potentially hazardous operations such as fueling of the generators would be conducted in compliance with the safety standards of OSHA, AADC’s safety programs and applicable operating procedures. Adherence to these regulations and procedures would minimize the potential for health and safety impacts.
Exposure to beryllium particles, dust, or fumes can cause chronic beryllium disease, a serious lung disease that can be disabling and even fatal. The current OSHA PELs for beryllium allow exposure to 2 \(\mu g/m^3\) of air as an 8-hour time-weighted average; between 5 \(\mu g/m^3\) and 25 \(\mu g/m^3\) exposure for up to 30 minutes at a time; and 25 \(\mu g/m^3\) as a maximum peak limit that can never be exceeded. Handling and replacement of the tube would not likely result in direct exposure of workers to beryllium, since the beryllium would be contained and any necessary repairs to the tube would be done off range by the tube’s manufacturer. Personal protective equipment would be available. Work practices, worker training and engineering controls, such as ventilation, would be used to further reduce the potential of beryllium exposure. No impact to public health and safety from IDT operation and maintenance would be expected.

4.1.7.2.4 Sensors

Construction

Proposed sensor use at one location on KLC and at one out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. Mobile systems would likely be parked at pre-existing parking areas. No adverse effects to health and safety are expected.

Operation

For communication link equipment, associated radio frequency emissions are considered to be of sufficiently low power so that there is no exposure hazard. All sensor systems would be sited before operation to ensure that no occupied structures or accessible travel areas are within any hazard area necessitated by radio frequency emissions. Through the use of these procedures, it has been previously determined that proper exposure control would be achieved, and that operation of these systems would not present a significant health and safety hazard (U.S. Army Space and Strategic Defense Command, 1993b).

4.1.7.2.5 TPS-X

Construction

The potential TPS-X location would be the same as described for the potential IDT and COMSATCOM facilities site south of the Loran-C station. Construction activities would be accomplished in accordance with the safety plans and procedures described in section 4.1.7.2.1. No adverse effects to health and safety are expected from construction of the TPS-X pad.

Operation

EMR hazard zones would be established within the beam’s tracking space and near emitter equipment. The potential interference distances are shown in figure 2.3.1-8. A visual survey of the area would be conducted to verify that all personnel are outside the hazard zone before startup. Personnel may not enter these hazard zones while the radar is in operation. The radar is prevented from illuminating in a designated cutoff zone, in which operators and all other system elements would be located. Potential safety consequences associated with radar interference with other electronic and emitter units (flight navigation systems, tracking radars, etc.) would also examined before startup. Adherence to AADC, FAA, and DoD safety procedures relative to radar operations would preclude significant impact to health and safety.
4.1.7.3 Alternative 2
Alternative 2 is similar to Alternative 1, except that GBI and IDT construction and operation activities would not occur and sensor operation would support only target missile launches.

4.1.7.4 Alternative 3
Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.7.5 Cumulative Impacts
There have been six launches as part of various DoD and National Aeronautics and Space Administration programs at KLC. Under these programs, the safety procedures at KLC have developed and matured. The discontinuous launches preclude cumulative health and safety impacts (Department of Energy, 1991c; Strategic Defense Initiative Organization, 1991; U.S. Army Strategic Defense Command, 1991b). The KLC EA indicated no significant impact to health and safety of personnel and the public from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. The maximum number of launches that could occur from KLC would be determined by the FAA and would be mandated in the launch site operator license. Safety and health planning would be done at the earliest stages of each missile test program. Implementation of DoD and range safety and health plans and procedures during all phases of operation would avoid or reduce the probability of potential impact to health and safety. Minor impacts from the Proposed Action, when added to other activities in the area, would not likely result in cumulative impacts to public health and safety.

4.1.7.6 Mitigation Measures
No health and safety mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.8 LAND USE—KODIAK LAUNCH COMPLEX
Land use is described as the human use of land resources for various purposes including economic production, natural resources protection, or institutional uses. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive uses. Potential issues typically stem from encroachment of one land use or activity on another or an incompatibility between adjacent land uses that leads to encroachment. The purpose of the Land Use Resource section is to addresses potential affects of the proposed action upon the use of land and the compatibility of the proposal and its alternatives with respect to the neighboring land uses and activities within an ROI.

4.1.8.1 No Action Alternative
Missile Defense Agency
Under the MDA's No Action Alternative, current operations at KLC with respect to land use would not change. Launches would continue from KLC subject to the terms and conditions of
the FAA’s launch site operator license. KLC’s activities would continue to involve the launching of single target missiles from existing facilities and would not result in any significant impacts to land use. The continuation of launches from KLC would not result in any significant impacts to land use. The AADC will apply for a renewal of their current launch site operator license, which ends in September of 2003. The renewal period would be for another 5 years. This license must be renewed for launch operations to continue at KLC.

The Narrow Cape area is primarily undeveloped and utilized for a number of recreational activities. Since less than 1 percent of Narrow Cape is occupied by KLC and its location is more than 40 kilometers (25 miles) from the Kodiak National Wildlife Refuge, the potential for land use conflicts caused by the existence of KLC is minimized.

Recreational activities along KLC’s coast are available to the public during all times except during a launch or hazardous operations. These short-duration closures of Narrow Cape would not have an appreciable impact on recreation. Under the No Action Alternative, times of non-availability of KLC’s beaches and access to its coastline would continue to be publicized to further minimize the potential for land use conflict.

AADC preserves the coastlines around KLC property in their natural condition. Under the MDA’s No Action Alternative, the continuation of activities at KLC would be compatible with the Alaska CZM Program.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. If the FAA’s No Action Alternative is selected, the land at Narrow Cape may become available for other uses. Therefore, no impacts to land use would occur from launches at KLC.

4.1.8.2 Alternative 1

Under the Proposed Action of Alternative 1, several facilities would be constructed as discussed in section 2.3.1.1. Before construction, a Memorandum of Agreement would be required between AADC and MDA regarding construction, operation, and final disposition of MDA facilities on KLC.

4.1.8.2.1 Ground-Based Interceptors

Construction

The construction of two GBI silos or a GBI launch pad and a Mechanical Electrical Building would be confined to and contribute to the development of the ridge site along the northern boundary of KLC. In addition, necessary access roads and an Entry Control building would occur along the corridor yielding access to the northern ridge.

Construction could also add an additional 465 square meters (5,000 square feet) to the existing Launch Control Center and 1,394 square meters (15,000 square feet) to the nearby Maintenance and Storage Building. Modifications and additions would be considered routinely
accomplished operations occurring within a compatible and already existing locale for such use. Likewise, no conflicts with land use would occur within or outside the boundaries of KLC.

Construction of an Oxidizer Storage Building would be located within the vicinity of the existing Hypergolic Storage Building and would not alter the overall land use and management of the surrounding facilities. The siting and use of this area would take into account ESQDs and applicable safety criteria preventing incompatible activities or land use conflicts.

Modifications to the Integration and Processing Facility, to serve as the Missile Assembly Building, would require some interior modifications. Since modifications would be confined within the already utilized Missile Assembly Building, neither changes nor impact to land use would occur. Furthermore, ESQDs and other appropriate safety measures would serve to prevent extending hazards areas.

Necessary housing for additional operation personnel may be provided by a mancamp near the Launch Control Center, or at the Narrow Cape Lodge or nearby hotels. Although the possible construction of a mancamp and additions to the Narrow Cape Lodge would alter the land use, such activity would be compatible with KLC’s Interagency Land Management Agreement between the Alaskan Department of Natural Resources and AADC, which encourages public access except in circumstances where safety or protection of structures are a concern. Furthermore, changes in the use of land would be confined within the immediate project area and only restrict access to a small portion of the total grazing lands.

Maximum use would be made of KLC’s existing infrastructure and facilities. General infrastructure improvements may also be required, such as fencing, road improvements, electrical service, and telephone and data transmission line installation. The decision to accomplish general improvements would be decided as needed, and would be considered minor and routine maintenance activities as described under the No Action Alternative.

A Coastal Project Questionnaire for GMD ETR activities would be submitted to the State of Alaska to confirm that construction activities would be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program. Submission of the Coastal Project Questionnaire would be coordinated among AADC, the State of Alaska, the U.S. Army Corps of Engineers, and MDA. As described in section 3.1.8.2, similar actions involving the developmental construction of KLC and the launch of missiles from KLC have previously undergone Coastal Consistency Determinations, resulting in decisions that activities were consistent with the state and local standards and policies. Therefore, it is anticipated that the similar construction and launch activities of the Proposed Action would be determined to be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program.

**Operation**

*Pre-Launch Activities*

Pre-launch activity would consist of all activities required to transport missile boosters, payloads, support equipment, and essential construction materials to KLC and to assemble the major components before flight. All necessary equipment and missile components would be
transported to KLC from U.S. Government storage depots or contractor facilities by air and or barge using the Kodiak Airport and Port Facilities as the prime delivery points.

The Alternate Strategic Target System Booster Off-loading Point or the original Booster Off-loading Point would be used as a parking area utilized by military transport aircraft transporting missile payloads and/or boosters (figure 4.1.7-1). The original booster off-loading point would require the establishment and enforcement of ESQDs from the plane 434 meters (1,425 feet) to any inhabited buildings, and 260 meters (855 feet) to public traffic routes. Impacts to recreational land use would be significantly reduced by coordination with the Alaska State Parks, Kodiak Division at least 30 days before the arrival of the missile payloads and/or missile boosters to ensure the campsites within the ESQD at Buskin River State Recreation Site would be vacated. Once the boosters and payloads are removed from the immediate vicinity, ESQDs would no longer be in effect and campsites would again be accessible.

The Primary Booster Off-loading Point would be considered the preferred parking area utilized by military transport aircraft transporting missile payloads and/or boosters (figure 4.1.7-1). Although this activity would also require the establishment and enforcement of ESQDs as mentioned above, land use conflicts involving evacuation would be minimal, given that no inhabited buildings exist within the ESQD and public traffic routes would only be subject to an infrequent traffic delay of short duration. In addition, prior planning of such activity for off-peak travel hours would further serve to minimize any traffic delays.

In an effort to transport large, extremely heavy, or over dimensional items and reduce any safety and security concerns involving the use of roads from the town of Kodiak, a beach landing could be performed as a secondary delivery point for barge traffic. All three barge landing sites (shown in figure 2.3.1-1) have ample water depth to allow near shore operation and direct access to roadways that would yield immediate access to KLC. Transportation across the beach would occur over temporary 1-inch thick steel plates placed on the beach. This would help preserve the existing condition of the land and prevent erosion. Changes in land use would be due to restricting access to beach landing areas and road closures during unloading and along roadway transportation routes. Such temporary closures would not significantly affect land use. Furthermore, barge beach landings would comply completely with the standards of the Alaskan Coastal Management Program.

Storage of missiles could occur in the Integration and Processing Facility at KLC. The storage of missile propellants would occur in storage areas designed for such use in accordance with all accepted governing standards. An ESQD area would be established and maintained around facilities where ordnance is stored or handled. These operations would be considered regular actions approved by the DoD Explosive Safety Board and consistent with KLC’s land use and adjacent land use. Only the inhabited building ESQD for the GBI silos or launch pad of 434 meters (1,425 feet) would overlap the northern portion of Fossil Beach. However, public access to the beach would not be restricted due to the ESQDs, and land use would not be impacted.

**Flight Activities**

Launch preparations scheduled at KLC would follow standard evacuation procedures of the launch vicinity. The Range Safety Officer would develop a Launch Hazard Area around the proposed launch site established by AADC in accord with the Interagency Land Management Agreement for the property. All civilian, nonessential contractor, personnel, and general public
would be cleared from the Launch Hazard Area several hours before launch. Agencies that would enforce the clearance of land areas would be notified in preparation for the procedures once a test event is officially scheduled. A notice of intent to clear hazardous areas would be published in the local newspaper and broadcast in local media approximately 1 week in advance. The boundaries of the Launch Hazard Area would also be posted with notifications. Flight safety corridors would be determined for each missile flight and would be verified clear according to range safety requirements.

The availability of recreational opportunities at Narrow Cape would not be significantly impacted by the GMD ETR activities. Only temporary closures during the transportation of missile components to the launch facilities and up to a full day closure on launch days would occur for the Pasagshak Point Road at the KLC site boundary. Public access through KLC to Fossil Beach would be limited or denied for each launch day. Although these safety closures would restrict beach combing, bird and whale watching, and fishing on these days, such temporary closures would not be considered to have an appreciable impact. Furthermore, any activities that could possibly restrict access to any recreational areas would be in the newspaper and announced on the local radio. Submission of a Coastal Project Questionnaire would be coordinated among AADC, the U.S. Army Corps of Engineers, and MDA. The Coastal Project Questionnaire would be submitted to the State of Alaska to confirm that actions would be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program.

Post-Flight Activities
As soon as the Range Safety Officer concludes that all hazardous areas are safe, all persons would be allowed to return. Only a preflight or early flight malfunction resulting in flight termination within the ROI would have any impact on surrounding land use by prolonging closures until hazardous conditions are cleared. Security requirements could require some areas to remain closed for several days following a launch.

Post-flight activities would also include removal of blast residue from the silos and/or launch pads and minor facility maintenance. These activities would have no effect on land use.

4.1.8.2.2 Target
Construction
The construction of target missile facilities is described in section 2.1.2. The immediate vicinity of the construction zone would be temporarily affected by limiting access to only necessary personnel. Nevertheless, such activity is consistent with KLC’s general land use, and would not cause any change in any use of land within or outside of KLC. The only minor conflict to land use would be the limiting of access to small portions of grazing land where the new facilities would be constructed. Therefore, no significant impacts are expected.

Under Alternative 1, internal modification would be made to the already existing Launch Pad 1’s launch service structure. Modifications would be confined to the existing Launch Pad, minimizing any possible land use changes or conflicts to land use.

Possible construction of a new Missile Storage facility, access roads north of Launch Pad 1, a Missile Assembly Building, new target pad, and Movable Missile Building would occur in the
vicinity of the northern ridge. Both construction areas would occur upon undisturbed natural grasslands and alter the land use within the immediate vicinity during construction and operation. However, such activity would not greatly reduce grazing lands and comply with the general land use and would not produce any land use conflicts within the immediate or adjacent vicinity.

Additional general infrastructure improvements such as fencing, minor road improvements, electrical service, and telephone and data transmission line installation may also be required within the construction area. Portions of such activity could be supported by barge landings and would be considered under individual site construction or general facility maintenance activities.

**Operation**

Operation of target missiles concerning land use would be similar to the operation of GBI missiles in section 4.1.8.1.

### 4.1.8.2.3 In-Flight Interceptor Communication System Data Terminal

**Construction**

The construction of a fixed or relocatable IDT at KLC would include a total disturbed area of 5.9 hectares (14.6 acres). Within this area, approximately 3.2 hectares (8 acres) would be fenced. The proposed IDT locations (figures 2.3.1-2 to 2.3.1-4) are within areas that are compliant with KLC’s general land use, and no land use conflicts would occur. Furthermore, safety precautions would be followed during operation to prevent any unidentified land use conflicts from arising.

Construction of the COMSATCOM would require a 2.8-hectare (7-acre) site surrounded by a security fence, a concrete footprint covering 0.14 hectare (0.34 acre) to accommodate the COMSATCOM and equipment, the installation of a communications cable using new and previously installed conduit, and all weather access roads. Each of the proposed locations would be compatible and related to nearby IDT facilities. Similarly, no conflicts with land use would occur.

**Operation**

*Pre-Launch Activities*

IDT components would be transported to the operation site from U.S. Government storage depots or contractor facilities by air, sea, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA and DOT safety standards to minimize any possible impacts to land use.

*Flight Activities*

Although operation of IDT and COMSATCOM facilities would only function during times of GMD exercises, installation would immediately be established and secured after delivery, limiting the access to the surrounding area. This would result in a temporary change in land use within the immediate operation area by restricting access to unauthorized personnel. However, all impacts to land use were considered in the facilities site selection and would not represent a significant impact to land use by decreasing the utilization of land nor change the general land use within or outside the boundaries of KLC.
Post-Flight Activities
Post-flight operation would include the standard maintenance procedures to secure the IDT and COMSATCOM facilities and preparation for possible relocation of the relocatable IDT. Procedures would be confined to areas already used for the establishment of such facilities and would not change or introduce a conflicting use of land within the vicinity.

A Coastal Project Questionnaire for GMD ETR activities would be submitted to the State of Alaska to confirm that construction and operation activities would be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program. Submission of the Coastal Project Questionnaire would be coordinated between AADC, the U.S. Army Corps of Engineers, and the MDA. The previous developmental construction of KLC and activities involving the launch of missiles have undergone Coastal Consistency Determinations resulting in decisions that current activities were consistent with the state and local standards and policies; as outlined within the KLC EA (Federal Aviation Administration, 1996) and the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b). Therefore, it is anticipated that the similar activities identified in the Proposed Action would be determined consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program.

4.1.8.2.4 Sensors

Construction
No construction would be required.

Operation

Pre-Launch Activities
Pre-launch activities would include the transportation and arrangement of four Mobile Telemetry Systems, two inside the boundaries of KLC and two others in appropriate locations on Kodiak Island. Positioning and operation would occur on a preexisting 61-meter (200-foot) by 61-meter (200-foot) level gravel area. Although an exact location of the Mobile Telemetry Systems has yet to be determined, the positioning would occur in a compatible land use area within and outside the boundaries of KLC.

Flight Activities
Operation of Telemetry Systems would be contained within the operational trailers and only occur during times of GMD exercises. Change in land use would be confined to the gravel area necessary for telemetry operations. Access to the telemetry would be limited to authorized telemetry personnel. Adjacent lands would not experience any changes or decrease in land utilization.

Post-Flight Activities
Post-flight activities would involve routine maintenance procedures in preparation for transport and possible relocation. Telemetry System components would be contained within trailers and shipped to suitable U.S. Government storage depots or contractor facilities.
4.1.8.2.5 TPS-X Radar

Construction

Alternative 1 construction would involve minor site preparations to position and create a concrete support pad for the transportable TPS-X radar and its operational components. The potential TPS-X location would be the same as described for the potential IDT and COMSATCOM site south of the Loran-C Station. Necessary EMR hazard exclusion areas would be observed in accordance with DoD and U.S. Air Force standards, and the proposed location would not produce a land use conflict.

Operation

Pre-Launch Activities
TPS-X components would be transported to the operation site from U.S. Government storage depots or contractor facilities by air, sea, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA, and DOT safety standards minimizing any possible impacts to land use.

Flight Activities
The operation of the each sensor during flight activities would only occur during times of GMD exercises. Access to the radar equipment and facilities would be limited to authorized personnel. Under the authority of the Range Safety Officer, each EMR hazard exclusion area would be cleared before operation.

Although operation of the TPS-X radar would temporarily alter land utilization by preventing encroachment into the hazard exclusion area, changes or possible conflicts to land use would be confined to the immediate operational area and the EMR hazard exclusion area. Adjacent lands would not experience any changes or decrease in land utilization.

Post-Flight Activities
Post-flight activities would involve routine maintenance procedures to secure the TPS-X radar equipment. The TPS-X components would be contained within its operational self contained trailers and shipped to suitable U.S. Government storage depots or contractor facilities. Such activity would be confined to and not affect the previously disturbed location.

4.1.8.3 Alternative 2

Alternative 2 would be similar to Alternative 1 without GBI, IDT, and TPS-X facilities.

4.1.8.3.1 Targets

Under Alternative 2, GMD activities and potential impacts involved in the construction and operation of target missile facilities would be the same as described under Alternative 1 in section 4.1.8.2.2.
4.1.8.3.2 Sensors

Under the Proposed Action of Alternative 2, GMD activities and possible impacts involved in the operation of sensory equipment within and outside the boundaries of KLC would be the same as described under Alternative 1 in section 4.1.8.2.4.

4.1.8.4 Alternative 3

Land use impacts due to construction and operation of GBI, target, IDT, and sensors, and their accompanying facilities for Alternative 3 would be as described for Alternative 1.

4.1.8.5 Cumulative Impacts

The KLC EA indicated no significant impact to land use from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target), in conjunction with other currently planned or anticipated launches at KLC, would exceed nine launches per year, the level of activity analyzed in the KLC EA. The total existing ground disturbances associated with current facilities and activities is approximately 1 percent of the 1,504 hectares (3,717 acres) leased by the AADC for KLC. Site preparation and new construction activities associated with the Proposed Action would disturb less than 2 percent of the total or 26 hectares (64.2 acres). The total cumulative impact of such actions would be less than 3% of the KLC’s total land or approximately 43 hectares (106 acres).

4.1.8.6 Mitigation Measures

No land use mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.9 NOISE—KODIAK LAUNCH COMPLEX

This section addresses the potential impacts to the noise environment due to the construction and operation of the GBI, target, IDT, and sensor elements of the ETR at KLC, as well as the identification of potential cumulative impacts and mitigation measures.

The analysis in this section is concerned with human receptors; noise effects on wildlife are discussed in section 4.1.3, Biological Resources.

4.1.9.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established, and there would be no change to noise at KLC. The GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. Current activities of single target and commercial launches would continue.

Under the KLC site license, an Environmental Monitoring Plan was required as part of the KLC launch site operator license and called for the monitoring of at least the first five launches from KLC. Results from noise monitoring are shown in table 4.1.9-1 for the ait-1, ait-2, QRLV, and
Athena-2 (data were not gathered for the fifth launch, Strategic Target System, due to adverse weather conditions). These levels were recorded at Ugak Island, approximately 5.6 kilometers (3.5 miles) from the launch pad.

Table 4.1.9-1: Noise Levels at KLC from Previous Launches

<table>
<thead>
<tr>
<th>Rockets Launched</th>
<th>Noise Metric (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ait-1</td>
</tr>
<tr>
<td>L_{max}</td>
<td>78.2</td>
</tr>
</tbody>
</table>

Source: Alaska Aerospace Development Corporation, 2002b

These levels would be audible for only short periods of time and would not be expected to interfere with the area’s fishing, camping, or other recreational uses. (U.S. Department of the Air Force, 2001)

**Federal Aviation Administration**

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, no impacts from noise from launches would occur at KLC.

**4.1.9.2 Alternative 1**

Alternative 1 includes the construction of numerous facilities as described in section 2.3.1.1. Construction at KLC would be temporary in nature and similar to any commercial construction site. Noise generated during construction should have minimal impact to offsite areas.

**4.1.9.2.1 Ground-Based Interceptors**

**Construction**

Construction would result in intermittent, short-term noise effects that would be temporary, lasting for the duration of the noise generating construction activities. Noise-generating construction activities would include excavation and grading, utility construction and paving, and frame building.

The specific types of equipment that would be used during these construction phases are not known at this time. Excavation and grading would normally involve the use of bulldozers, scrapers, backhoes, and trucks. The construction of buildings would likely involve the use of pile drivers, concrete mixers, pumps, saws, hammers, cranes, and forklifts. Typical sound levels from construction equipment are listed in table 4.1.9-2.

It is assumed that construction would take place 24 hours per day during the summer due to the shortened construction season in Alaska. Therefore, due to the 10 dBA penalty added to nighttime noise, the 65 dBA and 75 dBA contours are estimated to occur within approximately 152 meters (500 feet) and 122 meters (400 feet) from the construction site, respectively. Therefore, no impacts to the noise environment would be expected from construction equipment noise.
Table 4.1.9-2: Typical Construction Noises (dBA) at KLC

<table>
<thead>
<tr>
<th>Source</th>
<th>Noise level (peak)</th>
<th>15 meters (50 feet)</th>
<th>30 meters (100 feet)</th>
<th>61 meters (200 feet)</th>
<th>122 meters (400 feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Trucks</td>
<td>95</td>
<td>84-89</td>
<td>78-83</td>
<td>72-77</td>
<td>66-71</td>
</tr>
<tr>
<td>Dump Trucks</td>
<td>108</td>
<td>88</td>
<td>82</td>
<td>76</td>
<td>70</td>
</tr>
<tr>
<td>Concrete mixer</td>
<td>105</td>
<td>85</td>
<td>79</td>
<td>73</td>
<td>67</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>108</td>
<td>88</td>
<td>82</td>
<td>76</td>
<td>70</td>
</tr>
<tr>
<td>Scraper</td>
<td>93</td>
<td>80-89</td>
<td>74-82</td>
<td>68-77</td>
<td>60-71</td>
</tr>
<tr>
<td>Dozer</td>
<td>107</td>
<td>87-102</td>
<td>81-96</td>
<td>75-90</td>
<td>69-84</td>
</tr>
<tr>
<td>Generator</td>
<td>96</td>
<td>76</td>
<td>70</td>
<td>64</td>
<td>58</td>
</tr>
<tr>
<td>Crane</td>
<td>104</td>
<td>75-88</td>
<td>69-82</td>
<td>63-76</td>
<td>55-70</td>
</tr>
<tr>
<td>Loader</td>
<td>104</td>
<td>73-86</td>
<td>67-80</td>
<td>61-74</td>
<td>55-68</td>
</tr>
<tr>
<td>Grader</td>
<td>108</td>
<td>88-91</td>
<td>82-85</td>
<td>76-79</td>
<td>70-73</td>
</tr>
<tr>
<td>Dragline</td>
<td>105</td>
<td>85</td>
<td>79</td>
<td>73</td>
<td>67</td>
</tr>
<tr>
<td>Pile driver</td>
<td>105</td>
<td>95</td>
<td>89</td>
<td>83</td>
<td>77</td>
</tr>
<tr>
<td>Fork Lift</td>
<td>100</td>
<td>95</td>
<td>89</td>
<td>83</td>
<td>77</td>
</tr>
</tbody>
</table>

Source: Federal Aviation Administration, 1996

Due to the exclusion of the public from the immediate vicinity of the construction site, the public would not be exposed to hazardous noise levels. However, the public within a few kilometers (miles) of KLC would be subject to noise that could decrease the existing aesthetic quality. The nearest residence is approximately 3 kilometers (2 miles) from KLC. Individuals living near the Pasagshak Point Road would experience a slight increase in traffic noise.

Operation

Pre-Launch Activities

Noises produced during pre-launch activities include noise from mechanical equipment such as worker vehicles, trucks, and by the use of the public address systems. Transportation noise would increase, as up to 235 launch support personnel drive to the site and additional trucks bring material to the site. However, this increase is expected to be reduced as some personnel are expected to be housed onsite at the proposed mancamp and at the existing mancamp at Kodiak Ranch. The remainder would commute from accommodations elsewhere on Kodiak. The increase in traffic noise levels due to launch support personnel would be considered temporary and would not permanently impact the aesthetic quality of the surrounding area.

Launch Activities

Noise during launch activities includes the GBI launch itself, which is a result of the interaction of the exhaust jet with the atmosphere and the combustion of the fuel. The sound pressure from a missile is related to the engine’s thrust level and other design features.

Personnel would normally be at the Launch Control Center during launches. At approximately 3 kilometers (2 miles) from the launch pad, they would be exposed to approximately 118 dBA.
during a single launch. This value is within the OSHA standard of 118 dBA over 9.6 minutes (U.S. Department of Labor, 2002). In the event of a dual GBI launch, personnel located at the Launch Control Center are anticipated to be exposed to approximately 121 dBA. This level is within the OSHA standard of 121 dBA over 6.6 minutes. Although no standards exist for single-event noise exposure, a time-weighted average of 90 dBA is established as a limit for an 8-hour exposure. However, workers exposed to excessive launch noise would be required to wear hearing protection.

In addition to the noise of the rocket engine, sonic booms are possible. A sonic boom is a sound that resembles rolling thunder, and is produced by a shock wave that forms at the nose of a vehicle that is traveling faster than the speed of sound. However, GBI launches would be in a southerly direction, and a sonic boom would not occur over land. Sonic booms are not expected to impact Kodiak Island or Ugak Island. Vessels impacted by sonic booms would be expected to experience sound resembling mild thunder.

All public, civilian, and nonessential personnel would be required to be outside of the Ground Hazard Area where the expected noise levels would be below the 115 dBA limit for short-term exposure. Given the infrequency of the launches, the short duration of the launch, and the similarity to previous launches, adverse noise impacts from launch activities are not anticipated.

**Post-Launch Activities**
Noise generated during the removal of all mobile equipment and assets during post-launch activities should have minimal impact to the noise environment on or off of KLC.

**4.1.9.2.2 Targets**

**Construction**
Noise caused by construction of target facilities would be similar to that described in section 4.1.9.2.1 for GBI facility construction.

**Operation**

**Pre-Launch Activities**
Pre-launch activities would include noise from mechanical equipment and the increase in vehicles for transportation of personnel to KLC. Personnel transportation noise is expected to be moderate due to some personnel being located onsite at the proposed mancamp and the existing mancamp at Kodiak Ranch. The increase in traffic noise levels due to target launch support personnel would be considered temporary and would not permanently impact the aesthetic quality of the surrounding area.

**Launch Activities**
The launch vehicle boosters are the major source of target operational noises. Based on the duration of a launch, an A-weighted scale is used and dBA measurements are used to adequately characterize the operational noise. $L_{\text{max}}$ is used to compare noise levels due to its ability to cover the entire sound spectrum, especially sounds audible to humans. Table 4.1.9-3 lists previous launch $L_{\text{max}}$ levels as well as predicted levels for proposed targets. Also listed in
the table 4.1.9-3 are $L_{\text{max}}$ levels for the Castor 120™ motor. The Castor 120™ motor was analyzed in the KLC EA and found not to produce adverse noise levels.

Figure 4.1.9-1 shows predicted launch noise levels, including Strategic Target Systems, Peacekeeper Targets, and measured noise levels of a previous Athena-2 launch.

It is expected that these noise levels for single target launches would be audible for only short periods of time and would not be expected to interfere with the area’s fishing, camping, or other recreational uses. Figure 4.1.9-2 depicts calculated noise levels of a simultaneous dual Strategic Target System, Peacekeeper Target, and Athena-2 launches. Dual target launches are expected to occur virtually simultaneously. It is anticipated that noise impacts for dual launches would also fall within OSHA limits.

**Table 4.1.9-3: Predicted Noise Levels for Target Launches at KLC**

<table>
<thead>
<tr>
<th>Target</th>
<th>$L_{\text{max}}$ (dBA)</th>
<th>Distance (kilometers [miles])</th>
</tr>
</thead>
<tbody>
<tr>
<td>ait-1</td>
<td>78.2</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>ait-2</td>
<td>81.5</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>QRLV</td>
<td>73.3</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>Athena-2</td>
<td>90.8</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>Strategic Target System</td>
<td>107.9</td>
<td>0.8 (0.5)</td>
</tr>
<tr>
<td></td>
<td>91.5</td>
<td>3.2 (2.0)</td>
</tr>
<tr>
<td></td>
<td>81.3</td>
<td>6.4 (4.0)</td>
</tr>
<tr>
<td></td>
<td>69.2</td>
<td>12.9 (8.0)</td>
</tr>
<tr>
<td>Minuteman III</td>
<td>112.6</td>
<td>1.5 (0.94)</td>
</tr>
<tr>
<td></td>
<td>98.2</td>
<td>5.1 (3.2)</td>
</tr>
<tr>
<td></td>
<td>83.3</td>
<td>25.1 (15.6)</td>
</tr>
<tr>
<td>Peacekeeper</td>
<td>125.3</td>
<td>0.65 (0.40)</td>
</tr>
<tr>
<td></td>
<td>104.3</td>
<td>3.7 (2.3)</td>
</tr>
<tr>
<td>Castor 120™</td>
<td>108</td>
<td>1.3 (0.8)</td>
</tr>
<tr>
<td></td>
<td>94</td>
<td>3.0 (1.9)</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>5.6 (3.5)</td>
</tr>
</tbody>
</table>

All public, civilian, and nonessential personnel would be required to be outside of the Ground Hazard Area where the expected noise levels would be below the 115 dBA limit for short-term exposure. Given the infrequency of the launches, the short duration of the launch, and similarity to previous launches, adverse public impacts from launch activities are not anticipated.

**Post-Launch Activities**
Noise generated during the removal of all mobile equipment and assets should have minimal impact to the noise environment on or off of KLC.
Noise Levels For Single Launch

EXPLANATION

*54 dBA sound levels may be low due to sound damping from buildings, walls, and environmental factors at the time of monitoring. (U.S. Army Space and Strategic Defense Command, 1993)

Sound levels monitored during 26 Feb 93 Strategic Target System launch at PMRF.

Sound levels predicted for Strategic Target System launch using NASA noise model.

Noise Receptor

Athena-2 Noise Level (measured at Kodiak Launch Complex)

Peacekeeper Noise Level (measured at Vandenberg Air Force Base)

Peacekeeper Noise Level (extrapolated)

Note: Data depicted are maximum peak sound levels (L_{max})

Kodiak Island, Alaska

Figure 4.1.9-1

GMD ETR Final EIS
EXPLANATION

*57 dBA sound levels may be low due to sound damping from buildings, walls, and environmental factors at the time of monitoring. (U.S. Army Space and Strategic Defense Command, 1993)

Calculated from sound levels monitored during 26 Feb 93 Strategic Target System launch at PMRF

Calculated from sound levels predicted for Strategic Target System launch using NASA noise model

Noise Receptor

Athena-2 Noise Level

Peacekeeper Noise Level

Note: Data depicted are maximum peak sound levels (Lmax)

Scale

0 2.2 4.3 Kilometers

0 1.4 2.7 Miles

Kodiak Island, Alaska

Figure 4.1.9-2

Noise Levels
Calculated for Dual Launches
4.1.9.2.3  In-Flight Interceptor Communication System Data Terminal

Construction and operation of an IDT at KLC would have minimal impact to the surrounding environment’s noise levels. Construction noises would include noise from mechanical equipment. Noises involving traffic increases are included in analysis for GBI construction. Operational noise levels of an IDT are anticipated to be from the use of a 275-kW generator in the event of a loss of power. The IDT itself would produce minimal noise levels. Therefore, noise levels from the operation of an IDT would not increase the noise levels of the regional environment.

4.1.9.2.4  Sensors

Noise from the preparation of two gravel pads for mobile telemetry would be from the use of mechanical equipment. Exact types of equipment to be utilized are not known at this time. Typical sound levels from possible construction equipment are listed in table 4.1.9-2. It is expected that the two 10-kW generators to be used for mobile telemetry would produce noise levels less than that of normal speech. Noise levels from the operation of these systems would not increase the noise levels of the regional environment.

4.1.9.2.5  TPS-X

The TPS-X construction and operation requirements and potential impacts to noise levels would be similar to that described previously for sensors. Exact types of equipment to be used for construction are not known at this time; however, typical sound levels from possible construction equipment are listed in table 4.1.9-2. Operational noise levels of an IDT are expected to stem from the use of a 1.5-MW generator. Most 1.5-MW generators are equipped with attenuations equipment to reduce noise levels. Therefore, noise levels from the operation of the TPS-X would not increase the noise levels of the regional environment.

4.1.9.3  Alternative 2

4.1.9.3.1  Targets

Noise impacts due to construction and operation activities for target launches from KLC would be similar to those described in section 4.1.9.2.2 for Alternative 1.

4.1.9.3.2  Sensors

Sensor setup and operation activities would impact the surrounding noise environment as described in section 4.1.9.2.4 for Alternative 1.

4.1.9.4  Alternative 3

Noise impacts due to construction and operation of GBI, target, IDT, and sensors and their accompanying facilities for Alternative 3 would be similar to those described in section 4.1.9.2 for Alternative 1.
4.1.9.5 Cumulative Impacts

Construction at KLC for GMD ETR activities would cause a short-term temporary increase in the noise levels in the immediate vicinity of the construction work. This effect would be localized, and is not anticipated to cause permanent noise level impacts.

Since the sound level generated by each launch is a short, discrete event, the potential cumulative impacts to noise from GMD ETR launches would not be substantial. The KLC EA indicated no significant noise impacts to sensitive receptors for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Therefore, no cumulative noise impact is anticipated at KLC.

4.1.9.6 Mitigation Measures

No noise mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.10 SOCIOECONOMICS—KODIAK LAUNCH COMPLEX

General socioeconomic impacts resulting from the Proposed Action can lead to an economic gain or loss for the community or area. Potential socioeconomic impacts of the project stem from construction or operational activities, the duration and extent of displacement or modification of existing activities, and diversion or temporary suspension of access associated with the Proposed Action. Impact analysis is focused on the following broad areas of economic or social impacts: displacement of populations, residences or businesses; housing/accommodation availability; employment and income; growth inducement; and potential impacts to locally significant industries such as tourism, commercial fishing, or agriculture.

4.1.10.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC, but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. No displacement of populations, residences, or businesses would occur within the Kodiak Island Borough as a result of the MDA’s No Action Alternative. Under the MDA’s No Action Alternative there would continue to be a need for local temporary accommodation of personnel associated with launches. Under the current FAA launch site operator license there could be up to nine launches per year from KLC. Given the extent of local facilities, this is not anticipated to be a significant impact.

Though limited in scope, this alternative would nonetheless have a continued limited positive effect on the local economy of the Borough by the ongoing local service-based employment opportunities and through launch personnel spending money in the local economy. The overall impact would be slight and would not be expected to cause any population growth. No significant impacts to the commercial fishing or fish processing industries, tourism, or logging industries are anticipated. No significant socioeconomic impacts would occur, and no mitigation measures are proposed.
Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Any economic benefits to the Kodiak Island Borough from the periodic presence of launch-related personnel would not occur.

4.1.10.2 Alternative 1

4.1.10.2.1 Ground Based Interceptor

Construction

Implementation of Alternative 1 would result in construction of two GBI silos or one launch pad and associated support facilities and ancillary equipment and modifications to some existing facilities. Approximately 100 construction personnel would be required on Kodiak Island during the course of construction of new facilities and modification of existing facilities. Construction equipment and materials would be shipped via sea or air to Kodiak Island. Local procurement of materials and workers is expected to remain very limited, and while positive, would not represent a significant economic impact to the borough.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within Kodiak Island Borough. The duration of construction activities is expected to last 15 months. The accommodation needs of the additional personnel during this period would be met via local hotels and guesthouses. Given the extent of available facilities in Kodiak, this is not considered a potentially significant economic impact. Coordination with existing accommodations would be carried out to maximize their use while minimizing any potential long-term impacts.

The additional construction personnel, by spending money in the local economy, mainly via accommodation and procurement of goods and services, would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as commercial fishing, fish processing, tourism, or logging are anticipated during construction activities. Also, personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 1.

Operation

Pre-Launch, Flight, and Post-Flight Activities

Implementation of Alternative 1 would result in single and dual GBI launches from KLC. Interceptor missile boosters, payloads, and support equipment would be transported by air or ship from Government storage depots or contractor facilities to KLC. There would be a total of five GMD missile launches per year from interceptor and/or target missiles. A typical ramp up over a 3-month period would be 55, 120, and 235 personnel who would be required at KLC to support a dual interceptor launch. After an interceptor launch, the majority of these personnel would immediately depart KLC and Kodiak Island.
As part of pre-launch and flight activities, a Launch Hazard Area and flight safety zone would be established in accord with AADC’s Interagency Land Management Agreement for Narrow Cape, which provides for public access except in cases of danger and for protection of structures. These areas would be cleared approximately 1 to 4 hours before a launch. The actual launch is expected to last approximately 30 minutes. Upon the Range Safety Officer declaring the area safe after a launch, expected to be within hours, the areas can then be reoccupied. The notice given to the local communities via local newspapers, broadcast media, and commercial fishing and tourist boat trade associations would be extensive. As such, entities with an economic interest in the use of these areas such as the commercial fishing, aviation, and tourist industries of Kodiak would not be significantly impacted by the proposed clearance areas.

Personnel would reside offsite at local hotels and guesthouses to support a GBI launch. As outlined in section 3.1.10, Kodiak has approximately 250 hotel, motel, and guesthouse rooms. There are approximately 100 additional rooms within the Narrow Cape Lodge (56) and U.S. Coast Guard accommodation facilities (44). Additional rooms could be obtained through an addition to the Narrow Cape Lodge (approximately 60 rooms) and/or constructing a mancamp on KLC (approximately 60 rooms). Without the construction of additional facilities, the accommodation needs of as many as 235 additional personnel necessary to support a dual interceptor launch would represent a positive economic impact to the local economy during the tourist “off-season” period (from September to March), given both the current supply of rooms in Kodiak and the historically low vacancy rates during this time. With regard to pre-launch periods occurring during tourist “high-season” (from May to September), the accommodation needs of up to 235 personnel, without the construction of additional facilities, would represent a positive economic impact to the community; however, there could be a potential impact to the repeat/returning tourist clientele. In order to minimize any potential negative impacts during these months, every effort would be made to secure as many rooms as possible at alternate facilities to those used by visiting tourists. Coordination with existing accommodations would be carried out to maximize their use while minimizing any potential long-term impacts.

Generally, by spending money in the local economy, mainly via accommodations and the normal procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a positive economic impact to the local community for the duration of their stay. The overall impact would be moderate, and although each launch would represent a positive impact of several million dollars on the Kodiak economy, it would not cause any population growth. No population, housing or businesses would be displaced during operational activities. No significant impacts to locally significant businesses or industries such as commercial fishing, fish processing, tourism, or logging are anticipated during operational activities. Also, personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated. Other than potential shortage of accommodations, no negative socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.1.10.2.2 Target Construction

Implementation of Alternative 1 would result in construction of a target launch pad and associated support facilities and ancillary equipment and modifications to some existing facilities. Approximately 100 construction personnel would be required on Kodiak Island during
the course of construction of new facilities and modification of existing facilities. Construction equipment and materials would be shipped via sea or air to Kodiak Island. Local procurement of materials and workers is expected to remain limited and while positive would not represent a significant economic impact to the borough.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within Kodiak Island Borough. The duration of construction activities is expected to last 12 to 15 months. The accommodation needs of the additional personnel during this period would be met via local hotels and guesthouses. Given the extent of available facilities in Kodiak, this is not considered a potentially significant economic impact.

No population, housing or businesses would be displaced. An adequate supply of accommodation for construction personnel would be available and would consequentially represent a positive temporary economic impact to the local community. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries are anticipated during construction activities. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 1.

Operation

**Pre-Launch, Flight, and Post-Flight Activities**

Implementation of Alternative 1 would result in single and dual target launches from KLC. Target missile components would be built in contractor facilities and delivered to KLC via air or boat for system assembly and checkout. When a target missile test flight is planned, the same type of land and water clearance areas that were defined for the GBI would be established and cleared for the target missile. Again, entities with an economic interest in the use of these areas such as the commercial fishing and tourist industries of Kodiak would not be significantly impacted by the proposed clearance areas.

There would be a total of five GMD missile launches per year from interceptor and/or target missiles. A typical ramp-up over a 3-month period for a single target missile launch would be 25, 55, and 110 personnel who would be required at KLC to support a target launch. After a target launch, the majority of these personnel would immediately depart KLC and Kodiak. Requirements for a dual target launch would be 25, 75, and 150 personnel.

Personnel would reside offsite at local hotels and guesthouses to support a target launch. Approximately 250 hotel, motel, or guesthouse rooms are in Kodiak. There are approximately 100 additional rooms within the Narrow Cape Lodge (56) and U.S. Coast Guard accommodation facilities (44). Additional rooms would be obtained through an addition to the Narrow Cape Lodge (approximately 60 rooms) and/or constructing a mancamp on KLC (approximately 60 rooms). Without the construction of additional facilities, the accommodation needs of up to 150 additional personnel during the tourist “off-season” (from September to March) would represent a positive economic impact to the local economy given both the current supply of rooms in Kodiak and the historically low vacancy rates during this time. With regard to pre-launch periods occurring during tourist “high-season” (from May to September), the accommodation needs of up to 150 personnel, without the construction of additional facilities, would represent a positive economic impact to the community; however, there could be a potential impact to the
repeat/returning tourist clientele. In order to minimize any potential negative impacts during these months, every effort would be made to secure as many rooms as possible at alternate facilities to those used by visiting tourists.

Generally, by spending money in the local economy, mainly via accommodations and the normal procurement of goods and services, the additional launch-related personnel would represent both a potential increase in local service-based employment opportunities and a positive economic impact to the local community for the duration of their stay. The overall impact would be moderate, and although each launch would represent a positive impact of several million dollars on the Kodiak economy, it would not cause any population growth. No population, housing, or businesses would be displaced during operational activities. No significant impacts to locally significant businesses or industries such as commercial fishing, fish processing, tourism, or logging are anticipated during operational activities. Also, personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated. Other than the potential shortage of accommodations, no significant socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.1.10.2.3 In-Flight Interceptor Communication System Data Terminal

Construction

Implementation of Alternative 1 would result in the construction of an IDT on KLC. The IDT would be located near the Loran Station, the Oxidizer Storage Facility, or near the entry road. Construction equipment, materials, and personnel would arrive at KLC as part of the construction of the GBI silos and associated support equipment. The construction personnel and related construction equipment identified for GBI would be involved in the construction of the IDT.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within Kodiak Island Borough. The presence of the construction personnel represents both a potential increase in local service based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would however be slight and would not cause any population growth. No significant impacts to businesses or industries such as commercial fishing, fish processing, tourism, or logging, are anticipated during construction activities. No significant socioeconomic impacts would occur due to the construction activities associated with Alternative 1.

Operation

The IDT site would require three onsite support personnel when in operation. The generator would be tested weekly during non-launch periods and during power outages, approximately 250 hours a year. The personnel associated with the permanent IDT would be part of the people required to support an interceptor launch and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within Kodiak Island Borough. Similarly, no significant impacts to businesses or industries are anticipated. No significant socioeconomic impacts would occur thorough the IDT operational activities associated with Alternative 1.
4.1.10.2.4 Sensors

Construction

These systems are mobile and would be brought to the vicinity of the launch site approximately 2 to 6 weeks before the planned launch. No construction activities would be involved and no socioeconomic impacts would occur.

Operation

Implementation of Alternative 1 would include the operation of sensors. Instrumentation associated with the launch of a target missile would include two telemetry sites and a range control support equipment site. These systems would be transported to Kodiak and remain in position until the launch event has been complete. In most cases the equipment would be removed within days after the launch.

The personnel associated with the launch of a target missile would operate these systems; therefore, no personnel in addition to those already involved in target operations would be needed to operate the sensors, and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within Kodiak Island Borough. Similarly, no significant impacts to businesses or industries are anticipated. Under Alternative 1, no significant socioeconomic impacts would occur through the operational activities associated with sensors.

4.1.10.2.5 TPS-X Radar

Construction

The Proposed Action would require minor site preparation to construct a single concrete support pad for the transportable TPS-X radar and its operational components. The proposed location is the potential IDT site south of the Loran-C Station. Construction equipment, materials, and personnel would arrive at KLC as part of the construction of the GBI silos, and associated support equipment. No socioeconomic impacts would occur from such minimal construction activities.

Operation

The TPS-X would be transported to KLC by air or land and then transported to the potential site by truck. The personnel associated with the launch of a GBI missile would operate these systems; therefore, no additional personnel would be needed and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, businesses, or industries are anticipated. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.1.10.3 Alternative 2

Under Alternative 2, GBIs would be launched from Vandenberg AFB instead of KLC. Thus, there would be no construction or operations related to either GBI silos and their associated support equipment or an IDT on KLC. However, the other components described in Alternative 1, and the extent of the related impacts, would remain the same.
4.1.10.3.1 Target

The socioeconomic impacts to Kodiak Island from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to what was discussed in section 4.1.10.2.2.

4.1.10.3.2 Sensors

The socioeconomic impacts to the Kodiak Island from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to what was discussed in section 4.1.10.2.4.

4.1.10.4 Alternative 3

For Alternative 3, socioeconomic impacts due to construction and operation of GBI, target, IDT, and sensors, as well as their accompanying facilities, would be the same as described in section 4.1.10.2 for Alternative 1.

4.1.10.4.1 Cumulative Impacts

It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Other than those activities already described, no other activities have been identified that would combine with the Proposed Action and result in cumulative socioeconomic impacts.

4.1.10.4.2 Mitigation Measures

No socioeconomic mitigation measures are proposed for the GMD ETR activities at KLC. Coordination with the local tourist industry is a typical practice that would be used to reduce the potential impact on tourists during the peak tourist season. The construction of an addition to the existing Narrow Cape Lodge and/or the construction of an additional mancamp at KLC are alternatives that could be implemented. If a decision is made to proceed with proposed activities at KLC, then the housing availability and requirements would be reviewed at that time, and a decision would be made regarding this construction.

4.1.11 TRANSPORTATION—KODIAK LAUNCH COMPLEX

4.1.11.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC, but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. The AADC and the Alaska Department of Transportation and Public Facilities conducted studies of the roads, bridges, and culvert crossing conditions and determined that they are adequate for motor loads as heavy as a Castor 120™ (Alaska Aerospace Development Corporation, 2001).
Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to transportation from launches at KLC.

4.1.11.2 Alternative 1

4.1.11.2.1 Ground-Based Interceptors

Construction

Implementation of Alternative 1 would result in the construction of facilities as described in section 2.3.1.1. Kodiak Island and KLC have established air, ocean, and ground transportation systems. The construction equipment and materials would be brought to Kodiak Island by ocean carrier or by plane and transported over land or via barge/beach landing to KLC. Kodiak Island is already one of the leading shipping ports in southwest Alaska and as a commercial service facility is equipped to accommodate international cargo receipt and shipment. Scheduled service is in place to support the normal level of traffic; however, peak demands are anticipated and scheduled in advance. In addition, vessels serving the AMHS are rarely booked full to capacity with container vans (Alaska Department of Transportation and Public Facilities, 1998). These activities would be considered normal usage and would not result in an impact to the ocean transportation systems. Approximately 100 construction personnel would be brought to Kodiak Island via the AMHS and/or commercial airliner. Year-round service to Kodiak Island by sea and air currently exists, and movement of project-related people would not impact either of these transportation systems.

Once unloaded at Kodiak Island, construction equipment and material could be shipped by tractor-trailer transport to KLC with beach landings as a possible option. Roadway access to KLC is via Rezanof Drive West. This road is narrow and, in some cases, steep. There are switchbacks and 11 bridge crossings before reaching KLC. Due to the nature of these road conditions, movement of construction equipment and material would cause temporary traffic delays; however, these delays would be minimal and infrequent. Public announcements regarding potential delays would be made, and movements during off-peak travel hours would be scheduled to the greatest extent possible.

The roadways supporting the individual facilities within KLC are designed to accommodate tractor-trailer transport vehicles as well as passenger vehicles and light trucks. Road grades range from 1 percent to over 15 percent. Due to the nature of these road conditions, project-related movements would also cause temporary traffic delays within KLC; however, they would not extend to local roads. Development of these new facilities would result in the construction of new roads, parking for staff vehicles and tractor trailers, and upgrades to existing roads. The approximately 100 construction personnel would be housed in Narrow Cape Lodge and accommodations in the Kodiak area. The proposed Narrow Cape Lodge expansion, and/or the proposed mancamp would further decrease the transportation to and from Kodiak proper; thus the increase in personnel would only minimally change the ADT on key local roads, if at all, and the impact on Level of Service would be negligible.

Potential beach landing areas, for optional barge delivery, include Burton Ranch Beach (mancamp location), Boulder Beach (near Bear Paw Ranch), and Pasagshak Beach (near the
Pasagshak Recreation Area). The Narrow Cape Lodge is an example of direct barge delivery to KLC. For the latter two locations, some modification would be necessary: Boulder Beach would require a temporary ramp; Pasagshak Beach would require widening of a turn to allow access to the main road nearby. Temporary beach closure would be necessary, but would be considered routine and of short duration.

**Operation**

*Pre-Launch Activities*

Implementation of Alternative 1 would result in single and dual GBI launches from KLC. Interceptor missile boosters, payloads, and support equipment would be transported by air or ship/barge from Government storage depots or contractor facilities to KLC. All shipping would be conducted in accordance with DOT regulations. Applicable safety regulations would be followed in the transport and handling of hazardous materials. The interceptor may arrive at Kodiak with the EKV attached, or the booster may be shipped separately from the EKV. In either case, integration and assembly operations would be performed onsite. There would be up to five interceptor launches per year; however, as previously stated, Kodiak Island is one of the leading shipping ports in southwest Alaska and as a commercial service facility is equipped to accommodate this type of cargo and frequency of shipping.

As mentioned in section 4.1.7.2.1, use of the Kodiak State airport could be required to support receipt and transportation of missile components and mission personnel. This is typical procedure for rocket motor shipments to KLC, and, if chosen, appropriate safety measures (as established by AADC) would be instituted at the receiving terminals or airport, including specified receiving and parking areas (for transport vehicles), establishment and enforcement of applicable ESQDs around receiving areas, restricting handling and transportation of missile components to specific and properly trained personnel, and using established and permitted transportation routes from the receiving terminal or airport to KLC.

A Primary or Alternate Booster Off-loading Point (figure 4.1.7-1) could be utilized by military aircraft transporting missile payloads and/or boosters. An ESQD would be established around such aircraft to a distance of 434 meters (1,425 feet) to any inhabited buildings and 260 meters (855 feet) to any public traffic routes. Selection of the Primary Booster Off-loading Point would result in the temporary closure of portions of Airport Terminal Road and possibly a small portion of Buskin River Road. Selection of the alternate scenario would result in the temporary closure of the areas surrounding the junction of Buskin River Road and Buskin Beach Road, as well as the area just southwest of this junction, which includes the eastern portion of Airport Terminal Road.

With either scenario, traffic delays would be discrete and infrequent, and impacts to transportation on these non-primary roads would be significantly reduced by coordination with the Alaska State Parks, Kodiak Division. In keeping with this, AADC would provide a 30-day advance notice regarding any closure prior to the arrival of missile payloads and/or boosters in order to ensure that roadways at or near the recreation site that fall within the ESQD would be vacated. Once the boosters and payloads are removed from the immediate vicinity, ESQDs would no longer be in effect and roadways would again be accessible. Effects on Buskin River Road, Buskin Beach Road, and Airport Terminal Road would be minimal. In addition, prior planning of such activity for off-peak travel hours would further serve to minimize any traffic delays.
Once unloaded at Kodiak Island, the interceptor missile boosters, payloads, and support equipment would be shipped by tractor-trailer transport to KLC in a manner similar to that of the construction equipment and materials; as an option, they could be barged via one of the aforementioned potential beach landing areas. The Alaska Department of Transportation and Public Facilities has evaluated all of the bridges on this road and made improvements to them to support rocket motors in transport to KLC (Alaska Aerospace Development Corporation, 2001). Due to the nature of these road conditions, movement of interceptor missile boosters, payloads, and support equipment would cause temporary traffic delays; however, these delays would be minimal and infrequent. Prior planning of these movements for off-peak travel hours would further serve to minimize these delays. Once at KLC, the interceptor would be placed in secure storage until assembly and launch preparation. Due to the nature of the road conditions within KLC, movement of these vehicles would also cause temporary traffic delays, but they would not extend to local roads. As mentioned, utilizing the beach landing/barging options would require modifications. Temporary beach closure would be necessary, but would be considered routine and of short duration.

A typical manpower build-up over a 3-month period would be 55, 120, and 235 personnel who would be required at KLC to support a dual interceptor launch. They would come to Kodiak via commercial airliner or the AMHS. It is assumed that approximately 50 personnel would be housed at the existing mancamp on Kodi Ranch. If the additional mancamp is not constructed on KLC or the existing mancamp is not added on to, then it is conservatively estimated that the remaining 185 personnel would commute daily to KLC from accommodations in the surrounding areas and within the City of Kodiak during a peak month. This would add approximately 93 vehicles (assuming 2 persons per vehicle) to Rezanof Drive West each day during peak hours. Although the local road system would experience an increase in traffic, the increase would only minimally change the ADT on key local roads, and the impact on Level of Service would be negligible. The use of an onsite mancamp and/or expansion of the Narrow Cape Lodge to house personnel would also help to reduce automobile traffic between the worksite and the city of Kodiak, lowering the potential impacts even further.

**Flight Activities**

When a missile test flight is planned, there are certain areas where missile components and debris are expected to impact: the booster drop zone and the debris impact area. These areas are cleared of personnel as part of the test plan. There are other areas where debris may land if the test does not proceed as planned. These areas of the test event may be subject to the risk of mishap from a flight termination. Each missile flight test event would be modeled using computer predictions of the behavior of the missiles. Specific clearance areas would be defined for each flight test depending upon the profile of that test.

Once a test event is scheduled, there would be a standard sequence of notification and coordination procedures between the Range Safety Office and the agencies (FAA, Coast Guard, AMHS) that would enforce the clearance of land, air, and sea areas. The date and location of scheduled flight tests or training events would be published approximately one week in advance as described below for land, air, and sea areas. Clearances are of a short duration, and effects are anticipated to be negligible.

Land areas would be cleared by KLC Security personnel approximately 4 hours before launch. A Launch Hazard Area would be established around the launch site; however, since the launch
Azimuth for KLC is southwest and southeast over the Pacific Ocean and would not be over any public roads, there would be no impact to road transportation.

Impacts to commercial aviation and airspace from missile launches are evaluated in section 4.1.2.

Sea-surface areas that would have to be cleared include the Launch Hazard Area that extends overwater, the predicted booster drop zones, the predicted debris impact area, and the predicted whole body miss impact point for each missile. Sea-surface areas would be cleared with the cooperation of the U.S. Coast Guard. Sea-surface areas would need to be cleared in advance of a planned test event to allow sufficient time to ensure that it is indeed clear; this would be approximately 4 hours before test launch. The U.S. Coast Guard would publish a NOTMAR to clear certain sea-surface areas for safety reasons. Notice of intent to clear certain sea-surface areas for safety reasons would be published in local newspapers, broadcast in local news media, and distributed to commercial fishing and tourist boating trade associations. Subject to the conditions of appropriate Memoranda of Agreement, Coast Guard officials would close the sea-surface area(s) up to 4 hours before the planned launch and then survey them to ensure that they are clear of ships or watercraft. Coast Guard boats and range safety aircraft would patrol the area to ensure that it is clear of ships or watercraft. The AMHS ferry route is north of Kodiak and away from the KLC launch azimuth; therefore, no impacts to vessels traveling these routes would occur. The Pacific Ocean south of Kodiak does contain commercial shipping lanes for vessels traveling from Seattle to and from Nome and Yokohama. These vessels would be required to stay clear of these areas during a launch, which could cause them to be slightly delayed. These delays would be short-term and infrequent (up to five times per year), however, and the advanced notification would serve to further minimize any impact. Commercial and recreational fishing vessels would also be required to relocate their activities during a launch event; however, they would only be required to move for a short period of time and this would only occur infrequently (up to five times per year). Section 4.1.10 includes a more detailed analysis of the impacts to commercial and recreational fishing from the implementation of this alternative.

**Post-Flight Activities**

After completion of a missile flight test, the clearance areas would be released, or allowed to be re-occupied. The Range Safety Officer would do this as soon as he or she was assured that any hazardous aspect of the test was completed. Such residual hazardous concerns may include the presence of hazardous debris, debris still falling after an intercept, or other potentially dangerous consequences. Notification would be by radio, telephone, or computer to aviation and maritime authorities. If required, debris recovery on land may involve the use of helicopters and off-road vehicles, and the two main parachutes, if used to air-launch targets for interceptor tests, would be recovered from ocean drops. This debris cleanup would not have any impact on land-, air-, or sea-based transportation systems. After an interceptor launch, personnel would depart KLC and Kodiak by commercial air or sea (via the AMHS).

**4.1.11.2 Target Construction**

Implementation of Alternative 1 would result in the construction of facilities as described in section 2.3.1.1. The construction equipment and personnel associated with the construction of
the target pads and associated support facilities would be similar to the GBI construction. Construction materials for the new target launch pad and its associated support facilities would be transported to KLC via routes and in a manner similar to that utilized for transporting material for the GBI facilities. The transportation impacts from the construction of the target launch pad and its associated support facilities would be the same as for the GBI facilities.

**Operation**

**Pre-Launch Activities**

Implementation of Alternative 1 would result in single and dual target launches from KLC. Target missile components would be built in contractor facilities and delivered to KLC via air or boat for system assembly and checkout. Target missiles would not be shipped with initiators or other explosive devices. All missile components would be packaged in appropriately designed containers, labeled, and handled in accordance with applicable DOT regulations for the transport of hazardous materials. Trained personnel using only appropriately certified cranes and other materiel handling equipment would handle missile components and handling equipment in accordance with approved SOPs. There would be up to five target launches per year. As stated in section 4.1.11.2.1, Kodiak Island is one of the leading shipping ports in southwest Alaska and, as a commercial service facility, is equipped to accommodate this type of cargo and frequency of shipping; thus, there would be no impacts to transportation.

Once at Kodiak, the target missiles would likely be transported via roadways to KLC in the same manner as the GBIs. The impacts from the transfer of the target missiles to KLC would be similar to what is expected with the transfer of the GBIs, though GBIs could potentially utilize barge landings. Once at KLC, the missile components would be stored in a Missile Assembly Building until they are assembled for launch. The impact of the movement of the target missiles within KLC would be similar to what is expected with the GBIs.

A maximum of approximately 150 personnel would be required to support a dual target launch. They would travel to Kodiak via commercial airliner or the AMHS. It is assumed that approximately 50 personnel would be housed at the existing mancamp on Kodiak Ranch. If the additional mancamp is not constructed on KLC or the existing mancamp is not added on to, then it is conservatively estimated that the remaining 100 personnel would commute daily to KLC from accommodations in the surrounding areas and within the City of Kodiak during a peak month. This would add approximately 50 vehicles (assuming 2 persons per vehicle) to Rezanof Drive West each day during peak hours. Although the local road system could experience an increase in traffic, the increase would only minimally change the ADT on key local roads, and the impact on Level of Service would be negligible. Moreover, the proposed construction of the new mancamp on KLC property (see section 2.3.1.1) or expansion of the existing lodge located near KLC would reduce, if not preclude, this minor impact.

**Flight Activities**

When a target missile test flight is planned, the same type of clearance areas that were defined for the GBI in section 4.1.11.2.1 would be established and cleared for the target missile. These areas would be very similar or the same as the clearance areas for the GBI.
Post-Flight Activities
After a successful test, the clearance areas would be released, or allowed to be re-occupied. Test personnel would depart by commercial airliner or sea (via the AMHS). Thus, the impacts from post-flight target missile activities would be similar to those for the GBI.

4.1.11.2.3 In-Flight Interceptor Communication System Data Terminal

Construction
Implementation of Alternative 1 would result in the construction of an IDT on KLC. The IDT would be located near the Loran Station, the Oxidizer Storage facility, or near the entry road. The IDT would require approximately 0.8 hectare (2 acres) of land with an unobstructed line-of-sight. Construction equipment, material, and personnel for the IDT would arrive at KLC as part of the construction of the GBI and/or target construction efforts. Thus, there would be no additional impact to transportation from construction of an IDT.

One additional COMSATCOM system could be constructed at KLC as part of Alternative 1. Personnel numbers for its construction are included in the GBI construction numbers, and thus no impacts to transportation are expected from construction of this additional COMSATCOM.

Operation
The IDT sites would require three onsite support personnel when in operation. When not in operation, the onsite backup generators would be tested for approximately 45 minutes every 2 months. The personnel associated with the IDT would be part of the people required to support an interceptor launch and would not be an additional impact to transportation systems.

4.1.11.2.4 Sensors

Operation
Instrumentation associated with the launch of a target missile would include mobile telemetry sites, and a range control support equipment site. Representative telemetry sites are shown in figure 2.1.5-5. Telemetry is provided through a real-time data acquisition system. The mobile telemetry systems would consist of an 11-meter (31-foot) truck, two 5.4-meter (17.7-foot) antennas, and dual 10-kW generators. Range control support equipment would include a semitrailer van for the Flight Termination System, meteorological, transponder, control, communications, and timing systems. Target telemetry requirements include an up-range, mid-range, and down-range telemetry systems to support launches. One site could be located in a level gravel area 61 by 61 meters (200 by 200 feet) in the vicinity of the entry road and north of the maintenance building on KLC. Other up-range telemetry locations on Kodiak Island that may be used include Pasagshak and Pillar Mountain. Up-range telemetry locations that may be used in other parts of Alaska include Soldotna, Kenai, and Homer on the Kenai Peninsula, in south-central Alaska; Cordova, in southeast Alaska; and King Salmon and Adak Island in southwest Alaska. Examples of this equipment are shown in figure 2.1.5-4.

All of these systems are mobile and would be brought to the vicinity of the launch site approximately 1 to 2 weeks before the launch date. These systems would be transported to Kodiak by air or sea and then driven to KLC or other locations in Kodiak on the existing roads. Systems that would be located in Soldotna, Kenai, and Homer on the Kenai Peninsula would be
brought in by air, land, or sea and transported to their location by motor carrier. Systems that would be located in Cordova in southeast Alaska and King Salmon and Adak Island in southwest Alaska would only be brought in by air or sea and then driven to their location on the existing roads. Once onsite, they would remain in position until the launch event has been complete. In most cases the equipment would be removed within days after the launch. The personnel associated with the launch of a target missile would operate these systems. Since these systems encompass a small number of vehicles (seven), movement of these systems to KLC or other locations in south-central, southeastern, or southwestern Alaska would not have a measurable impact on the air, ocean, or ground transportation systems at any of these locations.

4.1.11.2.5 TPS-X

Construction
TPS-X components could be transported to the operation site from U.S. Government storage depots or contractor facilities by aircraft, sea vessels, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA and DOT safety standards to minimize any possible impacts to transportation. Site preparation would require construction of a gravel pad area of approximately 0.3 hectare (0.8 acre). The limited construction activities would have little to no effect on area transportation levels.

Operation
At KLC, the Prime Power Unit for the TPS-X would be a 1.5-MW generator that would provide power to the radar during testing. The generator is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during launch activities. The total time of operation is estimated at a maximum of 2,520 hours per year. Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. The limited trips required by the fuel truck would have no impact on current transportation systems.

4.1.11.2.6 Launch Complex Security

Security procedures would be established in accordance with AADC’s Interagency Land Management Agreement for property, which permits public exclusion during times of danger and assists in protecting structures. When interceptor testing occurs it would be on a periodic basis. It is assumed that testing would be on a campaign basis and the security for these tests would be on a similar basis. It is estimated that the potential security personnel would be on-site for approximately 5 weeks for each campaign. Implementation of this alternative would result in security personnel being brought to KLC during each campaign. The security personnel would travel to KLC via air or sea and would be housed onsite or offsite. Security vehicles would also be used. During the day, security vehicles would be on patrol, and at night additional vehicles would be used as needed. Since the additional security personnel would be working on site during much of the campaign, they would not measurably add to the ADT of the local roads. The addition of security vehicles would not measurably add to the ADT on KLC.

Up to three access control points would be required during a test campaign. One could be located at the entrance of KLC to record vehicles entering and leaving the site. The access control points would not disrupt the flow of traffic; however, they would be able to advise
motorists on the location of Launch Hazard Areas and minimize the potential for them to gain unauthorized access. Public access through KLC to Fossil Beach would be limited or denied only for each launch day. During the 5-week period building up to a launch, delays would be limited to clearance through security checkpoints. For the proposed five launches per year, the 5 days of closure would be less than 2 percent of the year.

4.1.11.3 Alternative 2

Alternative 2 would have GBIs launched from Vandenberg AFB instead of KLC. There would be no construction or operations related to GBI and its associated support equipment as well as an IDT. However the other components described in Alternative 1 would remain the same.

4.1.11.3.1 Target

The impacts to transportation from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to those discussed in section 4.1.11.2.2.

4.1.11.3.2 Sensors

The impacts to transportation from operation of target sensors on KLC or in other parts of southwestern Alaska would be similar to what was discussed in section 4.1.11.2.4.

4.1.11.4 Alternative 3

For the purposes of the discussion at KLC, the construction and flight impacts for Alternative 3 would be as described above for Alternative 1.

4.1.11.5 Cumulative Impacts

The KLC EA indicated no significant impacts to transportation from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA, and therefore, no substantial cumulative impacts to transportation are expected. At this time, there are no ongoing or foreseeable future programs taking place in the ROI other than those discussed previously that would have an added impact on transportation. Plans on the part of the Alaska Department of Transportation to pave some additional 40 kilometers (25 miles) between the town of Kodiak and KLC would actually have a beneficial effect, reducing risk to both personnel and equipment required to travel this roadway. Paving activities are currently underway.

4.1.11.6 Mitigation Measures

No transportation mitigation measures are proposed for the GMD ETR activities at KLC.
4.1.12 UTILITIES—KODIAK LAUNCH COMPLEX

A project may have substantial effects on infrastructure and utilities if it increases demand in excess of the utility system’s capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

4.1.12.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. These launches could include missions in support of the GMD program. KLC would continue to operate as a licensed launch facility, and, as concluded in the KLC EA (Federal Aviation Administration, 1996), no impacts to area utilities would be anticipated.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to utilities resources from launches at KLC.

There would be no impacts expected to utilities from the FAA’s No Action Alternative because there would be no additional launch events from KLC.

4.1.12.2 Alternative 1

4.1.12.2.1 Ground-Based Interceptors

Construction

Implementation of Alternative 1 would result in construction of several facilities as described in section 2.3.1.1. Kodiak Island and KLC have established air, ocean, and land transportation systems. Approximately 100 construction personnel would be brought to Kodiak Island during the course of construction of new facilities and modification of existing facilities.

Construction equipment and materials would also be shipped via sea or air to Kodiak Island. Once unloaded at Kodiak Island, construction equipment and materials would either be shipped by tractor-trailer transport or via one of the three potential beach landing sites to KLC. Access to KLC is via Rezanof Drive West.

In order to support construction and operations personnel, the creation of a new mancamp on KLC property (see section 2.3.1.1) has been proposed. Per table 2.3.1.2, this would house a maximum of 60 people. As an additional alternative, a similar-sized increase is proposed for the Narrow Cape Lodge, as well.
**Energy**
The addition of 100 construction personnel and related construction activities would not measurably increase the demand for electricity at KLC, although the housing of up to 60 personnel at the proposed mancamp or in the proposed expansion of the Narrow Cape Lodge would require the installation, or upgrading, of lines to tap into the current KLC electric system.

**Water**
The addition of 100 construction personnel and related construction activities would increase the demand for potable water. Given 189 liters (50 gallons) per day per worker, demand would be 18,927 liters (5,000 gallons) per day. This would be above the system capacity of 13,060 liters (3,450 gallons) per day. To allow for any additional demand, however, the utilization of portable drinking water systems would be necessary; this would include any potable water system required for the proposed mancamp.

Some water would be pumped from East Twin Lake for temporary use at the project’s cement batch plant and for emergency, fire-fighting purposes. Compared to the lake’s capacity (about 57 million liters [15 million gallons]) and average recharge rate (estimated to be 871 liters [230 gallons] per minute), this temporary use of water would represent a minor impact.

**Wastewater**
The addition of 100 construction personnel and their related construction activities would increase the demand on existing wastewater treatment services. Given 170 liters (45 gallons) per day per worker, wastewater production would be 17,034 liters (4,500 gallons) per day. This would be above the system capacity of 13,060 liters (3,450 gallons) per day. To allow for any additional demand, however, the utilization of portable septic/toilet systems would be necessary. This would include the installation of a septic/toilet system for the proposed mancamp, as necessary.

**Solid Waste**
Construction activities and 100 construction personnel would not increase the demand for solid waste disposal services beyond the existing capacity of 11.5 cubic meters (15 cubic yards) per month. Although construction of new facilities, such as the proposed mancamp, and modification of the existing Narrow Cape Lodge, would generate solid waste, this is not expected to exceed the existing capacity. Any increase over and above typical levels and capacity would be negotiated with and handled by the Kodiak Island Borough/Waste Management, Inc.

**Operation**

*Pre-Launch, Flight, and Post-Flight Activities*
Implementation of Alternative 1 would result in single and dual GBI launches from KLC. Interceptor missile boosters, payloads, and support equipment would be transported by air or ship from Government storage depots or contractor facilities to KLC. There would be up to five missile launches per year (target and interceptor). A maximum of approximately 235 personnel (contractor, military, and Government civilian) would be required to travel to KLC for a period of up to 2 months to support an interceptor launch. After an interceptor launch, the majority of these personnel would depart KLC and Kodiak.
As part of pre-launch and flight activities, a Launch Hazard Area would be established around the launch site in accord with the AADC Interagency Land Management Agreement has for the property, which allows public access restrictions in cases of public safety and to protect structures. The Launch Hazard Area would result in certain areas of KLC being cleared of personnel in the event of an accident during interceptor launch; however, establishing a Launch Hazard Area would not create an impact related to utility services.

**Energy.** An offsite commercial power supplier would be used to supply primary power to activities associated with missile flight tests, with a backup battery system and onsite backup diesel generators for emergency power. Generators for various GBI-related facilities would range in output from approximately 75 to 900 kW. Each generator would also have its own dedicated AST. Additionally, the new Missile Assembly Building would include wall mounted sodium-vapor lighting, aircraft obstruction lighting, and a 500-kW diesel generator. The integrated assemblies would be electronically tested. Therefore, compared to daily average demand for electricity at KLC of 825 kW, the total increase in demand for electricity would not exceed the existing capacity of 3,100 kW. No adverse impacts would be anticipated.

Additional electricity usage would occur as a result of up to a maximum 235 personnel residing offsite during the operational phase of the GBI. However, it is anticipated that the majority of the personnel would be staying at existing hotels and motels. This would create negligible additional demand on electricity services and would be within existing capacity. Upgrades to Narrow Cape Lodge or electric service for the proposed mancamp would of necessity provide the capacity for the electricity needs of up to 60 personnel.

**Water.** Domestic water usage represents the water consumed by the launch personnel in the ROI. Additional water usage would occur as a result of up to a maximum of 235 personnel at KLC to support a dual launch of the GBI.

Assuming an approximate average water requirement of 189 liters (50 gallons) per person per day, the water requirements for a typical dual launch flight test buildup are shown in table 4.1.12-1.

<table>
<thead>
<tr>
<th>GBI Personnel</th>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>55</td>
<td>120</td>
<td>235</td>
</tr>
<tr>
<td>Water Usage</td>
<td>10,410</td>
<td>22,712</td>
<td>44,479</td>
</tr>
<tr>
<td>liters (gallons)</td>
<td>(2,750)</td>
<td>(6,000)</td>
<td>(11,750)</td>
</tr>
<tr>
<td>Target Personnel</td>
<td>25</td>
<td>75</td>
<td>150</td>
</tr>
<tr>
<td>Water Usage</td>
<td>4,732</td>
<td>14,195</td>
<td>28,390</td>
</tr>
<tr>
<td>liters (gallons)</td>
<td>(1,250)</td>
<td>(3,750)</td>
<td>(7,500)</td>
</tr>
</tbody>
</table>

As shown in table 4.1.12-1, GMD requirements would exceed existing capacity of 13,060 liters (3,450 gallons) by as much as 31,419 liters (8,300 gallons). It is anticipated that additional
packaged potable water systems would be installed to meet the GMD requirements. The packaged system (well, pump, and AST) would be located within the construction footprint of the proposed GMD facilities. A new potable water system would be required for the proposed mancamp, if constructed. Permits would be obtained from the Alaska Department of Environmental Conservation for construction and use of the water supply systems, and such systems would comply with “new source” provisions as mandated by the Safe Drinking Water Act (see appendix B), as amended.

**Wastewater.** Assuming an approximate average of 170 liters (45 gallons) per person per day of wastewater production, the launch activities would generate wastewater at the rates shown in table 4.1.12-2.

As shown in table 4.1.12-2, GMD requirements would exceed existing design capacity of 13,060 liters (3,450 gallons) per day by as much as 26,970 liters (7,125 gallons). It is anticipated that new facility construction and additions to existing facilities would include additional wastewater treatment systems that, as with any additional potable water systems, would meet GMD requirements. Proposed construction of the new mancamp would also necessitate the installation of a wastewater system capable of accommodating up to 60 personnel. In keeping with KLC procedures, any septic systems would likely include a mounded absorption bed. Again, appropriate permits would be obtained where required.

<table>
<thead>
<tr>
<th>Table 4.1.12-2: Wastewater Requirements for Dual Launch Missile Flight Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GBI Personnel</strong></td>
</tr>
<tr>
<td>Personnel</td>
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<tr>
<td>Wastewater Usage</td>
</tr>
<tr>
<td>liters (gallons)</td>
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<tr>
<td><strong>Target Personnel</strong></td>
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<tr>
<td>Personnel</td>
</tr>
<tr>
<td>Wastewater Usage</td>
</tr>
<tr>
<td>liters (gallons)</td>
</tr>
</tbody>
</table>

**Solid Waste.** Municipal solid waste would be generated during the five GMD missile launches. However, the amount of waste is expected to be similar to previous missile launches and is not expected to exceed the existing quantity of 15 cubic yards (11.5 cubic meters), currently handled by Kodiak Island Borough/Waste Management, Inc. Were the amount of solid waste produced to increase over and above typical levels and capacity, however, this would be negotiated with and handled by the Kodiak Island Borough/Waste Management, Inc. Therefore, the total increase would not result in adverse impacts to existing services.
4.1.12.2 Target

Construction
Implementation of Alternative 1 would result in the construction of a new target launch pad and associated support facilities as described in section 2.3.1.1. The construction equipment and personnel associated with the target construction and associated support facilities would be similar to those used for the GBI facilities. The impacts from the construction of the target launch pad and its associated support facilities would be similar to the GBI construction impacts.

Energy
The impact to energy services from target facility construction would be similar to what would be expected for interceptor construction.

Water
The impact to potable water from target facility construction would be similar to what would be expected for interceptor construction.

Wastewater
The impact to wastewater from target facility construction would be similar to what would be expected for interceptor construction.

Solid Waste
The impact to solid waste from target facility construction would be similar to what would be expected for interceptor construction.

Operation
Pre-Launch, Flight, and Post-Flight Activities
Implementation of Alternative 1 would result in single and dual target launches from KLC. Target missile components would be built in contractor facilities and delivered to KLC via air or boat for system assembly and checkout. Trained personnel using only appropriately certified cranes and other materiel handling equipment would handle missile components and handling equipment in accordance with approved SOPs. There would be as many as five target launches per year.

The launch site, for target launches, would be occupied for approximately 3 months. A maximum of approximately 150 personnel (contractor, military, and government civilian) would be required to support a target launch.

Energy. An offsite commercial power supplier would be used to supply primary power to activities associated with the flight tests. Within the proposed Missile Service Structure, emergency power would be supplied from the Integration Processing Facility, and uninterrupted power supply batteries would serve critical loads. The Missile Assembly Building would include a 500-kW diesel generator. Additionally, both the Missile Assembly Building and Missile Service Structure would require wall mounted sodium-vapor lighting. Compared to the daily average
demand for electricity at KLC of 825 kW, the total increase in demand for electricity would not exceed the existing capacity of 3,100 kW. No adverse impacts would be anticipated.

**Water.** Domestic water usage represents the water consumed by the launch personnel in the ROI. Additional water usage would occur as a result of 150 personnel residing offsite during the operational phase of the target. However, it is anticipated that they would be staying at existing hotels/motels. This would not create additional demand on offsite water services, because they would not be exceeding the existing capacity of those facilities.

Table 4.1.12-1 shows water requirements for a typical target flight test buildup. As shown in the table, GMD requirements would eventually exceed existing capacity, but it is anticipated that additional packaged potable water systems would be installed to meet GMD requirements, thus negating the potential impact.

**Wastewater.** Assuming a proportional relationship between potable water consumption and wastewater treatment, the launch activities for targets would generate wastewater at the rates shown in table 4.1.12-2. Additionally, wastewater would be generated by the personnel residing offsite during the operational phase of the targets. However, it is anticipated that they would be staying at existing hotels/motels. Additional demand on wastewater treatment services would occur, but it would not exceed the existing capacity.

Table 4.1.12-2 shows wastewater requirements for a typical target flight test buildup. As shown in the table, GMD requirements would eventually exceed existing capacity, but it is anticipated that additional septic systems would be installed to meet GMD requirements, thus negating the potential impact.

**Solid Waste.** Municipal solid waste would be generated during the five GMD missile launches. However, the amount of waste is expected to be similar to previous missile launches and is not expected to exceed the existing quantity of 11.5 cubic meters (15 cubic yards), currently handled by Kodiak Island Borough/Waste Management, Inc. Were the amount of solid waste produced to increase over and above typical levels and capacity, however, this would be negotiated with and handled by the Kodiak Island Borough/Waste Management, Inc. Therefore, the total increase would not result in adverse impacts to existing services.

**4.1.12.2.3 In-Flight Interceptor Communication System Data Terminal Construction**

Implementation of Alternative 1 would result in the construction of an IDT on KLC. The IDT would be located near either the Loran Station, the Oxidizer Storage facility, or near the entry road. Construction equipment, material, and personnel would arrive at KLC as part of the construction of the GBI and/or target efforts. The different types of IDTs (i.e., re-locatable, mobile, and sea-based) do not require additional preparation (for construction and operation purposes) beyond what is required for land-based IDTs.

The IDT construction personnel and related construction equipment are included in the GBI construction. Potential impacts to energy, water, wastewater, and solid waste are included in section 4.1.12.2.
**Operation**

The IDT site would require three onsite support personnel when in operation. When not in operation, the onsite backup generators would be tested for approximately 45 minutes every 2 months. The personnel associated with the IDT would be part of the personnel (up to a maximum of 235) required to support an interceptor launch.

**4.1.12.2.4 Sensors**

**Construction**

These systems are mobile and would be brought to the vicinity of the launch site approximately 1 to 2 weeks before the launch site. No construction would be involved.

**Operation**

Implementation of Alternative 1 would include operation of mobile telemetry systems. The telemetry sites would be located in a level gravel area 61 by 61 meters (200 by 200 feet) in the vicinity of the #1 entry road and southwest of the Loran Station on KLC. Other up-range telemetry locations that may be used in other parts of Alaska include Soldotna, Kenai, Cordova, and Homer on the Kenai Peninsula in south-central Alaska and King Salmon and Adak Island in southwest Alaska.

These systems would be transported to Kodiak. Once onsite, they would remain in position until the launch event has been complete. In most cases the equipment would be removed within days after the launch. The personnel associated with the launch of a target missile would operate these systems.

**Energy**

The mobile telemetry systems would include dual 10-kW generators. Operation of the sensors would not require any additional electricity. Current capacities would not be exceeded. No adverse impacts would be anticipated.

**Water**

Domestic water usage represents the water consumed by the operation personnel in the ROI. In this case, the target missile launch personnel would operate these systems; therefore, no additional personnel over the 150 personnel already involved in target operations would be needed to operate the sensors.

**Wastewater**

The target missile launch personnel would operate these systems; therefore, no additional personnel over the 150 personnel already involved in target operations would be needed to operate the sensors.

**Solid Waste**

The target missile launch personnel would operate these systems; therefore, no additional personnel over the 150 personnel already involved in target operations would be needed to operate the sensors.
4.1.12.2.5 TPS-X

Construction

Installation of the TPS-X radar would require disturbance to 0.3 hectare (0.8 acre) of land on KLC for placement of a concrete pad. Potential impacts to energy, water, wastewater, and solid waste are included in section 4.1.12.2.

Operation

At KLC, the Prime Power Unit for the TPS-X would be a 1.5-MW generator that would provide power to the radar during testing. The generator is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during launch activities. The total time of operation is estimated at a maximum of 2,520 hours per year. Operation of the Prime Power Unit would require refueling operations, the fuel tank being filled from a fuel truck, as necessary. Such operations are routine and would have no impact on area utilities.

4.1.12.3 Alternative 2

Under Alternative 2, GBIs would be launched from Vandenberg AFB instead of KLC. Thus, there would be no construction or operations related to GBI and its associated support. However, the other components described in Alternative 1 would remain the same, and the impacts would be the same.

4.1.12.3.1 Target

The impacts to utilities (energy, water, wastewater, and solid waste) from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to what was discussed in section 4.1.12.2.2.

4.1.12.3.2 Sensors

The impacts to utilities (energy, water, wastewater, and solid waste) from operation of target sensors on KLC or other parts of southwestern Alaska would be similar to that discussed in section 4.1.12.2.4.

4.1.12.4 Alternative 3

Implementation of Alternative 3 would combine activities proposed for Alternative 1 and Alternative 2 and would include GBI launches from both KLC and Vandenberg AFB and construction of the required facilities. Therefore, the impacts to utilities (energy, water, wastewater, and solid waste) from Alternative 3 would be similar to those found under Alternative 1.

4.1.12.5 Cumulative Impacts

The KLC EA indicated no significant impacts to utility systems from nine annual launches (Federal Aviation Administration, 1996). Although direct impacts from the Proposed Action on potable water and wastewater would eventually exceed current capacity, these impacts would
be localized and this increased demand would be circumvented by the addition of potable water and septic systems to handle any increase over current capacity. It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year; the level of activity analyzed in the KLC EA, and would not result in any cumulative impacts to KLC utilities. In addition, there are no other ongoing or foreseeable future programs taking place in the ROI that would result in cumulative impacts.

4.1.12.6 Mitigation Measures

Direct impacts to water and wastewater demand and capacity, as previously addressed, would be met by the addition of new potable water and septic systems. No significant impacts to utilities systems would be anticipated and additional mitigation measures would not be required or proposed.

4.1.13 VISUAL AND AESTHETIC RESOURCES—KODIAK LAUNCH COMPLEX

4.1.13.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. There would be no alteration of the existing visual setting at KLC and the adjacent area. No significant impacts to visual and aesthetic resources would occur, and no mitigation measures are proposed.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to visual and aesthetic resources from launches at KLC.

4.1.13.2 Alternative 1

Visual impacts may be associated with changes in either the built or natural environment and can be short-term or long-term. The presence of heavy machinery during construction of the project is considered a short-term visual impact. Large trucks, cranes, and other construction equipment would be visible within the construction zone and in surrounding areas only during the construction phase. Long-term visual changes are associated with altering the existing visual environment by constructing buildings, including one with a very high vertical profile. The focus of this analysis is those long-term physical changes that are permanent in nature.

The construction and operation of the proposed GMD facilities at KLC would affect the visual resources of Narrow Cape by introducing new structures into a relatively isolated area that has both natural and man-made elements. The proposed KLC infrastructure for launching targets and interceptors would involve the construction of new structures and facilities to support the GMD program at various locations within the launch complex. Proposed new facilities are described in section 2.3.1.1.
Construction of these facilities would place additional man-made, mostly pre-engineered buildings that are color compatible to the existing facilities into an area that, although regionally scenic, has a somewhat disturbed local viewscape. Several of the proposed structures, including the Missile Assembly Building (18 meters [60 feet] high) and the Movable Missile Building (33.5 meters [110 feet] high), would change the view horizon. Other proposed buildings, such as the IDT, would have a noticeable horizontal presence. There is also the potential for impacts to visual resources due to nighttime lighting, particularly during construction.

In an effort to determine the existing visual quality, the following method was modified from *Landscape Aesthetics: A Handbook for Scenery Management* (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the Proposed Action location at KLC: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.

**Scenic Attractiveness**
The area encompassing KLC would be considered as having a “typical” (B) level of scenic attractiveness and is very similar to other regions of the island.

**Concern Level**
Potential viewers of the Proposed Action at KLC include hikers and other recreational users and would have a high (Level 1) level of concern for the scenic quality of the ROI.

**Distance Zone**
Viewers would be able to observe the Proposed Action over a wide variety of distances including within the foreground (FG) and mid-ground (MG) for the construction and within the background (BG) for launches.

**Scenic Value Class**
The scenic value class for KLC as determined from the Scenic Value Class table 4.1.13-1 is 1 to 2 and equates to a high public value scenic class.

**Scenic Integrity**
KLC has sporadically been altered and would be considered to have a moderate scenic integrity.
Table 4.1.13-1: Scenic Value Class Determined for KLC

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>Distance Zones and Concern Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FG1</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>


Scenic Attractiveness
A – Distinctive, B – Typical, C – Indistinctive
Distance zone and Concern Level
FG1 – Foreground with a high level of concern
MG1 – Mid-ground with a high level of concern
BG1 – Background with a high level of sensitivity
FG2 – Foreground with a moderate level of sensitivity
MG2 – Mid-ground with a moderate level of sensitivity
BG2 – Background with a moderate level of sensitivity
FG3 – Foreground with a low level of sensitivity
MG3 – Mid-ground with a low level of sensitivity
BG3 – Background with a low level of sensitivity

Scenic Value Class
1-2: High public value.
3-5: Moderate public value.
6-7: Low public value.

There are no residences in the immediate vicinity of KLC, and the nearest park is approximately 10 kilometers (6 miles) away. The existing AADC facilities along with the U.S. Coast Guard’s 190-meter-high (625-foot-high) Loran-C navigation transmitter tower and associated white-colored buildings already have a visual presence that alters the natural viewscape of the area. Although the Narrow Cape area is being developed, there is the potential that some sensitive viewers would be affected, particularly hikers, fishermen, and other recreational users; even though the amount of concerned viewers would be somewhat limited, there is a potential for adverse affects to visual resources.

4.1.13.3 Alternative 2
The construction and operation of target facilities at KLC for Alternative 2 would be the same as that for Alternative 1. An IDT and GBI related facilities would not be constructed at KLC. As discussed under Alternative 1, the Proposed Action would not have a significant impact on aesthetic or visual resources.

4.1.13.4 Alternative 3
Alternative 3 would be identical to Alternative 1 at KLC. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts to visual and aesthetics from Alternative 3 would be as described for Alternative 1.
4.1.13.5 Cumulative Impacts
Although construction of new facilities could potentially double the amount of development within and the area and would result in visual cumulative impacts, the area proposed for development is already designated as a commercial launch facility.

4.1.13.6 Mitigation Measures
No visual resources mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.14 WATER RESOURCES—KODIAK LAUNCH COMPLEX
This section addresses potential impacts to surface water and groundwater resources. Both freshwater and marine surface waters are covered. Potential changes in the availability of water supplies for consumptive purposes are also addressed. None of the action alternatives would involve the construction of new facilities in a floodplain; therefore, floodplain-related impacts are not addressed. Wetland-related impacts are addressed in section 4.1.3.

A proposed alternative would cause an adverse and significant impact on water resources if it would cause:

- A violation of applicable state or federal water quality standards, or inconsistencies with related stormwater pollution prevention plans, or other applicable water quality-related plans, policies, or permit conditions
- Major changes in existing drainage and runoff patterns that alter the course of existing waterways or exceed the capacity of existing stormwater drainage systems
- An increase in the use of consumptive water supplies to the point where the capacity of existing supply systems would not be adequate and new water supply sources would be needed
- Or if it would otherwise substantially degrade water quality

Best Management Practices and other SOPs would be used during construction and operational activities to minimize erosion and other types of impacts that could reduce the quality of affected water resources. Water quality-related SOPs that apply to each of the action alternatives are listed below. Mitigation commitments from previous environmental studies that are unique to a site or activity are described under the related alternative.

- Site preparation—vegetation preservation and protection, topsoil preservation, dust control, and temporary gravel construction entrance and exit
- Surface stabilization—temporary and permanent seeding and use of mulches and fabric and gravel blankets
- Runoff control and conveyance measures—installation of diversions, dikes, grassed waterways, and temporary slope drains
- Sediment barriers—straw bale and rock barriers, sediment fences
- Sediment traps and basins
- Stream protection—temporary stream crossings and streambank stabilization
- Protection of soil and fill storage piles

SOPs related to the handling, disposal, recycling, and other use of hazardous materials and wastes would be followed, including spill prevention, containment, and control measures while transporting equipment and materials. Other water quality-related SOPs to be followed include the use of portable toilets and waste disposal practices during construction, rapid response, control and cleanup activities in the event of unplanned spills or accidents, and worker education and training programs.

4.1.14.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. Table 4.1.1-1 summarizes the propellant information associated with these launches. The primary exhaust products from launches at KLC to date include hydrogen chloride, carbon monoxide, nitrogen oxide and aluminum oxide. These products would continue to be released and dispersed over large areas, with some of the emissions landing on surface water resources, or soil where they may enter the area’s water resources at a later time. The existing water quality monitoring required by KLC’s 401 Water Quality Assurance Permit (pH, perchlorates, and total aluminum) from the Alaska Department of Environmental Conservation, and the implementation of related components of the KLC NRMP would continue under all of the alternatives assessed in this EIS, including the MDA’s No Action Alternative. Water quality monitoring and the KLC NRMP are described further in section 4.1.14.2.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to water resources from launches at KLC.

4.1.14.2 Alternative 1

4.1.14.2.1 Ground-Based Interceptors

Construction

Construction of the new GBI-related facilities as described in section 2.3.1.1 has the potential to disturb approximately 14.4 hectares (35.5 acres) and cause adverse water quality impacts to nearby surface waters. These construction-related impacts could include an increase in the discharge of sediments and turbidity levels in receiving waters. Construction crews may accidentally spill some of the material used during construction procedures or by construction vehicles, including fuel, cement, paint, anti-freeze, oil, etc. None of these construction-related impacts are expected to be significant. The SOPs discussed in the beginning of section 4.1.14 and the commitments included in the KLC NRMP (described in the next paragraph) are all expected to minimize the magnitude of adverse water quality impacts. Only minor erosion and turbidity impacts, and insignificant and accidental spillage of petroleum products and other construction materials are expected.
The KLC NRMP commitments include such measures as collecting and disposing of sewage offsite, monitoring of soil conditions, periodic inspection by a designee of AADC to ensure erosion and sediment control structures are working properly, hazardous waste management measures and offsite disposal, post-launch monitoring and revegetation of areas around launch sites if needed (Alaska Aerospace Development Corporation, 1998). All of the SOPs and water quality-related elements of the KLC NRMP would be reviewed with Alaska Department of Environmental Conservation staff during consultations for the project’s required 401 Water Quality Assurance Permit. A related Stormwater Pollution Prevention Plan would be prepared before construction for the Alaska Department of Environmental Conservation (or the existing Plan would be amended) and would specify all of the measures to be used during construction to minimize and avoid adverse water quality impacts.

Potable water would be transported to facility sites during construction. Some water would be pumped from East Twin Lake for temporary use at the project’s cement batch plant and for emergency, fire-fighting purposes. Compared to the lake’s capacity (about 57 million liters [15 million gallons]) and average recharge rate (estimated to be 871 liters [230 gallons] per minute), this temporary use of water would represent a minor impact.

**Operation**

*Pre-Launch, Flight and Post-Flight Activities*

This section addresses potential impacts that could occur during any of the operational phases. The next section describes potential impacts unique to the flight operational phase.

Hazardous materials would be used during operational phases and such use has the potential to cause adverse and significant water quality impacts. As described in section 3.1.6, numerous SOPs, a spill prevention plan, and emergency response plan are currently in place and being used at KLC and would continue to be used under this alternative. These measures would minimize the risk of accidental spills to an acceptable level and significant and related water quality impacts would not occur.

The leaching of domestic sewage wastewater from septic tanks would occur as designed during operations.

Potable water used during operations would come in part from the existing water supply system. As noted in section 4.1.12.2, insufficient capacity exists in the current system to handle the increases in demand associated with this alternative. Therefore, new water supply sources would be needed. It is anticipated that packaged potable water systems, similar to the existing water systems, would be installed to meet the GMD requirements. The packaged system (well, pump, and AST) would be located within the construction footprint of the proposed GMD facilities. Permits would be obtained from the Alaska Department of Environmental Conservation for construction and use of the water supply systems.

*Flight Activities*

The missiles launched from KLC under this alternative would disperse certain exhaust emission products over a large area. These emissions would not cause a significant water quality impact. The primary emission products of concern from a water quality-standpoint are hydrogen chloride, which combines with water or water vapor in the atmosphere and forms hydrochloric
acid and aluminum oxide. Table 4.1.1-8 shows more information regarding the amounts and type of emissions from launched rockets. In any one area of the ROI, only small amounts of these combustion products would be present. For example, the 1996 KLC EA estimated the launching of an Athena-2 rocket would result in a maximum deposition of 0.427 grams of hydrogen chloride per square meter of surface area over a 10-square-kilometer (4-square-mile) area (Federal Aviation Administration, 1996). These small amounts of hydrogen chloride would be transitory given the area’s hydrologic characteristics and climate. The contaminants would be quickly washed out of the area’s relatively short and steep drainages during and after frequent precipitation events.

Aluminum oxide also would be emitted during missile launches and deposited in ROI surface waters. However, aluminum oxide is only a hazard to aquatic life in acidic environments when it dissolves into a free aluminum cation (Federal Aviation Administration, 1996). Aluminum oxide should not dissolve in water with pH levels between 5 and 9.5 because aluminum hydroxide, a much more soluble compound than aluminum oxide, is insoluble between pH levels 5 and 9.5. As summarized in Summary Findings of Environmental Monitoring Studies for the Kodiak Launch Complex 1998–2001 (Alaska Aerospace Development Administration, 2002b), water quality sampling and analysis indicate there have been no discernable effects on water chemistry from KLC launches to date. Water quality was sampled before and after KLC launches, including pH level, total aluminum, and perchlorate concentration. Samples were taken at various locations as shown in figure 3.1.14-1. The levels for pH, measured in streams 2, 4, 7b, and 8, ranged from 6.1 to 7.8. Table 4.1.14-1 provides results of the sampling for total aluminum and perchlorate concentration.

As shown in the table, total recoverable aluminum was detected in very low concentrations in the three water bodies sampled, but these did not exceed levels considered to be toxic to aquatic life and were comparable to values found elsewhere in Alaska. Although not shown, there was no associated decrease in pH to warrant concern from aluminum toxicity. As a result of the monitoring, the Environmental and Natural Resources Institute recommended long-term pH monitoring. AADC is conducting ongoing monitoring for pH, perchlorates (EPA method 314.0 for water), and total aluminum at an observation well adjacent to the existing Launch Pad 1. Results of the monitoring are provided to the Alaska Department of Environmental Conservation.

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Total Aluminum (microgram/L)</th>
<th>Perchlorate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stream 2</td>
<td>8 Nov 01</td>
<td>6.1</td>
<td>Non detect</td>
</tr>
<tr>
<td></td>
<td>9 Nov 01</td>
<td>15.0</td>
<td>Non detect</td>
</tr>
<tr>
<td>Stream 4</td>
<td>8 Nov 01</td>
<td>No Sample</td>
<td>Non detect</td>
</tr>
<tr>
<td></td>
<td>9 Nov 01</td>
<td>No Sample</td>
<td>Non detect</td>
</tr>
<tr>
<td>Stream 7b</td>
<td>8 Nov 01</td>
<td>37</td>
<td>Non detect</td>
</tr>
<tr>
<td></td>
<td>9 Nov 01</td>
<td>104</td>
<td>Non detect</td>
</tr>
<tr>
<td>Stream 8</td>
<td>8 Nov 01</td>
<td>8</td>
<td>Non detect</td>
</tr>
<tr>
<td></td>
<td>9 Nov 01</td>
<td>47</td>
<td>Non detect</td>
</tr>
</tbody>
</table>
Measurable or significant impacts to ocean water quality from launches are not expected. Spent rocket cases are composed of inert materials and do not represent a threat to water quality once their propellants are burned (Federal Aviation Administration, 1996). Early termination of a flight would lead to some amount of propellant reaching the ground, surface waters, or the ocean. The propellant is an inert, solid rubber material impregnated with ammonium perchlorate salt. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. Table 4.1.14-2 presents the results.

<table>
<thead>
<tr>
<th>Water Type</th>
<th>Water Temperature °Celsius (°Fahrenheit)</th>
<th>Hours</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deionized water</td>
<td>29 (84)</td>
<td>4,700</td>
<td>196</td>
</tr>
<tr>
<td></td>
<td>20 (68)</td>
<td>8,000</td>
<td>333</td>
</tr>
<tr>
<td></td>
<td>5 (41)</td>
<td>92,000</td>
<td>3,833</td>
</tr>
<tr>
<td>Salt water</td>
<td>29 (84)</td>
<td>6,500</td>
<td>271</td>
</tr>
<tr>
<td></td>
<td>20 (68)</td>
<td>13,000</td>
<td>542</td>
</tr>
<tr>
<td></td>
<td>5 (41)</td>
<td>160,000</td>
<td>6,667</td>
</tr>
</tbody>
</table>

The same report provided an average water temperature at a buoy in Alaska as 8.3°C (47°F). As shown in the table, it would take approximately 18 years for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean. For fresh water areas the temperature would be higher, and it would take about 1 year for 90 percent of the perchlorate to leach out. Even at this higher rate the perchlorate would be expected to be diluted as it mixes with the surrounding water. For an accident involving fresh water areas, larger pieces of propellant would be recovered, further minimizing the potential for perchlorate contamination.

In the unlikely event of an on-pad fire or catastrophic missile failure over land, most or all of the solid propellant fuel would likely burn up before being extinguished. Any remaining fuel would be collected and disposed of as a hazardous waste. The total quantities of hydrogen chloride and aluminum oxide released in an on-pad failure of a GBI would be equivalent to that released during a nominal launch of an Athena-2. Therefore, an on-pad failure is not expected to result in significant ground deposition of either pollutant.

4.1.14.2.2 Targets

Construction

Construction of the new target facilities has the potential to disturb approximately 10.5 hectares (26.0 acres) and cause the same type of construction-related water quality impacts described in section 4.1.14.2.1. Like the GBI-related construction, the SOPs and KLC NRMP commitments discussed in section 4.1.14.2.1 would prevent the target facility-related construction impacts from being significant.
Operation

Pre-Launch, Flight and Post-Flight Activities

The types of operations-related water resource impacts discussed in section 4.1.14.2.1 and common to pre-launch, flight, and post-launch activities would also be associated with the target launches included in this alternative. These impacts would be minor for the same reasons described in section 4.1.14.2.1.

Flight Activities

Target launches under this alternative would be similar to existing target launches at KLC. Table 4.1.1-13 in section 4.1.1.2.2 shows the expected emissions associated with these launches. While some deposition of these emissions would occur on freshwater and ocean surface waters, these depositions would not be a significant impact for the reasons described in section 4.1.14.2.1.

In the event of an on-pad fire or terminated launch, the Peacekeeper Target could potentially release 76,848 kilograms (169,420 pounds) of solid propellant, and 1968 liters (520 gallons) of liquid fuel. As discussed in section 4.1.5.2.1, most of the solid propellant would be expected to burn upon impact with the ground. Unburned components of the fuel would be removed and treated as hazardous waste. The total quantity of aluminum oxide and hydrogen chloride released in an on-pad failure of a Peacekeeper target would be approximately 26,900 kilograms (59,300 pounds) and 12,300 kilograms (27,100 pounds) respectively. This would be equivalent to that released during 3 nominal launches of an Athena-2 missile. As discussed in section 4.1.1.2.2, the airborne concentrations of the pollutants would be higher than during a nominal launch, but would return to ambient levels within several hours. Modeling results from the testing of much larger Advanced Solid Rocket Motor program vehicles, which output 196,357 kilograms (432,885 pounds) of aluminum oxide and 115,572 kilograms (254,789 pounds) of hydrogen chloride concluded that there would be no significant impacts to surface water from aluminum oxide and hydrogen chloride deposition (National Aeronautics and Space Administration, 1990). Most of the aluminum oxide would be suspended in the air and dispersed over extremely large areas, and the amount of aluminum oxide deposited in surface waters would have not significant impacts. The hydrogen chloride, under the most conservative rain conditions, would be buffered by the water and would not significantly change the pH of the water (National Aeronautics and Space Administration, 1990). The effects of hydrogen chloride deposition into surface waters are dependent upon the pH and buffering capability of the water. The buffering capability is a result of the degree of alkalinity in the water. Measurements of alkalinity are expressed in milligrams of calcium carbonate per liter of water. The higher the alkalinity, the greater the buffering capability. Alkalinity values from the Advanced Solid Rocket Motor program ranged from 5 milligrams calcium carbonate equivalent per liter to 124 milligrams calcium carbonate equivalent per liter with a mean value of 25 milligrams calcium carbonate equivalent per liter (National Aeronautics and Space Administration, 1990). The alkalinity values of surface water within the ROI as listed in table 3.1.14-1 have an average value of 19 milligrams calcium carbonate equivalent per liter and would have a similar buffering capability. Deposition of hydrogen chloride would result in a not significant impact to surface water due to the buffering capability of the water and the relatively small amount of hydrogen chloride deposited.

In the highly unlikely case of an on-pad accident, the liquid fuel (hydrazine) from the fourth stage of the Peacekeeper target is heavier than air and, if not oxidized when airborne, would react and/or possibly ignite with the porous earth or would form dimethylamine and oxides of nitrogen.
All of these substances are soluble in water. Airborne nitrogen dioxide would return to earth as dilute nitric acid rains in precipitation events. (U.S. Army Space and Strategic Defense Command, 1995)

4.1.14.2.3 In-Flight Interceptor Communication System Data Terminal

Construction
Construction of the IDT, COMSATCOM, and connecting roads would cause a minor increase in the discharge of sediments to receiving waters. These waters may also receive some construction-related pollutants, especially if materials are accidentally spilled by construction crews. However, the area to be disturbed is relatively small (approximately 5.9 hectares [14.6 acres]), and the SOPs and KLC NRMP-related commitments described in section 4.1.14.2.1 would prevent these impacts from being significant.

Existing water utilities are sufficient to handle the minor increase in demand for potable water during construction. Therefore, new water sources would not be needed.

Operation
Operation of the IDT and COMSATCOMs would have negligible effects on water quality. Potable water demands associated with the operation of these facilities can easily be served by existing infrastructure.

4.1.14.2.4 Sensors

Construction
The construction of two gravel pads for mobile telemetry would have very little impact on water quality. Minor amounts of sediment may enter nearby drainages, but these impacts would be minor.

Operation
Negligible amounts of motor oil or other automotive-related products may enter nearby drainages as vehicles associated with mobile units use the gravel pads and related roads. These impacts would be minor.

4.1.14.2.5 TPS-X Radar

The TPS-X construction, operation requirements, and potential impacts to water resources would be similar to that described above for the IDT. The alternative locations are the same, and the potential impacts would be similar.

4.1.14.3 Alternative 2

4.1.14.3.1 Targets

The impacts of target-related construction and operational activities on water resources under this alternative would be very similar to those described for Alternative 1 in section 4.1.14.2.2.
The total acreage disturbed would be the same as for Alternative 1. None of the impacts would be significant.

4.1.14.3.2 Sensors

The impacts of sensor-related activities at KLC on water resources under this alternative would be the same as those described for Alternative 1 in section 4.1.14.2.4.

4.1.14.4 Alternative 3

Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts to water resources from Alternative 3 would be as described for Alternative 1.

4.1.14.5 Cumulative Impacts

The Proposed Action and its alternatives are not expected to combine with related past, ongoing, or reasonably foreseeable actions to cause substantial cumulative impacts to water resources. Existing missile launches at KLC combined with the launches included in the Proposed Action would result in minor, short-term adverse water quality impacts in those areas where rocket emissions are deposited. For the same reasons described in section 4.1.14.2.1, such impacts would not be significant. Past construction at KLC combined with the new construction included in the Proposed Action and its alternatives would cause cumulative, but minor and temporary, increases in stormwater runoff and related discharges of sediments in affected drainages. These insignificant impacts have and would occur in drainages near paved areas or areas that are proposed to be paved. Such impacts have been and would continue to be minimized by construction SOPs and other commitments included in the related Stormwater Pollution Prevention Plan. Additional ongoing or foreseeable actions that would contribute to cumulative impacts to water resources have not been identified.

4.1.14.6 Mitigation

No water resources mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.15 SUBSISTENCE—KODIAK LAUNCH COMPLEX

The subsistence resources analytical approach involved evaluating the potential impacts of the Proposed Action and alternatives, such as construction, site preparation activities, use of existing and new sensors, and missile launches, on potential subsistence harvest access within the ROI. Several documents were analyzed to determine the effects to subsistence caused by the program.

4.1.15.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC, but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. Native Alaskans would continue to be allowed access to KLC for subsistence harvests between launches. According to the KLC EA,
to ensure public safety, access to some areas would be prohibited for a day up to nine times per year before a launch, which would result in minimal impacts to subsistence harvesting.

**Federal Aviation Administration**

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no closure of areas to subsistence harvesting during launches at KLC.

**4.1.15.2 Alternative 1**

The Proposed Action would require construction at KLC as described in section 2.3.1.1. New construction would occur mainly in upland areas, which would not impact the subsistence harvest of marine species.

Limitation of access for Alternative 1 would be mainly because of safety and security precautions taken before and during a launch to ensure that no unauthorized people are within the Ground Hazard Area around the launch site. Access would be limited for 1 day for each GBI or target missile launch, approximately 5 days per year for GMD launches. Since the Narrow Cape area hosts only a limited amount of subsistence harvesting and the entire coast from Pasagshak Bay to the southern end of the island is a harvesting area, temporarily restricting public access during GMD ETR pre-launch and launch activities as part of the activities would not be significant.

**4.1.15.3 Alternative 2**

The Proposed Actions at KLC under Alternative 2 would be identical to those described under Alternative 1, except GBI launches would occur from Vandenberg AFB and RTS instead of KLC and RTS. Potential restricted access to KLC would be as described for Alternative 1.

**4.1.15.4 Alternative 3**

Alternative 3 would be identical to Alternative 1 at KLC and would include GBI launches from both KLC and Vandenberg AFB, and construction of the required support facilities. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts to from Alternative 3 would be as described for Alternative 1.

**4.1.15.5 Cumulative Impacts**

The KLC EA indicated no cumulative impact to subsistence harvest for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. No other activities have been identified that when combined with any of the alternatives would contribute to cumulative impacts to subsistence on or near KLC.

**4.1.15.6 Mitigation Measures**

No subsistence mitigation measures are proposed for the GMD ETR activities at KLC.
4.2 MIDWAY

Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and would not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed. The Proposed Action in the mid-Pacific is the same for all three alternatives; therefore, the environmental consequences would be the same for all. Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS for both the No Action Alternative and the Proposed Action alternatives.

4.2.1 AIR QUALITY—MIDWAY

4.2.1.1 No Action Alternative

Under the No Action Alternative, IDT and COMSATCOM facilities would not be constructed for the GMD ETR, and Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS. There would be no impact to air quality.

4.2.1.2 Alternatives 1, 2, and 3

4.2.1.2.1 In-Flight Interceptor Communication System Data Terminal

Construction

Construction activities would include construction of one IDT, COMSATCOM, and fenced areas surrounding the facilities at one of the two proposed sites. Both sites are located on existing paved areas; therefore, ground disturbance would be kept to a minimum with only minimal emissions generated during construction.

Construction would be conducted in accordance with applicable federal and state regulations and permits. Construction air quality impacts would be both temporary and localized in nature. Once construction is completed, air quality would return to its former level.

Operation

Operation of the IDT and COMSATCOM would not result in long term or permanent impacts to the regional air quality. Power would be provided by a commercial source with a 275-kW backup generator. Along with the generator, an external aboveground 3,785-liter (1,000-gallon) fuel tank would be provided. Table 4.2.1-1 lists potential emissions for the generator if it is run up to 250 hours a year for weekly testing and power outages. These levels would not exceed existing standards.
Table 4.2.1-1: Potential Generator Emissions for IDT and COMSATCOM Facilities at Midway

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen (metric tons)</th>
<th>Hydrogen Chloride (metric tons)</th>
<th>Carbon Monoxide (metric tons)</th>
<th>PM-10 (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>275-kW Diesel Generator</td>
<td>0.6 (0.7)</td>
<td>0.09 (0.10)</td>
<td>0.80 (0.90)</td>
<td>0.03 (0.04)</td>
</tr>
</tbody>
</table>

4.2.1.2.2 Sensors

Construction

Mobile telemetry would utilize an existing gravel pad or paved area and result in no new construction; therefore, there would be no air quality impacts from construction.

Operation

Minor air quality impacts are expected during the operation of the mobile telemetry at Midway. Power would be provided by a 10-kW generator, which is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during test activities. The total operating time is estimated at a maximum of 2,520 hours per year. Table 4.2.1-2 lists the possible emissions that could be generated and are anticipated to remain within existing air standards.

Table 4.2.1-2: Potential Generator Emissions for Mobile Telemetry Facilities at Midway

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen (metric tons/year)</th>
<th>Hydrogen Chloride (metric tons/year)</th>
<th>Carbon Monoxide (metric tons/year)</th>
<th>PM-10 (metric tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-kW Diesel Generator</td>
<td>0.23 (0.26)</td>
<td>0.036 (0.039)</td>
<td>0.29 (0.32)</td>
<td>0.01 (0.02)</td>
</tr>
</tbody>
</table>

4.2.1.3 Cumulative Impacts

The limited construction and operation of the IDT and COMSATCOM, when combined with current activities on Midway, are not expected to result in significant cumulative air quality impacts.

4.2.1.4 Mitigation Measures

No air quality mitigation measures are proposed for the GMD ETR activities at Midway.
4.2.2 BIOLOGICAL RESOURCES—MIDWAY

The Proposed Action in the mid-Pacific is the same for all three alternatives; therefore, the environmental consequences would be the same for all.

4.2.2.1 No Action Alternative

Under the No Action Alternative, IDT and COMSATCOM facilities would not be constructed for the GMD ETR and Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS. There would be no impact to biological resources.

4.2.2.2 Alternatives 1, 2, and 3

The Proposed Action would require construction and operation of an IDT and two COMSATCOMs, and operation of mobile telemetry. Installation and operation of the IDT and COMSATCOMs, as well as operation of the sea-based IDT, would comply with all applicable regulations, such as the Plant Protection Act of 2000 (7 USC 7701, et. seq.); Executive Order 13112, Invasive Species (3 February 1999); and the National Invasive Species Act of 1996 (16 USC 4701, et seq.; see appendix B). The Proposed Action would follow all applicable procedures in place at Midway to prevent the introduction of alien nuisance species, such as removing visible mud, plant, fish, or animals from equipment before transporting it to Midway. Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought onto the island. These activities would result in impacts similar to, but less than, those caused by site preparation. Specific restoration actions, if necessary, would be determined on a case-by-case basis.

Site Preparation Activities

Vegetation

The IDT on Midway would require construction of an IDT on an existing paved area or pad within a fenced area. The fencing would be installed in the smallest area practicable, no more than 2 hectares (5 acres). The IDT would be located in previously disturbed areas to further minimize impacts to vegetation and would avoid areas of beach strand vegetation.

The two COMSATCOMs require a footprint of approximately 0.14 hectare (0.34 acre) each within a fenced area to accommodate the COMSATCOM and equipment. The COMSATCOMs would be placed on existing previously disturbed paved areas to further minimize impacts to vegetation. They would also be located within the IDT fenced area. A communication cable to the IDT would be installed along an existing road. Minimal requirements include a concrete base for the COMSATCOMs, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plants are located on Midway Atoll.
**Wildlife**

Construction activities would occur on previously disturbed ground and would not significantly impact wildlife. Primary power would be from a commercial source with backup power provided by generator. Noise from the generator may temporarily startle adjacent wildlife, but no long-term impacts are anticipated. Any lighting associated with the Proposed Action would be properly shielded following USFWS guidelines to minimize disorientation impacts to birds.

**Threatened and Endangered Wildlife Species.** No impacts are anticipated to the short-tailed albatross, Hawaiian monk seal, or basking sea turtles, which would all be located along the beach or nearshore water. Personnel would be instructed to stay at least 46 meters (150 feet) away from monk seals on the beach in accordance with current rules.

**Environmentally Sensitive Habitat**

The small wetland on the island, critical habitat for the Hawaiian monk seal, which is not located on Sand Island, and established Marine Protected Areas would not be affected by site preparation activities.

**Operation**

**Vegetation**

No impacts to vegetation would result from operation of the IDT and COMSATCOMs.

**Wildlife**

During normal operations, the IDT would not transmit except for a few minutes during annual testing of the equipment. Given the short duration of transmission, no adverse impacts to biological resources are anticipated. Most operational impacts to wildlife from the IDT and COMSATCOMs would come from security lighting and noise from backup electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Any lighting associated with the Proposed Action would be properly shielded following USFWS guidelines to minimize disorientation impacts to birds. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities required for backup generators, with minimal impact to wildlife adjacent to the site.

**Threatened and Endangered Wildlife Species.** No impacts are anticipated to the short-tailed albatross, Hawaiian monk seal, or basking sea turtles, which are all located along the beach or nearshore water outside of the highest noise levels. Personnel would be instructed to stay at least 46 meters (150 feet) away from monk seals on the beach in accordance with current rules.

**Environmentally Sensitive Habitat**

The small wetland on the island, critical habitat for the Hawaiian monk seal (which is not located on Sand Island), and established Marine Protected Areas would not be affected by site preparation activities.
4.2.2.3 Sensors
Mobile telemetry would be set up on an existing gravel pad or paved area. Operation of a 10 kW generator would cause noise levels of 80 to 85 dBA at up to 344 feet (105 meters). These noise levels would occur 24 hours per day for up to 3 weeks, five times per year, in support of missile flight tests, with minimal impact to wildlife.

4.2.2.4 Cumulative Impacts
The limited operation of the IDT and COMSATCOMs when combined with current activities on Midway is not expected to result in cumulative impacts to vegetation or wildlife.

4.2.2.5 Mitigation Measures
No biological resources mitigation measures are proposed for the GMD ETR activities at Midway.

4.2.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—MIDWAY
A general description of impact on hazardous material and waste management is provided in the beginning of section 4.1.6. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from GMD ETR activities are addressed as applicable.

4.2.3.1 No Action Alternative
Under the No Action Alternative, IDT and COMSATCOM facilities would not be constructed for the GMD ETR and Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS. There would be no impact to hazardous materials and waste management practices at Midway.

4.2.3.2 Alternatives 1, 2, and 3
4.2.3.2.1 In-Flight Interceptor Communication System Data Terminal
Installation and operation of an IDT and COMSATCOMs, in and of itself, would have minimal impact on the atoll with respect to hazardous materials use or hazardous waste generation. In accordance with DoD requirements, hazardous materials management would be planned into the installation and operation activities from conceptual design forward.

Construction
IDT and COMSATCOM construction would essentially be the same as routine commercial construction of a small communications facility and would result in only minor disturbance of the immediate area. Equipment would be fabricated prior to delivery, and only final assembly would be required on site. “Environmentally preferable” materials would be used where possible. Potentially hazardous materials such as adhesives, paints and low-toxicity cleaning products would be used to install and maintain the equipment, and diesel fuel would be used for electrical generator operation. Only the minimum quantity of material necessary to perform the work would be transported to the atoll. Pollution Prevention, Recycling, and Waste Minimization
would be practiced in accordance with applicable EPA, State of Hawaii, DoD, U.S. Army, and USFWS requirements. IRP sites from the Navy CLEAN program would not be affected.

Temporary storage tanks and other facilities for the storage of hazardous materials would be located in protected and controlled areas designed to comply with site-specific spill prevention and countermeasure plans. Hazardous wastes generated during construction would consist of materials such as waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. The minimal quantities of hazardous waste that could potentially be generated would be containerized and returned to Hawaii and/or the continental United States by the individual contractors for disposal.

Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the contractor's Stormwater Pollution Prevention Plan and Project SPCC Plan that would be developed. All hazardous materials used and hazardous waste generated during construction would be handled in accordance with applicable federal, state, and local regulations.

**Operation**

IDT operation would utilize electrical power for sending and receiving signals. Electrical power could be from the local electrical grid or from a dedicated standby diesel generator. Diesel fuel for the generator would be stored in ASTs. The ASTs would be double walled and have secondary containment to conform to API standards. No USTs would be used.

Although not normally considered hazardous waste (designation varies by state), used POL would be generated in small amounts. Tank bottoms from the ASTs would be withdrawn periodically and the fuel disposed of as used (nonhazardous) POL. Generator engine oil changes would likewise result in generation of small amounts of used motor oil. Also, small amounts of potentially hazardous waste would be generated by maintenance and housekeeping activities at the site. Handling of disposal of the minimal quantities of hazardous waste generated from IDT operation would the same as discussed under IDT construction.

**4.2.3.2.2 Sensors**

Mobile telemetry operation impacts would be similar to that described above for the IDT. A 10-kW generator would provide power to the mobile telemetry. Handling of POL waste would be as described for the IDT.

**4.2.3.3 Cumulative Impacts**

The limited operation of the IDT and COMSATCOM when combined with current and planned activities at Midway is not expected to result in cumulative hazardous materials and hazardous waste impacts.

**4.2.3.4 Mitigation Measures**

No hazardous waste management/hazardous materials mitigation measures are proposed for the GMD ETR activities at Midway.
4.3 REAGAN TEST SITE

Potential impacts of construction, building modification, and missile launches on air quality, biological resources, hazardous materials and waste, and health and safety have been addressed in detail in the applicable NEPA documents listed in appendix A, such as the USAKA Supplemental EIS and the USAKA Temporary ETR EA. Based on the prior analyses in those documents, and the effects of past target and interceptor launch activities, the potential environmental impacts from the proposed GMD activities are expected to be minimal, as discussed in the following sections.

4.3.1 AIR QUALITY—REAGAN TEST SITE

4.3.1.1 No Action Alternative

As described in section 2.2.1, missile flight test activities would continue at RTS. As determined in the Theater Missile Defense ETR EIS (U.S. Army Space and Strategic Defense Command, 1994) and the Supplemental USAKA EIS (U.S. Army Space and Strategic Defense Command, 1993a), emissions from a typical launch at RTS (i.e., one strategic launch vehicle) are assumed to be 7.14 metric tons (7.88 tons) of carbon monoxide, 5.18 metric tons (5.71 tons) of hydrogen chloride, and 9.27 metric tons (10.22 tons) of aluminum oxide. In the USAKA Supplemental EIS, air emission modeling was performed to predict maximum short-term concentration of the previously mentioned exhausts. The exhaust emission presented in the USAKA Supplemental EIS is shown in table 4.3.1-1. The worst-case scenario depicted the simultaneous launch of six strategic launch vehicles. Even with such large amounts of exhausts being emitted, the modeling results predicted that no UES or guidance levels would be exceeded.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging period</th>
<th>UES Ambient Air Quality Standards or Noncriteria Pollutant Guidance Level (milligrams per cubic meter)</th>
<th>Six Simultaneous Launches of Strategic Missiles (milligrams per cubic meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>40</td>
<td>0.00703</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>10</td>
<td>0.00492</td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour</td>
<td>1.5</td>
<td>0.393</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>8-hour</td>
<td>10</td>
<td>5.924</td>
</tr>
</tbody>
</table>

Source: U.S. Army Space and Strategic Defense Command, 1993a

4.3.1.2 Alternative 1

4.3.1.2.1 Ground-Based Interceptors

Construction

Alternative 1 would only require minor interior modifications to existing facilities on Meck; therefore, there would be no air quality impacts to the regional air quality due to construction.
Operation

Pre-Launch Activities
Operation activities for single and dual GBI launches at RTS up to five times a year would be similar to those described in section 4.1.1.2.1 for KLC. An accidental release of liquid fuel and liquid oxidizer from the EKV would be similar to that described for KLC (table 4.1.1-5). The implementation of approved emergency response plans would limit the impact of such a release. While not defined in detail, pre-launch activities would be expected to result in very low, insignificant emissions.

Offsite power sources with backup emergency generators would continue to be used for the existing facilities at RTS. Emissions at RTS are covered under an existing Document of Environmental Protection.

Launch Activities
Launch activities for a single or dual launch would be similar to previous launches at RTS. Possible emissions that would result from a GBI launch are listed in table 4.1.1-8. As described in section 3.3.1, air quality at RTS is considered good. It is expected that background levels would not add significantly to the ambient air concentrations.

Potential GBI exhaust emissions are 0.2 to 0.3 times the level of the launches modeled in the No Action Alternative, as shown in table 4.3.1-2. It is anticipated that the air quality impacts due to the dual launch of GBIs would be less than those modeled for six simultaneous strategic missile launches in the Supplemental USAKA EIS. The proposed GBI missile would not be expected to cause a significant impact to regional air quality surrounding RTS.

<table>
<thead>
<tr>
<th>GBI Configuration</th>
<th>Carbon Monoxide</th>
<th>Hydrogen Chloride</th>
<th>Aluminum Oxide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
</tr>
<tr>
<td>Six Strategic Missiles</td>
<td>42.9 (47.3)</td>
<td>31.1 (34.2)</td>
<td>55.6 (61.3)</td>
</tr>
<tr>
<td>Dual Orion GBI</td>
<td>9.6 (10.6)</td>
<td>9.6 (10.6)</td>
<td>16.3 (17.9)</td>
</tr>
</tbody>
</table>

Post-Launch Activities
Activities performed during post-GBI launch would include the removal of all mobile equipment and assets brought to RTS. The removal could result in small localized amounts of fugitive dust, which would have a minor impact to air quality. However, this impact would be minimized further through the use of dust suppression methods previously discussed.
4.3.1.2.2 Targets

Construction

With the implementation of Alternative 1, similar minor modifications to existing facilities at RTS for GBI launches would occur for target launches. An older silo would be modified to accommodate some target missiles. A new launch pad on Meck would be required to support dual target launches. A new launch pad would disturb approximately 0.4 hectare (1.0 acre) during construction. Table 4.3.1-3 shows potential construction emissions.

<table>
<thead>
<tr>
<th>Source</th>
<th>Emission Factor kilograms/hectare (pounds/acre)</th>
<th>Graded Area hectares (acres)/year</th>
<th>Exposed days/year</th>
<th>Emissions kilograms/year (pounds)/year</th>
<th>Emissions metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulldozing</td>
<td>1.046 (933.1)</td>
<td>0.4 (1.00)</td>
<td>NA</td>
<td>423 (933)</td>
<td>0.4 (0.5)</td>
</tr>
<tr>
<td>Grading</td>
<td>1.5 (1.3)</td>
<td>0.4 (1.00)</td>
<td>NA</td>
<td>0.5 (1)</td>
<td>0.0006 (0.0007)</td>
</tr>
<tr>
<td>Vehicle Traffic</td>
<td>1.019 (909)</td>
<td>0.4 (1.00)</td>
<td>NA</td>
<td>412 (909)</td>
<td>0.4 (0.5)</td>
</tr>
<tr>
<td>Erosion of Soil Piles</td>
<td>0.17 per day (0.15 per day)</td>
<td>0.4 (1.00)</td>
<td>90</td>
<td>6 (14)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>Erosion of Graded Surface</td>
<td>30.0 per day (26.4 per day)</td>
<td>0.4 (1.00)</td>
<td>90</td>
<td>1,078 (2,376)</td>
<td>1.1 (1.2)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,920 (4,233)</td>
<td>2.0 (2.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PM-10 produced during construction would be reduced by half through the use of dust suppression measures such as periodically watering areas being graded and wet sweeping or otherwise removing soils and mud deposits from paved roadways and parking areas. Proper tuning and preventive maintenance of construction vehicles would serve to minimize exhaust emissions.

Operation

Pre-Launch Activities

Pre-launch activities at RTS include the transportation and assembly of the target. The mobile exhaust emissions resulting from transportation would be intermittent and would not have a measurable impact to regional air quality.

Launch Activities

Proposed target launches would be similar to previous rocket launches at RTS. These land launched target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. Table 4.1.1-13 lists missile propellant information and table 4.1.1-14 lists emission constituents for each proposed missile. Up to five launches per year would occur at RTS over the duration of the program.

Potential target exhaust emissions from a dual target launch are anticipated to be, at most, 60 percent of the level of the launches modeled in the No Action Alternative, as shown in table 4.3.1-4. It is expected that the air quality impacts due to the dual launch of any of the targets...
listed in table 4.3.1-4 would be less than those modeled for six simultaneous strategic missile launches in the Supplemental USAKA EIS. The proposed target missile would not be expected to cause a significant impact to regional air quality surrounding RTS.

<table>
<thead>
<tr>
<th>Missile</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Aluminum Oxide metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six Strategic Missiles</td>
<td>42.9 (47.3)</td>
<td>31.1 (34.2)</td>
<td>55.6 (61.3)</td>
</tr>
<tr>
<td>Dual Strategic Target System</td>
<td>4.7 (5.2)</td>
<td>3.2 (3.5)</td>
<td>7.1 (7.8)</td>
</tr>
<tr>
<td>Dual Minuteman II Target</td>
<td>10.0 (11.0)</td>
<td>8.9 (9.9)</td>
<td>12.3 (13.9)</td>
</tr>
<tr>
<td>Dual Peacekeeper Target</td>
<td>20.0 (21.9)</td>
<td>18.9 (20.8)</td>
<td>19.4 (21.4)</td>
</tr>
<tr>
<td>Dual Trident I (C4) Target</td>
<td>11.0 (12.1)</td>
<td>0.8 (0.9)</td>
<td>13.4 (14.8)</td>
</tr>
</tbody>
</table>

Post-Launch Activities
Activities performed during post-target flight would include the removal of all mobile equipment and assets brought to RTS. The removal could result in small, localized amounts of fugitive dust, which would have a minor impact to air quality. However, this impact would be minimized further through the use of dust suppression methods previously discussed.

4.3.1.2.3 Sensors
All sensors to be utilized in Alternative 1 previously exist at RTS and are currently in use. Minor software and interior modifications could be performed to these elements; therefore, there would be no construction air quality impacts at RTS for sensors. Operation of existing range radar at RTS would be covered under the existing Document of Environmental Protection.

4.3.1.2.4 SBX
Construction
Warehouse and administrative space construction would occur in previously disturbed areas. All construction activities would be conducted in accordance with appropriate regulations and permits. Other than minor, short-term impacts from construction, no adverse effects to regional air quality are expected.

Operation
Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would consist primarily of minimal levels of volatile organic compound emissions and are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX
Based on five tests per year, the SBX would be at the RTS PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with
an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 5 to 6 kilometers (3 to 4 miles) north of the Kwajalein harbor. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. The SBX would not be considered a stationary source at RTS; therefore, the standards and procedures for new stationary sources would not be applicable.

Total time includes 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

4.3.1.3 Alternatives 2 and 3

4.3.1.3.1 Ground-Based Interceptors
Construction and operation of GBI facilities at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.1.2.1 for Alternative 1.

4.3.1.3.2 Targets
Construction and operation of target launches and associated target facilities at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.1.2.2 for Alternative 1.

4.3.1.3.3 Sensors
Construction and operation of range sensors at RTS for Alternatives 2 and 3 would be same as those described in section 4.3.1.2.3 for Alternative 1.

4.3.1.3.4 SBX
Construction and operation of the SBX at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.1.2.4 for Alternative 1.

4.3.1.4 Cumulative Impact
Due to the limited industrialization of USAKA and the surrounding environment, the potential cumulative impacts to air quality due to the proposed interceptor and target facility construction and launches would not be substantial. Missile launches are short-term, discrete events, thus allowing time between launches for emissions products to be dispersed. The 1993 Supplemental USAKA EIS determined that there would be no significant cumulative impacts to air quality under the high level of activity alternative as a direct result of up to 14 launches of six missiles simultaneously per year. The modeling resulted in no predicted annual impacts that exceed UES Ambient Air Quality Standards. It is not likely that the Proposed Action in conjunction with current planned or anticipated launches would exceed this level of activity. The
anticipated number of missile launches from RTS in support of the GMD ETR would be up to five missiles (GBI and targets combined) per year.

4.3.1.5 Mitigation
No air quality mitigation measures are proposed for GMD ETR activities.

4.3.2 AIRSPACE—REAGAN TEST SITE

4.3.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. As described in section 2.2.1, operations currently conducted at RTS would continue.

4.3.2.2 Alternatives 1, 2, and 3
The Proposed Action for all alternatives related to airspace would be full power emissions from the SBX while at the mooring location north of Kwajalein.

4.3.2.2.1 SBX Operation

Controlled and Uncontrolled Airspace
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect aircraft operations. Both the DoD and the FAA have standards for EMR interference to aircraft, which should not be exceeded. DoD uses MIL-STD-464 standards; therefore, military aircraft must be hardened or protected from EMR with a peak power threshold up to 3500 volts per meter (V/m) and 1270 V/m (average power). The SBX would not exceed these levels. Commercial aircraft must be hardened or protected from EMR levels up to 3000 V/m (peak power) and 300 V/m (average power) as mandated by the Federal Aviation Association (FAA) by Notice 8110.71, Guidelines for the Certification of Aircraft Flying through High Intensity Radiated Field Environments. The SBX would not exceed the 3000 V/m peak power threshold. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern here is not interference but is a reduction in life of the aircraft avionics/electronic equipment. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, USAKA, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed
DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and on figure 3.3.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this SBX high energy radiation area would not impose any new flight restriction requirements. The operating area would be similar to the existing operating area for the GBR-P radar at Kwajalein (figure 4.3.2-1). As shown in the figure, the GBR-P is restricted from radiating in several areas. These include the arrival and departure corridors for Bucholz Army Airfield, in the direction of the rest of Kwajalein Island, and in the direction of other nearby islands.

SBX operations would be coordinated with the FAA and Kwajalein and would be scheduled to occur during hours of minimal aircraft operations. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace
There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes
Two en route high altitude airways (R 584 and A 222) enter the 65 percent and fully populated aircraft interference areas and terminate at Kwajalein. There are additional approach and departure routes within the ROI that would also need to be considered when defining the SBX operating area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

Airports and Airfields
Bucholz Army Airfield is located on Kwajalein, approximately 5 to 6 kilometers (3 to 4 miles) south of the proposed mooring location. With the controls placed on the SBX in a manner similar to the GBR-P radar, standard instrument approach and departure procedures at the airfield would continue unhindered. Existing airfield or airport arrival and departure traffic flows would also not be affected and access to the airfield would not be curtailed. All arriving and departing aircraft and all participating military aircraft are under the control of the Bucholz Army Airfield Control Tower; thus, there would be no airfield conflicts in the ROI under the Proposed Action, and no impact.
Notional GBR-P Operating Area

Figure 4.3.2-1
Emissions from the XBR may also potentially degrade the overall system performance of in-band airborne and ship-based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high-energy radiation area would be configured to avoid impacts to these airborne and ship-based systems.

4.3.2.3 Cumulative Impacts

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. The use of the required scheduling and coordination process, and adherence to applicable DoD directives and U.S. Army regulations concerning radar operations would preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.3.2.4 Mitigation Measures

The SBX high energy radiation area would be configured to mitigate potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition to charting the SBX high energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high energy radiation area.

4.3.3 BIOLOGICAL RESOURCES—REAGAN TEST SITE

Regulations governing endangered species and wildlife resources at RTS are specified in UES Section 3-4. Water quality and reef protection standards at RTS are in UES Section 3-2 (U.S. Army Space and Missile Defense Command 2001)

4.3.3.1 No-Action Alternative

If the GMD ETR is not established, the following activities would still continue at RTS: launch of GBIs, use of extensive range instrumentation, use of the GBR-P ground-based XBR, use of existing IDT facilities, and missile intercepts in the BOAs north and northeast of RTS. Impacts to biological resources would be minimal as described in the applicable NEPA documents listed in appendix A, such as the USAKA Supplemental EIS and the USAKA Temporary ETR EA.
4.3.3.2 Alternative 1

4.3.3.2.1 Ground-Based Interceptors

Alternative 1 would require the use of existing GBI silos on Meck, a Missile Assembly Building, missile storage facility, maintenance and storage facility, and launch control facility to support GBI launches for the GMD ETR.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought into the installation. These activities would result in impacts similar to, but less than, those caused by site preparation. Specific restoration actions, if necessary, would be determined on a case-by-case basis.

Construction

Only minor maintenance activities would be required.

Vegetation

No new construction or other ground-disturbing activities are planned; therefore, there would be no impacts to vegetation.

Wildlife

Personnel would be instructed to avoid areas designated as avian nesting or roosting habitat and to avoid all contact with any nest that may be encountered. Sea turtles or turtle nests would also be avoided. No site preparation activities are planned that could impact Essential Fish Habitat.

Environmentally Sensitive Habitat

No site preparation activities are planned that could impact reef slopes and flats or seagrass beds.

Operation

Dual target launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

Vegetation

Meck has been extensively altered by human activity, and little native vegetation remains to serve as wildlife habitat. No additional impacts to vegetation are expected from continued GBI launches.

Wildlife

Results of monitoring conducted for a Strategic Target System launch from KTF at PMRF indicated little effect upon wildlife due to the low-level, short-term hydrogen chloride emissions (U.S. Army Space and Strategic Defense Command, 1993b). The program included marine
surveys of representative birds and mammals for both pre-launch and post-launch conditions. Studies on representative birds and mammals reviewed in the *Final EIS for the Strategic Target System* (U.S. Army Strategic Defense Command, 1992) also indicated that low-level, short-term exposure to hydrogen chloride would not adversely affect threatened or endangered species or other wildlife. Aluminum oxide and hydrogen chloride do not bioaccumulate; therefore, no indirect effects to the food chain are anticipated.

An early flight termination or mishap could result in debris impacts along the flight corridor, which may temporarily impact fishing activities in the immediate area. Due to the small amount of propellant involved and the limited number of launches, the project is not anticipated to adversely affect trust marine resources. The potential ingestion of toxins by fish species, which may be used for food sources, would be remote because of the diluting effect of the ocean water and the relatively small area that would be affected. The primary flight test activity that may have an effect on wildlife within the flight test corridor is the actual intercept of the target missile. Debris impact areas for both the interceptor and target vehicles would be located over the Mid-atoll Corridor of the Kwajalein Lagoon or the BOA.

Any debris from mishaps landing in the Kwajalein Lagoon in approximately 50 meters (164 feet) of water would be recovered. The debris is not expected to contain hazardous materials. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water. Larger pieces of propellant would be recovered following a mishap in the lagoon, further minimizing the potential for perchlorate contamination.

Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Wildlife such as waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Waterfowl driven from preferred feeding areas by aircraft or explosions usually return soon after the disturbance stops, as long as the disturbance is not severe or repeated (Federal Aviation Administration, 1996).

**Threatened and Endangered Wildlife Species.** An early flight termination or mishap could result in debris impact along the flight corridor. Sensitive marine species are widely scattered, and the probability of debris striking a threatened or endangered species is considered remote. For example, according to the *Strategic Target System EIS*, which assessed the low potential in regard to debris striking whale species, the probability of an impact is less than a 4.6 chance in 1 million (4.6 x 10⁻⁶) (U.S. Army Strategic Defense Command, 1992).

Thus, debris impact and booster drops in the BOA are not expected to adversely affect marine mammal species protected by the UES. In addition, the probability is rather low that migratory whales or sea turtles would be within the area to be impacted by falling debris and boosters.
**Environmentally Sensitive Habitat**

Proposed nominal launch activities would not impact sensitive habitat such as coral reefs.

### 4.3.3.2.2 Targets

Alternative 1 would require the use of existing facilities on Meck, including a Missile Assembly Building, missile storage facility, maintenance and storage facility, and launch control facility for target launches in support of the GMD ETR. Dual launches of target missiles would occur from a modified Payload Launch Vehicle GBI silo on Meck and a new launch pad on Meck.

### Construction

Other than the construction of a new launch pad on Meck, only minor maintenance activities and internal modifications to an existing silo would be required.

### Vegetation

Meck has been extensively altered by human activity, and little native vegetation remains to serve as wildlife habitat. The new target launch pad on Meck would require installation of a launch stool on reinforced concrete within a previously disturbed area. No impacts to vegetation are expected.

### Wildlife

Disturbance to wildlife from the construction noise and temporary increase in personnel would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Personnel would be instructed to avoid areas designated as avian nesting or roosting habitat and to avoid all contact with any nest that may be encountered. Sea turtles or turtle nests would also be avoided. No site preparation activities are planned that could impact Essential Fish Habitat.

**Environmentally Sensitive Habitat**

No site preparation activities are planned that could impact reef slopes and flats or seagrass beds.

### Operation

Dual target launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

### Vegetation

No impacts to vegetation would occur as a result of launch activities on Meck, since the new target launch site would be located within a previously disturbed area.

### Wildlife

Impacts to wildlife from target missile launches would be similar to those discussed above for GBI launches.
Environmentally Sensitive Habitat
Impacts to sensitive habitat would be the same as those discussed above for GBI launches.

4.3.3.2.3 Sensors

Existing range sensors at RTS would be used, including the Advanced Research Project Agency Lincoln C-Band Observable Radar and Long-range Tracking and Instrumentation. Both of these tracking radars are located on Roi-Namur at RTS. Additional radars include the TPS-X, Millimeter Wave Radar, Tracking and Experiment Discrimination Experiment Radar, and two MPS-36 C-band general-purpose instrumentation radars located at RTS. Although the potential for mainbeam exposure thermal effects from these radars to birds exists; mitigating these concerns is the fact that radar beams are relatively narrow and constantly in motion. To remain in the beam for any period requires that a bird fly directly along the beam axis, or that a hovering bird does so for a significant time. Thus, although the potential for adverse effects exists, the probability of such an occurrence happening frequently is considered low. The potential for impacts from the use of these radars have been analyzed in prior environmental documentation and determined to be not significant.

Personnel would be instructed to avoid areas designated as avian nesting or roosting habitat and to avoid all contact with any nest that may be encountered. Sea turtles or turtle nests would also be avoided. No site preparation activities are planned that could impact Essential Fish Habitat.

4.3.3.3 SBX

Construction

Although the piers at the Kwajalein harbor do not offer adequate depth to accommodate the draft of the SBX, the vessel can enter the Kwajalein lagoon and moor in a protected anchorage. RTS has a full complement of supply and fueling vessels. The mooring site would be approximately 5 to 6 kilometers (3 to 4 miles) north of the Kwajalein harbor. The SBX would enter the lagoon either through South Pass on the west side of the atoll or at Mellu Pass on the north side. Both passes offer sufficient depth to accommodate the vessel; however, Mellu Pass offers a much greater width for maneuverability. Personnel would be ferried to the SBX each day either by watercraft or helicopter.

Existing facilities with 900- to 1,500-square-meters (3,000- to 5,000-square-feet) of environmentally controlled warehouse would potentially be required for SBX operations. Any facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations.

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996). Most wildlife is known to exhibit a startle response when exposed to short-term noise impacts. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, sufficient
foraging and feeding habitat occurs in adjacent areas. Studies (U.S. Department of the Air Force, 1997b) indicate that birds usually show signs of disturbance, such as fluttering of wings, when a noise event occurs, but quickly return to normal behavior after the event. Although construction activities could cause flushing (birds suddenly flying up), this is a common reaction to sudden natural sounds that only slightly increases the energy expenditure of individual birds. Construction is therefore not expected to have a long-term significant adverse effect on wildlife. Other than these minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

The SBX is a high-powered radar system that would use a pulsed microwave beam to perform tracking, discrimination, and kill assessments of incoming ballistic missile warheads. Since this system has the potential for exposing regions in its vicinity to EMR, consideration has been given to the evaluation of the potential for any adverse impacts that EMR may have on biological resources.

As described in section 2.1.4, the SBX would be mounted on a semi-submersible platform. The platform would be self-propelled in open water with a cruising speed of approximately 15 kilometers per hour (8 knots), but assisted by tug(s) while in port. Total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft. The main beam would not be directed toward the ground or water surface, would have a lower limit of 10 degrees above horizontal for calibration and maintenance testing while at the PSB, and thus would not directly illuminate the surface. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. Table 2.1.4-2 lists the EMR potential interference distances. The total amount of RF radiation per week would be approximately 5 to 6 hours. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of the EMR/EMI survey.

In terms of the potential for EMR impacts on wildlife, the GBR Family of Radars EA (U.S. Army Program Executive Office Missile Defense, 1993) analyzed potential impacts on wildlife from EMR. This EA determined that several factors significantly reduce the potential EMR exposure for birds and other wildlife. The radar main beam would normally be located at least 2 degrees above horizontal, which limits the probability of energy absorption by surface-oriented wildlife. The radar beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further reduces the probability of bird species remaining within this limited region of space, even if the beam were still. (Ballistic Missile Defense Organization, 2000)

The analysis methods used to evaluate potential effects of RF radiation on birds is the MPEL, which defines the maximum time-averaged radio frequency power density allowed for uncontrolled human exposure (and by extrapolation, to birds and other species). The MPEL method is independent of body size or tissue density being exposed. Analysis conducted during preparation of the GBR Family of Radars EA (U.S. Army Program Executive Office Missile Defense, 1993) was based on a conservative approach of limiting the microwave energy absorption rate on the Aplomado falcon (*Falco femoralis*), a bird listed as endangered by the USFWS and the State of New Mexico. The energy absorption rate was based on the falcon remaining continuously within the main beam of the GBR. The absorption rate was then
compared to the bird’s resting metabolic rate. The analysis indicated power densities would have to exceed 42 mW/cm² to affect the falcon. Power densities of 38 to 61 mW/cm² have been determined necessary to affect other birds weighing up to 3.5 kilograms (7.7 pounds). Analysis conducted during preparation of the prototype High Power Discrimination Radar at PMRF was based on the potential effects on the Laysan albatross (U.S. Department of the Navy, 2002a).

The analyses were based on the conservative assumption that the energy absorption rate of a bird’s body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect. Birds in general typically expend energy at up to 20 times their resting metabolic rates during flight. Since birds are not likely to remain continuously within the radar beam and the power density is not expected to exceed levels stated above that could impact birds, the likelihood of harmful exposure is not great. (Ballistic Missile Defense Organization, 2000)

Potential impacts from EMR from the XBR on wildlife have been compared to the existing Cobra Dane radar operating on Eareckson Air Station on Shemya Island, Alaska. The Cobra Dane operates in the L-band (1,000 to 2,000 MHz), while the proposed SBX would operate in the X-band (8,000 to 12,000 MHz). The X-band has less potential to cause thermal heating in biological resources than the L-band. Like the Cobra Dane, the proposed SBX main beam would be constantly moving and would not be stationary over one area. The USFWS has not noticed die-offs of birds below the Cobra Dane radar (Martin, 1999). Overall, it is expected that no bird deaths would be expected as a result of operation of the SBX. (Ballistic Missile Defense Organization, 2000)

The total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft and the SBX radar main beam would not be directed toward the ocean’s surface. Since marine mammals would normally be found below the surface of the water, this signal height would be safely above any surfacing mammals. RF radiation does not penetrate the surface of water to any great degree. The power density level just below the surface of the ocean would not exceed the permissible human exposure level for uncontrolled environments. (U.S. Department of the Navy, 2002a) No adverse impacts would occur to whales, other marine mammals, or sea turtles at least 1.3 centimeters (0.5 inch) below the surface. It is also highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time during the 3 to 6 hours per week that the SBX radar would be operating. For these reasons, no effects are anticipated on humpback whales, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations. Operation of the SBX would not require delays if whales and other marine mammals are observed. Therefore, no further action regarding whales or sea turtles is required pursuant to the Endangered Species Act and the Marine Mammal Protection Act.

The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards (UNDS) provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the SBX platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals or sea turtles are anticipated.
4.3.3.4 Alternatives 2 and 3

The Proposed Actions and environmental effects at RTS under Alternatives 2 and 3 are identical to those described under Alternative 1.

4.3.3.5 Cumulative Impacts

The limited amount of facility modification planned on RTS would not likely result in cumulative impacts to biological resources. The 1993 Supplemental USAKA EIS determined that there would be no significant cumulative impacts to biological resources under the intermediate level of activity alternative as a direct result of launching up to 28 strategic launch vehicles per year from Meck. The anticipated number of missiles launches from RTS in support of the GMD ETR could be up to five missile launches (GBI and targets combined) per year. No significant cumulative impacts to biological resources have been identified as a result of prior launch-related activities from RTS. The GMD ETR activities when combined with current and proposed launch activities on RTS would not increase the total number of annual launches currently allowed. These activities would have negligible cumulative impacts on biological resources.

4.3.3.6 Mitigation Measures

As a standard practice, personnel would be instructed to avoid areas designated as avian or sea turtle nesting or avian roosting habitat and to avoid all contact with any nest that may be encountered.

4.3.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—REAGAN TEST SITE

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with launch operations from the RTS.

A general description of impact on hazardous material and waste management is provided in appendix B. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from GMD ETR activities are addressed under each alternative as applicable.

4.3.4.1 No Action Alternative

If the GMD ETR is not established, the following activities would still continue at RTS: launch of GBIs, use of extensive range instrumentation, use of the GBR-P ground-based XBR, use of existing IDT facilities, and missile intercepts in the BOAs north and northeast of RTS. Impacts to hazardous materials and hazardous waste management practices would be minimal as described in the previous NEPA documents listed in appendix A.
4.3.4.2 Alternative 1

4.3.4.2.1 Ground-Based Interceptors

Under Alternative 1, Meck Island would serve as the location for missile assembly and as well as launch. GBI launches would utilize existing GBI facilities on Meck as described in section 2.3.1.3.

Construction

Alternative 1 would only require minor interior modifications to existing facilities on Meck; therefore, only minor impacts to hazardous materials and waste management practices would be expected.

Operation

Pre-Launch Activities

Missile components would likely be brought to Kwajalein Island as the initial arrival point at the USAKA. Kwajalein Island would also serve as the supply point for consumable materials to be employed during interceptor vehicle preflight assembly and checkout operations, and consumable supplies needed for the maintenance of the ongoing radar operations. Some of the materials in these consumable supplies are considered to be hazardous materials (e.g., contact cleaners for sensor systems). These materials would be stored on Kwajalein in appropriate warehouse facilities before issuance for use on other islands. These materials are similar to hazardous materials already in use for other operations (including standard facility maintenance activities) and represent only a small increase in the total amount of materials to be handled. The quantity of these materials that would be used represents a de minimis increase above those already in use and could, therefore, easily be accommodated by the current hazardous materials management systems.

Launch Activities

GBI launch activities would be similar to ongoing activities. The use of hazardous materials during target launch operations would be limited to small amounts of solvent cleaners (e.g., acetone, isopropyl alcohol), ethylene glycol coolant in the radar, and some handling and storage of motor fuels for use in motor vehicle and/or generator systems. Use and management of hazardous materials associated with missile launch activities would continue to be performed in accordance with the requirements of the UES and the RTS Range Safety office.

No USTs exist on Meck Island. ASTs exist for storage of diesel fuel for the power plant and for MOGAS fuel storage.

As discussed in section 3.3.4, hazardous waste management at USAKA is performed in accordance with the UES, which requires shipment of hazardous waste back to the Continental United States for treatment and/or disposal. In most cases, contractors utilize USAKA Prime Contractor Services for waste packaging, manifesting, shipment, and disposal. If contractors make their own hazardous waste arrangements, shipments have to be arranged through USAKA Shipping and Receiving. Minimal hazardous waste generation would occur.
Personnel trained in the appropriate procedures to handle potentially hazardous materials, including spill containment and cleanup, would be on standby should a mishap occur. Such personnel involved in these operations would wear appropriate protective clothing, as necessary.

During normal flight operations there would be no hazardous materials or waste issues associated with flight corridors. If an in-flight malfunction occurs, the range safety officer may initiate flight termination, resulting in missile debris being deposited beneath the flight path. Debris impacts may occur in the Mid-atoll Corridor within the Kwajalein Atoll Lagoon. The potential effects on the ocean environment from hazardous materials associated with missile debris are discussed in section 4.3.2 and have been analyzed in previous NEPA documents, such as the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992), with the conclusion that impacts would be minimal.

Post-Launch Activities
Specific restoration actions and debris recovery, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

The types of hazardous wastes that would potentially be generated from GBI launches are similar to wastes already handled at the USAKA. The quantity of hazardous waste that may be generated would represent a small increase over current conditions and would be collected in accordance with the KEEP and UES. Collected wastes would be sent first to point of generation accumulation point on Meck, and on to the USAKA Hazardous Wastes Collection Point (Building 1521) on Kwajalein for eventual shipment to the continental United States and final disposition. The de minimis increase in the quantity of hazardous waste would not significantly impact the existing hazardous waste management and disposal system.

4.3.4.2.2 Targets
Construction
Under Alternative 1, similar minor modifications to existing facilities as described for GBI would occur on Meck. An older silo could be modified to accommodate some target missiles. A new target launch pad on Meck would be required to support dual launches. A new launch pad would consist of basic reinforced concrete and structural steel construction, with little hazardous waste generation.

Many facilities at RTS date from the 1950s through the 1970s. Therefore, any structure, such as an existing launch silo, to be modified for target launch activities would be sampled for asbestos or lead-based paint. Meck Island is essentially PCB-free due to an aggressive PCB removal plan pursued during the 1990s. If asbestos, lead-based paint, or PCBs are encountered during the sampling or modification process, then these materials would be contained and removed in accordance with USAKA SOPs. Such activities are routine at RTS. Launch control wiring and instrumentation modification would also be performed as necessary. Installation of trenches for fiber optic cable and fencing around the launch site would not result in the release of a potentially hazardous material or waste.
Minor construction is normally performed by USAKA Facilities Engineering. Major construction at RTS is routinely contracted and managed by the U.S. Army Corps of Engineers–Pacific Ocean Division, Honolulu District, and performed according to U.S. Army Corps of Engineers requirements, as modified to meet USAKA environmental management requirements. USAKA requirements are incorporated into the U.S. Army Corps of Engineers Statement of Work, and all contractors provide an Environmental Compliance Plan demonstrating knowledge of UES requirements. In accordance with DoD regulation 5200.2R, Personal Security Program Regulation, pollution prevention, waste minimization and recycling would be incorporated into design and construction plans. Construction activities would be performed in accordance with the USAKA Stormwater Pollution Prevention Plan to minimize potential erosion and stormwater runoff.

**Operation**

Pre-launch, launch, and post-launch activities for target missiles would be similar to that described for the GBI.

4.3.4.2.3 SBX

Any facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing protocol and regulations.

**Operation**

*Shipboard Hazardous Materials and Waste Management*

The U.S. Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Discharging hazardous materials overboard is not standard practice and would only be done as a worst case scenario.

Twenty-five liquid discharges, such as clean ballast, deck runoff and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices, in design or routine operation. All vessels containing ballast water taken on outside the territorial waters of the RMI and intending to discharge ballast water in RMI waters shall off-load ballast water outside of 19 kilometers (12 miles) from shore, and two times the volume of the tank of clean sea water shall be taken on and discharged immediately prior to entry within 19 kilometers (12 miles) of shore. Discharge of ballast from the fuel tanks of watercraft within waters of the RMI shall be minimized and only in accordance with the UES. No vessel shall dispose of sewage (blackwater) or discharge from a marine sanitation device in USAKA controlled waters. (U.S. Army Space and Missile Command 2002).
Increased operations that could take place at RTS would be servicing and maintenance of the SBX. This small increase in servicing operations would not significantly affect hazardous materials management or waste disposal. There would be no significant operational impacts, and no mitigation would be required.

### 4.3.4.3 Alternatives 2 and 3

The Proposed Actions and potential impacts would be the same as those described under Alternative 1. Construction and operation of the SBX at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.4.2.3 for Alternative 1.

### 4.3.4.4 Cumulative Impacts

Adherence to the hazardous materials and waste management systems on USAKA would preclude the potential accumulation of hazardous materials or waste. The UES establishes emergency response procedures that would aid in the evaluation and cleanup of any hazardous materials released. GMD actions are not expected to result in cumulative hazardous materials and hazardous waste impacts on USAKA. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.

### 4.3.4.5 Mitigation Measures

Mitigation measures would be employed in accordance with the UES, which incorporates CEQ NEPA requirements, applicable EPA regulatory requirements, and Executive Order (Presidential) requirements for installations outside the continental United States. In addition other DoD and U.S. Army requirements apply, as tiered requirements under the preceding.

### 4.3.5 HEALTH AND SAFETY—REAGAN TEST SITE

Appendix B includes a description of health and safety issues.

#### 4.3.5.1 No Action Alternative

If the GMD ETR is not established, the following activities would still continue at RTS: launch of GBIs, use of extensive range instrumentation, use of the GBR-P ground-based XBR, use of existing IDT facilities, and missile intercepts in the BOAs north and northeast of RTS. Impacts to health and safety would be minimal as described in the previous NEPA documents listed above and in appendix A.

Planning and execution of GBI launches would be in compliance with federal, state, local, and international health and safety requirements and regulations, as well as RTS standards and procedures. Adherence to such requirements would ensure that potential risks to the general public, workers, and the launch areas do not exceed RCC Standard 321-02 criteria. Therefore, no increase in potential impact to health and safety would be expected as a result of the No Action Alternative.
4.3.5.2 Alternative 1

4.3.5.2.1 Ground Based Interceptor

Construction

Existing RTS missile sites and support facilities on Meck would be used under Alternative 1. Therefore, no potential impact to health and safety from construction activities would be expected.

Pre-Launch

Pre-launch activities, including the transportation, storage and handling of missile components would generally occur as described in sections 3.3.5 and 4.1.7.2.

Missile components would initially be transported to Kwajalein. Kwajalein would also be used as the storage location for all consumable materials (e.g., solvents/cleaners, small parts, tools) that would be used during test flight pre-launch and launch operations. As indicated in section 4.3.4, the primary hazard related to these storage operations would be the potential for explosion/fire of solid fuel motors and/or small explosive actuation devices (used in missile control and the Flight Termination System). At Kwajalein, as at all other USAKA locations, all operations involving explosives (including packaging and handling for movement) would require implementation of a written procedure, which has been approved by the USAKA Safety Office. These operations must be conducted under the supervision of an approved ordnance officer using explosive-certified personnel. All storage and handling of explosives is required to take place in facilities designed to handle explosives and which have been sited in accordance with the requirements of Kwajalein Missile Range Regulation 385-75, Explosive Safety (U.S. Army Kwajalein Atoll, 1993). The regulation specifies the required ESQDs for each facility to ensure safety in the event of explosion, based upon the maximum quantity of explosive material permitted for the facility. This would serve to prevent propagation of explosions to nearby facilities where explosives are also stored.

The explosive devices and materials proposed for use as part of the GBI flight tests would be very similar to those currently stored and used at RTS. Storage operations would not entail any specialized procedures beyond those already in use. Storage facilities (magazines) are available at Kwajalein for proper storage of all explosive materials. Missile assembly buildings, launch silos, launch pads and operations buildings are separated by distances specified in DoD and U.S. Army regulations. The types of facilities, as well as the quantity and type of propellant and other explosives stored in magazines and missile handling areas, are used to determine the distance requirements for structure spacing. In situations such as on Meck where the distance requirements cannot be met by separation, other methods of personnel protection would be implemented. The Meck Control Building and the Systems Technology Testing Facility are hardened and provide protection from fragments.

Launch

Under Alternative 1, launch of GBI missiles would occur at existing RTS facilities on Meck. As lead range, RTS would coordinate with other ranges to track and document safety responsibilities. The principal health and safety concerns would be missile malfunctions on or near the launch silo, potential hazards following a flight termination action and intercept debris impact.
Flight safety studies would be performed to ensure that launches would not compromise range safety requirements and that risk to personnel would be within RCC Standard 321-02 limits. Launches would not be permitted to occur without review and agreement by the Range Safety Officer. Protection circles, based on the payload, missile and launch azimuth, would be established for each launch. Figure 4.3.5-1 indicates the protection circles associated with GMD ETR launch activities. Access to launch sites and the island would be limited to all but mission essential persons. Personnel essential to launch activities would be sheltered in hardened buildings. The GBI flight corridor would be over the islands and BOA. At RTS, thrusted stages that can potentially hazard populated areas must have a flight termination system. (Smith, 2002)

Targets launched from KLC, Vandenberg AFB, air and/or ocean platforms, if not destroyed by intercept, would impact in the BOA. Intercept debris would land in the BOA or possibly on uninhabited islands within the precalculated debris hazard/impact zone. When containment within the debris hazard/impact zone appears impossible, risk analysis based on established RTS Flight Safety risk equation is done to determine if the risk to the public is within acceptable RCC Standard 321-02 criteria. (Smith, 2002) Collective risk to the general public from any potentially hazardous inert debris (debris impacting the earth with a kinetic energy equal to, or greater than, 1.4 kilogram-meters [11 foot-pounds]) during a single launch would be limited to RCC Standard 321-02 criteria of 3x10⁻⁵. Individual risk from potentially hazardous inert debris would be limited to 1x10⁻⁷.

Post-Launch

Post-launch activities at RTS would generally occur as described in sections 3.3.5 and 4.1.7.

4.3.5.2.2 Targets

Dual target launches would occur from RTS under Alternative 1. Such launches would require construction of new launch pad and modification of an existing GBI Payload Launch Vehicle silo. Otherwise, existing facilities on Meck would be used as previously discussed. Potential impacts from pre-launch, launch, and post-launch activities would be similar to those described for the GBI.

4.3.5.2.3 In-Flight Interceptor Communication System Data Terminal

Under Alternative 1, existing communication systems would be used at current levels discussed under the No Action Alternative. Therefore, no increased impact to health and safety from ongoing operations would be expected.

4.3.5.2.4 Sensors

Use of sensors would continue in accordance with ongoing activities at RTS. For communication link equipment, associated RF emissions are considered to be of sufficiently low power so that there is no exposure hazard. All sensor systems would be sited before operation to ensure that no occupied structures or accessible travel areas are within any hazard area necessitated by RF emissions. Through the use of these procedures, it has been previously determined that proper exposure control would be achieved, and that operation of these systems would not present a significant health and safety hazard (U.S. Army Space and Strategic Defense Command, 1993a).
EXPLANATION

Protection Circle - Based on Payload, Missile, and Launch Azimuth

Source: Tybrin Corporation, 2002b.

Launch Protection Circles

Reagan Test Site

Figure 4.3.5-1
4.3.5.2.5 SBX

Construction

An existing 279- to 465-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse space would potentially be required to support SBX operations. Any facility modification required to support the SBX would occur in accordance with existing RTS safety protocol/plans and applicable UES requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation

The operating area for the SBX would be similar to the existing operating area for GBR-P radar at Kwajalein as described in section 2.1.4.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety hazards associated with operation of similar radars were analyzed in two previous documents: *Ground-Based Radar Family of Radars (GBR) Environmental Assessment* (U.S. Army Program Executive Office Missile Defense, 1993) and *Finding of No Significant Impact* and the *Environmental Assessment for Theater Missile Defense Ground-Based Radar Testing Program at Fort Devens, Massachusetts* (U.S. Army Space and Strategic Defense Command, 1994a). The analysis considered both program operational requirements and restrictions and range-required safety procedures. It was concluded that the required implementation of operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce from exposure to EMR.

Potential EMR effects of the proposed action are described below and in appendix G.

Radiation Hazards

**Human Exposure.** The analysis method used to evaluate potential effects of RF radiation is the Institute of Electrical and Electronics Engineers Maximum Permissible Exposure Limits (IEEE MPELs), which defines the maximum time-averaged RF power density allowed for uncontrolled human exposure. The MPEL method is independent of body size or tissue density being exposed. EMR hazard zones provide a safety factor 10 times greater than the MPEL. MPELs are capped at 5 mW/cm² for frequencies greater than 1,500 MHz (IEEE C95.1-1999, *Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*). General public exposure is typically limited to one-fifth of the occupational limits.

At X-band frequencies (8,000 MHz-12,000 MHz), the IEEE standard for human exposure is 5.33 mW/cm²-8 mW/cm², respectively. In order for the SBX to have an effect on human health, the
beam operating at full power would have to come in contact with a person and remain on them for 7.5 minutes (at 8,000 MHz) or 11.25 minutes (at 12,000 MHz). With the implementation of software controls on the SBX, there is no radiation hazard area on the deck of the SBX.

**EEDs.** The potential impacts to EEDs from emissions from the XBR are twofold: (1) the EED could be made not to work, or (2) the EED could be inadvertently initiated. The majority of the time, an EED is either installed in its intended application with its leads attached (the presence phase) or is in the shipping/storage phase. Typical EED applications in the presence phase would include fire extinguishers, automotive airbags, a missile attached to the wing of an aircraft, and military aircraft ejection seats. However infrequently, EEDs are sometimes handled without the protection of a storage container (handling/loading phase). Therefore, different susceptibility criteria have been developed for each of these two distinct conditions described above.

As can be seen from table 2.1.4-2, EEDs in the handling/loading phase are substantially more susceptible to EMR hazards; however, main beam illumination on the ground would not occur. As shown in table 2.1.4-2, based upon a grating lobe illumination on the ground from the fully populated SBX, a potential interference distance of 2.3 kilometers (1.4 miles) exists for EEDs in the handling/loading phase. The distances for the 65 percent populated SBX are also shown in the table. It is assumed that the handling/loading of EEDs would not occur when aircraft are airborne. However, main beam illumination of aircraft with EEDs (mainly military aircraft ejection seats) in the presence and shipping phases is possible. There is a potential for EED radiation interference for distances up to 7.5 kilometers (4.6 miles) in the air. Software controls on the SBX and coordination with military and commercial aircraft controllers would be used to ensure that aircraft bearing EEDs are not threatened by main beam interference. Based on the EMR/EMI survey results and coordination with the FAA, DOT, and others, the SBX operating area would be crafted in time and space so as to avoid existing airports, air routes, and airspace users. The SBX operating area would be published on appropriate aeronautical charts to inform pilots of the potential EMI hazard to certain aircraft.

The main beam and side lobes of the SBX could also illuminate EEDs on the ground in the presence/shipping phase. However, the potential radiation hazard would exist only 10 meters (33 feet), in front of the radar, which would be limited to the deck of the SBX. Therefore EEDs in the presence/shipping phase on the ground, including those associated with airbags in vehicles, would not be affected.

**Fuels.** Based upon the threshold of 5,000 mW/cm² from Technical Order 31Z-10-4, the SBX does not present a radiation hazard to fuels because the SBX does not emit radiation levels that exceed 5,000 mW/cm².

**Communications–Electronics Frequency-Related Interference**

In-band frequency interference addressed in this EIS is for the X-band (8,000-12,000 MHz). In-band RF interference occurs when two pieces of communications-electronics equipment are located within the same frequency band. Therefore, equipment with frequencies falling within the X-band would most likely be affected.
Adjacent band RF interference is similar to in-band RF interference. The adjacent bands for the X-band include all frequencies that are within approximately 5 percent of the operating frequency.

Harmonic band interference refers to interference produced in harmonically related receivers or interference caused by sub-harmonically related transmitters. Harmonic frequencies include those frequencies that are integer multiples of the operating frequencies.

Ground-based, airborne, and ship-based systems would be evaluated for in-band, adjacent band, and harmonic band interference during the detailed EMR/EMI survey that is underway. Level 2 surveys are planned to be completed in the summer of 2003.

Communications–Electronics Non-Frequency-Related Interference

Non-frequency-related interference from the SBX to the electromagnetic environment is limited to high-power effects. High-power effects typically occur in receivers that are located in proximity to high power transmitters and may be the result of either antenna-coupled signals or equipment case penetration. The accepted levels for high power effects are 1 mW/cm² for military equipment and 0.1 mW/cm² for civilian equipment. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any appreciable period of time, thus the odds of interference from high power effects with any electronic equipment on the ground would be slight, 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than a second, should this occur.

Aircraft/Avionics. The potential exists for EMR emissions from the main beam of the SBX to adversely affect aircraft avionics systems as discussed in section 4.3.2.2.1. The potential health and safety related impacts to aircraft is a reduction in life of the aircraft avionics, not a direct impact to the aircraft operation.

Implementation of RTS operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce from exposure to EMR. The total amount of radar RF radiation from SBX operation would be approximately 5 to 6 hours per week. The actual operating area of the SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft, or mariners are anticipated.

4.3.5.3 Alternatives 2 and 3

The Proposed Actions and health and safety impacts would be the same as those described under Alternative 1. Construction and operation of the SBX at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.5.2.5 for Alternative 1.
4.3.5.4 Cumulative Impacts
The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to health and safety. Adherence to RTS safety plans and procedures would preclude potential cumulative impacts to health and safety resulting from the implementation of the GMD ETR.

4.3.5.5 Mitigation Measures
Limitations imposed on the range of azimuth and angles of operation for the SBX and other radar would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control radar operation.

4.3.6 UTILITIES—REAGAN TEST SITE
Appendix B includes a description of utilities issues. A project may have substantial effects on infrastructure and utilities if it increases demand in excess of utility system capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

4.3.6.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Kwajalein would continue their current operations.

Energy
Daily average demand for electricity at Kwajalein is 13,500 kW. This is 46 percent of the maximum capacity of the electrical service to RTS, or 29,200 kW.

Water
Potable water consumption at Kwajalein is 1.1 million liters (300,000 gallons) per day. This is 64.7 percent of the maximum available amount of potable water, 1.7 million liters (450,000 gallons) per day.

Wastewater
Recent wastewater generation at Kwajalein amounted to approximately 560 liters (148 gallons) per capita per day. This would remain below available capacity.
**Solid Waste**

Solid waste disposal at Kwajalein is handled by landfill and shipping offsite.

### 4.3.6.2 Alternatives 1, 2, and 3

The Proposed Action related to utilities for all alternatives would be PSB support for the SBX while at the mooring location north of Kwajalein.

#### 4.3.6.2.1 SBX

All of the alternatives would include SBX as one of the component of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW, supplied by six of the eight on-board 3.64-MW generators. The SBX would be self-propelled by four steerable, 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume 7 MW, leaving 14.8 MW available for necessary ship-board operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would amount to only about 1.8 percent of total fuel capacity daily. There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would either return to a PSB or a nearby mooring location for crew rotations, re-supply, and maintenance activities. If at an adjacent mooring location, three of the generators would still be used: one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar 3 hours per day. If necessary, a supply ship would typically deliver food, supplies, repair parts, and fuel from the PSB. In cases wherein pier-side docking is possible, a hookup would be required to provide basic shore power for daily ship functions.

Although the piers at the RTS harbor do not have adequate depth to accommodate the draft of the SBX, the vessel can enter the Kwajalein lagoon and moor in a protected anchorage. An additional re-supply vessel would not be required, as RTS has a full complement of supply and fueling vessels. The mooring site would be approximately 5 to 6 kilometers (3 to 4 miles) north of the RTS harbor. The SBX would enter the lagoon either through South Pass on the west side of the atoll or at Mellu Pass on the north side. Both passes offer sufficient depth to accommodate the vessel. However, Mellu Pass offers a much greater width for maneuverability. Personnel would be ferried to the SBX each day either by watercraft or helicopter. In this case, the self-contained nature of the SBX, particularly its reliance on on-board generators, would ensure that there would be no direct impacts to RTS area utilities.

Existing 900- to 1,500-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse space would potentially be required for SBX operations. This would require
accommodations for a maximum of 25 personnel. Ongoing logistics and support operations such as re-supply, fueling, and maintenance and crew/operator training would also occur at the PSB.

Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,259 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any facility modifications being considered would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.3.6.3 Cumulative Impacts
At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.3.6.4 Mitigation Measures
No mitigation measures would be required or proposed.
4.4 PACIFIC MISSILE RANGE FACILITY

Potential impacts of construction, building modification, and missile launches at PMRF have been addressed in detail in the Strategic Target System EIS, the Restrictive Easement EIS, the PMRF Enhanced Capability EIS, and several program-specific EAs. Based on the prior analyses done and the effects of past target and missile launch activities, the potential impacts related to proposed GMD ETR activities are expected to be minimal, as discussed in the following sections. The existing capability to launch four Strategic Target System target missiles per year would be utilized for GMD. There are no new missile launches proposed from PMRF for the GMD ETR.

4.4.1 AIR QUALITY—PACIFIC MISSILE RANGE FACILITY

4.4.1.1 No Action Alternative

Under the No Action Alternative, there would be no change in current air quality impacts at PMRF. The GMD ETR would not be established and GBI and target launch scenarios would not be tested under operationally realistic conditions. Missile flight test activities would continue at PMRF.

Activities associated with the pre-launch of a target missile include the transportation of targets to the PMRF facilities as well as the assembly of the target. The mobile exhaust emissions due to transportation would be intermittent and would not have a measurable impact to air quality.

The exhaust emissions presented in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998) are shown in table 4.4.1-1. As shown, no guidance levels would be exceeded.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Guidance Levels</th>
<th>Hawk$^{(1)}$ mg/m$^3$</th>
<th>Talos/Zest$^{(2)}$ mg/m$^3$</th>
<th>Strategic Target System$^{(3)}$ mg/m$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>10 (8-hour TLV)</td>
<td>8.46$^{(4)}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 (8-hour TWA)</td>
<td>0.07$^{(5)}$</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>40 (1-hour TWA)</td>
<td>0.92$^{(6)}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 (8-hour TWA)</td>
<td>0.096</td>
<td>0.68$^{(6)}$</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1.5 (1-hour TWA)</td>
<td>0.087</td>
<td>0.051</td>
<td>0.47$^{(6)}$</td>
</tr>
</tbody>
</table>

Source: Pacific Missile Range Facility, Barking Sands, 1998

(1) Hawk emissions based on EPA approved version of TSCREEN/PUFF model at 1900 meters (6200 feet)
(2) Talos emissions based on commercial version of TSCREEN/PUFF model at 3000 meters (9840 feet)
(3) Strategic Target System used Rocket Exhaust Effluent Dispersion Model to model Hydrogen Chloride
(4) At 190 meters (623 feet)
(5) Value is a 1-hour TWA. Due to near-instantaneous nature of emissions, 8-hour TWA would be lower
(6) At 3,000 meters (9,840 feet)
mg/m$^3$ = milligrams per cubic meter
TLV = Threshold Limit Value
TWA = Time-weighted Average
Previous analysis for target launches at PMRF included the Strategic Target System in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998). Table 4.4.1-2 lists the exhaust emissions of the Strategic Target System.

<table>
<thead>
<tr>
<th>Missile</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Chlorine metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Hydrogen metric tons (tons)</th>
<th>Water metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>3.56 (3.92)</td>
<td>0.019 (0.02)</td>
<td>2.35 (2.59)</td>
<td>0.19 (0.21)</td>
<td>0.22 (0.24)</td>
<td>0.60 (0.66)</td>
<td>1.58 (1.74)</td>
<td>0.87 (0.96)</td>
</tr>
</tbody>
</table>

The EIS determined that exhaust emissions from Strategic Target System launches would produce 5.1 metric tons (5.6 tons) of aluminum oxide, 3.8 metric tons (4.2 tons) of carbon monoxide, and 1.8 metric tons (1.9 tons) of hydrogen chloride. These levels were not determined to produce short-term exceedences within a previously determined ground hazard area of 3,048 meters (10,000 feet). This area is evacuated of all personnel before any launch. Therefore, no air quality impacts are anticipated for target launches at PMRF.

Activities performed during post target launch would include the removal of all mobile equipment and assets brought to PMRF. The removal could result in small, localized amounts of fugitive dust, which would have a minor impact to air quality. However, this impact would be minimized further through the use of dust suppression methods previously discussed.

4.4.1.2 Alternatives 1, 2, and 3

4.4.1.2.1 Target

Construction

No modifications to existing facilities would be required, and there would be no impact to regional air quality.

Operation

Pre-Launch Activities

Activities associated with the pre-launch of a target missile would be as described under the No Action Alternative.

Launch Activities

Launch activities at PMRF for Alternative 1, 2, or 3 would include launching up to four Strategic Target System targets per year. Potential impacts would be as described under the No Action Alternative.
Post-Launch Activities
Potential impacts would be as described under the No Action Alternative.

4.4.1.2.2 TPS-X

Construction
Installation of the TPS-X radar would require 0.3 hectare (0.8 acre) of previously disturbed land on northern PMRF or at Makaha Ridge. There would be no anticipated impacts to regional air quality.

Operation
The prime power unit for the TPS-X at PMRF is a 1.5-MW generator that provides power to the radar during testing. The generator is assumed to be in operation a maximum of 2,520 hours per year. Potential emissions for the TPS-X are listed in table 4.4.1-3. It is anticipated that operation of the TPS-X would have no adverse impacts on regional air quality at PMRF.

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen (metric tons)</th>
<th>Hydrogen Chloride (metric tons)</th>
<th>Carbon Monoxide (metric tons)</th>
<th>PM-10 (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 Megawatt Diesel Generator</td>
<td>4.6 (5.1)</td>
<td>0.66 (0.72)</td>
<td>5.7 (6.3)</td>
<td>0.27 (0.30)</td>
</tr>
</tbody>
</table>

4.4.1.3 Cumulative Impacts
The annual number of closures of the Restrictive Easement for missile launches from PMRF is currently limited to 30 per year. The Proposed Action of up to four target launches per year would be previously analyzed Strategic Target System missiles and would not introduce any new launches to PMRF. No cumulative impacts to air quality have been identified from past launches at PMRF. Missile launches are short-term, discrete events with temporary impacts that are not expected to result in a cumulative impact on air quality.

4.4.1.4 Mitigation Measures
No mitigation measures would be required.
4.4.2 BIOLOGICAL RESOURCES—PACIFIC MISSILE RANGE FACILITY

4.4.2.1 No Action Alternative

If the GMD ETR is not established, PMRF would still continue to be operated as an LF and would support single launches of target missiles for a less robust GMD program. Missile flight test activities would continue at PMRF. Impacts from launches of Strategic Target System missiles are described below.

Construction

Vegetation

Only minor site preparation activities are required for target launches. The site(s) for the launch activities are previously cleared, improved locations. Any spill or release of hazardous material would likely be restricted to a small, localized area near the source. SOPs and spill plans reduce any potential impact to vegetation. Negligible impacts to vegetation are anticipated.

Threatened and Endangered Plant Species. No adverse impacts are anticipated to the Ohai and Lau‘ehu habitat since no ground-disturbing activities would be required.

Wildlife

Disturbance to wildlife, including migratory birds, from minor site preparation activities and increased personnel would be short-term and is not expected to have a lasting impact or a measurable negative effect.

Any spill or release would likely be restricted to a small, localized area near the source. SOPs and spill plans would reduce any potential impact to wildlife in the vicinity of the spill.

Threatened and Endangered Wildlife Species. No impacts from site preparation activities are expected to the Newell’s Townsend’s shearwater, Hawaiian dark-rumped petrel, Hawaiian (American) coot, Hawaiian black-necked stilt, Hawaiian common moorhen, and Hawaiian duck, which have been observed in the drainage ditches and ponds on PMRF. Reflection from outdoor lighting could disorient the Newell’s Townsend’s shearwater, which may fly over PMRF at night (mainly between April and November). Any outdoor lighting associated with site preparation activities is properly shielded, following USFWS guidelines, to minimize reflection and impact to these birds.

Site preparation activities and personnel presence are not anticipated to affect the Hawaiian hoary bat, which has been observed feeding offshore of Polihale State Park north of the Strategic Target System launch pad. Site preparation activities are also not likely to affect marine species such as the Hawaiian monk seal and sea turtles since areas used are not within areas used by the monk seal or sea turtles. Any observed green sea turtle nests near the launch pad would be noted and avoided.
Environmentally Sensitive Habitat
No adverse impacts to the coastal dune systems, marine sanctuary, coral reefs, or critical habitats are anticipated as a result of any minor site preparation activities.

Operation
Up to four Strategic Target System missiles per year may currently be launched from the KTF at PMRF. The current missile trajectories are toward the RTS BOA and toward the BOA off the northwest coast of North America. The RTS trajectory has been successfully used four times in the last 10 years.

Vegetation
Normal launch activities are not expected to impact vegetation. Analysis provided in the Strategic Target System EIS (U.S. Army Strategic Defense Command, 1992) concluded that although vegetation near the Strategic Target System launch pad could suffer some temporary distress from the heat generated at launch and from hydrogen chloride or aluminum oxide emissions, there is no evidence of any long-term adverse effect on vegetation from two decades of launches at PMRF. The continued presence of the adder’s tongue, a species removed from the list of federal candidate species, indicates that emissions from Strategic Target System missiles have not had a significant impact on sensitive vegetative species.

Threatened and Endangered Plant Species. The possibility of a spill or other accident involving hazardous materials impacting Ohai and Lau’ehu habitat is considered remote since these plants have only been observed north of PMRF. Any spill or release of hazardous material would likely be restricted to a small, localized area near the source and would be cleaned up in accordance with PMRF’s spill plan.

Wildlife
No substantial impacts to threatened and endangered species from existing EMR sources on PMRF have been identified.

Noise. Disturbance to wildlife from the launches is brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Wildlife such as waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed.

Potential noise effects on wildlife can be categorized as auditory and non-auditory. Auditory effects would consist of direct physical changes, such as eardrum rupture or TTS. Non-auditory effects could include stress, behavioral changes, and interference with mating or foraging success. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat. Animals can also be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations. (Larkin, 1996) Informal observation at several LFs indicates the increased presence of personnel immediately before a launch tends to cause birds and other mobile species of wildlife to temporarily leave the area that would be subject to the highest level of launch noise. Therefore, no direct physical auditory impacts are anticipated. Wildlife is known to exhibit a startle effect when exposed to short-term noise impacts, such as
the launch of a target missile. Birds usually show signs of disturbance, such as fluttering of wings, when the noise occurs, but quickly return to normal behavior after the event. Video camera observations of a wood stork colony located 0.8 kilometer (0.5 mile) south of the Space Shuttle launch pad at Kennedy Space Center showed the birds flew south away from the noise source and started returning within 2 minutes, with a majority of individuals returning in 6 minutes (National Aeronautics and Space Administration, John F. Kennedy Space Center, 1997).

A rookery at Kennedy Space Center used by wood storks and other species of wading birds is located approximately 750 meters (2,461 feet) from a Shuttle launch pad. This rookery continues to be used successfully, even though it has received peak noise levels of up to approximately 138 dB. (American Institute of Aeronautics and Astronautics, 1993) As mentioned above, monitoring studies of birds during the breeding season indicate that adults respond to Space Shuttle noise by flying away from the nest, but they return within 2 to 4 minutes. Birds within 250 meters (820 feet) of Titan launch complexes at Cape Canaveral Air Station have shown no mortality or reduction in habitat use. Titan IV vehicles produce noise levels of approximately 170 dB in the immediate vicinity of the launch pad. This attenuates to 125 dB at a distance of 3 kilometers (2 miles) within about 30 seconds following launch. (U.S. Department of the Air Force, 1990b)

No evidence has indicated that serious injuries would result, and no long-term adverse effects are anticipated. The brief noise peaks produced by the missiles such as the Strategic Target System are comparable to levels produced by close range thunder (120 dB to 140 dB peak), and there is no species known to be susceptible to hearing damage following intermittent exposure to this common noise source (U.S. Department of the Air Force, 2001).

**Emissions.** Hydrogen chloride, which is emitted during missile launches, is known to affect wildlife. However, results of monitoring conducted following a Strategic Target System launch from the KTF at PMRF indicated little effect upon wildlife due to the low-level, short-term hydrogen chloride emissions (U.S. Army Space and Strategic Defense Command, 1993a). The program included marine surveys of representative birds and mammals for both pre-launch and post-launch conditions. Studies on representative birds and mammals reviewed in the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992) also indicated that low-level, short-term exposure to hydrogen chloride would not adversely affect threatened or endangered species or other wildlife. Aluminum oxide and hydrogen chloride do not bioaccumulate; therefore, no indirect effects to the food chain are anticipated.

An early flight termination or mishap could result in debris impact along the flight corridor, which may temporarily impact fishing activities in the immediate area. Due to the small amount of propellant involved and the few number of launches, ongoing launches are not anticipated to adversely affect marine resources. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus, no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the
perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29 °C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water. The potential ingestion of toxins by fish species, which may be used for food sources, would be remote because of the diluting effect of the ocean water and the relatively small area that would be affected.

**Essential Fish Habitat.** The potential impact to Essential Fish Habitat from nominal launch activities would mainly be from spent boosters and missile debris to waters off the coast within the Temporary Operating Area. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species’ populations. The majority of propellant would be expended before booster drop and impact and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)

In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect Essential Fish Habitat. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

**Threatened and Endangered Wildlife Species.** Impacts from launch noise to the Newell’s Townsend’s shearwater, Hawaiian dark-rumped petrel, Hawaiian (American) coot, Hawaiian black-necked stilt, Hawaiian common moorhen, and Hawaiian duck would be limited to startle or flushing reactions as discussed above. Reflection from outdoor lighting could disorient the Newell’s Townsend’s shearwater; however, any outdoor lighting associated with launch activities would be properly shielded, following USFWS guidelines. Existing range radars and other instrumentation that would be used at PMRF are discussed in section 2.3.1.4. No substantial impacts to threatened and endangered species from existing EMR sources on PMRF have been identified.

No adverse impacts are anticipated to the Hawaiian hoary bat, which has been observed feeding offshore of Polihale State Park, north of the project area. The likelihood that debris from a spent booster or terminated launch would strike a Hawaiian monk seal is considered remote since the waters adjacent to PMRF are used infrequently by this species. The launch would be delayed if monk seals are observed in the launch safety zone or beach portion of the Launch Hazard Area. Green sea turtles nests have been observed in the sand near the Nohili Ditch. Green sea turtles lay eggs only at night, once every 2 to 4 years. Thus, the potential for debris to strike a green sea turtle near or on shore is remote. Access to green sea turtle nesting beaches would be restricted.
Environmentally Sensitive Habitat

The Hawaiian Islands Humpback Whale National Marine Sanctuary FEIS and Management Plan (U.S. Department of Commerce, National Oceanic and Atmospheric Administration and State of Hawaii, Office of Planning, 1997) recognizes that PMRF plays an important role in national defense training. The EIS includes missile launches as one of the DoD activities that currently occurs within the sanctuary boundaries. The ongoing missile launches would have impacts within the parameters of ongoing missile programs.

According to analysis provided in the PMRF Enhanced Capability EIS, debris from shore-based missile launch programs is not expected to produce any measurable impacts on benthic (sea floor) resources beyond those currently experienced during natural conditions associated with storms.

4.4.2.2 Alternatives 1, 2, and 3

Alternatives 1, 2, and 3 would require the use of existing launch pads, Missile Assembly Building, missile storage facility, range radars, and maintenance and storage facility to support target missile launches.

4.4.2.2.1 Targets

Site Preparation Activities

Site preparation activities at PMRF for Alternative 1, 2, or 3 would include launching up to four Strategic Target System targets per year. Potential impacts would be as described under the No Action Alternative.

Launch Activities

Launch activities at PMRF for Alternative 1, 2, or 3 would include launching up to four Strategic Target System targets per year. Potential impacts would be as described under the No Action Alternative.

Post-Launch Activities

Potential impacts would be as described under the No Action Alternative.

4.4.2.2.2 TPS-X Radar

Construction

Vegetation

Installation of the TPS-X radar would require 0.3 hectare (0.8 acre) of previously disturbed land on northern PMRF or at Makaha Ridge. No impacts to vegetation are anticipated.

Threatened and Endangered Plant Species. No impacts to potential Ohai or Lau‘ehu habitat on PMRF or to the endangered dwarf iliau found within the Makaha Ridge complex are anticipated since no ground-disturbing activities would be required.
Wildlife
Disturbance to wildlife, including migratory birds, from the minor site preparation activities and temporary increase in personnel in the area would be short-term and is not expected to have a lasting impact or measurable negative effect.

Threatened and Endangered Wildlife Species. Site preparation activities could potentially startle any Newell's Townsend's shearwater, Hawaiian dark-rumped petrel, Hawaiian (American) coot, Hawaiian black-necked stilt, Hawaiian common moorhen, or Hawaiian duck, which could be in the drainage ditches adjacent to the TPS-X radar site on northern PMRF, or the Hawaiian goose population present in the Makaha Ridge area. This disturbance would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Wildlife such as waterfowl would quickly resume feeding and other normal behavior patterns. Reflection from outdoor lighting could disorient the Newell's Townsend's shearwater, which may fly over PMRF at night (mainly between April and November). Any outdoor lighting associated with construction activities and permanent structures would be properly shielded, following USFWS guidelines to minimize reflection and impact to these birds.

Site preparation activities and personnel presence are not anticipated to affect the Hawaiian hoary bat, which has been observed feeding offshore north of the Nohili Ditch. Site preparation activities are also not likely to affect marine species such as the Hawaiian monk seal and sea turtles since these animals are normally offshore or on the beach seaward of the berm. Any observed green sea turtle nests near the northern PMRF site would be noted and avoided.

Environmentally Sensitive Habitat
No wetlands or other sensitive habitat would be disturbed during installation of the TPS-X radar.

Operation
Vegetation
Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations of the Prime Power Unit and Cooling Equipment Unit system hook-up. Spill control procedures would be established in cooperation with the host installation, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

Threatened and Endangered Plant Species. No impacts to potential Ohai or Lau'eahu habitat on PMRF or to the endangered dwarf iliau found within the Makaha Ridge complex are anticipated from operation of the TPS-X radar since no ground-disturbing activities would be required.

Wildlife
The Prime Power Unit is a self-contained trailer with a noise-dampening shroud that would minimize the potential for diesel generator noise impacts.

As discussed in the KLC section, the power densities emitted from the TPS-X radar are unlikely to cause any biological effects in animals or birds. The TPS-X radar is not expected to radiate lower than 5 degrees, which would preclude EMR impacts to terrestrial species from either
operation of the TPS-X radar during flight tests or later during proposed tactical testing. Impacts to wildlife on PMRF or Makaha Ridge would be similar to those discussed above in the KLC TPS-X radar section.

**Threatened and Endangered Wildlife Species.** There have been no reports of birds being affected by EMR from the existing sensors located in the Makaha Ridge complex. Impacts to the threatened and endangered birds on and offshore of PMRF would be similar to those discussed above in section 4.1.3.2.5. The protection provided by the restricted access, and grassy habitat within Makaha Ridge would continue to have a positive effect on the small population of Hawaiian goose (Pacific Missile Range Facility, 2000). Impacts to threatened and endangered marine species offshore of PMRF would be similar to those discussed above in section 4.1.3.2.5.

*Environmentally Sensitive Habitat*

No wetlands or other sensitive habitat would be adversely affected by operation of the TPS-X radar.

### 4.4.2.3 Cumulative Impacts

No cumulative impacts to biological resources have been identified from past launches at PMRF. Combined activities would be performed at different times and locations and therefore, no substantial cumulative impacts to biological resources are anticipated at PMRF.

### 4.4.2.4 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities.

### 4.4.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—PACIFIC MISSILE RANGE FACILITY

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with launch operations from PMRF, and construction required to support GMD launch operations. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from launch activities are addressed under each alternative as applicable.

#### 4.4.3.1 No Action Alternative

Implementation of the No Action Alternative would result in the ongoing launch of Strategic Target System missiles from PMRF. Use of PMRF for flight preparation and testing has been previously analyzed in the PMRF Enhanced Capability Final EIS (Pacific Missile Range Facility, Barking Sands, 1998) and the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b). These documents concluded that adherence to PMRF standard SOPs as well as federal, state and local regulations would significantly reduce any impact from hazardous materials handling or waste generation. Impacts from launches of Strategic Target System missiles would be as described below.
Pre-Launch Activities
All elements of the Strategic Target System would be transported, handled and stored at PMRF in accordance with applicable federal, state, U.S. Army and U.S. Air Force regulations and standard range SOPs.

Launch Activities
Potentially hazardous materials (external to those preloaded into the missiles) to be used would be fuel required for electrical power generators, coating, sealants and solvents needed for launch and launch preparation. The types of hazardous materials used and hazardous waste generated would be managed in accordance with existing PMRF procedures and requirements. These procedures and requirements conform to federal and State of Hawaii laws and regulations. Best practices, lessons learned, and expectations indicated in the interim guidance DoD 5000.2R would be incorporated into design and construction plans.

In addition, the PMRF Fire Department and Hazardous Materials Response Team are trained in the appropriate procedures to handle the materials associated with Strategic Target System launches should a mishap occur. All personnel involved in these operations would wear protective clothing and receive specialized training in spill containment and cleanup.

During launches there is the potential for a mishap to occur resulting in potentially hazardous missile debris and propellants falling within the Ground Hazard Area. As addressed for previous launch programs on PMRF, the hazardous materials that result from a flight termination would be cleaned up and any contaminated areas remediated. All hazardous waste generated in such a mishap would be disposed of in accordance with appropriate state and federal regulations.

Post-Flight Test Activities
Specific restoration actions, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

4.4.3.2 Alternatives 1, 2, and 3

4.4.3.2.1 Target
Alternatives 1, 2, and 3 would involve single Strategic Target System launches from PMRF, as described in the No Action Alternative. This is a routine activity for PMRF and is included in current hazardous materials and hazardous waste management plans. No additional activities would be performed, no new potentially hazardous materials would be used, and no significant increase in the amount of hazardous waste currently generated would be expected to occur. Hazardous materials used and hazardous wastes generated would continue to be handled in accordance with existing laws and regulations governing the transportation and disposal of these materials.

4.4.3.2.2 TPS-X Radar
Construction
Alternatives 1, 2, and 3 would require the set up of the TPS-X radar and associated equipment. The site would include a gravel pad, concrete pad, security fencing and utilities/communications
installation. Generation of potential hazardous waste (e.g., corrosion control coatings, adhesives, and sealants) would be minimal. Management of hazardous materials and hazardous waste would be performed in accordance with PMRF requirements and would not significantly impact existing PMRF hazardous materials and hazardous waste management procedures.

**Operation**

Operation of the TPS-X would have little effect on hazardous waste and hazardous materials management. A 3,785-liter (1,000-gallon) AST would be used for diesel fuel for the backup generator.

### 4.4.3.3 Cumulative Impacts

Adherence to the hazardous materials and waste management systems on PMRF would preclude the potential accumulation of hazardous materials or waste. The base has implemented an emergency response procedure that would aid in the evaluation and cleanup of any hazardous materials released. The Proposed Action is equivalent to the No Action Alternative and is not expected to result in cumulative hazardous materials and hazardous waste impacts on PMRF.

### 4.4.3.4 Mitigation Measures

No hazardous materials/hazardous waste management mitigation measures are proposed for GMD ETR activities.

### 4.4.4 HEALTH AND SAFETY—PACIFIC MISSILE RANGE FACILITY

#### 4.4.4.1 No Action Alternative

Under the No Action Alternative, Strategic Target System launches would continue at PMRF. Potential health and safety issues associated with Strategic Target System launches include pre-launch, launch, and post-launch activities. Use of PMRF for flight preparation and testing and potential health and safety issues have been previously analyzed in the PMRF EIS and North Pacific Targets Program EA. These documents concluded that PMRF takes every reasonable precaution during the planning and execution of these operations to prevent injury to human life or property. Therefore, no increased risk to health and safety is expected as a result of implementing this alternative. Impacts from launches of Strategic Target System missiles would be as described below.

**Pre-Launch Activities**

Missiles and support equipment may arrive at Pearl Harbor before final shipment to PMRF. Equipment would be available at Pearl Harbor for the loading and unloading of missiles. Storage areas would be available for the temporary storage of any hazardous materials. Missiles and support equipment would be transported by ship to Nawiliwili Harbor, then by DoD/DOT-approved over the road carrier truck to PMRF. Missiles and support equipment may also be transported directly to PMRF by aircraft. Applicable state and federal regulations and range safety plans and procedures are followed in transporting and handling potentially explosive ordnance and hazardous materials. Missile components, including any propellant, are transported in DOT and military designed and approved shipping containers.
The type of protection afforded by shipping containers is sufficient to protect solid rocket motors from receiving the shock required to cause an explosion. In the event of a transportation accident, it is more likely that the solid propellants would burn. The solid propellants would release exhaust components, specifically hydrogen chloride, which would irritate the eyes and skin of persons in the nearby area. Such an accident would not likely occur given the in-place safety procedures used by PMRF during transportation and handling of missile components. ESQDs would be established around transportation corridors.

On arrival at PMRF, support equipment is placed in secure storage until assembly and launch preparation. ESQDs are established around ordnance storage and Missile Assembly Buildings. Access to storage and support facilities is limited to trained and authorized PMRF/mission critical personnel.

Launch Activities

A pre-launch accident on the launcher or in the assembly building would be characterized by either an explosion and/or detonation of missile propellants or burning of the propellants without an explosion or detonation. An ESQD surrounding the launcher would be calculated based on the equivalent explosive force of all propellant and pyrotechnic materials contained on the flight vehicle. Areas outside the ESQD zone provide acceptable protection and require that areas inside the ESQD zone be cleared of non-mission-essential personnel. The ESQD would vary from missile to missile. Fire suppression, hazardous materials emergency response, and emergency medical teams would routinely be provided during the actual launch operations.

Potential health and safety impacts associated with launch operations could occur as a result of inhalation of exhaust products associated with normal operation; impact hazard associated with a launch anomaly (explosion, crash, flight termination); and inhalation hazards from an abnormal launch (fire, crash, flight termination). The primary method for preventing potential adverse safety and health effects associated with these occurrences involves the physical isolation of the area immediately surrounding the launch site, before launch. At no time shall individuals of the public be exposed to a probability of fatality greater than 1 in 10 million for any single mission and 1 in 1 million on an annual basis. This standard maximum risk to the public is less on an annual basis than the risks from accidents occurring in the home or in public. (Range Commanders Council, Range Safety Group, 2002) Before launch, safety clearance areas would be established to provide an area where all potentially hazardous debris from a launch anomaly would be contained. Ground and range safety areas would be determined to protect the general public and private property against potential launch mishap. Non-mission-essential personnel would be excluded from the ground safety area and Launch Hazard Area during launch operations. Personnel working within the Launch Hazard Area would be protected in bunkers or behind berms. Numerous factors determine the shape and dimensions of the ground safety area and Launch Hazard Area, including the following:

- Size and flight characteristics of the missile
- Individual flight profile for each exercise or flight test
- Reaction time between recognition of a flight malfunction and the decision to terminate flight
The ground safety area size is determined by simulating the missile’s capability to travel off course in any direction (360 degrees) from the launch point for a specified period of time. Five seconds would be the commonly used time period, but this period can be modified based on local range procedures, capabilities, and mission requirements. The analysis assumes that at the end of the time period, the missile flight would be terminated by the Flight Termination System, and the associated debris would fall to the ground or sea. The outer perimeter within which this potentially hazardous debris could fall, in any direction, factoring in prevailing wind conditions, defines the boundaries of the ground safety area.

Data processed by ground-based or onboard missile computer systems is used to recognize malfunctions and terminate missile flight. The Safety Officer continuously monitors the flight and would always retain the capability to terminate the flight, if necessary. For a typical aerial target drone, the nominal ground safety area for launches extends to a radius of up to approximately 366 meters (1,200 feet). For ballistic missiles, the nominal ground hazard area is 610 meters (2,000 feet) for unguided rail-launched targets and a modified 3,048 meters (10,000 feet) for larger stool-launch guided missile targets (Pacific Missile Range Facility, Barking Sands, 1998). The Range Safety Officer would use computer models to determine actual ground safety area dimensions and safety procedures for each target missile flight, based on the above factors.

To accommodate launches of larger missiles, PMRF has an existing restrictive easement for a ground safety area of a modified 3,048 meters (10,000 feet) that extends beyond the PMRF property boundary. This restrictive easement is used to set up the Launch Hazard Area to ensure public safety during a launch. The use of the restrictive easement until 2030 was analyzed in the PMRF Enhanced Capability EIS. As described in the PMRF Enhanced Capability EIS, launches from KTF toward the BOA near USAKA/Kwajalein Missile Range used the launch azimuth of 280 degrees to avoid overflight of the Island of Niihau. The North Pacific Targets Program EA analyzed launches for payload impact in the BOA off the northwest coast of North America with initial launch azimuths of 310 to 360 degrees. The Range Safety Officer would use computer models to determine actual ground safety area dimensions and safety procedures for each target missile flight.

In addition to the ground safety area, a Launch Hazard Area is established over water where any potentially hazardous debris from a flight termination or missile stage could fall. The Launch Hazard Area would be determined for each type of flight test, taking into account the same parameters used in determining the ground safety area. Before launch PMRF would issue NOTAMs and NOTMARs. Area surveillance and clearance of the Launch Hazard Area is provided by PMRF aircraft and marine vessels, as part of their routine operations. To further minimize potential launch-associated hazards, emergency response teams are on standby during launch operations for fire suppression, hazardous materials collection and removal, and medical response as necessary.

The potential health and safety impact resulting from a nominal launch includes the inhalation of exhaust products during the first few seconds of the launch operation. Concentrations of exhaust products are expected to be below applicable health-based standards by the time the exhaust plume reaches the boundary of the ground safety area or Launch Hazard Area. Thus the public would not be exposed to concentrations exceeding exposure limits. Modeling conducted for previous Strategic Target System launches has determined that a normal launch would not endanger public health or safety in the vicinity/area of PMRF.
Post-Launch Activities
Potentially hazardous debris would impact the ground or open ocean should a flight termination occur. Debris would primarily consist of metals, solid propellant, and batteries. Much of any hazardous material in the missile would be consumed in launch anomaly. Potentially hazardous debris would be recovered from the ground and disposed of in accordance with applicable state, federal, and range hazardous waste regulations and operating procedures. Most liquid propellant potentially used in upper stages would be consumed in flight termination and would not likely affect health and safety.

4.4.4.2 Alternatives 1, 2, and 3

4.4.4.2.1 Target
Single target launches would occur from PMRF under Alternatives 1, 2, and 3. All launch activities would be conducted as previously analyzed in the PMRF EIS, Strategic Target System EIS, North Pacific Target Program EA, and in compliance with federal, state, local and, if applicable, international health and safety requirements and strict PMRF SOPs. Therefore, no increased risk to health and safety would be expected as a result of selecting these alternatives.

4.4.4.2.2 TPS-X Radar
Construction
The potential TPS-X locations would be northern PMRF or at Makaha Ridge. Construction activities would be accomplished in accordance with the safety plans and procedures described in section 4.1.7.2. No adverse effects to health and safety are expected from construction of the TPS-X pad.

Operation
EMR hazard zones would be established within the beam's tracking space and near emitter equipment. The potential interference distances are shown in figure 2.3.1-8. A visual survey of the area would be conducted to verify that all personnel are outside the hazard zone prior to startup. Personnel may not enter these hazard zones while the radar is in operation. The radar is prevented from illuminating in a designated cutoff zone, in which operators and all other system elements would be located. Potential safety consequences associated with radar interference with other electronic and emitter units (flight navigation systems, tracking radars, etc.) would also examined prior to startup. Adherence to PMRF, FAA, and DoD safety procedures relative to radar operations would preclude significant impact to health and safety.

4.4.4.3 Cumulative Impacts
Potentially hazardous operations at PMRF would continue at levels similar to current conditions. No cumulative impact to the public health and safety would be expected from exposure to EMR emission, hazardous air pollutants, hazardous materials or hazardous waste operations at PMRF. Any long-term exposures to on-base personnel would be minimized due to the strict adherence to regulatory control when handling materials. Based on the PMRF SOPs and other activities in the area, there is minimal potential for cumulative health and safety risk to the public from operations at PMRF. The proposed number of single target launches expected under
Alternatives 1, 2, and 3 would not represent an increase over current conditions and therefore would not increase potential public health and safety risk.

4.4.4 Mitigation Measures
No health and safety mitigation measures are proposed for GMD ETR activities.

4.4.5 SOCIOECONOMICS—PACIFIC MISSILE RANGE FACILITY

4.4.5.1 No Action Alternative
Under the No Action Alternative, Strategic Target System launches would continue at PMRF. The use of PMRF for flight preparation and testing and potential socioeconomic issues have been previously analyzed in the PMRF EIS and North Pacific Targets Program EA. These documents concluded that there would be no significant impacts to socioeconomics from the launch of four Strategic Target System missiles per year. Impacts from launches of Strategic Target System missiles would be as described below for the Proposed Action.

4.4.5.2 Alternatives 1, 2, and 3

4.4.5.2.1 Target
Under the implementation of Alternatives 1, 2, and 3, PMRF would be used as a launch site for single Strategic Target System vehicles; the impacts from the launch of these targets have previously been analyzed in the PMRF Enhanced Capability Final EIS (Pacific Missile Range Facility, Barking Sands, 1998) and in the North Pacific Targets EA (U.S. Army Space and Missile Defense Command, 2001b). Potential impacts would be the same as described for the No Action Alternative.

4.4.5.2.2 Sensors
Under the implementation of each alternative, PMRF would be used as a supporting facility for mid-range telemetry during both target and GBI launches and intercepts. This could include the use of existing tracking and surveillance radars, telemetry receivers and recorders, and communications systems. Mobile telemetry systems could also be used at PMRF or at Makaha Ridge.

4.4.5.2.3 Cumulative Impacts
The Proposed Action is equivalent to the No Action Alternative and is not expected to result in cumulative socioeconomic impacts at PMRF.

4.4.5.2.4 Mitigation Measures
No socioeconomic mitigation measures are proposed for GMD ETR activities.
4.5  VANDENBERG AIR FORCE BASE

4.5.1  AIR QUALITY—VANDENBERG AIR FORCE BASE

4.5.1.1  No Action Alternative

Under the No Action Alternative, launch activities would continue at Vandenberg AFB, although
the GMD ETR would not be established and GBI and target launch scenarios would not be
tested under operationally realistic conditions.

Table 4.5.1-1 lists propellant information for the Titan IV, Delta II and IV, and Atlas V, common
launch vehicles at Vandenberg AFB. The exhaust emissions presented in the EIS for the
Evolved Expendable Launch Vehicle Program (U.S. Department of the Air Force, 1998a) and
the Supplemental EIS for the Evolved Expendable Launch Vehicle (U.S. Department of the Air
Force, 2000) for these vehicles are shown in table 4.5.1-2.

Table 4.5.1-1: Missile Propellant Information at Vandenberg AFB

<table>
<thead>
<tr>
<th>Missile</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titan IV</td>
<td>631,400.6 (1,392,000)</td>
</tr>
<tr>
<td>Delta II</td>
<td>106,140.6 (234,000)</td>
</tr>
<tr>
<td>Atlas V</td>
<td>&lt;382,106.2 (&lt;842,400)</td>
</tr>
<tr>
<td>Delta IV</td>
<td>&lt;227,063.8 (&lt;500,590)</td>
</tr>
</tbody>
</table>


Table 4.5.1-2: Predicted Pollutant Concentration Levels at Vandenberg AFB

<table>
<thead>
<tr>
<th>Launch Vehicle</th>
<th>Time</th>
<th>Hydrogen Chloride (ppm)</th>
<th>Aluminum Oxide (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titan IV a</td>
<td>3.32</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Delta II a</td>
<td>1.821</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Atlas V b</td>
<td>Peak/Instantaneous 1.896</td>
<td>2.694</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-minute</td>
<td>0.067</td>
<td>0.116</td>
</tr>
<tr>
<td></td>
<td>60-minute</td>
<td>0.033</td>
<td>0.058</td>
</tr>
<tr>
<td>Delta IV b</td>
<td>Peak/Instantaneous 1.270</td>
<td>1.779</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-minute</td>
<td>0.045</td>
<td>0.077</td>
</tr>
<tr>
<td></td>
<td>60-minute</td>
<td>0.023</td>
<td>0.039</td>
</tr>
</tbody>
</table>

a U.S. Department of the Air Force, 1998a
b U.S. Department of the Air Force, 2000

ppm = parts per million
mg/m³ = milligrams per cubic meters
NA = Not available
These vehicle emissions are typical of those launched from Vandenberg AFB. The U.S. Air Force standard for hydrogen chloride is 10 ppm for an instantaneous level. The OSHA standard for aluminum oxide is 5 milligrams per cubic meter (mg/m³).

The EELV EIS and Supplemental EIS concluded that up to an additional nine launches per year would not exceed NAAQS, state AAQS, U.S. Air Force, or OSHA standards. Current range activities would continue. Launches from Vandenberg AFB are limited to 30 annually (10 military launches and 20 space launches), including current launching of the Peacekeeper, BV, targets and Minuteman II. Table 4.5.1-3 lists annual emissions from Vandenberg AFB and Santa Barbara County.

### Table 4.5.1-3: Vandenberg AFB and Santa Barbara County Emissions

<table>
<thead>
<tr>
<th></th>
<th>Volatile Organic Compounds (metric tons/year)</th>
<th>Oxides of Nitrogen (metric tons/year)</th>
<th>Carbon Monoxide (metric tons/year)</th>
<th>Sulfur Dioxide (metric tons/year)</th>
<th>PM-10 (metric tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated 2001 Emissions from Vandenberg AFB</td>
<td>4.5 (5.0)</td>
<td>17.8 (19.6)</td>
<td>47.0 (51.8)</td>
<td>1.0 (1.1)</td>
<td>58.6 (64.6)</td>
</tr>
<tr>
<td>1996 Santa Barbara County Annual</td>
<td>40,333 (44,460)</td>
<td>15,049 (16,589)</td>
<td>93,775 (103,369)</td>
<td>785 (865)</td>
<td>12,295 (13,553)</td>
</tr>
</tbody>
</table>

Source: U.S. Department of the Air Force, 2000

**Upper Atmosphere**

No specific requirements are used for regulating emissions to the upper atmosphere. The Supplemental EELV EIS states launches that would result in local and global impacts to the upper atmosphere. The passage of a lift vehicle through the stratosphere has been shown to cause a temporary, local decrease in a so-called “hole” in the ozone layer; however, these holes only exist for a matter of minutes to hours. According to the EELV EIS and Supplemental EELV EIS, current launches would not result in significant impacts to the upper atmosphere.

4.5.1.2 Alternative 1

4.5.1.2.1 Targets

Construction

Construction activities associated with target facilities at Vandenberg AFB would include interior and software modifications to existing facilities. Therefore, there would be no increase to regional air quality emissions at Vandenberg AFB due to construction.

Operation

Santa Barbara County is in attainment for all air quality standards except the state ozone and PM-10 standards. Santa Barbara County has recently met the federal standard for ozone and is in the process of being redesignated by the EPA as being in attainment. Alternative 1 would not substantially impact the regional air quality within the Santa Barbara Air Basin.
Pre-Launch Activities

Vandenberg AFB complies with the Santa Barbara County Air Pollution Control District rules and regulations listed below. Alternative 1 would comply with these and any other applicable rules.

- Rule 317, Organic Solvents, provides limits to any solvent materials used in the project.
- Rule 323, Architectural Coatings, provides for coating materials applied to an architectural structure.
- Rule 330, Surface Coating of Metal Parts and Products, applies if metal parts are coated on base before construction.
- Rule 353, Adhesives and Sealants, applies if adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, or any other primers are used during the project unless specifically exempted by this rule.
- Only California Air Resources Board-certified blasting medium would be permitted if abrasive blasting were used.
- Any portable equipment powered by an internal combustion engine of 20 British horsepower or higher used in this project must be registered in the California State-wide Portable Equipment Registration Program or have a valid Santa Barbara County Air Pollution Control District Permit to operate. (Vandenberg Air Force Base, 2001)

Pre-launch activities associated with Alternative 1 at Vandenberg AFB would include the transportation of the target. The mobile emissions resulting from this transportation would be intermittent and would not have a measurable impact to regional air quality.

If used as a target, the fourth stage of a Peacekeeper target would utilize a single liquid propellant and require onsite fueling. Although total vapor emissions can vary depending on the propellant transfer equipment used and how it is assembled, it is anticipated that only very small amounts (approximately 10 grams [0.4 ounce]) of vapors would be released to the atmosphere during the transfer operation. It is not anticipated that normal fueling operations would impact air quality.

It is unlikely that a propellant release larger than that described above would occur at Vandenberg AFB. However, if such an accidental release were to occur, it would most likely occur during fueling. A reasonable scenario would involve failure of the transfer equipment or valves. The analysis assumes a leak contained over a 3-minute period that releases up to 17 liters (4.5 gallons) of hydrazine fuel. Analysis indicated no potential exceedances of the Immediately Dangerous to Life and Health (IDLH) health standard of 50 ppm. The low likelihood of such an occurrence and the implementation of approved emergency response plans would limit the impact of such a release.

Emergency generators would supply backup power to target facilities with offsite commercial power sources providing primary power. The emergency backup generators would be operated under appropriate permits and restrictions. Portable generators that operate less than 200 hours per year currently do not require permits; however, Santa Barbara County Air Pollution
Control District is in process of changing permitting applicability which could require New Source Review permitting, emission offsets, or emission control equipment.

Launch Activities

Proposed target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II target, Peacekeeper target, and Trident I (C4) target. Table 4.5.1-4 lists missile propellant information and table 4.5.1-5 lists emission constituents during Stage I for each proposed missile. In Alternative 1, a total of five target launches per year would be anticipated at Vandenberg over the duration of the program.

Table 4.5.1-4: Missile Propellant Information for Proposed Targets at Vandenberg AFB

<table>
<thead>
<tr>
<th>Missile</th>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>Stage I</td>
<td>9,422 (20,772)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>4,025 (8,874)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>414 (913)</td>
</tr>
<tr>
<td>Minuteman II Target</td>
<td>Stage I</td>
<td>20,810 (45,879)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>6,296 (13,851)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>1,658 (3,655)</td>
</tr>
<tr>
<td>Peacekeeper Target</td>
<td>Stage I</td>
<td>44,661 (98,462)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>24,556.3 (54,137.7)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>7,069 (15,584)</td>
</tr>
<tr>
<td></td>
<td>Stage IV</td>
<td>644 (1,420)</td>
</tr>
<tr>
<td>Trident I (C4) Target</td>
<td>Stage I</td>
<td>17,667 (38,948)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>7,924 (17,469)</td>
</tr>
<tr>
<td>AKM</td>
<td></td>
<td>415 (914)</td>
</tr>
</tbody>
</table>

Table 4.5.1-5: Potential Target Exhaust Emissions (Single Launch) at Vandenberg AFB

<table>
<thead>
<tr>
<th>Missile</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Chlorine metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Hydrogen metric tons (tons)</th>
<th>Water metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>3.56 (3.92)</td>
<td>0.019 (0.02)</td>
<td>2.35 (2.59)</td>
<td>0.19 (0.21)</td>
<td>0.22 (0.24)</td>
<td>0.60 (0.66)</td>
<td>1.58 (1.74)</td>
<td>0.87 (0.96)</td>
</tr>
<tr>
<td>Minuteman II Target</td>
<td>6.29 (6.93)</td>
<td>0.027 (0.030)</td>
<td>5.00 (5.51)</td>
<td>0.77 (0.85)</td>
<td>0.44 (0.48)</td>
<td>1.98 (2.18)</td>
<td>4.47 (4.93)</td>
<td>1.83 (2.02)</td>
</tr>
<tr>
<td>Peacekeeper Target</td>
<td>15.58 (17.17)</td>
<td>0.085 (0.093)</td>
<td>9.75 (10.75)</td>
<td>0.65 (0.72)</td>
<td>0.23 (0.25)</td>
<td>5.04 (5.55)</td>
<td>7.12 (7.85)</td>
<td>3.65 (4.03)</td>
</tr>
<tr>
<td>Trident I (C4) Target</td>
<td>6.71 (7.40)</td>
<td>&lt;0.009 (&lt;0.01)</td>
<td>5.48 (6.04)</td>
<td>0.35 (0.39)</td>
<td>NA (0.79)</td>
<td>0.72 (0.43)</td>
<td>0.39 (4.06)</td>
<td></td>
</tr>
</tbody>
</table>

NA = Not available
Emissions from dual target launches were modeled using the Peacekeeper Target, as it is the largest of the proposed target vehicles. Dual emissions were modeled using OBODM to determine levels of hydrogen chloride, aluminum oxide and carbon monoxide. The modeling for a nominal dual Peacekeeper target launch showed that the peak hydrogen chloride standard would be exceeded out to a distance of approximately 625 meters beyond the Vandenberg AFB boundary (table 4.5.1-6). The 1-hour, 8-hour, and 24-hour hydrogen chloride standards would not be exceeded. Emission levels for both carbon monoxide and aluminum oxide would be within NAAQS and California AAQS. A nominal launch of a single Peacekeeper Target is anticipated to be within the NAAQS, California AAQS, and Air Force standards as fewer emissions would be released.

<table>
<thead>
<tr>
<th>Table 4.5.1-6: Potential Peacekeeper Target Exhaust Emissions (Dual Launch) at Vandenberg AFB</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dual Peacekeeper Target Launch</strong></td>
</tr>
<tr>
<td>Carbon Monoxide</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS
(2) Based upon the maximum California AAQS level of PM-10 concentrations over a 24-hour period
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

The *de minimis* thresholds are federal limits listed in 40 CFR 51.583(b)(1). In the event that 5 Peacekeeper Targets are launched in a year, the conservatively estimated annual emissions for oxides of nitrogen would total 18.3 metric tons (20.2 tons), below the 45.3-metric-ton (50-ton) limit. Carbon monoxide was calculated to be 48.8 metric tons (53.8 tons), also below the federal limit of 90.7 metric tons (100 tons).

If flight termination becomes necessary, the potential resulting fire would cause short-term impacts to air quality in the form of combustion byproducts and potentially hazardous fumes. Most or all of the solid propellant fuel would likely burn up before being extinguished. These combustion byproducts would be similar to those previously described for a nominal launch. Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of an on-pad accident involving dual Peacekeeper Targets. As shown in table 4.5.1-6, the 1-hour and peak hydrogen chloride Air Force standards would be exceeded. The 8-hour and 24-hour hydrogen chloride standards were not exceeded. All other standards would continue to be within NAAQS and California AAQS. The consequences to regional air quality would be localized (within approximately 3.8 kilometers (2.4 miles) of Vandenberg AFB for the peak hydrogen chloride standard and 1.3 kilometers (0.8 miles) of Vandenberg AFB for the 1-hour hydrogen chloride standard) and would be of a short duration. The modeling included both day and nighttime meteorological data. Nighttime data typically depicts very calm wind conditions which results in higher emission concentrations. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and
the conservative nature of the OBODM inputs, the impact to regional air quality is considered minor.

Potential health and safety impacts due to launch emissions are discussed under section 4.5.6, Health and Safety. Before each launch, the Rocket Exhaust Effluent Diffusion Model is used to locate toxic zones. A toxic risk-assessment-based recommendation to launch or not to launch is based on the results of the LATRA program that evaluates the risk to people, regardless of whether they are mission essential or non-mission essential. Among other criteria in determining whether to launch, the LATRA accounts for (1) whether people are sheltered or unsheltered; (2) whether they are healthy or sensitive individuals; and (3) the probability of a catastrophic launch failure.

**Determination of Non-Applicability**

Santa Barbara County is in non-attainment for the state standards for ozone and PM-10 and is currently in the process of being redesignated by the EPA as being in attainment for the federal ozone standard. The review of the Proposed Action as required by the General Conformity Rule resulted in a finding of presumed conformity. Total foreseeable direct and indirect emissions caused by the proposed action are less than the mandated *de minimis* thresholds as shown in appendix J.

**Post-Launch Activities**

Post-launch activities would include the removal of all mobile equipment and assets brought to Vandenberg AFB. The removal could result in small localized amounts of PM-10, which would be minimized further through dust suppression measures previously discussed.

**4.5.1.2.2 Sensors**

Current range radars (such as High Accuracy Instrument Radar, AN/TPQ-18, AN/FPS-16, AN/MPS, and TPS-X), sensors, fixed and mobile telemetry, and optics equipment would be utilized in Alternative 1 and would require no construction or modifications. Operation of existing range radars at Vandenberg AFB would be covered under existing permits.

**4.5.1.3 Alternative 2**

**4.5.1.3.1 Ground-Based Interceptors**

**Construction**

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant air quality impacts to the regional air. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. The GMD program would perform sampling and abatement for lead-based paint, asbestos, and PCBs as required before modification, using Vandenberg AFB-approved procedures. Facility
modifications and site preparation activities at the locations identified would have a localized, minimal impact on air quality.

For communication among the components at Vandenberg AFB, the proposed action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would have a localized, minimal impact on air quality.

Operation

Pre-Launch Activities

Pre-launch activities associated with the GBIs would be similar to pre-launch activities for targets at Vandenberg AFB.

An accidental release of liquid fuel or liquid oxidizer from the EKV would be similar to that described for KLC in section 4.1.1.2.1. During nominal propellant tank installation, the propellants remain sealed inside their tanks. The likelihood of an accidental release of the liquid fuel or oxidizer would be low; however, if such an accident were to occur, it would most likely occur during missile assembly. Table 4.5.1-7 indicates the results of analysis using the U.S. Air Force Toxic Corridor Model computer model to determine distances at which IDLH health standard could be exceeded assuming all 7.5 liters (2 gallons) of fuel and 5.5 liters (1.5 gallons) of oxidizer were released to the atmosphere during an accident. The IDLH is the level of exposure (not time-weighted) above which it is thought a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment. The IDLH level was the only level of concern as others are based on time weighted averages over prolonged exposures.

Actual hazard distances would depend on the propellant released, the amount released, meteorological conditions, and emergency response measures taken. However, the low likelihood of such an event and the implementation of approved emergency response plans would limit the impact of such a release.

Table 4.5.1-7: Potential Exceedances Due to Accidental Oxidizer or Fuel Leak at Vandenberg AFB

<table>
<thead>
<tr>
<th>Propellant</th>
<th>Health Standard</th>
<th>Standard Limit</th>
<th>Exceedance Distance b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine</td>
<td>NIOSH IDLH a</td>
<td>50 ppm (66.5 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Methyl Hydrazine</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (38.4 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (liquid)</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (36 mg/m³)</td>
<td>60 meters (197 feet)</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (gas)</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (36 mg/m³)</td>
<td>30 meters (98 feet)</td>
</tr>
</tbody>
</table>

Source: Center for Disease Control and Prevention, 2002a, b; Asia Pacific Space Launch Centre EIS Site

a The National Institute for Occupational Safety and Health (NIOSH) Immediately Dangerous to Life and Health (IDLH) is the level of exposure (not time-weighted) above which it is anticipated a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment.

b Exceedance Distance—Average of U.S. Air Force Toxic Corridor model results for 15-minute and 30-minute averaging time and multiple stability classes

ppm = parts per million by volume
mg/m³ = milligrams per cubic meter
Launch Activities

Alternative 2 launch activities include up to five launches (GBI and target combined) per year at Vandenberg AFB over the duration of the test program and would also comply with the rules listed in section 4.5.1.2.1. Table 4.5.1-8 lists propellant information for the proposed GBI configuration and table 4.5.1-9 gives emissions constituents for Stage 1 of the proposed GBI configuration. Emissions from rocket and missile launches are not considered stationary sources by the Santa Barbara County Air Pollution Control District.

Table 4.5.1-8: Propellant Information for Proposed GBI at Vandenberg AFB

<table>
<thead>
<tr>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>15,069 (33,227)</td>
</tr>
<tr>
<td>Stage II</td>
<td>3,926 (8,655)</td>
</tr>
<tr>
<td>Stage III</td>
<td>772 (1,701)</td>
</tr>
</tbody>
</table>

Table 4.5.1-9: Potential Stage 1 GBI Exhaust Emissions (Single Launch) at Vandenberg AFB

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Aluminum Oxide</th>
<th>Carbon Monoxide</th>
<th>Carbon Dioxide</th>
<th>Nitrogen</th>
<th>Hydrogen Chloride</th>
<th>Water</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td>metric tons (tons)</td>
<td></td>
</tr>
<tr>
<td>3.01 (3.32)</td>
<td>0.98 (1.08)</td>
<td>1.47 (1.62)</td>
<td>5.77 (6.36)</td>
<td>1.77 (1.95)</td>
<td>1.89 (0.54)</td>
<td>1.93 (2.13)</td>
<td></td>
</tr>
</tbody>
</table>

As determined in the Booster Verification Test EA (U.S. Department of the Air Force, 1999) the configuration of the proposed GBI is similar to that of the Athena-2 (formerly the Lockheed Martin Launch Vehicle). However, the Athena-2 has a much larger solid rocket fuel capacity compared to that of the GBI. Air quality emission modeling in the Booster Verification Test EA (U.S. Department of the Air Force, 1999) concluded that a normal launch of an Athena-2 at Vandenberg AFB would not cause a significant impact to regional air quality; therefore, the much lower levels of the GBI exhaust would not be expected to cause a significant impact to air quality.

Dual GBI launches were analyzed using OBODM to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. Table 4.5.1-10 lists emission concentrations and standards. As shown on the table, all concentrations produced by dual launches of a GBI would remain within NAAQS, California AAQS, and U.S. Air Force standards. It is anticipated that a nominal single launch would also remain within NAAQS, California AAQS, and U.S. Air Force standards for aluminum oxide, hydrogen chloride, and carbon monoxide as fewer emissions would be released.
Table 4.5.1-10: Potential GBI Exhaust Emissions (Dual Launch) at Vandenberg AFB

<table>
<thead>
<tr>
<th></th>
<th>Dual GBI Launch</th>
<th>Dual GBI On-Pad Accident</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour 2.1 ppm</td>
<td>8-hour 2.9 ppm</td>
<td>35 ppm (1)</td>
</tr>
<tr>
<td></td>
<td>8-hour 2.1 ppm</td>
<td>8-hour 2.9 ppm</td>
<td>35 ppm</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour 6 μg/m³</td>
<td>8-hour 0.3 mg/m³</td>
<td>50 μg/m³ (2)</td>
</tr>
<tr>
<td></td>
<td>8-hour 6 μg/m³</td>
<td>8-hour 0.3 mg/m³</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour 0.3 ppm</td>
<td>8-hour 0.3 ppm</td>
<td>2 ppm (3)</td>
</tr>
<tr>
<td></td>
<td>Peak 6 ppm</td>
<td>Peak 49 ppm</td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS
(2) Based upon the maximum California AAQS level of PM-10 concentrations over a 24-hour period
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

The \textit{de minimis} thresholds are federal limits listed in 40 CFR 51.583(b)(1) for non-attainment areas. In the event that 5 GBIs are launched in a year, the conservatively estimated annual emissions for oxides of nitrogen would total 31.8 tons, below the 50 ton \textit{de minimis} limit. Carbon monoxide was calculated to be 5.4 tons, also below the federal limit of 100 tons.

Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of an on-pad accident involving dual GBIs. Results of the modeling show that both the 1-hour and peak hydrogen chloride U.S. Air Force standards would be exceeded (table 4.1.1-10). The 24-hour hydrogen chloride standard was not exceeded. The consequences to regional air quality would be localized (within approximately 2.5 kilometers [1.6 miles] of Vandenberg AFB for both the 1-hour and peak hydrogen chloride U.S. Air Force standards) and would be of short duration (less than 24 hours). The modeling included both day and nighttime meteorological data. Nighttime data typically depicts very calm wind conditions, which result in higher emission concentrations. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and the conservative nature of the OBODM inputs, the impact to regional air quality is considered minor.

As described above in 4.5.1.2.1, potential health & safety impacts due to launch emissions are discussed under section 4.5.6, Health and Safety. Models are run before each launch to evaluate the risk to people.

\textit{Determination of Non-Applicability}

Santa Barbara County is in non-attainment for the state standards for ozone and PM-10 and is currently in the process of being redesignated by the EPA as being in attainment for the federal ozone standard. The review of the proposed action as required by the General Conformity Rule resulted in a finding of presumed conformity. Total foreseeable direct and indirect emissions caused by the proposed action are less than the mandated \textit{de minimis} thresholds as shown in appendix J.
Post-Launch Activities
Post-launch activities would include the removal of all mobile equipment and assets brought to Vandenberg AFB. The removal could result in small localized amounts of PM-10, which would be minimized further through dust suppression measures previously discussed.

4.5.1.3.2 Targets
Target construction and operation at Vandenberg AFB for Alternative 2 would be the same as described in section 4.5.1.2.1 for Alternative 1.

4.5.1.3.3 In-Flight Interceptor Communication System Data Terminal
Construction
An IDT site would be constructed for Alternative 2, requiring the disturbance of approximately 5.9 hectares (14.6 acres). Construction would last for approximately 7 months. The potential construction emissions are listed in Table 4.5.1-11.

<table>
<thead>
<tr>
<th></th>
<th>7 Months metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.36 (0.40)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>1.6 (1.8)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>0.35 (0.39)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.11 (0.13)</td>
</tr>
<tr>
<td>PM-10</td>
<td>4.8 (5.3)</td>
</tr>
</tbody>
</table>

As Vandenberg AFB is within a non-attainment area for the California AAQS 1-hour ozone standard, exhaust emissions of nitrogen oxides and hydrocarbons would be of concern. Construction emission levels would be below de minimis levels set by the federal government as analyzed in appendix J. Limits are set for carbon monoxide (90.7 metric tons [100 tons]), oxide of nitrogen (45.3 metric tons [50 tons]), volatile organic compounds (45.3 metric tons [50 tons]), oxides of sulfur (90.7 metric tons [100 tons]), and PM-10 (90.7 metric tons [100 tons]). Emissions would be monitored in accordance with Memorandum of Agreements between Vandenberg AFB and Santa Barbara County Air Pollution Control District. Therefore, impacts are not expected to be substantial.

Operation
Operation of the IDT at Vandenberg AFB would have little effect on regional air quality. Power would be provided by offsite commercial power sources; however, in the event of a loss of power a 275-kW diesel generator would be used. Along with the generator itself, there would be a 3,785-liter (1,000-gallon) AST for fuel. Table 4.5.1-12 lists the possible emissions associated with the use of this generator. The generator is assumed to be tested weekly during non-launch periods and used during power outages for approximately 200 hours a year.
### Table 4.5.1-12: Potential Generator Emissions for IDT Facilities at Vandenberg AFB

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Oxides of Nitrogen (metric tons)</th>
<th>Hydrogen Chloride (metric tons)</th>
<th>Carbon Monoxide (metric tons)</th>
<th>PM-10 (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>275-kW Diesel Generator</td>
<td>0.51 (0.56)</td>
<td>0.07 (0.08)</td>
<td>0.63 (0.70)</td>
<td>0.02 (0.03)</td>
</tr>
</tbody>
</table>

All generators, including the proposed 275-kW generator for the IDT, would be operated under appropriate permits and restrictions, which could possibly include New Source Review permitting, emission offsets, or emission control equipment.

#### 4.5.1.3.4 Sensors

Current range radars (such as High Accuracy Instrument Radar, AN/TPQ-18, AN/FPS-16, AN/MPS, and TPS-X), sensors, fixed and mobile telemetry, and optics equipment would be utilized in Alternative 2 and would require no construction or modifications.

#### 4.5.1.4 Alternative 3

Alternative 3 would require the use of pre-existing missile support facilities and range radars. Air quality impacts for these activities are similar to those described for Alternatives 1 and 2.

#### 4.5.1.5 Cumulative Impacts

Launches from Vandenberg AFB are limited to 30 annually (10 military launches and 20 space launches). The prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a; U.S. Department of the Air Force, 1999) indicated no cumulative impact to air quality for up to six GBI launches annually. Based on preliminary planning information through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the 30 annual launches from Vandenberg AFB.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. Backup generator emissions at four GBI LFs, and minor site preparation emissions would be regulated in accordance with MOAs between Vandenberg AFB and the Santa Barbara County Air Pollution Control District and would not result in cumulative impacts to air quality.

#### 4.5.1.6 Mitigation Measures

No air quality mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

#### 4.5.2 BIOLOGICAL RESOURCES—VANDENBERG AIR FORCE BASE

The biological resources analytical approach involved evaluating the potential impacts of the Proposed Action and alternatives, such as construction, site preparation activities, use of existing and new sensors, and missile launches, on vegetation, wildlife, threatened and
endangered species, and sensitive habitat within the ROI. Impacts that could result from construction and other site preparation activities include disturbance and removal of vegetation and disturbance to wildlife from the accompanying noise and presence of personnel. Impacts could also result from launch-related activities such as noise, air emissions, debris impacts, and the use of radar equipment.

All transportation of equipment and materials such as fuels would be conducted in accordance with applicable federal (DOT) and state regulations. SOPs for spill prevention, containment, and control measures while transporting equipment and materials would preclude impacts to biological resources.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought into the installation. These activities would result in impacts similar to, but less than, those caused by site preparation. Specific restoration actions, if necessary, would be determined on a case-by-case basis.

4.5.2.1 No Action Alternative

If the GMD ETR is not established, Vandenberg AFB would still continue to be operated as a test area for space and missile operations. Other GMD-related activities would continue such as the GBI test flights addressed in the EA for Booster Verification Tests (U.S. Department of the Air Force, 1999) and the Alternate Booster Vehicle Verification Tests EA (U.S. Army Space and Missile Defense Command, 2002c) and single target launches. These activities are consistent with the ongoing mission of Vandenberg AFB and have been analyzed by the referenced EAs. No additional impacts to biological resources would occur as a result of the No Action Alternative.

4.5.2.2 Alternative 1

4.5.2.2.1 Targets

Target missiles are currently launched from LF-6 and LF-3 in support of the GMD program. Up to five target missiles per year could be launched from Vandenberg AFB to support the GMD ETR program over the 10-year performance period. Dual target missile launches could potentially occur.

Construction

Vegetation

Alternative 1 would require the use of existing LFs (LF-6 and LF-3) (figure 3.5.2-1), a Missile Assembly Building (Building 6816), and missile and maintenance storage facilities. No new construction would be needed to support target launches for this alternative. The minor site preparation activities would result in no ground disturbance, and thus there would be no impacts to vegetation.

Threatened and Endangered Plant Species. No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of site preparation activities since no ground disturbance is anticipated.
Wildlife
Site preparation activities would implement procedures to minimize the potential for soil erosion if necessary and are not expected to adversely affect waterbodies, including Essential Fish Habitat. Site preparation activities would be limited in duration, and no direct physical auditory changes are anticipated.

California sea lions, northern elephant seals, northern fur seals, and other sensitive marine mammals in adjacent offshore areas would normally be at least 296 meters (970 feet) from the closest launch site (LF-6) and are not expected to be affected by site preparation noise.

Threatened and Endangered Wildlife Species. Site preparation activities would not occur in areas that could result in impacts to water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

The California brown pelican and western snowy plover preferentially forage and roost along the coast approximately 296 meters (970 feet) away and are unlikely to be affected by site preparation noise. Site preparation activities are also not anticipated to result in impacts to the southern sea otter or other sensitive marine mammals in adjacent offshore areas due to the distance from the proposed GMD-related facilities to the shoreline (approximately 296 meters [970 feet]).

Environmentally Sensitive Habitat
The coastal dune systems are outside the area that could potentially be disturbed during site preparation activities at LF-6 or LF-3. Site preparation activities are not anticipated to directly or indirectly impact the nearest wetlands, which are approximately 1.6 kilometers (1 mile) northwest of Building 1819.

Operation
Vandenberg AFB typically supports approximately five Minuteman or Peacekeeper launches per year from northern launch sites on base. Based on previous environmental studies and a Letter of Authorization with the National Marine Fisheries Service, up to 10 Minuteman and Peacekeeper launches per year could occur from northern Vandenberg AFB launch sites. GMD target missiles would be included in this number. Up to five GMD target launches would occur per year from north Vandenberg AFB. Dual target missile launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

Vegetation
Normal launch activities are not expected to impact vegetation. Launch exhaust products would include hydrogen chloride, aluminum oxide, carbon monoxide, nitrogen dioxide, carbon dioxide, water, and chlorine. Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of the aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited in surface waters would have little effect. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that non-fibrous aluminum oxide, as found in solid rocket motor exhaust, is nontoxic (U.S. Department of the Air Force,
Analysis of launch-related deposition of aluminum oxide has not shown it to be harmful to vegetation (Federal Aviation Administration, 1996).

The greatest potential for impacts to vegetation comes from hydrogen chloride deposition. Direct effects could include discoloration, foliage loss, and changes in species composition. Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid propellant missile launches for very large flight vehicles (such as the Space Shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launches of the smaller target missiles is expected to be slight. The hydrogen chloride would cause a change in marine or fresh surface water pH for only a short duration; any alteration of the water’s pH would be almost imperceptible. (U.S. Department of the Air Force, 1997b)

Vandenberg AFB has a wildland fuels management plan, prepared by the U.S. Forest Service, containing measures to help prevent large wildfires (such as prescribed burning activities, which lower the age class of area vegetation). Moreover, emergency fire-fighting personnel are on standby status for all launch activities as a protective measure.

**Threatened and Endangered Plant Species.** No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of nominal launch activities since these plants have not been identified at the proposed target launch sites.

**Wildlife**

**Emissions.** The small quantities of hydrogen chloride that could potentially be deposited are not expected to injure or affect wildlife. The hydrogen chloride would cause a change in surface water pH for only a short duration, and any alteration of the water’s pH would be almost imperceptible. The EPA has determined that non-fibrous aluminum oxide from solid rocket exhaust is non-toxic (Vandenberg Air Force Base, 1999).

**Threatened and Endangered Wildlife Species.** As mentioned above, hydrogen chloride and aluminum oxide deposition is not anticipated to adversely affect wildlife, including threatened or endangered wildlife species.

**Noise.** The primary potential for impacts to wildlife would be from the noise created during the proposed missile launches. Wildlife in general is known to exhibit a startle response when exposed to short-term noise impacts. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Studies indicate that birds usually show signs of disturbance, such as fluttering of wings, when the noise occurs, but quickly return to normal behavior after the event (U.S. Department of the Air Force, 1997b). Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations.

Pacific harbor seals, the main pinniped species using north Vandenberg AFB, would normally be at least 2.0 kilometers (1.2 miles) from the launch site. Other pinnipeds such as California sea lions and northern elephant seals may haul-out temporarily on beaches several kilometers (miles) from the launch facility. Noise from prior launches has not appeared to affect pinniped use of the coastal areas on Vandenberg AFB. Pinniped monitoring has been performed for
launches of larger missiles on north Vandenberg AFB such as the Peacekeeper and Delta II. The effect to harbor seals, which were most susceptible to disturbance, has been a negligible short-term (5- to 30-minute) abandonment of a haul-out area at Spur Road and Purisima Point. No pinniped mother-pup separations have been noted at the harbor seal haul-out sites closest to the launch site. Recent surveys discovered a new harbor seal haul-out site on north Vandenberg AFB that is regularly used by up to three harbor seal mothers and their pups. The U.S. Air Force, 30 SW, Vandenberg AFB began monitoring harbor seals at this site for Minuteman and Peacekeeper launches (launch reports in preparation) that occurred during the harbor seal pupping season (March–June) in accordance with the 5-year programmatic permit and Letter of Authorization issued by National Marine Fisheries Service to the 30 SW.

Noise monitoring would be performed during the initial launch of GMD target missile and harbor seal monitoring would be conducted during the pupping season in accordance with Vandenberg AFB guidelines. The target launches would be included in the number of intercontinental ballistic missile currently allowed under Vandenberg AFB’s 5-year programmatic permit and Letter of Authorization. If the annual launch rates from Vandenberg AFB increase above the levels currently projected and covered under the National Marine Fisheries Service authorization, the Letter of Authorization would be amended accordingly with appropriate analysis of impacts to marine mammals.

Threatened and Endangered Wildlife Species. Prior agency consultations have provided both for regulatory agency assessments of missile programs on Vandenberg AFB and identified monitoring/minimization measures to ensure there are no significant impacts. These consultations have been addressed in several documents: USFWS Biological Opinion for the Theater Ballistic Missile Targets program, May 1998; the Threatened/Endangered Species Monitoring Plan for the Theater Ballistic Missile Targets Program prepared in compliance with the Biological Opinion, September 1999; and the Programmatic Marine Mammal Incidental Harassment Authorization for Space and Missile Launches on Vandenberg AFB, May 2000. (Vandenberg Air Force Base, 2002a)

The California brown pelican and western snowy plover preferentially forage and roost along the coast approximately 296 meters (970 feet) away from the proposed launch area. The California least tern has only nested at Purisima Point (over 11 kilometers [7 miles] from the nearest proposed LF) in recent years and has never been recorded nested north of San Antonio Creek (Vandenberg Air Force Base, 2003). No effects to sensitive bird species have been identified from prior launches in the area. Proposed launch activities are unlikely to adversely affect the long-term wellbeing, reproduction rates, or survival of these listed birds. The level of noise during launch and flight is also expected to be relatively short in duration. Noise monitoring would be performed in accordance with Vandenberg AFB guidelines.

Southern sea otters in adjacent offshore areas would also be at least 296 meters (970 feet) from the launch site. Noise from prior launches has not appeared to affect sea otter use of the coastal areas on Vandenberg AFB. Noise from launches of the larger Delta II missile has not affected use of coastal areas by sea otters with dependent pups. Disturbance as a result of visual stimulus is unlikely because the target missile would be at an altitude of 407 meters (1,335 feet) as it arches past the coastline. The intermittent launches planned for the GMD ETR test flights (up to five target missile flights per year over a 10-year period) are not expected to substantially impact the southern sea otter. (U.S. Department of the Air Force, 1997b; 1999)
Debris. Nominal launch activities are not expected to adversely impact Essential Fish Habitat. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species’ populations. The majority of propellant would be expended before booster drop and impact, and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)

In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect Essential Fish Habitat and pinnipeds hauled out along the adjacent coastline. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would likely strike the water further downrange. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al, 2000) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C). The perchlorate would be expected to be diluted as it mixes with the surrounding water. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

Potential exists to disturb biological resources during debris recovery activities; however, recovery efforts would be coordinated with applicable range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts. Negligible adverse effects to biological resources would be expected during debris recovery activities.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure.

In the unlikely event of an accidental release of stored liquid propellant, Vandenberg AFB’s Hazardous Materials Emergency Response Plan and Spill Control and Countermeasures Plan would be implemented in order to prevent impacts to biological resources in the vicinity. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations and OSHA requirements would be followed, which would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to wildlife if an accident were to occur. With the plans mentioned above in place, no impacts to wildlife are expected as a result of accidental release of liquid propellant.
**Threatened and Endangered Wildlife Species.** Impacts to threatened and endangered species resulting from proposed GMD ETR activities would be similar to those addressed above for wildlife. Debris from nominal launches is not expected to impact water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog. Since the westerly launch trajectory used for most missile launches would carry the missile over snowy plover habitat, fire and debris from an anomaly could potentially impact snowy plovers. However, as stated above, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure. Any required recovery activities would follow Vandenberg AFB SOPs with negligible adverse effects expected to the snowy plovers and their habitat. The reproductive success of the snowy plover does not appear to have been affected by prior launches.

Debris impact and booster drops in the BOA off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote since sensitive marine species in the ocean are widely scattered and occupy relatively small surface areas, and the probability of debris striking a threatened or endangered species is considered remote, $1 \times 10^{-6}$ or less than 1 in 1 million.

**Environmentally Sensitive Habitat**

No adverse impacts as a result of the GMD ETR activities are anticipated to occur within the current Channel Islands National Marine Sanctuary located off the coast south of Vandenberg AFB. Additional consultation would be performed with the National Oceanographic and Atmospheric Administration following their decision on the sanctuary boundary expansion.

**4.5.2.2 Sensors**

Existing range sensors at Vandenberg AFB include several range radars (AN/TPQ-18, AN/FPS-16, High Accuracy Instrumentation Radar, AN/MPS-39, TPS-X) as well as fixed and mobile telemetry and optics equipment. Launch control would be located in existing launch control facilities. No additional impacts to biological resources would result from these existing sensors in support of the GMD ETR activities.

**4.5.2.3 Alternative 2**

Alternative 2 would be similar to Alternative 1 with the exception that GBI launches would be from Vandenberg AFB and RTS instead of KLC and RTS. The GBI launch would require construction of an IDT and modifications of existing support facilities at Vandenberg AFB. The other components described in Alternative 1 would remain the same.

**4.5.2.3.1 Ground-Based Interceptors**

Under Alternative 2, Vandenberg AFB would continue to be a launch site for GMD target missiles and would support dual GBI launches. The following activities would continue at Vandenberg AFB: dual launch of target missiles, dual launch of GBI missiles, use of the TPS-X radar, and use of existing range instrumentation.
Construction

Vegetation
Facilities located on north Vandenberg AFB that may be required for the GBI tests are listed in table 2.3.2-1 and shown on figures 2.3.2-1 and 3.5.2-1. Minor internal modification and construction (potential expansion of parking areas) could be required as part of proposed site preparation activities for, and thus there would be little to no ground disturbance and resultant impact to vegetation in or around applicable LFs, as well as required support buildings. Some facilities have been used to support GBI booster verification tests and, as such, would require only minor interior modifications to support continued GMD testing, and therefore no vegetation impacts are anticipated.

For communication among the components on the same installation, the ETR would maximize use of available communications assets to include cable. Cables would be installed in existing conduits, where available. If existing conduits are not available, the cable(s) would be installed in new conduits that would be placed in routes along existing roads designed to avoid environmental impacts and approved by 30 CES/CEV. Once communication line routes are selected, biological surveys would be conducted as required. Trenching for the new communications cable/conduit would have a maximum depth of 0.91 meter (3 feet). Slant/directional drilling is also being proposed as a means of minimizing impacts to the environment if required.

Threatened and Endangered Vegetation. No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of site preparation activities since these plants have not been identified in the vicinity of proposed launch facilities.

Wildlife
Site preparation activities, which would include fiber optic cable installation, would implement procedures to minimize the potential for soil erosion, such as the use of slant/directional drilling, and are not expected to adversely affect waterbodies, including Essential Fish Habitat.

Site preparation activities would be limited in duration, and no direct physical auditory changes are anticipated. Typically the noise at 15 meters (50 feet) from a construction site does not exceed an equivalent sound level of 90 dBA. Most of the site preparation noise and human activity would be caused by truck traffic to and from the launch site and the potential short-term use of heavy machinery. Site preparation may disturb wildlife in the immediate area. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996).

Disturbance would be restricted mainly to areas within 15 meters (50 feet) from the construction site. The increased presence of personnel would tend to cause birds and other mobile species of wildlife to temporarily evacuate areas subject to the highest level of noise. Additional ruderal vegetation is nearby for displaced wildlife.
California sea lions, northern elephant seals, northern fur seals, and other sensitive marine mammals in adjacent offshore areas would normally be at least 731.5 meters (2,400 feet) from the launch site and are not expected to be affected by site preparation noise.

**Threatened and Endangered Wildlife.** Site preparation activities would not occur in areas that could result in impacts to water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

The California least tern, California brown pelican, and western snowy plover preferentially forage and roost along the coast approximately 731.5 meters (2,400 feet) or farther away from the proposed launch area and are unlikely to be affected by site preparation noise.

Site preparation activities are also not anticipated to result in impacts to the southern sea otter or other sensitive marine mammals in adjacent offshore areas due to the distance from the launch sites (approximately 731.5 meters [2,400 feet] or farther).

**Environmentally Sensitive Habitat**

The coastal dune systems are outside the area that could potentially be disturbed during site preparation activities at the LFs. Wetlands would be avoided to the maximum extent practicable. The use alternative methods of drilling for installation of required fiber optic cable could minimize the potential for impacts to wetlands or other sensitive habitat.

**Operation**

Dual GBI launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

**Vegetation**

The majority of the blast residue would be contained within the silo, minimizing the potential for impacts on vegetation. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations and OSHA requirements would be followed. Compliance with these regulations would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to vegetation if an accident were to occur.

Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of the aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited in surface waters would have little effect. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that nonfibrous aluminum oxide, as found in solid rocket motor exhaust, is nontoxic (U.S. Department of the Air Force, 1997b).

Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid propellant missile launches for very large flight vehicles (such as the Space Shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launch of the smaller GBI is expected to be slight. The hydrogen chloride would cause a change in surface
water pH for only a short duration; any alteration of the water’s pH would be almost imperceptible. (U.S. Department of the Air Force, 1997b)

Vandenberg AFB has a wildland fuels management plan, prepared by the U.S. Forest Service, containing measures to help prevent large wildfires (such as prescribed burning activities which lower the age class of area vegetation). Moreover, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure.

**Threatened and Endangered Vegetation.** No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of nominal launch activities since these plants have not been identified at the proposed launch facilities.

**Wildlife**

**Emissions.** The small quantities of hydrogen chloride that could potentially be deposited are not expected to injure or affect wildlife. The hydrogen chloride would cause a change in pH of only short duration, and any alteration of the water’s pH would be almost imperceptible. The EPA has determined that non-fibrous aluminum oxide from solid rocket exhaust is nontoxic (Vandenberg Air Force Base, 1999).

**Threatened and Endangered Wildlife.** As mentioned above, hydrogen chloride and aluminum oxide deposition is not anticipated to adversely affect wildlife, including threatened or endangered wildlife species.

**Noise.** The primary potential for impacts to wildlife would be from the noise created during the proposed missile launches. Noise from Minuteman launches ranges from 98 dBA approximately 4.2 kilometers (2.6 miles) from the launch site to 80 dBA approximately 13 kilometers (8 miles) from the launch site. The level of noise for the GBI missile during launch and flight is expected to be less and relatively short in duration. At approximately the same distance from the LF, the previous booster vehicle-2 launch (GBI vehicle) was 6 dB less than the Minuteman III launch and 17 dB less than Peacekeeper launches.

Pacific harbor seals, the main pinniped species using north Vandenberg AFB, would normally be at least 2.0 kilometers (1.2 miles) from the launch site. Other pinnipeds such as California sea lions and northern elephant seals may haul-out temporarily on beaches several kilometers (miles) from the launch facility. Noise from prior launches has not appeared to affect pinniped use of the coastal areas on Vandenberg AFB. Pinniped monitoring has been performed for launches of larger missiles on north Vandenberg AFB such as the Peacekeeper and Delta II. The effect to harbor seals, which were most susceptible to disturbance, has been a negligible short-term (5- to 30-minute) abandonment of a haul-out area at Spur Road and Purisima Point. No pinniped mother-pup separations have been noted at the harbor seal haul-out sites closest to the launch site. Recent surveys discovered a new harbor seal haul-out site on north Vandenberg AFB that is regularly used by up to three harbor seal mothers and their pups. The U.S. Air Force, 30 SW, Vandenberg AFB began monitoring harbor seals at this site for Minuteman and Peacekeeper launches (launch reports in preparation) that occurred during the harbor seal pupping season (March-June) in accordance with the 5-year programmatic permit and letter of authorization issued by National Marine Fisheries Service to the 30 SW.
Noise monitoring would be performed during the initial launch of a GBI and harbor seal monitoring would be conducted during the pupping season in accordance with Vandenberg AFB guidelines. The target launches would be included in the number of intercontinental ballistic missile currently allowed under Vandenberg AFB’s 5-year programmatic permit and Letter of Authorization. If the annual launch rates from Vandenberg AFB increase above the levels currently projected and covered under the National Marine Fisheries Service authorization, the Letter of Authorization would be amended accordingly with appropriate analysis of impacts to marine mammals.

The disturbance to pinnipeds as a result of visual stimulus is unlikely due to the approximate altitude of 1,250 meters (4,100 feet) a GBI could reach as it approaches the coastline. The intermittent launches planned for the GBI test flights (up to five per year) are not expected to substantially impact marine species. (U.S. Department of the Air Force, 1999)

Wildlife in general is known to exhibit a startle response when exposed to short-term noise impacts. Studies (U.S. Department of the Air Force, 1997b) indicate that birds usually show signs of disturbance, such as the flutering of wings, when the noise occurs but quickly return to normal behavior after the event. Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed.

Threatened and Endangered Wildlife. The California brown pelican and western snowy plover preferentially forage and roost along the coast approximately 1,250 meters (4,100 feet) away from the proposed launch area. Noise levels 4.2 kilometers (2.6 miles) from the launch site during previous Minuteman missile launches were 98 dBA. No effects to sensitive bird species have been identified. The GBI is a smaller vehicle with less propellant than a Minuteman, and lower noise levels are anticipated. Proposed launch activities are unlikely to adversely affect the long-term well-being, reproduction rates, or survival of these listed birds. The level of noise for the GBI during launch and flight is also expected to be relatively short in duration. Noise monitoring would be performed for the first launch.

Southern sea otters in adjacent offshore areas would also be at least 1,250 meters (4,100 feet) from the launch site. Noise from prior launches has not appeared to affect sea otter use of the coastal areas on Vandenberg AFB. Noise from launches of the larger Delta II missile has not affected use of coastal areas by sea otters with dependent pups. Disturbance as a result of visual stimulus is unlikely because the GBI would be at an altitude of 1,250 meters (4,100 feet) as it approaches the coastline. The intermittent launches planned for the GBI test flights (up to five flights per year) are not expected to substantially impact the southern sea otter. (U.S. Department of the Air Force, 1997b; 1999)

Debris. Nominal launch activities are not expected to adversely impact Essential Fish Habitat. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species’ populations. The majority of propellant would be expended before booster drop and impact, and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)
In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect pinnipeds hauled out along the adjacent coastline and Essential Fish Habitat. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

Debris impact and booster drops in the BOA off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel are on standby status for all launch activities as a protective measure.

In the unlikely event of an accidental release of stored liquid propellant, Vandenberg AFB’s Hazardous Materials Emergency Response Plan and Spill Control and Countermeasures Plan would be implemented in order to prevent impacts to biological resources in the vicinity. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations and OSHA requirements would be followed, which would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to wildlife if an accident were to occur. With the above plans in place, no impacts to wildlife are expected as a result of accidental release of liquid propellant.

*Threatened and Endangered Wildlife.* Debris from nominal launches is not expected to impact water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

As discussed above, sensitive marine species in the ocean are widely scattered and occupy relatively small surface areas, and the probability of debris striking a threatened or endangered species is considered remote.

*Environmentally Sensitive Habitat*

No adverse impacts to the coastal dune systems are anticipated as a result of launch activities. Personnel would be instructed to avoid bird nesting and roosting locations and pinniped haul-out areas. Nominal launch activities are not anticipated to impact the wetlands approximately 1.6 kilometers (1 mile) northwest of Building 1819. An early flight termination or mishap would result in widely scattered debris, which could potentially impact the wetlands. Debris would be recovered and removed if practicable.

No adverse impacts as a result of the GMD ETR activities are anticipated to occur within the current Channel Islands National Marine Sanctuary located off the coast south of Vandenberg.
AFB. Additional consultation would be performed with the National Oceanographic and Atmospheric Administration following their decision on the sanctuary boundary expansion.

4.5.2.3.2 In-Flight Interceptor Communication System Data Terminal Construction

Once an IDT site is selected, biological surveys would be conducted as required.

Vegetation

The IDT (figure 2.3.2-1) would require disturbance of approximately 5.9 hectares (14.6 acres), including a perimeter road, with a fenced area of approximately 3.2 hectares (8 acres). The minimal requirements include a concrete base for the COMSATCOM, an all-weather road to the site, and a prepared surface within the fence around the site at least 4.6 meters (15 feet) wide. This loss of vegetation would represent only a small portion of the total vegetation available within Vandenberg AFB boundaries.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species would be impacted by installation of the IDT.

Wildlife

Impacts from ground disturbance and equipment noise could include loss of habitat, displacement of wildlife, increased stress to wildlife, and disruption of daily or seasonal behavior. However, new construction would occur in previously disturbed areas to the maximum extent practicable. Additional habitat for species that could potentially be displaced is located adjacent to the areas proposed for disturbance. Site preparation activities would not result in impacts to Essential Fish Habitat since no water bodies would be affected.

Noise rather than the sight of machines appears to cause more disturbance to wildlife. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat (Larkin, 1996). As mentioned above, a short-term maximum noise exposure of 92 dB, which level is equivalent to being 1 meter (3 feet) from a power lawnmower, was suggested as a significant cut-off for impacts in a noise monitoring study for the HEDI I missile (U.S. Army Strategic Defense Command, 1990; 1989). This noise level is similar to the range of 80 to 90 dBA defined as known to disturb waterfowl and wildlife.

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. Wildlife is known to exhibit a startling response when exposed to short-term noise impacts. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, sufficient foraging and feeding habitat occurs in adjacent areas. Studies (U.S. Department of the Air Force, 1997) indicate that birds usually show signs of disturbance, such as fluttering of wings, when a noise event occurs, but quickly return to normal behavior after the event. Although construction activities could cause flushing (birds suddenly flying up), this is a common reaction to sudden natural sounds that only slightly increases the energy expenditure of individual birds. Some wildlife may leave the area permanently, while others may likely become accustomed to the increased noise and human presence.
Locations proposed for IDT use are inland and site preparation would not impact Essential Fish Habitat; wildlife associated with the coast, such as hauled out pinnipeds; or marine mammals offshore. Site preparation activities would be limited in duration. Construction is therefore not expected to have a long-term significant adverse effect on wildlife.

**Threatened and Endangered Wildlife Species.** Disturbance from site preparation activities would be restricted mainly to areas within 15 meters (50 feet) from the construction site. Listed wildlife species such as the California brown pelican and southern sea otters would not be affected by site preparation noise since they are found along the coast or offshore. No waterbodies that support listed species would be affected by site preparation activities.

*Environmentally Sensitive Habitat*

No wetlands or other sensitive habitat would be disturbed during construction and installation of the IDT.

**Operation**

During normal operations, the IDT would not transmit except for a few minutes during annual testing of the equipment. Given the short duration of transmission, no adverse impacts to biological resources are anticipated. Most operational impacts to wildlife from the IDT would come from security lighting and noise from electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities required for backup generators or continuously if no commercial power is available.

**4.5.2.3.3 Targets**

Impacts of site preparation and launch activities in support of target launches from Vandenberg AFB would be the same as those addressed in Alternative 1.

**4.5.2.4 Alternative 3**

Alternative 3 would consist of a combination of Alternative 1 and Alternative 2 with similar or the same potential for impacts to biological resources.

**4.5.2.5 Cumulative Impacts**

Prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a; U.S. Department of the Air Force, 1999) indicated no cumulative impact to biological resources for up to six GBI launches annually. The proposed GMD launches would be included in the number of intercontinental ballistic missile currently allowed under Vandenberg AFB’s 5-year programmatic permit and Letter of Authorization. If the annual launch rates from Vandenberg AFB increase above the levels currently projected and covered under the National Marine Fisheries Service authorization, the Letter of Authorization would be amended accordingly with appropriate analysis of impacts to marine mammals. Missile launches are short-term, discrete events, thus allowing time between launches for emission products to be dispersed and minimizing the potential for cumulative impacts to vegetation and wildlife. Launch activities would also be performed at different times and locations. Debris from
the Proposed Action and other launch operations on Vandenberg would impact different areas of the Pacific Ocean. Therefore no cumulative impacts to biological resources are anticipated from the proposed missile launches when combined with other current and planned activities on Vandenberg AFB.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. The operation of backup generators at each LF would be similar to those described above for the IDT, and would result in minor cumulative impacts.

No cumulative impacts to biological resources are expected as a result of fuel and oxidizer transport operations. Accidental releases or spills of liquid or gaseous materials would be contained or dispersed before reaching sensitive vegetation or wildlife. The amount of gaseous materials dispersed during launch is not expected to result in an increased potential for cumulative impact to marine species when combined with the missile launches currently planned from Vandenberg AFB.

### 4.5.2.6 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities at Vandenberg AFB since noise monitoring during the initial launch of a GBI and harbor seal monitoring during the pupping season would be performed in accordance with current Vandenberg AFB SOPs.

### 4.5.3 CULTURAL RESOURCES—VANDENBERG AIR FORCE BASE

#### 4.5.3.1 No Action Alternative

Under the No Action Alternative, GMD ETR activities would not be established and Vandenberg AFB would be operated as a test area for space and missile operations. Other GMD activities would continue, such as the GBI test flights for Booster Verification tests. No additional impacts to cultural resources would occur as a result of the No Action Alternative.

#### 4.5.3.2 Alternative 1

##### 4.5.3.2.1 Target

**Construction**

Possible minor modifications may be required for both LF-6 and LF-3. Both of these are eligible for listing on the National Register of Historic Places. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure their protection or appropriate mitigation to preserve information concerning the sites.

**Operation**

Proposed target operations for Alternative 1 at Vandenberg AFB would include single and dual launches of target missiles.
Flight Activities

Target launch activities would be similar to interceptor launches. Potential effects could result from debris striking the ground where surface or subsurface archaeological deposits or other cultural resources are located resulting in soil contamination, fire, and/or resource damage, which would all require a reparation effort. These efforts would be coordinated with applicable range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary. Debris falling offshore would pose no threat to Vandenberg AFB’s cultural resources.

Lastly, potentially adverse effects to area historic and prehistoric resources could also occur as a result of the unauthorized collection of artifacts by flight preparation personnel. Personnel would receive a brief orientation involving a definition of cultural resources and protective federal regulations.

Post-Flight Activities

If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with Vandenberg AFB procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with Vandenberg AFB personnel to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.

4.5.3.2 Sensors

Operation

Existing range sensors at Vandenberg AFB include several range radars (AN/TPQ-18, AN/FPS-16, High Accuracy Instrumentation Radar, AN/MPS-39, TPS-X) as well as fixed and mobile telemetry and optics equipment. Launch control would be located in existing launch control facilities. No additional impacts to cultural resources would result from these existing sensors in support of the GMD ETR activities.

4.5.3.3 Alternative 2

4.5.3.3.1 Ground-Based Interceptors

Construction

Construction would include minor modifications to existing facilities. As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected. The GMD Project Office would be responsible for implementation of any cultural resources avoidance or mitigation measures assigned to this project as a condition of approval for proceeding with any proposed activity. These measures may include, but are not limited to, literature searches, archaeological and American Indian monitoring, flagging or fencing to protect resources, avoidance of resource areas, archaeological testing, data recovery, evaluation of historic structures, and report preparation. If previously undocumented cultural resource items are found during excavation, grading, or other ground-disturbing activities, work would immediately cease. In addition, work would be temporarily suspended within 30 meters (100 feet) of the discovery of the cultural resources until it has been properly evaluated and
secured. Any discovery of previously unidentified cultural resources would be reported to the Vandenberg AFB Historic Preservation Officer.

The modification to LF-21 was covered in detail in the Booster Verification EA (U.S. Department of the Air Force, 1999) and the modification to LF-23 was covered in detail in the Alternate Booster Vehicle Verification Tests EA (U.S. Army Space and Missile Defense Command, 2002c). The Proposed Action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Modifications may be required for Buildings 1819 and 1900, as well as for LF-02, LF-03, and LF-10 described above. All of these facilities are eligible for listing on the National Register of Historic Places. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure their protection or appropriate mitigation to preserve information concerning these facilities.

For communication among the components at Vandenberg AFB, the Proposed Action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Trenching for the new communications cable/conduit would have a maximum depth of 0.91 meter (3 feet). Slant/directional drilling is also being proposed as a means of minimizing impacts to the environment if required. Installation of cable would have a localized, minimal impact on cultural resources.

**Operation**

**Flight Activities**

Proposed GBI operations for Alternative 2 at Vandenberg AFB would consist of single and dual launches of GBIs. Only in the unlikely event of flight termination over land (necessitating debris recovery within the ROI) would the possibility for impacts to cultural resources from off-road vehicle activity exist. Even then, all areas affected by ground impacts of flight hardware would be cleared of all recoverable debris in strict accordance with current Vandenberg AFB policy.

Other potential effects could result from debris striking the ground where surface or subsurface archaeological deposits are located, resulting in soil contamination, fire, and/or resource damage. The probability of this occurring, however, is considered extremely remote. Debris falling offshore would pose no threat to Vandenberg AFB's cultural resources.

Lastly, potentially adverse effects to area historic and prehistoric resources could also occur as a result of the unauthorized collection of artifacts by flight preparation personnel. Personnel would receive a brief orientation involving a definition of cultural resources and protective federal regulations.

**Post-Flight Activities**

If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in
accordance with Vandenberg AFB procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with Vandenberg AFB personnel to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.

4.5.3.3.2 Target Operation

Proposed target operations for Alternative 2 at Vandenberg AFB would be identical as that described for Alternative 1.

4.5.3.3.3 In-Flight Interceptor Communication System Data Terminal Construction

Proposed IDT construction for Alternative 2 at Vandenberg AFB includes a new IDT with associated roads and cables at one of six alternative locations.

The proposed IDT construction area is located very close to previously paved roads. Approximately 5.9 hectares (14.6 acres) would be disturbed during construction of the IDT. As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected. Records on file at Vandenberg AFB would be consulted to determine whether sites have been identified at this location. Therefore, no archaeological resources are anticipated to be impacted. Should cultural resources be found during the course of any GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided.

Operation

IDT operations are not expected to adversely impact cultural resources. The nature of the operation of these systems combined with the lack of existing cultural resources would most likely result in negligible impacts. Once again, personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed.

4.5.3.4 Sensors

Proposed sensor operation for Alternative 2 at Vandenberg AFB is the same as that described for Alternative 1.

4.5.3.4 Alternative 3

Alternative 3 at Vandenberg AFB would consist of a combination of both Alternatives 1 and 2.

4.5.3.5 Cumulative Impacts

Construction would occur in new locations with minimal impact and not result in cumulative impacts to cultural resources. The total area disturbed during IDT construction would be
approximately 5.9 hectares (14.6 acres), which is approximately 0.01% of the 39,821 hectares (98,400 acres) owned by Vandenberg AFB. Launches from Vandenberg AFB are limited to 30 annually (10 military launches from north Vandenberg AFB and 20 space launches). The prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a; U.S. Department of the Air Force, 1999) indicated no cumulative impact to cultural resources for up to six GBI launches annually. Based on preliminary planning information through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the 30 annual launch limit from Vandenberg AFB. Missile launches are short-term, discrete events. Activities would be performed at different times and locations, and therefore no cumulative impact to cultural resources is anticipated.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. Operations would include backup generators at four GBI LFs, and minor site preparation activities. However these actions would not result in cumulative impacts to cultural resources.

4.5.3.6 Mitigation Measures

No cultural resources mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB at this time. However, once specific communication and fiber optic cable routes are identified they would be reviewed to determine if cultural resources mitigations are necessary. As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected.

4.5.4 GEOLOGY AND SOILS—VANDENBERG AIR FORCE BASE

The proposed program activities have the potential to increase soil erosion during construction of IDT facilities. GBI and target missile launches could alter the chemical composition of site soils from exhaust emissions. No known geologic resources exist at any of the proposed program locations and no impacts are anticipated. Program support facilities, IDT, sensors, radar, and other critical equipment would be potentially subject to strong vibratory ground motions from moderate earthquakes.

4.5.4.1 No Action Alternative

If the No Action Alternative were selected, Vandenberg AFB would support single target launches and GBI test flights in support of GMD-related Booster Verification Tests. No additional environmental consequences would be anticipated from the GBI and target launches because Vandenberg AFB is an existing U.S. Air Force test range and, as such, routinely conducts testing similar to the GMD program. Existing environmental documentation, including the Alternate Booster Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c) and the Booster Verification Test EA (U.S. Department of the Air Force, 1999), would cover all environmental aspects of the No Action Alternative.
4.5.4.2 Alternative 1

4.5.4.2.1 Targets

Construction
The proposed activities under Alternative 1 would use existing facilities at Vandenberg AFB to support target operations; therefore, no new construction would be required, and no adverse affects to geology or soils would be expected from proposed activities.

Operation
Vandenberg AFB could support up to five target launches per year over the duration of the test program. Target missile launches could cause minor alteration of local soil chemistry as a result of exhaust emissions and debris from the launch. The potential adverse effects to soil would be minor and would be the same as that described in section 4.1.5.2.1.

There would be a potential for strong, near-field vibratory ground motion at Vandenberg AFB from seismic activity on the active Lion’s Head, Hosgri, Santa Ynez River, and Honda faults that transect Vandenberg AFB, and from other known active faults in Santa Barbara County. Movement on any of these known active faults would potentially affect the project area, as would activity along the regional San Andreas Fault System. Strong ground-shaking could promote mishaps and possible spills during storage and handling. However, the recurrence intervals for major earthquakes (magnitude 5.2 to 7.0 on the Gutenberg and Richter scale) are wide ranging, from every 14 to 115 years (U.S. Department of the Air Force 1999), and the base has not reported historic damage to its facilities from earthquakes (U.S. Department of the Air Force 1999). Although some of these faults have displayed evidence of surface rupture in the last 10,000 years, it is not expected that future earthquakes would cause surface ruptures at or directly adjacent to any of the proposed facility sites. In addition, given the periodic nature of the program testing periods, the risks to program support personnel would be minor.

4.5.4.3 Alternative 2

4.5.4.3.1 Ground-Based Interceptors

Construction
Modifications to LF-21 and LF-23, and upgrades to the Missile Assembly Building and launch control buildings, have been covered under the Alternate Booster Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c) and the Booster Verification Test EA (U.S. Department of the Air Force, 1999), which concluded no adverse effects to geology and soils would be anticipated. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Modifications to existing facilities would not cause adverse effects to geology and soils.

For communication among the components at Vandenberg AFB, the proposed action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to
avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would have a localized, minimal impact on geology and soils.

**Operation**

GBI target launches would create minor adverse affects to the site soils as a result of GBI rocket emissions. The potential effects from a nominal launch as well as possible premature termination are described in section 4.1.5.2.1.

The potential adverse effects from seismic ground shaking of GBI facilities would be the same as that described in section 4.5.4.1.

**4.5.4.3.2 Targets**

Under Alternative 2, target construction would be the same as that described for Alternative 1.

**4.5.4.3.3 In-Flight Interceptor Communication System Data Terminal Construction**

The Alternative 2 action would require new construction for an IDT and a connecting road and cables at one of six alternate locations. The probable area of soil disturbance for the site preparation activities would be approximately 5.9 hectares (14.6 acres), primarily owing to grubbing and clearing of vegetation within the perimeter fence, foundation excavation, stockpile, and equipment maneuver areas. Minor effects to soils would be likely to occur as a result of potential soil erosion, depending on the local relief and soils at the selected alternate site.

Before determining the final site layout and design standards for the IDT facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.

**Operation**

Operation of the IDT at Vandenberg AFB would have no direct or indirect, short- or long-term adverse effects on site geology or soils. The potential adverse effects from seismic ground shaking of IDT facilities would be the same as those described in section 4.5.4.1.

**4.5.4.4 Alternative 3**

Alternative 3 includes all actions as described for Alternatives 2 and 3.

**4.5.4.5 Cumulative Impacts**

The existing mission of Vandenberg AFB is to conduct space and missile test activities similar to those proposed for GMD ETR. The proposed action would pose no cumulative impacts to geology and soils, with the exception of minor residual deposition of exhaust emissions from multiple launches over the duration of the program. This alteration in soil chemistry would be local and would not pose an increased risk to human health, as described in section 4.1.5.2.1.
Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. Operations would include backup generators at four GBI LFs, and minor site preparation activities. Adherence to established procedures would limit potential impacts and not result in cumulative impacts to geology and soils.

4.5.4.6 Mitigation Measures

Although no specific mitigation measures are proposed, standard measures for seismic safety would include special provision for proper anchoring and/or dampening of missile components and fuel canisters while in storage. Likewise, missile storage buildings and Missile Assembly Buildings would be inspected to ensure structural integrity of foundation, roof, wall connections, and storage racks to reduce risk to program personnel during a design seismic event. Before determining the final site layout and design standards for IDT facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.

4.5.5 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—VANDENBERG AIR FORCE BASE

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with launch operations from Vandenberg AFB, and construction required to support GMD launch operations. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from launch activities are addressed under each alternative as applicable. A general description of impact on hazardous material and waste management is provided in the beginning of section 4.1.6.

4.5.5.1 No Action Alternative

Under the No Action Alternative, Vandenberg AFB would continue to be operated as a test area for space and missile operations. GMD-related activities such as the booster verification test flights addressed in the EA for Booster Verification Tests (U.S. Department of the Air Force, 1999) and the Alternate Booster Vehicle Verification Tests EA (U.S. Army Space and Missile Defense Command, 2002c), and single target launches would continue. No new substantive use of hazardous materials or generation of hazardous waste would occur as a result of the No Action Alternative.

4.5.5.2 Alternative 1

4.5.5.2.1 Targets

Alternative 1 would involve single and dual target launches from Vandenberg AFB. This is within the range of launches routinely performed at Vandenberg AFB, as described in chapter 2.0 and under the No Action Alternative, and no new substantive use of hazardous materials or generation of hazardous waste would occur.
Operation

Vandenberg AFB could support the proposed five target launches per year over the duration of
the test program. Existing hazardous materials and waste management procedures at
Vandenberg AFB would ensure that no adverse environmental impacts occur. MDA would be
responsible for the shipment and distribution of hazardous materials to the base. Vandenberg
AFB Safety and Environmental offices would provide guidance for the receipt and storage of
hazardous materials, and the disposal of hazardous waste generated from implementation of
Alternative 1.

Pre-Launch Activities

Pre-launch activities include transportation of target missiles to Vandenberg AFB, temporary
storage, pre-launch assembly and checkout, and preparation of the missiles for launch.

Missile components arrive at Vandenberg AFB approximately 4 to 6 weeks before launch.
Missile components would be handled and stored in accordance with applicable federal, state,
and U.S. Air Force regulations. An ESQD would be established around storage and assembly
areas based on the equivalent explosive force of propellant contained within the missile.

As discussed in section 3.5.4, hazardous materials (external to those preloaded into the
missiles) that may typically be used as part of missile launch activities include coatings,
cleaners, solvents, lubricants, and motor and diesel fuel. Most of these materials would be
consumed during use, generating minimal waste. In the unlikely event that a spill or release
occurs, the use of procedures outlined in the Vandenberg AFB SPCC Plan and Hazardous
Materials Emergency Response Plan would ensure that the potential impact would be minimal.
Target launch and launch support activities would not require additional fuel storage tanks or
hinder actions at Vandenberg AFB IRP sites.

Facility modifications associated with target launch and launch support activities at Vandenberg
AFB may disturb asbestos or lead-based paint. Management and abatement of asbestos and
lead-based paint at Vandenberg AFB would be compliant with the Vandenberg AFB Lead-
Based Paint Management Plan, Air Force Instruction (AFI) 32-1052, Facility Asbestos
Management Plan, the Vandenberg AFB Asbestos Management Plan, the Asbestos Operating
Plan, as well as the appropriate state and federal regulatory requirements and standards
referenced in appendix B. Best practices, lessons learned, and expectations indicated in the
Vandenberg AFB Lead-Based Paint Management Plan, AFI 32-1052, Facility Asbestos
Management Plan, the Vandenberg AFB Asbestos Management Plan, and Asbestos Operating
Plan would be incorporated into design and construction plans.

Launch Activities

Flight activity considerations include the Launch Hazard Area, flight corridor clearance, missile
launch, and missile impact.

An ESQD would be calculated around the launch site based on the equivalent explosive force of
all propellant and pyrotechnic materials contained within the missile. Before each launch, the
Vandenberg AFB Safety Office computes a toxic hazard corridor to ensure surrounding
communities are not at risk in the event of an anomaly. Only when meteorological conditions
indicate this corridor does not extend off the base is the operation allowed to proceed.
It is possible for a missile booster to detonate or for the propellant to burn but not explode and terminate the launch at the launch site. It is also possible for missile flight to be terminated at the point of/shortly after liftoff, or to be terminated shortly after the missile has left the launch pad. In the event of such a mishap, the incident would be handled as an explosive ordnance event. In accordance with Range Safety Requirements, EWR 17-1, an emergency response team from Vandenberg AFB would be on standby near the launch site to ensure immediate response and rapid control in the event of such an occurrence. The emergency response team would consist of Vandenberg AFB fire-fighting, safety, medical, and bio-environmental engineering personnel. Any remaining hazardous materials would be regarded as hazardous waste for management purposes. The resulting hazardous waste would be rendered safe by Explosive Ordnance Disposal personnel and disposed of in accordance with applicable federal, state, and base requirements.

If a launch is terminated after the missile has left the launch pad, then hazardous material would remain within the ESQD/evacuation zone and there would be minimal impact to personnel and no impact to the public from an accidental release. Any debris would fall within the Vandenberg AFB Test Ranges and the open ocean west of the base. Areas such as oil rigs and shipping lanes would be cleared before launch in accordance with existing Vandenberg AFB SOPs. Any debris falling on Vandenberg AFB would fall in areas cleared before launch and would be handled in accordance with Vandenberg AFB emergency response plans.

Post-Launched Activities
Post-flight activities involve check of release areas, clean-up, and transportation from Vandenberg AFB. Following test activities, the target launch facilities would be readied for the next use or placed in standby mode. Any waste would be collected and segregated as nonhazardous, hazardous, and possibly special wastes for proper disposal in accordance with federal, State of California, and DoD requirements. Specific restoration actions, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

4.5.5.3 Alternative 2
Alternative 2 would consist of activities described in the No Action and Alternative 1 except as noted herein. Single and dual launch of GBI missiles would also occur under Alternative 2. GBI-related activities would include support facility modification, and IDT construction and operation. Hazardous materials use and hazardous waste generation would be managed as described in section 3.1.6.

4.5.5.3.1 Ground-Based Interceptor

Construction
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant impacts to hazardous materials and hazardous waste. The Proposed Action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require
modifications. The staging areas for any construction materials and equipment associated with the modification of the missile launch silos or buildings would be paved. Since some of the facilities proposed for use were constructed in a period during which lead-based paint was used as exterior and interior coating and asbestos was used in equipment and construction materials, the minor modifications planned could result in disturbance of exterior or interior surfaces.

Prior to the initiation of any construction/structural modification, the contractor responsible for facility modifications would perform surveys and sampling for lead-based paint, asbestos and PCBs using applicable federal, state regulations, the Vandenber AFB Lead-Based Paint Management Plan, AFI 32-1052, Facility Asbestos Management, the Vandenber AFB Asbestos Management Plan, the Asbestos Operating Plan, the Vandenber AFB PCB Management Plan and the Vandenber AFB Hazardous Waste Management Plan. Any removal/abatement or disposal of these hazardous wastes would be conducted in accordance with applicable federal and state regulations, and the referenced AFI and Vandenber AFB management plans and requirements. Therefore, there is a low likelihood of the potential release of lead-based paint, asbestos, or PCBs.

The potential installation of new conduit and fiber optic cable would not likely result in the release of a potentially hazardous material or waste.

Missile components would be handled and stored in accordance with applicable federal and state, and U.S. Air Force regulations as discussed in section 3.5.4 and under the No Action Alternative and Alternative 1. No onsite fueling of the GBI would be required. No release or spills of hazardous materials would be expected as a result of pre-launch operations.

Operation

GBI launch operations would be conducted as described in section 4.1.6. The proposed launch of GBIs from Vandenberg AFB is not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at Vandenberg AFB. MDA would be responsible for the shipment and distribution of hazardous materials to the base. Transportation and handling of missile components are discussed in section 2.3.2. Vandenberg AFB Safety and Environmental Offices or the MDA contractor would be responsible for the receipt and storage of hazardous materials, and the disposal of hazardous waste.

4.5.5.3.2 In-Flight Interceptor Communication System Data Terminal

Hazardous materials use would be minimal for IDT construction and operation and would consist of corrosion control materials (e.g., paints) and low-toxicity cleaning products. These materials are routinely used at Vandenberg AFB and would be handled in compliance with applicable federal, state, and base regulations and requirements.

4.5.5.4 Alternative 3

The proposed actions and potential impacts would be the same as those described under Alternatives 1 and 2.
4.5.5.5 Cumulative Impacts

Construction would occur in new locations with minimal impact and not result in cumulative impacts to hazardous waste and hazardous materials management. Launches from Vandenberg AFB are limited to 30 annually (10 military launches from north Vandenberg AFB and 20 space launches). The prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002c; U.S. Department of the Air Force, 1999) indicated no cumulative impact to hazardous materials and waste management for up to six GBI launches annually. Based on preliminary planning information through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the 30 annual launch limit from Vandenberg AFB. Adherence to the hazardous materials and waste management systems on Vandenberg would preclude the accumulation of hazardous materials or waste, and therefore no cumulative impact to hazardous material or hazardous waste management practices is anticipated at Vandenberg AFB.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. These actions would also adhere to hazardous materials and waste management systems on Vandenberg and not result in cumulative impacts.

4.5.5.6 Mitigation Measures

No hazardous waste/hazardous materials management mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.6 HEALTH AND SAFETY—VANDENBERG AIR FORCE BASE

4.5.6.1 No Action Alternative

Under the No Action Alternative, single target launches would occur at Vandenberg AFB. Regional safety programs would be the same as safety programs for current launch systems as described in section 3.5.5. Potential issues related to health and safety would be associated with pre-launch, launch, and post-launch activities. Planning and execution of target launches would be in compliance with federal, state, local, and range health and safety requirements. Therefore, no increase in risk to health and safety would be expected as a result of implementing this alternative.

4.5.6.2 Alternative 1

4.5.6.2.1 Target

Construction

Existing launch facilities, support facilities, and equipment would be utilized for the target launches. No construction or facility modification would be necessary under this alternative. Therefore, no increase in potential impact to health and safety would be expected from construction activities.
Pre-Launch Activities

Launch preparation activities would consist of transportation and storage of the booster/launch vehicle, target re-entry vehicle, missile components, and support equipment to Vandenberg AFB. Transportation of missile components would be accomplished by aircraft or over road by truck in compliance with applicable state, federal, and U.S. Air Force safety regulations. Hazardous materials and explosives would be packaged in shipping containers designed according to DOT requirements to protect against release in the event of an accident. All containers would have proper placards, and only carriers licensed to handle/transport hazardous materials would be utilized. These transportation procedures would minimize the potential for accidents, as well as provide the means of mitigating potential adverse effects should an accident occur. Therefore, no health and safety effects to the general public or to military and government-employed civilians working on the base are anticipated.

Storage areas would be fenced, and appropriate placards would be used. Access would be limited to mission critical personnel. All personnel associated with the Proposed Action, including material storage, would be properly trained in compliance with 29 CFR 1910 procedures and other applicable state and federal regulations and guidelines. However, the handling and assembly of missile components, accomplished within enclosed areas, has the potential to affect worker health and safety training; adherence to appropriate safety regulations and operating plans and protocol would serve to maintain potential health and safety risks to mission personnel within acceptable levels. Since public access to Vandenberg AFB is limited, and since ESQDs would be established around storage areas and Buildings 1855 and 6816, no impact to public health and safety would be expected.

Launch Activities

Compliance with launch safety regulations would be provided through 30 SW/CCC, 30 SW/SE, and the Mission Flight Space Control Officer. A written procedure for all explosive pre-launch activities is required and must be approved by 30 SW/SE. An ESQD would be established around the launch site because of the potential for missile malfunction during a launch. Established procedures to prohibit access to restricted areas would be followed. The restricted areas are based upon the probability of potential hazards involved with malfunction during test flights and would include:

- The impact limit line, which sets the boundary of the protection line for all non-mission-essential personnel
- The launch caution corridor, an area limited to essential personnel
- The Launch Hazard Area, an area around the launch point limited to essential personnel in hardened facilities (approximately 20 essential personnel in the Launch Control Center)
- The stage impact area

For impact limit lines that extend beyond Vandenberg AFB boundaries, an agreement would be made with the appropriate landowners to control the use of these areas during launches. The 30 SW/SE and the 30th Range Squadron Airspace and Offshore Management Section (for offshore oil rigs) would oversee evacuations of surrounding land and water users.
An emergency response team, consisting of fire fighting, safety, medical, and bio-environmental engineering personnel, would be near the proposed project site during launch activities. Additional Vandenberg AFB personnel and resources would be called out if needed. Emergency response would also be provided through local county entities, if needed. The range of acceptable launch azimuths for a Minuteman II from LF-23 was between 260 degrees and 280 degrees. The final range of approved azimuths for target launches would be determined after submittal of the preliminary flight data package, which defines the proposed launch azimuth and all launch vehicle performance characteristics for the proposed launch vehicle configuration. The azimuth would be limited to ensure that potential missile failure would not result in debris outside the azimuthal boundary. Final launch azimuth boundaries would be established after all vehicle performance data and areas of endangerment are reviewed, and Flight Termination System requirements are established.

Target launches would take place in either existing restricted areas or warning area airspace that would be cleared of non-participating aircraft. The launches would be short-term events, after which joint-use airspace would be released to other users; advance scheduling would obviate impacts. The Flight Safety Analyst from 30 SW/SE would define which airspace areas would potentially be affected by the Proposed Action and the Chief of Range Operations would coordinate with the FAA and the U.S. Coast Guard to identify and address any issues of concern. No additional impacts would occur to airspace as a result. With the implementation of the appropriate safety regulations and approvals and coordination with 30 SW/SE, the target launches would not be expected to present a substantial impact to the health and safety of base workers and personnel or the public.

The Western Range has a three-tiered, three-zone deterministic approach plus a probabilistic approach to protecting against harmful toxic exposures of hydrogen chloride. The Western Range implements safety measures that are designed to protect mission essential and non-mission essential persons. Before launch, the Rocket Exhaust Effluent Diffusion Model is used to locate toxic zones.

There are three zones for assessing an individual’s proximity to toxic combustion products, including those that could result from a launch failure. Zone 1 is an area where airborne concentrations of any toxic product are equal to or exceed Tier 1 levels (2 ppm) but are less than Tier 2 levels (10 ppm). Zone 2 is an area where airborne concentrations of any toxic product are equal to or exceed Tier 2 levels (10 ppm) but are less than Tier 3 levels (50 ppm). Zone 3 is an area where airborne concentrations of any toxic product range from a low defined by Tier 3 (50 ppm) to an unknown high. Table 3.5.6-1 describes the Tier levels.

Before launch, the Rocket Exhaust Effluent Diffusion Model is run to ensure that any mission essential persons within a Zone 2 (having predicted hydrogen chloride concentrations exceeding the Tier 2 level [see 30 SWI 91-106, 1998]) are aware of being in a Zone 2, have personnel protection equipment, and have a pre-determined route of departure. If mission essential personnel do not meet these requirements, then they are relocated out of the zone. Any non-mission essential people on-base are also moved, if feasible. If they cannot be moved, or if they are off-base and not subject to being moved, then their locations and exposure are taken into account in the risk assessment procedure.

The Western Range toxic risk-assessment-based recommendation to launch or not to launch is based on the results of the LATRA program (i.e., risk assessment program) that evaluates the
risk to people, regardless of whether they are mission essential or non-mission essential. Among other criteria in determining whether to launch, the LATRA accounts for (1) whether people are sheltered or unsheltered; (2) whether they are healthy or sensitive individuals; and (3) the probability of a catastrophic launch failure.

Post-Launch Activities

Minor facility maintenance would occur after each launch to ensure that the launch site would be operational for the next test. Post-launch procedures would include silo inspection, removal of blast residue, and minor silo refurbishing. Any blast residue generated from the launch would remain within the launch silo and the missile canister. Entry to the silo would be restricted to trained and approved personnel in proper protective equipment. The blast residue would be removed, collected, and properly disposed of according to 40 CFR, California Code of Regulations Title 22, and the Vandenberg AFB Hazardous Waste Management Plan. Should the residue be identified as hazardous, there would be no impact to the health and safety of base personnel or the public.

4.5.6.2.2 Sensors

Sensor operation would continue at current levels. No increased impact to health and safety would be expected as a result of implementing Alternative 1 at Vandenberg AFB.

4.5.6.3 Alternative 2

4.5.6.3.1 Ground-Based Interceptor

Construction

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant safety related impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. Any facility modifications would comply with OSHA, U.S. Air Force safety and health regulations, Range Safety Requirements, and other recognized standards for operations that involve construction. Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers. A formally trained individual would be appointed to act as safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of construction team personnel and visitors to the job site. Compliance with regulations would ensure that no health and safety impacts would result from the silo and building modification.

Operation

Pre-launch, launch, and post-launch activities would generally occur as discussed in section 4.5.4.3.1. No increased impact to health and safety would be expected.
4.5.6.3.2 Target

Construction
Construction of a target launch pad would generally occur as discussed in section 4.5.4.3.1. Adherence to base safety plans and procedures would ensure no increased risk to health and safety.

Operation
Pre-launch, launch, and post-launch activities would generally occur as discussed in section 4.5.4.2.1. No increased impact to health and safety would be expected.

4.5.6.3.3 In-Flight Interceptor Communication System Data Terminal

Construction
Adherence to base safety plans and procedures would ensure no increased risk to health and safety.

Operation
Adherence to base safety plans and procedures would ensure no increased risk to health and safety.

4.5.6.3.4 Sensors

Sensor operation would continue at current levels. No increased impact to health and safety would be expected as a result of implementing Alternative 2 at Vandenberg AFB.

4.5.6.4 Alternative 3

Implementation of Alternative 3 would include all of the components Alternative 1 and Alternative 2. Therefore, no increase in potential risk to health and safety would be expected as a result of selecting this alternative.

4.5.6.5 Cumulative Impacts

Adherence to Vandenberg AFB safety plans and procedures would preclude potential cumulative impacts to health and safety resulting from the implementation of the GMD ETR. Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. These actions would also adhere to Vandenberg AFB safety plans and procedures and not result in cumulative impacts. Based on Vandenberg AFB SOPs and other activities in the area, there is minimal potential for cumulative health and safety risk to the public from operations at Vandenberg AFB.

4.5.6.6 Mitigation Measures

No health and safety mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.
4.5.7 LAND USE—VANDENBERG AIR FORCE BASE

4.5.7.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under operationally realistic conditions. Activities and facilities involved in GBI booster verification launches, single target missile launches, and radar operation would continue and would not change Vandenberg AFB’s general land use. Adjacent lands that exhibit open-type agricultural uses with no development would continue to be compatible with the requirements of Vandenberg AFB. Planning and execution of launches would be in total compliance with federal, state, local, and range land use requirements. Therefore, adverse impacts to the land use would not be expected under the No Action Alternative.

The continuation of activities at Vandenberg AFB is compatible with the California CZM Program under the No Action Alternative. Under the No Action Alternative, closures of recreational areas and adjacent parks would continue during periods of hazardous operation. To minimize the land use conflicts, Vandenberg AFB extensively publicizes Launch Hazard Areas. Coastline, beach, and recreational area availability would continue to be made known to the public through various local media sources. Furthermore, similar coastal opportunities are not unique to Vandenberg AFB and are provided elsewhere along the coast.

4.5.7.2 Alternative 1

Under Alternative 1, Vandenberg AFB would conduct single and dual target missile launches and sensor support facilities.

4.5.7.2.1 Target

Construction

Existing launch facilities, support facilities and equipment would be utilized for the target launches. No construction or facility modification would be necessary under this alternative. Therefore, activities would be accomplished completely within the compatible existing locale for such use and would not produce an adverse impact involving land use.

Operation

Pre-Launch Activities

Pre-launch activities would involve the transportation and storage of missile components and support equipment to Vandenberg AFB. All missile components and support would be handled, labeled, and stored in accordance with all pertinent FAA, DOT, OSHA, and U.S. Air Force safety regulations for transportation by air and/or over land by trucks. Regulations would minimize the potential for adverse impacts to land use and provide a means of mitigating adverse effects should an improbable mishap occur.

Storage of target missiles and their propellants would occur in separate existing storage areas designed for such use in accordance with all accepted governing standards. ESQDs would be established and maintained around storage facilities.
Before each launch, the target missile and necessary components would be moved from storage to a Missile Assembly Building where it would be assembled and checked before being transported to the launch pad. Transportation of assembled target missiles would use on-base roads. Although temporary on-base closures would cause a land use impact to traffic, closures would be of short duration and considered normal base activity.

**Flight Activities**

Launch preparations scheduled at Vandenberg AFB would follow standard evacuation procedures of the launch vicinity. During the time the target missile booster is on the launch pad, potential impacts to land use could occur. Land areas that are within the Launch Hazard Area would be cleared approximately 1 hour before launch and guarded to ensure they remain clear of all non-mission personnel. A Notice of Intent to clear hazardous areas would be published in the local newspaper and broadcast in local media. Clearance and closures are considered normal operations and would be determined by necessary pre-launch missile Launch Hazard Area determinations and flight corridor clearances.

Under Alternative 1, no new Launch Hazard Area would be created or extended that would violate existing or off-base land uses. Launch operations would utilize the already existing LF-6 or its alternate LF-3 launch silos. Potential impacts to the California Coastal Zone would be the same as determined for the No Action Alternative.

Only a preflight or early flight malfunction resulting in flight termination within the ROI would have any impact on Vandenberg AFB. In the unlikely event of an early flight termination within the boundaries of Vandenberg AFB, target missile and/or debris recovery would follow applicable environmental regulations and range procedures as directed by the Range Safety Officer to minimize impacts on land use by the increase number of activities.

**Post-Flight Activities**

As soon as the Range Safety Officer concludes that all hazardous areas are safe, all non-mission essential personnel would be allowed to return. Post-flight activities would also include removal of blast residue from the launch pad or silo and other minor facility maintenance. These activities would be confined to areas currently used for similar launch activities having no affect on land use.

4.5.7.3 Alternative 2

Under Alternative 2, Vandenberg AFB would conduct single and dual GBI and target missile launches and operate necessary IDT and sensory support facilities.

4.5.7.3.1 Ground-Based Interceptors

**Construction**

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant impacts to land use. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying
levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Modifications would be accomplished completely within the compatible existing locale for such use and would not produce an adverse impact involving land use.

For communication among the components at Vandenberg AFB, the Proposed Action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would not have an adverse impact on land use.

**Operation**

Under Alternative 2, pre-launch, flight, and post-flight activities of GBI missiles would be similar to the operation of target missiles in section 4.5.6.2.1.

### 4.5.7.3.2 Target

Under Alternative 2, activities involving target missiles at Vandenberg AFB would include all actions and pose the same potential impacts mentioned under Alternative 1 in section 4.5.6.2.

### 4.5.7.3.3 In-Flight Interceptor Communication System Data Terminal

The construction and operation of a fixed, relocatable, or mobile IDT at Vandenberg AFB would require an area of approximately 5.9 hectares (14.6 acres). The IDT site would include several facilities with commercial electrical power, site backup electrical generation, all-weather access road, security fencing, and water and sewer services. The proposed IDT locations are shown on figure 2.3.2-1 and include Tracking E, Titan, Have Stare, Doppler, Borrow Pit, and Talo Road. Construction at any of the proposed locations would be routinely accomplished and the facility would exist within an area compliant with Vandenberg AFB’s overall general land use. Likewise, no conflicts with land use would occur. Furthermore, safety precautions would be followed during operation to prevent any unidentified land use conflicts from arising.

**Operation**

*Pre-Launch Activities*

IDT components would be transported to the operation site from U.S. Government storage depots or contractor facilities by air, sea, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA and DOT safety standards to minimize any possible impacts to land use.

*Flight Activities*

Although operation of IDT facilities would only function during times of GMD exercises, installation would immediately be established and secured after delivery, limiting the access to the surrounding area. This would result in a change in land use within the immediate operation area by restricting access to unauthorized personnel. However, all impacts to land use were considered in the facilities site selection and would not decrease land utilization nor change the general land use within or outside the boundaries of Vandenberg AFB.
Post-Flight Activities
Post-flight operation would include the standard maintenance procedures to secure the IDT facilities and preparation for possible relocation of the transportable IDT. Procedures would be confined to areas already used for the establishment of such facilities and would not change or introduce a conflicting use of land within the vicinity.

4.5.7.4 Alternative 3
Under Alternative 3, GMD activities would include all actions and pose the same potential impacts as described in Alternatives 1 and 2.

4.5.7.5 Cumulative Impacts
Since the proposed activities would be compatible with existing Vandenberg AFB land use plans and policies, the potential for cumulative impacts with existing activities are avoided. Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. These actions would also adhere to Vandenberg AFB land use plans and policies and not result in cumulative impacts.

Recreational activities along the Vandenberg AFB’s coast and recreational areas are only available to the public during times of non hazardous operations. The proposed GMD launches would be encompassed in the yearly planning for intercontinental ballistic missile launches at Vandenberg AFB. Furthermore, similar coastal opportunities are not unique to Vandenberg AFB and are provided elsewhere along the coast.

4.5.7.6 Mitigation Measures
No land use mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.8 NOISE—VANDENBERG AIR FORCE BASE
This section is concerned with the potential impacts due to construction and operation of the GBI, target, and sensor elements of the GMD ETR on the regional noise environment at Vandenberg AFB. Also identified are the potential cumulative impacts and possible mitigation measures.

Noise impacts to wildlife are addressed in section 4.5.2.

4.5.8.1 No Action Alternative
The No Action Alternative would not change the level of noise at Vandenberg AFB. Existing facilities already in use would continue, and the GMD ETR would not be established. The GBI and target launch scenarios would not be tested under operationally realistic conditions.
4.5.8.2 Alternative 1

4.5.8.2.1 Targets

Construction

Construction activities involved in the building and silo modification for target launches for Alternative 1 would be minor at Vandenberg AFB. Current facilities would be used and minor interior and software alterations would be made. Noise impacts to the surrounding environment would be minor.

Operation

Pre-Launch Activities

Noise from launch preparation, including silo and building modifications, would comply with the Occupational Safety and Health Act, the U.S. Air Force Occupational Safety and Health regulations, Range Safety Requirements, and other recognized standards for operations that involve construction or facility modifications. Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan requiring the use of hearing protection when appropriate would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers.

Launch Activities

OSHA has established noise limits to protect workers at their work places. According to these standards, no worker can be exposed to noise levels higher than 115 dBA. The exposure level of 115 dBA is limited to 15 minutes or less during an 8-hour work shift (U.S. Air Force 1992). The OSHA standards are the maximum allowable noise levels for the personnel in the vicinity of the launch pad. Workers exposed to excessive launch noise would be required to wear hearing protection.

Noise from missile launches can range from 60 to 100 dBA in the vicinity of the launch including areas near Lompoc and Santa Maria. The noise from a Minuteman launch is 80 dBA approximately 13 kilometers (8 miles) from the launch site. Figure 4.5.7-1 depicts noise levels for a Minuteman launch from Vandenberg AFB. However, because the launches occur infrequently, the resulting noise has little impact on the L_{eq} or CNEL in these areas. Therefore, ambient noise levels would not be affected substantially on an annual basis from the proposed GMD ETR tests. Noise impacts would also be short in duration.

Since the flight pattern of a target launch would be over the open ocean to the west, the flight would not cross populated areas such as nearby Lompoc or Santa Maria. Therefore, impacts from noise to populated areas would be minor. Noise impacts from prior Vandenberg AFB missile launches have been determined to be short term and therefore insignificant. Based on these results and compliance with regulations, the proposed launches would not cause or contribute to noise impacts.

Post-Launch Activities

Noise generated during the removal of all mobile equipment/assets should have minimal impact to the noise environment.
No substantial noise would be expected from post-launch activities. However, any noise would likely fall within or below the noise level measurements of post-launch noise associated with the previously approved Minuteman launch vehicles. Noise impacts would also be short in duration. Post-launch activities would not cause or contribute to noise impacts.

4.5.8.3 Alternative 2

4.5.8.3.1 Ground-Based Interceptors

Construction
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant noise impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas.

Noise from launch preparation, including silo and building modifications, would comply with the Occupational Safety and Health Act, the U.S. Air Force Occupational Safety and Health regulations, the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), Range Safety Requirements, and other recognized standards for operations that involve construction or facility modifications. Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan, requiring the use of hearing protection when appropriate would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers.

Operation

Pre-Launch Activities
Noises produced during pre-launch activities include noise from mechanical equipment such as worker vehicles and trucks and by the use of the public address systems. Transportation noise would increase as launch support personnel drive to the site and additional trucks bring material to the site.

Launch Activities
All public, civilian, and nonessential personnel would be required to be outside of the ground hazard area where the expected noise levels would be below the 115-dBA limit for short-term exposure.

Personnel would normally be at the Launch Control Center during launches. Although no standards exist for single-event noise exposure, a time-weighted average of 90 dBA is established as a limit for an 8-hour exposure. However, workers exposed to excessive launch noise would be required to wear hearing protection.
The GBI launch noise level is expected to fall within or below the noise level of previously measured Minuteman III launches. Figure 4.5.8-1 depicts the noise levels produced during a Minuteman III launch as well as a Peacekeeper from Vandenberg AFB. Figure 4.5.8-2 depicts the noise levels calculated for a dual launch from the single launch data. Dual launches are expected to occur virtually simultaneously. It is anticipated that noise impacts for dual launches would also fall within OSHA limits.

The flight patterns of GBI launches would be over the open ocean area and would not cross populated areas. Noise impacts form prior Vandenberg AFB launches have been previously determined to be short-term and insignificant. Based on these results and compliance with regulations, the proposed launches would not cause or contribute to noise impacts.

In addition to the noise of the rocket engine, sonic booms are possible. However, GBI launches would be in a western direction and would not occur over land. They are not expected to impact Vandenberg AFB or surrounding communities. Vessels impacted by sonic booms would be expected to experience sound resembling mild thunder.

During operations, it is estimated that up to 300 personnel would be involved in supporting a dual launch. The increase in noise associated with these personnel traveling to and from Vandenberg AFB is expected to be a minor impact.

**Post-Launch Activities**

Noise generated during the removal of all mobile equipment/assets should have minimal impact to the noise environment.

**4.5.8.3.2 Targets**

Under Alternative 2, construction and operation of target facilities and target launches from Vandenberg AFB would be the same as those described in section 4.5.6.3.2 for Alternative 1.

**4.5.8.3.3 In-Flight Interceptor Communication System Data Terminal**

Construction and operation of an IDT at Vandenberg AFB would have minimal impact to the surrounding environment’s noise levels. Construction noises would include noise from mechanical equipment. Noises involving traffic increases are included in analysis for GBI construction.

**4.5.8.4 Alternative 3**

Construction and operation of GBI facilities, target facilities, GBI launches, target launches, and range radars for Alternative 3 would be the same as those described in Alternative 1.
Noise Levels for a Single Launch (LF-03)

Vandenberg Air Force Base, California

Figure 4.5.8-1

EXPLANATION

Pacific Ocean

Land

Vandenberg Air Force Base

Target Launch Sites

GBI Launch Sites

TPS-X Radar Site

Scale

NORTH

0 1.82 3.63 miles

0 2.92 5.84 kilometers

Peacekeeper Noise Level
(measured at Vandenberg Air Force Base)

Noise Levels from Minuteman III launch
(comparable to GBI and Minuteman Target)

LF = Launch Facility

IDT = In-flight Interceptor Communication System Data Terminal

TPS-X = Transportable System Radar

GBI = Ground Based Interceptor

Calculated Noise Levels of Dual Launches (LF-03 and LF-06)

Vandenberg Air Force Base, California

Figure 4.5.8-2

Source: Berg, 2003

- Noise contours calculated from noise levels monitored during previous Minuteman launches
- Peacekeeper Noise Level (measured at Vandenberg Air Force Base)
- Note: Noise levels from Minuteman launch comparable to GBI and Minuteman target
4.5.8.5 Cumulative Impacts

Since the sound level generated by each launch is a short, discrete event, the potential cumulative impacts to noise from GMD ETR launches would not be substantial. It is not likely that the Proposed Action, in conjunction with current planned or anticipated launches, would result in cumulative noise impacts.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. The operation of backup generators at each LF would be similar to those described above for the IDT, and would not result cumulative impacts.

4.5.8.6 Mitigation Measures

No noise mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.9 SOCIOECONOMICS—VANDENBERG AIR FORCE BASE

4.5.9.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under operationally realistic conditions. The activities at Vandenberg AFB would continue their current operations. No significant socioeconomic impacts from the No Action Alternative would occur.

4.5.9.2 Alternative 1

Under the implementation of Alternative 1, target launches would occur from Vandenberg AFB.

4.5.9.2.1 Target Operation

Target missile components would be built in contractor facilities and delivered to Vandenberg AFB via air or road for system assembly and checkout. Target launch facilities would include existing launch pads/silos, Missile Assembly Building, missile storage, maintenance and storage, and target launch. There would be up to five missile launches per year. Integration and assembly operations would be performed onsite. A typical ramp up over a 3-month period would be 25, 75, and 150 personnel who would be required to support a target launch. After a launch, a portion of these personnel would immediately depart Vandenberg AFB.

As part of pre-launch and flight activities, a Launch Hazard Area would be established around the launch site. The Launch Hazard Area would result in certain areas of Vandenberg AFB being cleared of personnel in the event of an accident during interceptor launch. Similarly, certain sea-surface areas would also have to be cleared. While the closure areas in question are significant in size, their nature is decidedly temporary; land areas would need to be cleared approximately 1 hour before a launch, with sea surface areas cleared approximately 4 hours before a launch. The actual launch is expected to last approximately 30 minutes. Upon the Range Safety Officer declaring the area safe after a launch, expected to be within hours, the areas can then be reoccupied. Also, the notice given to the local communities via local
newspapers, broadcast media, and commercial fishing and tourist boat trade associations would be extensive. As such, entities with an economic interest in the use of these areas such as the commercial fishing and tourist industries would not be significantly impacted by the proposed clearance areas.

For a dual target launch, up to 175 support personnel would be housed in motels or hotels within the surrounding cities of Vandenberg AFB during the operational phase of the launch. Activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. As outlined in section 3.5.8, there are numerous hotels and motels situated within the surrounding cities of Lompoc, Santa Maria, and Guadalupe, and the availability of temporary accommodation is considered to be adequate.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local communities. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as services, agriculture or manufacturing are anticipated during operational activities. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 1.

4.5.9.2.2 Sensors

Operation

Instrumentation associated with the launch of a target missile would include existing range control radar and telemetry equipment.

The personnel associated with the launch of a target missile would operate these systems; therefore, no additional personnel other than those associated with a target launch would be needed to operate the sensors and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. Similarly, no significant impacts to businesses or industries are anticipated. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.5.9.3 Alternative 2

Under the implementation of Alternative 2, GBI launches would be from Vandenberg AFB instead of KLC. The GBI would require construction of an IDT and modifications to existing support facilities at Vandenberg AFB. The other components described in Alternative 1, including the launch of target missiles, would remain the same.
4.5.9.3.1 Ground-Based Interceptor

Construction
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant environmental impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the construction personnel would represent a small but positive temporary economic impact to the local community. Given that construction activities are limited and short-term, the overall impact would be slight and would not cause any significant impacts to local businesses or industries. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 2.

Operation
The impact from the launch of interceptor missiles would be similar to the impact from the launch of target missiles. There would be up to five missile launches per year (combined interceptor and target). Integration and assembly operations would be performed onsite. A typical ramp up over a 3-month period would be 65, 150, and 300 personnel who would be required to support a launch. After a launch, a portion of these personnel would immediately depart Vandenberg AFB.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local communities. The overall impact would be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as services, agriculture or manufacturing are anticipated during operational activities. Activities related to the implementation of Alternative 2 would not cause any displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 2.

4.5.9.3.2 In-Flight Interceptor Communication System Data Terminal

Construction
Implementation of Alternative 2 would result in the construction of an IDT on Vandenberg AFB. One COMSATCOM would be used as part of the IDT. Approximately 35 construction personnel and related construction equipment and would be involved in the construction of the IDT.

Construction activities related to the implementation of Alternative 2 would not cause any displacement of populations, residences, or businesses. The presence of the construction personnel represents both a potential increase in local service based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to
businesses or industries are anticipated during construction activities. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 2.

Operation
An IDT site would require approximately 10 permanent onsite support personnel when in operation. When not in operation, the onsite backup generators would be tested for approximately 200 hours per year. The personnel associated with the IDT would be part of the approximately 300 people required to support an interceptor launch and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. Similarly, no significant impacts to businesses or industries are anticipated. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 2.

4.5.9.4 Alternative 3
Alternative 3 would combine activities proposed for Alternatives 1 and 2 and would result in impacts that are similar to those discussed under Alternative 1 and Alternative 2.

4.5.9.5 Cumulative Impacts
Based on preliminary planning information for fiscal year 2002 through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches would not exceed the current limit of 30 launches per year. The addition of the GMD ETR launches to the identified ongoing and future programs in the ROI would result in a positive cumulative socioeconomic impact.

4.5.9.6 Mitigation Measures
No socioeconomic mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.10 TRANSPORTATION—VANDENBERG AIR FORCE BASE

4.5.10.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and GBI and target launch scenarios would not be tested under operationally realistic conditions. All existing launch areas would continue their current operations. Transportation-related impacts from current operations have been evaluated in previous environmental documents, and no significant impacts were identified.

4.5.10.2 Alternative 1
Under the implementation of Alternative 1, target launches would occur from Vandenberg AFB.
4.5.10.2.1 Target Operation

Implementation of Alternative 1 would result in single and dual target launches from Vandenberg AFB. Target missile components would be built in contractor facilities and delivered to Vandenberg AFB via air or road for system assembly and checkout. Target missiles would not be shipped with initiators or other explosive devices. All missile components would be packaged in appropriately designed containers, labeled, and handled in accordance with applicable DOT regulations for the transport of hazardous materials. Some missile components may be shipped to a military airfield near the launch site and transferred to the launch site by vehicle. Trained personnel using only appropriately certified cranes and other materiel-handling equipment would handle missile components and handling equipment in accordance with approved SOPs. There would be as many as five target launches per year. Once at Vandenberg, the missile components would be stored in a Missile Assembly Building until they are assembled for launch.

A maximum of approximately 150 contractor, military, and government civilian personnel would be required to support a single target launch at Vandenberg AFB, whereas a dual target launch would require roughly 175 personnel. They would travel to Vandenberg AFB via commercial airliner or motor vehicle. Target missile contractor personnel would be housed in motels or hotels in the vicinity and would commute to the launch site daily. Government and military test personnel may use military or commercial lodging if available. Assuming 4 persons per vehicle, this would add approximately 40 to 45 vehicles, during peak hours, to the key local roads providing access to Vandenberg AFB such as SR-1, SR-135, Santa Lucia Canyon Road, SR-246, U.S. 101, and Central Avenue. Although the local road system would experience a slight increase in traffic, the increase would only minimally change the ADT on key local roads and would not result in an unacceptable Level of Service.

Target missile launches would not require the temporary closure of any roads off Vandenberg AFB. Roads near the launch pads on Vandenberg are all on U.S. Air Force property. Consequently, no off-base traffic would be affected. Thus, no adverse impact to the area’s transportation infrastructure is anticipated. Target missile launch activity would have no impact on air traffic in the immediate ROI but has the potential to affect rail traffic and marine traffic. However, at Vandenberg AFB, train movement through the base is monitored by electronic surveillance and radio communication between train engineers, station masters, and Vandenberg AFB launch personnel to minimize the possibility of a launch vehicle overflight (U.S. Army Space and Strategic Defense Command, 1994). This is done routinely at Vandenberg AFB, so the target missile launches would not represent a significant new impact. Similarly, ocean vessels would be notified in advance of launch activity by the appropriate safety office as part of their routine operations through a NOTAM by the 11th Coast Guard District. Again, since this is done on a regular basis already, impacts are expected to be not significant.

4.5.10.3 Alternative 2

Under the implementation of Alternative 2, GBI launches would be from Vandenberg AFB instead of KLC. The GBI would require construction of an IDT and possibly minor modifications of existing support facilities at Vandenberg AFB. Were any new communications cable/conduit required, they would be buried along existing roads, insofar as possible. The other components described in Alternative 1 would remain the same.
4.5.10.3.1 Ground-Based Interceptors

Construction
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant environmental impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Transportation impacts would be negligible.

For communication among the components at Vandenberg AFB, the proposed action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would have a localized, minimal impact on transportation.

Operation
The impact from the launch of interceptor missiles would be similar to the impact from the launch of target missiles. Since existing transportation facilities at Vandenberg AFB would be utilized for the GMD ETR program, the presence of approximately 260 GMD program personnel during a single launch or 300 GMD program personnel during a dual launch test flight at Vandenberg AFB, would not adversely impact the transportation facilities at Vandenberg AFB.

4.5.10.3.2 In-Flight Interceptor Communication System Data Terminal

Construction
Implementation of Alternative 2 would result in the construction of an IDT on Vandenberg AFB. An all-weather road would be constructed as part of this alternative. Construction equipment, material, and personnel would arrive at Vandenberg AFB via air or road. Site preparation activities and construction of the IDT would have minimal impact on transportation.

Operation
An IDT site would normally be unmanned, except during acceptance/flight testing, preventative maintenance, corrective maintenance, and future upgrades; this could require support of up to ten personnel. When not in operation, the onsite, diesel-powered backup generators would be tested for approximately 200 hours per year.

Access to the IDT compound would be via an all-weather road from the nearest existing service road through a lockable service gate. There would be a similar road from the gate in the perimeter fence to the IDT building, and a patrol road circumnavigating the fence would be required. A hardened surface of 9.1 meters (30 feet), surrounding the concrete pad, would permit access for a crane or other required equipment where necessary. The personnel associated with the IDT would be a part of approximately 260 GMD program personnel required during a single launch or 300 GMD program personnel required during a dual GBI launch, and thus there would not be an additional impact to transportation systems.
4.5.10.4 Alternative 3
Alternative 3 would combine activities proposed for Alternatives 1 and 2 and would include GBI launches from both KLC and Vandenberg AFB and construction of the required support facilities. The impacts from construction of IDTs and minor modifications to existing facilities at Vandenberg AFB would be the same as the impacts described under Alternative 1 and Alternative 2. The impacts from single and dual GBI and single and dual target launches, as well as operation of range support equipment, would also be the same as described under Alternative 1 and Alternative 2.

4.5.10.5 Cumulative Impacts
Based on preliminary planning information for fiscal year 2002 through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the current limit of 30 launches per year. Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. The addition of the GMD ETR launches to the identified ongoing and future programs in the ROI would result in a minor cumulative impact on transportation.

4.5.10.6 Mitigation Measures
No transportation mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.11 WATER RESOURCES—VANDENBERG AIR FORCE BASE

4.5.11.1 No Action Alternative
Existing operations would continue at Vandenberg AFB under the No Action Alternative and any new impacts associated with the GMD ETR would not occur. Water resources-related impacts from current operations have been evaluated in previous environmental documents, and no significant impacts were identified.

4.5.11.2 Alternative 1

4.5.11.2.1 Targets
Construction
Target missile-related construction activities at Vandenberg AFB under Alternative 1 would only consist of minor modifications to the interior of launch silos and associated support facilities. Therefore, there would not be any adverse construction-related water resource impacts under this alternative.

Operation
Deposition of rocket emission products onto surrounding surface waters would occur as a result of target missile launches; however, these impacts would not be significant. These types of impacts are further described in section 4.1.14.2.1. This same issue was assessed for
Vandenberg AFB rocket launches in each of the NEPA-related documents listed below. All of these studies reached the conclusion that related water quality impacts would be adverse but not significant.

- EA for Booster Verification Tests (U.S. Department of the Air Force, 1999)
- Final EIS Evolved Expendable Launch Vehicle (U.S. Department of the Air Force, 1998a)
- Theater Missile Defense Extended Test Range, Supplement to the Draft EIS (U.S. Army Space and Strategic Defense Command, 1994)

4.5.11.3 Alternative 2

4.5.11.3.1 Ground-Based Interceptors

The potential water resource impacts of GBI alternate booster verification construction activities at Vandenberg AFB were addressed by the Alternate Booster Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c). The Alternate Booster Vehicle EA concluded that potential impacts from construction and launches of these types of missiles would not be significant. Minor modifications to other support facilities would result in negligible impacts to water resources.

The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. The GMD program would perform sampling and abatement for lead-based paint, asbestos, and polychlorinated biphenyls (PCBs) as required before modification, using Vandenberg AFB-approved procedures. Facility modifications and site preparation activities at the locations identified would have a negligible impact to water resources.

4.5.11.3.2 Targets

The target missile-related impacts associated with Alternative 2 would be the same as those described for Alternative 1 in section 4.5.10.2.1.

4.5.11.3.3 In-Flight Interceptor Communication System Data Terminal

Construction of an IDT under Alternative 2 would disturb approximately 5.9 hectares (14.6 acres) at Vandenberg AFB. Construction projects that disturb 1 acre or greater require a Construction Activities Storm Water General Permit from the California State Water Resources Control Board, or its local Central Coast Regional Water Quality Control Board. A related Stormwater Pollution Prevention Plan would also need to be prepared before the commencement of any soil-disturbing activities. All appropriate water quality-related Best Management Practices would be followed during construction, and related water quality impacts would not be significant. Operation of the IDT would not cause water quality impacts and potable water supplies are sufficient to handle the minor increase in potable water demand.
4.5.11.4  Alternative 3

Alternative 3 would require minor modifications to existing GBI launch sites, and the use of existing missile support facilities and radars. These types of impacts are described under Alternatives 1 and 2.

4.5.11.5  Cumulative Impacts

The major cumulative water resource impact in the Vandenberg AFB ROI is an overdraft condition in the Lompoc Terrace aquifer, caused by the groundwater pumping of a number of communities and water users, including Lompoc and Vandenberg AFB. As Vandenberg AFB continues to rely on imported surface water from the California Department of Water Resource’s State Water Project, Vandenberg AFB’s contribution to this cumulative impact would continue to diminish over time and overdraft conditions in the aquifer should improve.

Cumulative, but minor and temporary, increases in stormwater runoff and related discharges of sediments have also occurred in base drainages. These insignificant impacts have typically occurred near areas that have been paved during past construction projects and where runoff rates have increased. Such impacts have been and would continue to be minimized by construction SOPs and the other commitments included in the related Stormwater Pollution Prevention Plans.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. The operation of backup generators at each LF would be similar to those described above for the IDT, and would result in no cumulative impacts to water resources.

The proposed action of up to five missile launches per year, in combination with other planned launches and activities, would not result in cumulative impacts to surface water, ground water, or ocean water quality.

4.5.11.6  Mitigation

No water resources mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.
4.6 PEARL HARBOR—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.6.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Current air emission levels would remain the same, as listed in table 4.6.1-1. Operations currently conducted at Pearl Harbor would continue.

Table 4.6.1-1: Emissions Recorded Near Barbers Point

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Averaging Time</th>
<th>Hawaii Standards (μg/m³)</th>
<th>Federal Primary Standards (μg/m³)</th>
<th>West Beach Monitoring Station (μg/m³)</th>
<th>Kapolei Monitoring Station (μg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-10</td>
<td>24-hour</td>
<td>150</td>
<td>150</td>
<td>21</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>Annual (arithmetic)</td>
<td>50</td>
<td>50</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>3-hour</td>
<td>1,300</td>
<td>-</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>365</td>
<td>365</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Annual (arithmetic)</td>
<td>80</td>
<td>80</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>10,000</td>
<td>40,000</td>
<td>1026</td>
<td>2280</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>5,000</td>
<td>10,000</td>
<td>456</td>
<td>1596</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>Annual (arithmetic)</td>
<td>70</td>
<td>100</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: State of Hawaii, Department of Health, Clean Air Branch, 2001

4.6.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Construction activities would be conducted in accordance with all appropriate regulations and permits. Other than minor, short-term impacts from construction, no exceedances of the NAAQS or state AAQS would be anticipated.

Operation

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Air quality impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.
Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX
Based on five tests per year the SBX would be at the Pearl Harbor PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 4.8 kilometers (3 miles) from Barbers Point. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the Barbers Point mooring site, only three of the generators would be used. One would operate continually while at the mooring location for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at Pearl Harbor; therefore neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas in the BOA.

4.6.1.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to the air quality in the ROI.

4.6.1.4 Mitigation Measures
No air quality resources mitigation measures are proposed for GMD ETR activities.

4.6.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Pearl Harbor would continue.

4.6.2.2 Alternatives 1, 2, and 3
The Proposed Action related to airspace would be full power emissions from the SBX while at the mooring location south of Barbers Point. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Airspace impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation. A location outside the approach/departure area for Honolulu International Airport would probably reduce the potential restrictions on SBX operations and simplify the coordination process.
Operation

Controlled and Uncontrolled Airspace

Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect aircraft operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and are shown on figure 3.6.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a radio frequency radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations, EEDs, and communications equipment. The establishment of this SBX high energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations. In addition, the SBX would utilize a real-time link to the FAA operations radar to insure the airspace is clear of any aircraft prior to operating the SBX. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace

There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes

Several en route low altitude airways (V15, V12, V4, V16, V8, V2, V20, and V21) cross the 65 percent and fully populated aircraft interference areas. There are additional approach and departure routes within the ROI that would also need to be considered when defining the SBX.
The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

**Airports and Airfields**
Honolulu International Airport is located approximately 19 kilometers (11.8 miles) east of the SBX mooring. Kalaeloa (Rodgers) Airport is located approximately 7 kilometers (4.3 miles) northeast of the mooring site, and Wheeler Army Airfield is located several kilometers (several miles) northeast of the ROI. Traffic control radars at these locations would be major factors in the EMR/EMI survey and analysis and subsequent operating permit. Operation of the SBX has the potential to interfere with both aircraft systems and air navigation systems. However, the SBX high-energy radiation area would be configured not to impose any flight restriction requirements and would not change any airfield/airport arrival and departure traffic flows.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the mHz range) than the X-band SBX and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.6.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high power effects).

Emissions from the SBX may also potentially degrade the overall system performance of in-band airborne and ship based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high energy radiation area would be configured to minimize impacts to these airborne and ship based systems.

**4.6.2.3 Cumulative Impacts**
Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, the frequency allocation operating permit process would take into consideration potential impacts on other resources in the region and would preclude the potential for cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports.

**4.6.2.4 Mitigation Measures**
The SBX high-energy radiation area would be configured to mitigate potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition to charting the SBX high energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high energy radiation area.
4.6.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR
PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Pearl Harbor would continue.

4.6.3.2 Alternatives 1, 2, and 3

Section 2.1.4 includes a description of the SBX.

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Biological impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.

Section 4.3.3.3 includes a general description of the potential for impacts from operation of the SBX. As described in section 2.1.4, the SBX would be mounted on a semi-submersible sea platform. The sea platform would be self-propelled in open water with a cruising speed of approximately 15 kilometers per hour (8 knots), but towed while in port. Total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft. The SBX main beam would not be directed toward the ground or water surface and would have a lower limit of 10 degrees above horizontal for calibration and maintenance testing while at the Primary Support Base. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total amount of RF radiation per week would be approximately 5 to 6 hours. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of the EMR/EMI survey.

The radar main beam would not be directed toward the ground, which, when combined with the height of the SBX, limits the probability of energy absorption by surface-oriented wildlife. The main beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further reduces the probability of bird species remaining within this limited region of space, even if the beam were still. (Ballistic Missile Defense Organization, 2000)

Analyses based on the conservative assumption that the energy absorption rate of a bird’s body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect
determined that birds are not likely to remain continuously within the radar beam, and the power density is not expected to exceed levels stated above that could impact birds; thus, the likelihood of harmful exposure is not great. (Ballistic Missile Defense Organization, 2000)

Humpback whales forage and calve during the winter months beyond the 183-meter (600-foot) depth contour. As stated earlier, the SBX main beam would not be directed toward the surface of the ocean, and marine mammals would normally be found below the surface of the water. The power density level just below the surface of the ocean would not exceed the permissible exposure level for uncontrolled environments. (U.S. Department of the Navy, 2002a) No adverse impacts would occur to whales, other marine mammals, or sea turtles at least 1.3 centimeters (0.5 inch) below the surface. It is also highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time within the main beam or side lobe areas when the SBX would be operating. For these reasons, no effects are anticipated on the humpback whale, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations. Operation of the SBX would not require delays if humpback whales and other marine mammals are observed. Therefore, no further action regarding humpback whales is required pursuant to the Endangered Species Act and the Marine Mammal Protection Act.

The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. It is unlikely that the Hawaiian monk seal would be present at the offshore location of the SBX platform. There is evidence that dolphins can identify the presence of diesel fuel and lubricating oil and avoid it (U.S. Department of the Navy, 2001). The relatively slow speed of the SBX platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals are anticipated.

4.6.3.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on the humpback whale, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations.

4.6.3.4 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities.

4.6.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.4.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Pearl Harbor would continue.
4.6.4.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing protocol and regulations.

Operation

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Hazardous materials and hazardous waste impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.

Shipboard Hazardous Materials and Waste Management

The Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Discharging hazardous materials overboard is not standard practice and would only be done as a worst case scenario.

Twenty-five liquid discharges, such as clean ballast, deck runoff and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation.

Increased operations that could take place on Pearl Harbor would be servicing and maintenance of the SBX. The supply barge that would service the SBX vessel would transport potentially hazardous materials and hazardous waste from the SBX to the pier at Pearl Harbor. The quantity of hazardous materials and hazardous waste is not expected to significantly affect the PSB generator status or significantly affect current hazardous materials management or waste disposal practices. There would be no significant operational impacts, and no mitigation would be required.

4.6.4.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.

4.6.4.4 Mitigation Measures

No hazardous materials/waste management mitigation measures are proposed.
4.6.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.5.1 No Action Alternative

Under the No Action Alternative, the primary support base for the SBX would not be located at Pearl Harbor/Barbers Point. Operations currently conducted at Pearl Harbor would continue.

4.6.5.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to support the SBX would occur in accordance with existing host installation safety protocol/plans and applicable state and federal requirements. Public access to Pier Victor 3 would be limited. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operations

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Health and safety impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified before SBX operation.

Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

The actual operating area of the SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft, or mariners are anticipated.
4.6.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.

4.6.5.4 Mitigations

Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.6.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

This section addresses potential environmental impacts caused by changes to the utilities services due to the proposed construction and operation of the SBX element. Potential impacts considered include potential effects from ongoing or planned activities at these sites.

4.6.6.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Pearl Harbor would continue their current operations.

4.6.6.2 Alternatives 1, 2, and 3

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Utilities impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.84 MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume approximately 7 MW, leaving 14.8 MW available for necessary shipboard operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.
There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would typically return to a PSB, or an adjacent mooring station, for crew rotations, re-supply, and maintenance activities. If at the adjacent mooring location, three of the six generators would still be used, one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar 3 hours per day.

When the SBX is at the Barbers Point mooring site, about 4.8 kilometers (3 miles) off Barbers Point (figure 2.3.1-13), a supply ship would deliver supplies, repair parts, and fuel. The most likely area to dock the supply ship would be at Pier Victor 3. Personnel would be ferried to the SBX each day either by watercraft or helicopter. There would be no direct impacts to area utilities from the self-contained SBX.

A utility hookup would be required for the supply ship to run onboard lighting and other basic needs. Supply ships would utilize Pier Victor 3. The pier is currently supplied with a 15-centimeter (6-inch) potable water line (Noborikawa, 2002) and jet fuel, and although there are no shore power dock outlets, power lines run near enough to allow relatively easy modification to provide the platform with primary shore power. Electricity requirements are typically supplied by power lines linking to nearby buildings; as an option, a temporary transformer, tapped into a primary line, can be provided (Noborikawa, 2002). Due to the possibility of cross-contamination, regulations prevent the Public Works Center from providing a wastewater line at Pier Victor 3 (Noborikawa, 2002), and wastewater, as well as solid waste, would have to be containerized and arrangements made with local authorities on an as-needed basis to provide for their disposal.

Should existing facilities at Pearl Harbor be unavailable or inadequate at the PSB to accommodate approximately 25 personnel, construction of new storage and administration facilities would be necessary. If existing facilities were used, security upgrades, environmental controls for storage areas, fueling capability, ship gases handling facilities, computer networks, phone systems, and hazardous material storage and disposal may be added. Ongoing logistics and support operations such as re-supply, fueling and maintenance and crew/operator training would also occur at the PSB. Warehouses in the same fenced compound as Pier Victor 3 would possibly be renovated for SBX use, or new warehouses and administrative facilities could be constructed.

Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.
4.6.6.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.6.6.4 Mitigation Measures

No utilities mitigation measures are proposed for the GMD ETR activities.

4.6.7 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.7.1 No Action Alternative

Under the No Action Alternative, the SBX would not be located off-shore at Barbers Point. There would be no alteration of the existing visual setting and the adjacent area. The SBX facilities at Pearl Harbor would be visually synonymous with historic and present military activities that occur there. The SBX would have a very minor impact on views from Barber's Point. No significant impacts to visual and aesthetic resources would occur.

4.6.7.2 Alternatives 1, 2, and 3

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from "Landscape Aesthetics: A Handbook for Scenery Management" (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.

Scenic Attractiveness

Several areas such as residential areas, resort locations, and recreational areas at Barbers Point where the SBX would be visible can be classified as having a “Distinctive” (A) scenic attractiveness because of the unique visual quality and the strong positive attributes.

Concern Level

The concern level of the viewers at Barbers Point would be considered to be “high” (Level 1) due to the recreational and residential use of the adjacent and surrounding areas.
Distance Zone
The mooring area would be approximately 5 kilometers (3 miles) away from shore, which is the mid-ground (MG), but could potentially be viewed in the foreground (FG) by recreational boaters and fishermen.

Scenic Value Class
The scenic value class for Pearl Harbor as determined from the scenic value class table, table 4.6.7-1, is 1, which equates to a high public value.

Scenic Integrity
The SBX mooring site has a very high scenic integrity level, which is defined as a landscape where the valued landscape is intact with only insignificant if any deviation or disturbance. This would contribute to the area’s high scenic value.

Visual resources would be slightly affected by the proposed SBX off-shore at Barbers Point. The radar would be approximately 5 kilometers (3 miles) away from the beach and approximately 76 meters (250 feet) tall. These figures would account for a 1-degree line-of-sight with the horizon for the SBX if the viewer were standing on the shore. This measurement would be comparable to boats and ships passing along the horizon. The SBX would be moored at an adequate distance away from the shore and would not obstruct panoramic views.

Visual resources could also be affected by the SBX if it is in the line-of-sight from boats to the island. However, the SBX would only inhibit the view of the island temporarily, as the boat passes by.

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>FG1</th>
<th>MG1</th>
<th>BG1</th>
<th>FG2</th>
<th>MG2</th>
<th>BG2</th>
<th>FG3</th>
<th>MG3</th>
<th>BG3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
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<tr>
<td>B</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)
Scenic Attractiveness
A – Distinctive, B – Typical, C – Indistinctive
Distance zone and Concern Level
FG1 – Foreground with a high level of concern
MG1 – Mid-ground with a high level of concern
BG1 – Background with a high level of sensitivity
FG2 – Foreground with a moderate level of sensitivity
MG2 – Mid-ground with a moderate level of sensitivity
BG2 – Background with a moderate level of sensitivity
FG3 – Foreground with a low level of sensitivity
MG3 – Mid-ground with a low level of sensitivity
BG3 – Background with a low level of sensitivity
Scenic Value Class
1-2: High public value.
3-5: Moderate public value.
6-7: Low public value.
4.6.7.3 Cumulative Impacts
The SBX would be at the mooring location intermittently throughout the year. No other activities have been identified that would contribute to cumulative impacts.

4.6.7.4 Mitigation Measures
No visual resources mitigation measures are proposed for the GMD ETR activities.
4.7 NBVC PORT HUENEME—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.7.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

4.7.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue. Table 4.7.1-1 lists the existing emissions at San Nicolas Island.

<table>
<thead>
<tr>
<th>Emissions (metric tons [tons]/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
</tr>
<tr>
<td>30.77 (33.92)</td>
</tr>
</tbody>
</table>

Source: Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002

4.7.1.2 Alternatives 1, 2, and 3

Construction

Warehouse and administrative space may be available at NBVC Port Hueneme. If required, construction and facility modification to provide the needed space would occur in previously disturbed areas. All construction activities would be conducted in accordance with appropriate regulations and permits. Other than minor, short-term impacts from construction, no adverse effects to regional air quality are expected.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the NBVC Port Hueneme PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 1.6 kilometers (1 mile) east of San Nicolas Island. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the mooring location at San Nicolas Island, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at San Nicolas Island; therefore neither a Prevention of Significant Deterioration review nor a Title V permit would be required.
The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

Under the provisions of the 40 CFR Parts 51 and 93, federal actions are required to be in conformity with the State Implementation Plan for those areas categorized as nonattainment or maintenance areas for an criteria pollutant. While San Nicolas Island is within Ventura County, which is in nonattainment for federal and state ozone levels and state PM-10 levels, San Nicolas' regional air quality is considered to be in attainment or unclassifiable. The provisions of the General Conformity Rule do not apply to activities occurring at San Nicolas Island. (Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002)

4.7.1.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to regional air quality in the ROI.

4.7.1.4 Mitigation Measures
No air quality mitigation measures are proposed for GMD ETR activities.

4.7.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME
4.7.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme and San Nicolas Island would continue.

4.7.2.2 Alternatives 1, 2, and 3
The Proposed Action related to airspace would be full power emissions from the SBX while at the mooring location southeast of San Nicolas Island.

Operation
Controlled and Uncontrolled Airspace
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

To avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and
other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and are shown on figure 3.7.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The operating area would be similar to the existing operating area for the GBR-P radar at Kwajalein (figure 4.3.2-1).

SBX operations would be coordinated with the FAA and NAWCWD and would be scheduled to occur during hours of minimal aircraft operations if possible. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

**Special Use Airspace**

The airspace over San Nicolas Island is within the Point Mugu Sea Range and is located within Warning Area W-289. This Warning Area is active on an intermittent basis and is activated in coordination with the FAA. Notification is made through NOTAMs issued by the FAA. There is also a restricted airspace R222 located above San Nicolas Island and extending outward approximately 6 kilometers (3.7 miles). The SBX high-energy radiation area would be partially contained within this restricted area and wholly contained within Warning Area W-289. Coordination between the FAA, NAWCWD, and the SBX would mitigate potential conflicts between users of the special use airspace. Consequently, there would be no impacts to special use airspace.

**En Route Airways and Jet Routes**

En route airways that cross the Point Mugu Sea Range north and south of the proposed mooring area are within special CAE airways. Neither CAE is within the ROI; therefore, impacts to the en route airways are not anticipated.

**Airports and Airfields**

The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics. There is one runway on San Nicolas Island. Other runways in the region are located more than 97 kilometers (60 miles) from the mooring location. With the controls placed on the SBX in a manner similar to the GBR-P radar, standard instrument approach and departure procedures at the San Nicolas Island would continue unhindered. Existing airfield arrival and departure traffic flows would also not be affected, and access to the airfield would
not be curtailed. All arriving and departing aircraft and all participating military aircraft are under the control of the military tower at NAS Point Mugu; thus, there would be no airfield conflicts in the ROI under the Proposed Action, and no impact.

4.7.2.3 Cumulative Impacts
Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. The use of the required scheduling and coordination process, and adherence to applicable DoD directives and regulations concerning radar operations would preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.7.2.4 Mitigation Measures
The SBX high energy radiation area would be configured to mitigate potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition to charting the SBX high energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high energy radiation area.

4.7.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME

4.7.3.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue.

4.7.3.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation
Impacts to biological resources from operation of the SBX at NBVC Port Hueneme/San Nicolas would be similar to those described in section 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to
seabirds and shorebirds, Guadalupe fur seals, California sea lions, northern elephant and harbor seals, and sea otters or to widely distributed, open-water species such as gray and killer whales.

No adverse impacts as a result of the SBX activities are anticipated to occur within the current Channel Islands National Marine Sanctuary located off the coast south of Vandenberg AFB. Additional consultation would be performed with the National Oceanographic and Atmospheric Administration following their decision on the sanctuary boundary expansion.

4.7.3.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations.

4.7.3.4 Mitigation Measures

No biological resources mitigation measures are proposed for the GMD activities.

4.7.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

4.7.4.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue.

4.7.4.2 Alternatives 1, 2, and 3

Construction

Construction of new or modification of existing facilities may result in temporary use of potentially hazardous materials and the generation of small amounts of hazardous waste. The small increases in the amount of potentially hazardous materials used during construction activities would result in an added throughput in the Supply Department. However, this increase is not expected to be significant. The Environmental Materials Management Division has a model facility which would be able to accommodate the increased hazardous materials in accordance with existing regulations.

There is an existing less-than-90-day accumulation area. If it is not adequate to handle construction requirements, other temporary areas may be designated and operated according to RCRA and state regulations. Any temporary sites would be removed at the completion of construction. There would be no significant impact on hazardous waste management from construction activities.
Operation

Shipboard Hazardous Materials and Waste Management

The U.S. Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Since all portions of the Point Mugu Sea Range are within 370 kilometers (200 nautical miles) of the California coast, shipboard discharge of hazardous materials is prohibited within range. Any hazardous waste disposal at beyond 370 kilometers (200 nautical miles) would comply with OPNAVINST 5090.1 Appendix L. Discharging hazardous materials overboard is not standard practice and would only be done as a worst-case scenario. Twenty-five liquid discharges, such as clean ballast, deck runoff and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices, in design or routine operation.

Hazardous Materials Management

Range support operations would increase, resulting in a minor increase of hazardous materials use. The support units handling the SBX would have the capacity to do so. The small increases in the amount of hazardous materials used due to increased support operations would result in an added throughput in the Supply Department. However, this increase is not expected to be significant. The Environmental Materials Management Division has a model facility which would be able to accommodate the increased hazardous materials in accordance with existing regulations.

Fuels (jet fuel and unleaded gasoline) are stored in ASTs on San Nicolas Island. Current throughput is approximately 15,142 liters (4,000 gallons) of unleaded gasoline and 189,271 liters (50,000 gallons) of jet fuel per month. Impacts from the Proposed Action are most likely to arise from an increase in the amount of fuel required for SBX support and operation. Impacts to fuel storage and throughput from implementation of the Proposed Action would be less than significant.

Hazardous Waste Management

San Nicolas Island manages approximately 29,813 kilograms (65,689 pounds) of hazardous waste annually (Naval Air Weapons Center, Point Mugu, 1998). Hazardous waste generated by the SBX would be stored at one of the eight satellite hazardous waste accumulation areas on the island before being transported to the less-than-90-day accumulation area. It is expected that these accumulation areas would be able to accommodate the quantity of hazardous waste generated by the SBX. No significant long-term adverse impacts are anticipated to current hazardous waste management practices.

4.7.4.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.
4.7.4.4 Mitigation Measures
No hazardous materials/hazardous waste management mitigation measures are proposed for the GMD ETR activities.

4.7.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME

4.7.5.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue.

4.7.5.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to support the SBX would occur in accordance with existing installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation
The SBX operating area would be in the vicinity of the mooring location at San Nicolas Island, as shown in figure 2.3.1-14. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

Implementation of SBX operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce from exposure to EMR. SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate.
Therefore, no health and safety impacts to coastal areas, airspace/aircraft, or mariners are anticipated.

4.7.5.3 Cumulative Impacts
The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to health and safety.

4.7.5.4 Mitigations
Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.7.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME
4.7.6.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. NBVC Port Hueneme and San Nicolas Island would continue their current operations.

Energy
Daily average demand for electricity at NBVC Port Hueneme is 8,000 kW, amounting to only 18.2 percent of total capacity. During summer peaks, the typical demand of 13,000 kW equates to approximately 30 percent of capacity.

Water
Potable water consumption at NBVC Port Hueneme is an average of 6.1 million liters (1.6 million gallons) per day, or 27.7 percent of the City of Port Hueneme’s total 22.0-million-liter (5.8-million-gallon) per day capacity; this accounts for approximately 30 percent of the total daily demand on the city system of 20.06 million liters (5.3 million gallons).

Wastewater
Wastewater generation at NBVC Port Hueneme is 1.8 million liters (480,000 gallons) per day, or 12 percent of its total capacity of 22.0 million liters (5.8 million gallons) per day.

Solid Waste
Solid waste disposal at NBVC Port Hueneme is handled by landfill and shipping offsite. It is anticipated the landfill in question would operate for another 30 years at the present rate of
waste generation, with its capacity currently at 4 million cubic meters (30 million cubic yards). NBVC Port Hueneme generation levels are at 16 metric tons (18 tons) per day.

4.7.6.2 Alternatives 1, 2, and 3

All of the alternatives would include SBX as one of the components of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8-MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume approximately 7 MW, leaving 14.8 MW available for necessary shipboard operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB or adjacent mooring location for crew rotations, re-supply, and maintenance activities. While at an adjacent mooring location, three of the six generators would still be used, one operating continually while in port for daily ship functions, while the remainder would power the half- or fully populated radar 3 hours per day.

The latter scenario would apply at NBVC Port Hueneme, which is not deep enough to permit SBX entry; however, the harbor can host a resupply ship to service the SBX (delivering food, supplies, repair parts, and fuel), which would be moored just off San Nicolas Island. NBVC Port Hueneme routinely provides underway replenishment operations in support of test operations. Personnel would be ferried to the SBX each day either by watercraft or helicopter. Currently there is no fuel pier at San Nicolas Island. Fuel is delivered by pipeline from a moored location. There is a Military Construction Project for a pier due to be complete in late 2003 that would be suitable for SBX resupply vessel operations.

Existing warehouses at NBVC Port Hueneme would possibly be renovated for SBX use. Should these nearby facilities prove inadequate to accommodate a maximum of 25 personnel, construction of new storage and administration facilities would be necessary. If existing facilities are used, security upgrades, environmental controls for storage areas, fueling capability, ship gases handling facilities, computer networks, phone systems, and hazardous material storage and disposal may be added. Ongoing logistics and support operations such as re-supply, fueling and maintenance, and crew/operator training would also occur at the PSB.
Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.7.6.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.7.6.4 Mitigation Measures

No utilities mitigation measures are proposed for the GMD ETR activities.
4.8 NAVAL STATION EVERETT—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.8.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue. Table 4.8.1-1 lists the existing emissions in the vicinity of Naval Station Everett.

Table 4.8.1-1: Maximum Measured Pollutant in Naval Station Everett Vicinity

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>Standard</th>
<th>Location</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>8-hour</td>
<td>9 ppm</td>
<td>Everett</td>
<td>6.1 ppm</td>
<td>3.9 ppm</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>35 ppm</td>
<td>Everett</td>
<td>10.5 ppm</td>
<td>6.2 ppm</td>
</tr>
<tr>
<td>PM-10</td>
<td>Annual</td>
<td>50 μg/m³</td>
<td>Marysville Lake Sammamish</td>
<td>19 μg/m³</td>
<td>17.5 μg/m³</td>
</tr>
<tr>
<td>Ozone</td>
<td>Maximum 1-hour</td>
<td>0.12 ppm</td>
<td>Getchell Lake Sammamish</td>
<td>0.094 ppm</td>
<td>0.079 ppm</td>
</tr>
<tr>
<td></td>
<td>Maximum 8-hour</td>
<td>0.08 ppm</td>
<td></td>
<td>0.073 ppm</td>
<td>0.65 ppm</td>
</tr>
</tbody>
</table>

Source: Puget Sound Clean Air Agency, 2000, 2001

4.8.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Frequent rains common to the area would minimize dust and PM-10 formation. Dust suppression measures such as periodic watering of areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near the work areas, and wet sweeping, or otherwise removing soil and mud deposits from paved roadways and parking areas, would be used as required. All construction would be conducted in accordance with the appropriate permits and regulations. No exceedences of the NAAQS or state AAQS would be anticipated.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Naval Station Everett PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 1,650 hours per year (3 hours a day for 9 months) docked at Naval Station Everett. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB, only two of the generators would be
used. These generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 1,650 hours (825 hours each) of operation for the two generators that would be in operation while the SBX is at Naval Station Everett. Total power output for the two 3.64-MW generators would be 6,006 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at Naval Station Everett; therefore, neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas in the BOA.

### 4.8.1.3 Cumulative Impacts

Cumulative impacts at Naval Station Everett would include the use of generators while the SBX is docked, as well as the possible increase in vehicle trips due to the number of personnel and deliveries required for the SBX. Since Snohomish County has been identified as being in non-attainment, it must be assumed that any emissions have the potential to impact the surrounding area. The Clean Air Act, as amended in 1990, requires that, in non-attainment areas, federal actions conform to the appropriate State Implementation Plan; however the SBX is not considered a stationary source as defined in the Clean Air Act and would not require permitting.

### 4.8.1.4 Mitigation Measures

No air quality mitigation measures are proposed for GMD ETR activities.

### 4.8.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

#### 4.8.2.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue.

#### 4.8.2.2 Alternatives 1, 2, and 3

The Proposed Action related to airspace would be full power emissions from the SBX while at the pier location at Naval Station Everett.

**Operation**

*Controlled and Uncontrolled Airspace*

Unrestricted operation of the SBX at the pier location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.
In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and are shown on figure 3.8.2-1.

The actual SBX operating area at the pier location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this high energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations if possible. In addition, the SBX would utilize a real-time link to the FAA operations radar to ensure the airspace is clear of any aircraft. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace
There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes
Two low altitude air routes (V-23 and V-287) enter the ROI and terminate at Paine Airport.

Both air routes cross the 65 percent and fully populated radar aircraft interference areas. There may be additional approach and departure routes within the ROI that would also need to be considered when defining the SBX operating area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the onboard electronics.

Airports and Airfields
Seattle-Tacoma International Airport is located approximately 60 kilometers (37 miles) south of Naval Station Everett outside the ROI. Snohomish County (Paine) Airport is about 8 kilometers (5 miles) southwest of Naval Station Everett. Class D airspace above Paine Airport extends to near Naval Station Everett, with the edge of a class E airspace extension above Naval Station...
Everett. Several other airfields are located within the ROI including Harvey, Heineck, Large, Frontier, Arlington, and Whidbey.

Airports with traffic control radars would be major factors in the EMR/EMI survey and analysis and subsequent operating permit. Operation of the SBX has the potential to interfere with both aircraft systems and air navigation systems. However, the establishment of the high-energy radiation area would not impose any flight restriction requirements and would not change any airfield/airport arrival and departure traffic flows.

Most air navigation facilities within the airspace ROI would operate at lower frequencies (in the megahertz range) than the X-band SBX, and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.8.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high power effects).

Emissions from the XBR may also potentially degrade the overall system performance of in-band airborne systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high-energy radiation area would be configured to minimize impacts to these airborne and ship-based systems.

4.8.2.3 Cumulative Impacts
Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, the frequency allocation operating permit process would take into consideration potential impacts on other resources in the region and would preclude the potential for cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.8.2.4 Mitigation Measures
The actual SBX operating area at the pier location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. In addition to charting the SBX high-energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued to notify pilots of the high-energy radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high-energy radiation area.
4.8.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.3.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue.

4.8.3.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Although eel grass areas could be impacted by the shadow of the SBX, this would not be an issue at the depths to which the SBX is limited. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation
Impacts to biological resources from operation of the SBX at Naval Station Everett would be similar to those described above in sections 4.3.3.3 and 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to seabirds, shorebirds (bald eagle), Chinook salmon, bull trout, or widely distributed, open-water species such as humpback, blue, fin, sei, and sperm whales; green, leatherback, and loggerhead sea turtles; and steller sea lions.

4.8.3.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations.

4.8.3.4 Mitigation Measures
No biological resources mitigation measures are proposed for GMD ETR activities.

4.8.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.4.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue.
4.8.4.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents, and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing protocol and regulations.

Operation

Shipboard Hazardous Materials and Waste Management

The Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Any hazardous waste disposal beyond 370 kilometers (200 nautical miles) would comply with OPNAVINST 5090.1 Appendix L. Discharging hazardous materials overboard is not standard practice and would only be done as a worst-case scenario.

Twenty-five liquid discharges, such as clean ballast, deck runoff, and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation.

Range

Increased operations that could take place at Naval Station Everett would be servicing and maintenance of the SBX. This small increase in servicing operations would not significantly affect hazardous materials management or waste disposal. There would be no significant operational impacts.

4.8.4.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.

4.8.4.4 Mitigation Measures

No hazardous materials/hazardous waste management mitigation measures are proposed for GMD ETR activities.
4.8.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.5.1 No Action Alternative

Under the No Action Alternative, the primary support base for the SBX would not be located at Naval Station Everett. Operations currently conducted at Naval Station Everett Harbor would continue.

4.8.5.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to support the SBX would occur in accordance with existing installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation

The SBX operating area would be in the vicinity of Pier Alpha or Pier Bravo at Naval Station Everett, as shown in figure 2.3.1-15. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

The actual operating area of SBX at the pier location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated.

4.8.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental
exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.

4.8.5.4 Mitigations
Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.8.6 SOCIOECONOMICS—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.6.1 No Action Alternative
Under the No Action Alternative, the primary support base for the SBX would not be located at Naval Station Everett. Operations currently conducted at Naval Station Everett would continue. No displacement of populations, residences, or businesses would occur within the City of Everett or adjacent areas as a result of the No Action Alternative. The facilities would continue to be utilized as currently designated.

This alternative would not provide a positive impact upon the local economy through additional ongoing test based employment opportunities and related resultant infusion of monies through a variety of channels into the local economy. No significant impacts to locally significant businesses or industries such as aerospace, technology, or shipping are anticipated with the No Action Alternative. No significant socioeconomic impacts would occur, and no mitigation measures are proposed.

4.8.6.2 Alternatives 1, 2, 3

Construction
Implementation of Alternative 1 would result in limited construction and facility modification to provide support to the SBX, to occur at existing pier and warehouse facilities within Naval Station Everett. Since the extent of construction required at Naval Station Everett would be limited, and the SBX platform would be constructed entirely in Europe and then towed to the operational base, the economic impact of construction to the surrounding community in the form of local expenditure on basic building materials, limited use of local contractors, and also related spending through wages by specialist contractors would be positive but relatively limited.

Construction activities related to the related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within the city of Everett and surrounding areas. The duration of construction activities would be temporary and would be expected to last several months. The accommodation needs of the non-local construction personnel during this period would be adequately met via local hotels and guesthouses. Given the extent of available lodging facilities within the City of Everett, the presence of additional construction personnel would not be considered a potentially significant impact.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional construction personnel associated with the Proposed Action would
represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local economy. The overall impact would however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as aerospace, technology, or shipping are anticipated. No significant socioeconomic impacts would occur through the construction activities associated with Alternatives 1, 2, or 3.

**Operation**

Implementation of Alternative 1, 2, or 3 would result in a large sea-based platform located at Pier Alpha or Bravo at Naval Station Everett. Based on an assumption of a total of five tests per year, the SBX would be at the Naval Station Everett for a total of approximately 7 months annually. For a given test, the SBX would have a basic crew of 50 people, which currently includes approximately 20 marine crewmembers and 30 GMD mission support personnel. In addition, the SBX could accommodate an additional 50 people associated with the SBX on a temporary basis to support testing. Approximately 10 to 12 days before a GMD test mission, the SBX would leave the PSB to travel to the designated performance region.

While in port prior to a test operation, personnel would reside offsite at local hotels and guesthouses. The accommodation needs of approximately 50 additional personnel would be adequately met through the numerous lodging facilities within the city of Everett. Generally, by spending money in the local economy mainly via accommodations and the normal procurement of goods and services, the additional test related personnel would represent both a potential increase in local service based employment opportunities and a positive economic impact to the local community for the duration of time spent at the facility. The overall economic impact through this, while moderate regionally, would still represent a positive cumulative economic impact of several million dollars to the Everett economy. The proposed project would not cause any population growth. No population, housing, or businesses would be displaced during operational activities.

The SBX would be approximately 76 meters (250 feet) tall with the platform 119 meters long (390 feet) and 73 meters (238 feet) wide and moored at Naval Station Everett for about 6 weeks at a time for a total of 7 months of the year. Given the physical proportions, proposed location, and duration of time in port of the SBX, the proposed project could represent potentially adverse visual impacts to the waterfront view of a number of residential areas and businesses surrounding the base, potentially leading to commercial and residential property value impacts, as well as an influence on tourism.

As outlined in section 4.8.8.2 (Visual and Aesthetic Resources), Naval Station Everett is also home to the naval aircraft carrier *USS Abraham Lincoln*. *USS Abraham Lincoln* has a much greater length than the SBX; however, the SBX is taller and not as sleek as the aircraft carrier. The SBX would be moored at Pier Alpha or Pier Bravo, either in the location currently occupied by *USS Abraham Lincoln* when it is at sea or on the other side of Pier Alpha when *USS Abraham Lincoln* is in port. Also, Naval Station Everett is adjacent to several industrial land uses, such as a large paper mill and manufacturing areas. Visual impacts to the surrounding area would be partially mitigated by the fact that the SBX would be an additional structure on an existing military base immediately surrounded by industrial land uses, thereby reducing the potential impacts to commercial and residential property values.
Other potential project-related economic impacts concern impacts to property values of residences and businesses within the areas surrounding the base, pertaining to the in port use, and perceived threats to human health by EMR associated with the proposed project.

The proposed SBX operating conditions would include full power operation to track objects in space. The beam would be pointed up and constantly moving along with the object. Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. Similar software controls have been proven and effectively used on the large X-band radar operating at Kwajalein Island in the RMI. The disruption of pacemakers via RF radiation has been studied extensively by the U.S. Air Force and Georgia Technical Research Institute, and the SBX would not exceed the 10 mW/cm² those agencies determined would be required to affect pacemakers.

The SBX would not exceed the 3,000 volts per meter peak power threshold for commercial aircraft as established by the Federal Aviation Administration. The SBX can exceed the 300 volts per meter average power threshold; however, the concern here would not be interference but rather a reduction in life of the aircraft avionics.

As outlined in section 4.8.5, Health and Safety, based on the current standards and documented analysis referenced above, the proposed operation of the SBX in port, with appropriate controls and coordination, would not pose a hazard to personnel or equipment.

Everett is also in the process of redeveloping an area on the northern side of the marina. The Port of Everett North Marina Redevelopment Master Plan (Maritime Trust Company, 2002) would include the addition of residential, commercial, and recreational areas within the northern part of the marina near the existing North Marina. Figure 4.8.6-1 shows where the Redevelopment Plan project study area is in relation to the potential SBX locations. While it is possible that those that visit and reside in this area may be affected by the SBX, the effects would be minimal. The potential SBX site is over 1 mile (1.6 kilometers) from the North Marina and the view of the SBX would be obstructed by existing and proposed buildings, vegetation, and docked ships. It is possible, however, that those within the southwest corner of this area would have an unobstructed view of the SBX along the channel. Due to the distance from the SBX to the redevelopment location, and the partially obstructed views, it is anticipated that the SBX would have a minimal economic impact on the redevelopment plan.

It is, however, worth noting that the perception held by many persons that project-related use of EMR does indeed pose a health risk could potentially lead to a diminished level of desirability, and therefore demand for certain properties within the areas perceived to be affected, thereby having the potential to adversely affect property values within those areas. Given that this impact would be solely attributable to individual interpretation of a perceived risk, the extent and nature of the potential fall in property values, if any, and the areas affected are unable to be determined. The assumption that the SBX would result in a reduction in property values is conjecture and does not present any quantifiable statistics or other information that can be readily or credibly analyzed. In addition, real estate values in an area are more directly related to the levels of income and employment that occur in the area. Socioeconomic studies prepared by the U.S. Air Force and the military's experience during several rounds of base closures have shown that housing values and military programs are generally positively related.
EXPLANATION

- **North Marina Redevelopment Plan Project Study Area**
- **Existing Marina**
- **Naval Station Everett**
- **Potential SBX Locations**

Source: Maritime Trust Company, 2002 (Modified).

North Marina Redevelopment Plan Project Study Area and Potential SBX Locations

Everett, Washington

Figure 4.8.6-1
Particularly in a port area where the mooring of ships and other Navy activities are a normal incidence of the military presence, a reduction of property values from the visual effect of large vessels in the harbor, or a perceived risk, does not seem likely.

In transit to and from the test site, coordination with marine traffic would be adequately advertised through a NOTMAR in order to prevent any conflicts with tribal fishing areas, and to prevent any impacts on current shipping schedules, ship-borne commerce, recreational boating, or general transit. As outlined in section 4.8.6.1 Naval Station Everett is located close to the port and provides easy access to the main channel of Puget Sound. Commercial tugboats would be utilized for this purpose.

At the test site, and while in port, SBX operations would be coordinated with the FAA and would be scheduled, if possible, to occur during hours of minimal aircraft operations. There would no reduction in the amount of the navigable airspace, no disruption of existing aircraft operation would be foreseen, and no resultant economic impacts are expected.

4.8.7 TRANSPORTATION—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.7.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations at Port Everett would continue as currently conducted.

4.8.7.2 Alternatives 1, 2, and 3

All of the alternatives would include SBX as one of the components of the Proposed Action.

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas, and in accordance with host installation guidelines and regulations. As excess warehouse and administrative space is available, there is the possibility that no new construction would be necessary. No adverse effects to transportation resources are anticipated.

Operation

The SBX would be required to meet environmental requirements for commercial vessels.

At Naval Station Everett, both Pier Alpha (the primary ship berthing facility) and Pier Bravo could be used for the SBX and would be coordinated with the naval station. *USS Abraham Lincoln*, a Nimitz-class aircraft carrier that utilizes the naval station as a homeport, is out of port approximately 6 months out of each year.

Naval Station Everett provides easy access to the main channel of Puget Sound. At least two tugboats would be required to assist the SBX when in port. However, Naval Station Everett has no tugboat complement of its own, and thus tugs used at the port are primarily commercial (GlobalSecurity.org, 2002b).
Such activities are typical for Port Everett and, as with all such shipping issues, would require coordination with the U.S. Coast Guard. Requests for tugs must be made 72 hours in advance of anticipated time of movement, and are handled by the Senior Officer Present Afloat Puget Sound (GlobalSecurity.org, 2002b). Adequate coordination with the Tulalip Tribes would prevent any conflicts with tribal fishing areas (Naval Station Everett, 2003). Coordination with the Coast Guard and the Port of Everett would prevent any impacts on current shipping schedules, ship-borne commerce, or general transit (Miller, 2002).

No additional security standoff would be required while the SBX is at Naval Station Everett. The SBX would be within the existing exclusion zone that varies from no standoff along the western side of Pier Bravo to a 91 meter (300 foot) standoff along the southern end of Pier Alpha and Pier Bravo, to a 182 meter (600 foot) standoff along the eastern side of Pier Alpha. Once underway, the SBX security zone would be similar to the Navy vessel protection zone that applies to Navy vessels that are underway. This moving zone includes a 91.4-meter (100-yard) security exclusion zone around the vessel and a slow speed zone between 91.4 and 457 meters (100 and 500 yards) from the vessel.

Some 20 people would be instated at the PSB. As many as 50 personnel could leave the SBX for onshore activities. Even given a maximum, and extreme case, of 50 automobile trips per day, this level would be less than a 0.59 percent over the current level of 8,520 vehicle trips generated by Naval Station Everett per day. No impacts to area roadways are expected.

Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to transportation in the ROI.

Mitigation Measures
No transportation mitigation measures are proposed for GMD ETR activities.

4.8.8 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.8.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Naval Station Everett would continue their current operations.

Energy
Daily average demand for electricity at the Naval Station Everett waterfront site is 36,000 kVA, some 45 percent of the available 80,000 kVA.

Water
Potable water consumption at the Naval Station Everett waterfront site is typically 3.4 million liters (900,000 gallons) per day, or 33.3 percent of the total available capacity of 10.2 million liters (2.7 million gallons) per day.
Wastewater
Wastewater generation at Naval Station Everett’s sanitary sewer system is typically 3.8 million liters (990,000 gallons) per day, or 33.3 percent of the available capacity of 11.4 million liters (3 million gallons) per day.

Solid Waste
Solid waste disposal at Naval Station Everett is handled by landfill and shipping offsite. The average level generated at the waterfront site and by transient Navy ships is 4.6 metric tons (4.5 tons) per day.

4.8.8.2 Alternatives 1, 2, and 3
All of the alternatives would include SBX as one of the components of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8-MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively propel and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume 7 MW, leaving 14.8 MW available for necessary ship-board operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3.1 million liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the Naval Station Everett pier would be approximately 2,270 liters (600 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB for crew rotations, re-supply, and maintenance activities.

The current plan would be to moor the SBX at Pier Alpha or Bravo to allow the SBX to conduct pier-side operations. A utility hookup would be required for the SBX to run onboard lighting and other basic needs and would be utilized in lieu of a continually operating generator. Utility levels would be typical of that for other ships supplied by the Naval Station Everett piers and would be considered routine.

Currently, there is no excess warehouse or administrative space available for the PSB; however, there is adequate space for the construction of new storage and administration facilities for a maximum of 25 personnel. Due to this limited space, a new 900- to 1,500-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse would potentially be required for SBX operations.
Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.8.8.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.8.8.4 Mitigation Measures

No utilities mitigation measures are proposed for GMD ETR activities.

4.8.9 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.9.1 No Action Alternative

Under the No Action Alternative, the SBX would not be located at Naval Station Everett. There would be no alteration of the existing visual setting and the adjacent area. No significant impacts to visual and aesthetic resources would occur.

4.8.9.2 Alternatives 1, 2, and 3

Visual resources could be affected by the proposed SBX at Naval Station Everett. The SBX would be approximately 76 meters (250 feet) tall, and the SBX platform would be 119 meters (390 feet) long and 73 meters (238 feet) wide. The SBX would be located at Naval Station Everett for about 6 weeks at a time, a total of 7 months per year.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from “Landscape Aesthetics: A Handbook for Scenery Management” (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.
The potential location for the SBX at Naval Station Everett would be pier-side at Pier Alpha or Pier Bravo. Primarily, the areas from which the SBX can be seen include residential areas, recreational areas, industrial areas, and also the Naval Base itself.

**Scenic Attractiveness**

Due to the development of the area and the lack of visual attributes the area is considered to be indistinctive (C).

**Concern Level**

The concern level of the viewers at Naval Station Everett would be considered to be “high” (Level 1) due to the recreational and residential use of the adjacent and surrounding areas.

**Distance Zone**

The potential SBX location would be within the foreground (FG) of the shoreline, the mid-ground (MG) for the residential areas, and the background (BG) for the residents of Whidbey Island. However, it is very unlikely that residents of Whidbey Island would be able to distinguish between the SBX and Everett itself.

**Scenic Value Class**

The scenic value class for Naval Station Everett, as determined from the scenic value class table, table 4.8.9-1, would be high (1) within the foreground, moderate (2) within the mid-ground, and low (3) within the background, depending on the distance between the viewer and the SBX.

### Table 4.8.9-1: Scenic Value Class Determined for Naval Station Everett

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>Distance Zones and Concern Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FG1</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

**Scenic Attractiveness**  
A – Distinctive, B – Typical, C – Indistinctive

**Distance zone and Concern Level**  
FG1 – Foreground with a high level of concern  
MG1 – Mid-ground with a high level of concern  
BG1 – Background with a high level of sensitivity  
FG2 – Foreground with a moderate level of concern  
MG2 – Mid-ground with a moderate level of concern  
BG2 – Background with a moderate level of sensitivity  
FG3 – Foreground with a low level of concern  
MG3 – Mid-ground with a low level of sensitivity  
BG3 – Background with a low level of sensitivity

**Scenic Value Class**  
1-2: High public value.  
3-5: Moderate public value.  
6-7: Low public value.
Scenic Integrity

It should also be noted that the area appears heavily altered resulting in a “very low” ranking for the level of scenic integrity.

The potential impacts to visual and aesthetics related to the SBX would be the view across the waterfront from nearby residential, recreational, and commercial areas. Aside from an area immediately adjacent to the SBX, the SBX would occupy only a small part of the horizon and panoramic views would not be inhibited. Naval Station Everett is home to *USS Abraham Lincoln*, a naval aircraft carrier, and is a port area where the mooring of ships and other Navy activities are a normal incidence of the military presence. In addition, Naval Station Everett is adjacent to industrial areas which inhibit the view of the waterfront. While there is a high amount of viewer concern, the SBX would be considered visually synonymous with the port and present military uses; therefore, only moderate impacts are expected to visual resources.

4.8.9.3 Cumulative Impacts

The SBX would be at the pier-side location intermittently throughout the year. No other activities have been identified that would contribute to cumulative impacts.

4.8.9.4 Mitigation Measures

No visual resources mitigation measures are proposed for GMD ETR activities.
4.9 PORT ADAK—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.9.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.1.1 No Action Alternative

Under the No Action Alternative, the home port for the SBX would not be located at Port Adak. Current air emission levels would remain the same, stemming primarily from regional volcanic activity.

4.9.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Construction activities would be conducted in accordance with all appropriate regulations and permits. Other than minor, short-term impacts from construction, no exceedances of the NAAQS or state AAQS would be anticipated.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Port Adak PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 3.5 kilometers (2.2 miles) from Port Adak in Finger Bay. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB mooring location, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 (825 hours each) hours of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at Port Adak; therefore, neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

It is also anticipated that the emissions would not impact the Maritime National Wildlife Refuge located on the southern portion of Adak. Due to the speed and frequency of wind on and around the island, it is expected that the emissions would disperse quickly before reaching this area.
4.9.1.3 Cumulative Impacts

Due to the limited industrialization of Adak and the surrounding environment, the potential cumulative impacts to air quality due to the proposed mooring of the SBX would not be substantial. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to the air quality in the ROI.

4.9.1.4 Mitigation Measures

No air quality mitigation measures are proposed for GMD ETR activities.

4.9.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.2.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions.

4.9.2.2 Alternatives 1, 2, and 3

The Proposed Action related to airspace would be full power emissions from the SBX while at the mooring location at Finger Bay, south of Port Adak.

Operation

Controlled and Uncontrolled Airspace

Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and on figure 3.9.2-1.
The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this SBX high energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations. Coordination with the Anchorage ARTCC would occur prior to and during each test. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace

There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes

The two en route low altitude airways (G8 and G1), three high altitude jet routes (J 115, J600, and J120), two great circle routes from North America to the Far East (R 336 and R451), and one military route (V 480) would be considered in defining the SBX operating area. There are additional approach and departure routes within the ROI that would also need to be considered when defining the SBX operating area. The SBX would be programmed to limit RF emissions in the airways that pass through the ROI. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

Airports and Airfields

Adak Airfield is located approximately 5.5 kilometers (3.4 miles) north of the proposed mooring location. With the restrictions placed on the SBX in a manner similar to the GBR-P radar at RTS, standard instrument approach and departure procedures at the airfield would continue unhindered. Existing airfield or airport arrival and departure traffic flows would also not be affected and access to the airfield would not be curtailed. All arriving and departing aircraft are under the control of the Adak Airfield Control Tower; thus, there would be no airfield conflicts in the ROI under the Proposed Action, and no impact.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the megahertz range) than the X-band SBX, and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.9.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high-power effects).

Emissions from the SBX may also potentially degrade the overall system performance of in-band airborne and ship-based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12
GHz). However, the SBX high energy radiation area would be configured to minimize impacts to these airborne and ship based systems.

### 4.9.2.3 Cumulative Impacts

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. The use of the required scheduling and coordination process, and adherence to applicable DoD directives and U.S. Army regulations concerning radar operations would preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

### 4.9.2.4 Mitigation Measures

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. In addition to charting the SBX high-energy radiation area notice, information would be published in the Airport Facility section of the *FAA Airport Guide*, and local NOTAMs would be issued to notify pilots of the high-energy radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high-energy radiation area.

### 4.9.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

#### 4.9.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Port Adak would continue.

#### 4.9.3.2 Alternatives 1, 2, and 3

**Construction**

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

**Operation**

Impacts to biological resources from operation of the SBX at Port Adak would be similar to those described above in sections 4.3.3.3 and 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to
area seabirds and water fowl or widely distributed, open-water species such as Steller sea lions, sea otters, harbor seals, and whales that occur around Adak Island.

4.9.3.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or birds that might be present in the vicinity of the homeport and transit locations.

4.9.3.4 Mitigation Measures
No biological resources mitigation measures are proposed for GMD ETR activities at Adak.

4.9.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.4.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Port Adak would continue.

4.9.4.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with Port Adak guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents, and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing Port Adak protocol and applicable state and federal regulations.

Operation
Increased operations that could take place at Port Adak would be servicing and maintenance of the SBX. Purchase and use of potentially hazardous materials associated with SBX operation and maintenance would be handled in accordance with ongoing materials management practices. Routine and preventative maintenance activities associated with the SBX would result in the generation of small quantities of potentially hazardous waste. The types of waste generated are not expected to dramatically differ from existing waste generated at the Port Adak, and these wastes would be handled in accordance with ongoing Port Adak procedures. SBX operation is not expected to significantly impact ongoing hazardous waste management or disposal practices.

4.9.4.3 Cumulative Impacts
The use of the required scheduling and coordination process and adherence to applicable Port Adak and APSC procedures and DoD directives concerning radar operations would preclude
the potential for significant incremental, additive cumulative impact to hazardous materials and waste management practices.

4.9.4.4 Mitigation Measures
No hazardous materials/hazardous materials management mitigation measures are proposed for GMD ETR activities at Port Adak.

4.9.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.5.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Port Adak would continue.

4.9.5.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to support the SBX would occur in accordance with existing host installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation
The SBX operating area would be in the vicinity of the mooring location at Finger Bay, as shown in figure 2.3.1-16. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.
The actual operating area of SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated.

4.9.5.3 Cumulative Impacts
The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.

4.9.5.4 Mitigation Measures
Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.9.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK
A project may have substantial effects on infrastructure and utilities if it increases demand in excess of utility system capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

4.9.6.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Port Adak would continue their current operations.

Energy
Daily average demand for electricity at the City of Adak is 1 MW. This is 6.9 percent of the maximum capacity of the electrical service, 14.5 MW.

Water
Potable water consumption at Adak is approximately 1.1 million liters (300,000 gallons) per day. This is 30 percent of the maximum available amount of potable water, 3.8 million liters (1 million gallons) per day.

Wastewater
Recent wastewater generation at Adak amounted to approximately 1 percent of the total water flow into Kuluk Bay, or 30,283 liters (8,000 gallons) per day.
Solid Waste
Solid waste disposal at Adak is handled by landfill and burning.

4.9.6.2 Alternatives 1, 2, and 3
All of the alternatives would include SBX as one of the components of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume 7 MW, leaving 14.8 MW available for necessary ship-board operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to only approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB or nearby mooring area for crew rotations, re-supply, and maintenance activities. While at an adjacent mooring location, only three of the generators would be used, one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar 3 hours per day. A supply ship would deliver food, supplies, repair parts, and fuel from the PSB.

The latter scenario would apply at Port Adak. Although Adak piers do not offer adequate depth to accommodate the draft of the SBX, the vessel can potentially moor at nearby Finger Bay. A re-supply vessel could be required. Personnel would be ferried to the SBX each day either by watercraft or helicopter. There would be no direct impacts to area utilities from the self-contained SBX.

Should existing facilities at Port Adak be unavailable or inadequate at the PSB to accommodate approximately 25 personnel, construction of new, environmentally controlled storage and administration facilities would be necessary. A potential location for a new warehouse would be adjacent to Building 2310. Ongoing logistics and support operations such as re-supply, fueling and maintenance, and crew/operator training would also occur at the PSB.

Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum
25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water, or 0.125 percent of current capacity; 4,258 liters (1,125 gallons) wastewater, or 0.125 percent of current capacity; and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed at Port Adak would be required to facilitate this level of use, as well as to accommodate any energy demand. Utilities at Adak were originally designed for a much larger population than that currently residing in the ROI since base closure took place. Consequently, current demand levels, as opposed to capacity, remain comparatively low and utilities systems would easily be able to accommodate the increased demand from SBX-related activities.

4.9.6.3 Cumulative Impacts
At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that when combined with the relatively minor SBX utility requirements would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.9.6.4 Mitigation Measures
No utilities mitigation measures are proposed for GMD ETR activities at Adak.

4.9.7 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.7.1 No Action Alternative
Under the No Action Alternative, the SBX would not be located at Adak. There would be no alteration of the existing visual setting and the adjacent area. No significant impacts to visual and aesthetic resources would occur, and no mitigation measures are proposed.

4.9.7.2 Alternatives 1, 2, and 3
Visual resources could possibly be affected by the proposed SBX at Adak. The radar would be approximately 76 meters (250 feet) tall and the SBX platform would be 119 meters (390 feet) long and 73 meters (238 feet) wide. Potentially the SBX would be located at Adak intermittently over a period of 7 months per year.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from “Landscape Aesthetics: A Handbook for Scenery Management” (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.
Scenic Attractiveness
The potential mooring location for the SBX at Port Adak is within Finger Bay, where the viewing areas are considered to be typical (B) of the area.

Concern Level
Although the visual resources at Port Adak may be considered significant by some viewers, most of those affected would be associated with the port and would be accustomed to this type of activity. Therefore, the level of concern of the viewers would be considered to be low (Level 3).

Distance Zone
The SBX would be moored within the foreground (FG) view of the shoreline.

Scenic Value Class
The scenic value class for Port Adak as determined from the scenic value class table, table 4.9.7-1, would be moderate (3) due a lack of viewer concern and a typical level of scenic attractiveness.

<table>
<thead>
<tr>
<th>Table 4.9.7-1: Scenic Value Class Determined for Port Adak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Zones and Concern Levels</td>
</tr>
<tr>
<td>FG1</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
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<tr>
<td>C</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

Scenic Attractiveness
A – Distinctive, B – Typical, C – Indistinctive

Distance zone and Concern Level
FG1 – Foreground with a high level of concern
MG1 – Mid-ground with a high level of concern
BG1 – Background with a high level of sensitivity
FG2 – Foreground with a moderate level of sensitivity
MG2 – Mid-ground with a moderate level of sensitivity
BG2 – Background with a moderate level of sensitivity
FG3 – Foreground with a low level of sensitivity
MG3 – Mid-ground with a low level of sensitivity
BG3 – Background with a low level of sensitivity

Scenic Value Class
1-2: High public value.
3-5: Moderate public value.
6-7: Low public value.

Scenic Integrity
Alteration of the area has been greatly limited and the level of scenic integrity is currently considered to be “very high”, which means that the valued landscape is intact with only insignificant if any deviation or disturbance.

The potential mooring site is located within Finger Bay, which is separated from Adak by a small peninsula known as Lucky Point. This peninsula has an elevation of approximately 150 meters.
(492 feet), which would inhibit the view of the SBX from Adak. Also, due to weather conditions the visibility in Adak is typically limited to 1.6 kilometers (1 mile) horizontally, and the potential SBX mooring site is approximately 3.7 kilometers (2.3 miles) from Port Adak. These factors, along with a moderate scenic value and low viewer concern, would result in minimal adverse impacts to the visual resources at Adak.

4.9.7.3  Cumulative Impacts
The SBX would be moored temporarily and intermittently; therefore, cumulative impacts due to the SBX are not anticipated.

4.9.7.4  Mitigation Measures
No visual resources mitigation measures are proposed for GMD ETR activities at Adak.
4.10 PORT OF VALDEZ—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.10.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Current air emission levels would remain the same, as listed in table 4.10.1-1. Operations currently conducted at the Port of Valdez would continue.

| Table 4.10.1-1: Summary of Emissions of Regulated Air Pollutants in the Port of Valdez |
|--------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                                | PM-10 metric tons (tons)/year | Sulfur Dioxide metric tons (tons)/year | Carbon Monoxide metric tons (tons)/year | Nitrogen Dioxide metric tons (tons)/year | Volatile Organic Compounds metric tons (tons)/year |
| Valdez Marine Terminal         | 252.2 (278)                  | 1593.9 (1,757)               | 124.3 (137)                  | 1,431.5 (1,578)               | 3142.5 (3,464)               |
| Adjacent Facilitiesa           | 27.2 (30)                    | 116.1 (128)                  | NA                          | 100.7 (111)                   | NA                          |

Source: U.S. Department of the Interior, Bureau of Land Management, 2002b

a = Includes the Petro Star Refinery, the City of Valdez and the Valdez Airport
NA = Not Available

4.10.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Construction activities would be conducted in accordance with all appropriate regulations and permits. Other than minor, short-term impacts from construction, no exceedances of the NAAQS or state AAQS would be anticipated.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Port of Valdez PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months). The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three
3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. During the times the SBX is able to moor at the dock at Valdez, only two generators would be used for 3 hours per day to power the radar. The SBX would connect to shore power for normal ship functions. The SBX would not be considered a stationary source at the Port of Valdez; therefore, neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

4.10.1.3 Cumulative Impacts
Other emission sources within the proposed ROI include the Valdez Marine Terminal, which is the largest emission producer in the area. The TAPS owners have recently completed an EIS for a 30-year continuation of an Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline, which includes the Valdez Marine Terminal. The analysis has determined that current and future levels of emissions at the Valdez Terminal would be within Alaska Department of Environmental Conservation operating permits. It is anticipated that the addition of emissions from the SBX in the vicinity of the Valdez Marine Terminal would not exceed NAAQS or AAQS levels.

4.10.1.4 Mitigation Measures
No air quality mitigation measures are proposed for GMD ETR activities.

4.10.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions.

4.10.2.2 Alternatives 1, 2, and 3
The Proposed Action related to airspace would be full-power emissions from the SBX while at the mooring location south of Valdez in the Port of Valdez.

Operation
Controlled and Uncontrolled Airspace
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the
300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and on figure 3.10.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high-energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this SBX high-energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations. Coordination with the Anchorage ARTCC would occur prior to and during each test. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace
There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes
The two en route low altitude airways (A7, V 481), one high altitude jet route (J167), and two great circle routes from North America to the Far East (NCA 13 and NCA 20) would be considered in defining the SBX operating area. There are additional approach and departure routes for the Valdez Pioneer Airport that would also need to be considered when defining the SBX high energy radiation area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

Airports and Airfields
Valdez Pioneer Airport is located approximately 12 kilometers (7.5 miles) northeast of the proposed mooring location. With the restrictions placed on the SBX in a manner similar to the
GBR-P radar at RTS, standard instrument approach and departure procedures at the airfield would continue unhindered. Existing airfield or airport arrival and departure traffic flows would also not be affected and access to the airfield would not be curtailed.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the MHz range) than the X-band SBX, and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.10.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high-power effects).

Emissions from the SBX may also potentially degrade the overall system performance of in-band airborne and ship based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high-energy radiation area would be configured to minimize impacts to these airborne and ship-based systems.

4.10.2.3 Cumulative Impacts

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, the frequency allocation operating permit process would take into consideration potential impacts on other resources in the region and would preclude the potential for cumulative impacts. The use of the required scheduling and coordination process, and adherence to applicable DoD directives concerning radar operations would also preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.10.2.4 Mitigation Measures

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. In addition to charting the SBX high-energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued to notify pilots of the high-energy radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high-energy radiation area.
4.10.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.

4.10.3.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

Impacts to biological resources from operation of the SBX at the Port of Valdez would be similar to those described above in sections 4.3.3.3 and 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to Essential Fish Habitat, area seabirds and water fowl, or widely distributed, open-water species such as humpback, killer, and minke whales, sea otters, Steller sea lions, harbor seals, and Dall and harbor porpoises that occur in Prince William Sound.

4.10.3.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or birds that might be present in the vicinity of the homeport and transit locations.

4.10.3.4 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities at the Port of Valdez.

4.10.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.4.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.
4.10.4.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing APSC protocol and applicable state and federal regulations.

Operation
Increased operations that could take place at the Port of Valdez would be servicing and maintenance of the SBX. Purchase and use of potentially hazardous materials associated with SBX operation and maintenance would be controlled within the APSC HAZCORE system. Recycling and reuse of spent and excess materials can be expected to maintain the level of hazardous material usage at or near current conditions. Routine and preventative maintenance activities associated with the SBX would result in the generation of small quantities of potentially hazardous waste. The quantity of waste generated would not change the port’s generator status. The types of waste generated are not expected to dramatically change. Wastes would be handled in accordance with TAPS Environmental Protection Manual, EN-43-2 procedures. SBX operation is not expected to significantly impact ongoing hazardous waste management or disposal practices.

4.10.4.3 Cumulative Impacts
The use of the required scheduling and coordination process and adherence to applicable Port and APSC procedures and DoD directives concerning radar operations would preclude the potential for significant incremental, additive cumulative impact to hazardous materials and waste management practices.

4.10.4.4 Mitigation Measures
No hazardous materials/hazardous waste management mitigation measures are proposed for GMD ETR activities at the Port of Valdez.

4.10.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.5.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.
4.10.5.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to support the SBX would occur in accordance with existing host installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation

The SBX operating area would be in the vicinity of the mooring location in the Port of Valdez, as shown in figure 2.3.1-17. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

The actual operating area of SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated.

4.10.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.
4.10.5.4 Mitigation Measures

Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar's operation.

4.10.6 TRANSPORTATION—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.6.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.

4.10.6.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas, such as the Container Dock staging area or the “Old Town” area, in accordance with guidelines and regulations. No adverse effects to transportation resources are anticipated.

Operation

The SBX would be required to meet environmental requirements for commercial vessels.

At the Port of Valdez, the City Dock is incapable of accommodating either cruise ships or the SBX, although the City of Valdez is upgrading this dock to allow its usage by the former. At high tide, the nearby North Pacific Fuel Dock is deep enough to accommodate the SBX. At the Container Dock, pier-side operations could be carried out in areas wherein depths exceed 15.2 meters (50 feet).

Pier space would not be available year-round at the Container Dock, however, as the space would be yielded to cruise shipping during the May-September tourism season. Other activities at the Container Dock could also interfere with the SBX potential for utilizing it, including occasional barge use. However, there are mooring locations near the Container Dock and across the port near the terminus of the Alaska Pipeline.

A security area or restricted area could be required for the mooring location at Valdez and would require coordination with the U.S. Army Corps of Engineers; a secure area currently exists near the oil tanker site. An Alaska Department of Natural Resources permit would be required for all actions within 4.8 kilometers (3 miles) of the shoreline, including mooring sites. Once underway, the SBX security zone would be similar to the Navy vessel protection zone that applies to Navy vessels that are underway. This moving zone includes a 91.4-meter (100-yard) security exclusion zone around the vessel and a slow speed zone between 91.4 and 457 meters (100 and 500 yards) from the vessel.
Coordination with local Native American groups such as the Tatitlek would be necessary to prevent any impacts to native fishing areas, particularly during the August salmon run and during other peak fishing seasons (such as halibut). Mooring locations would also be required to avoid the area wherein two major communication cables are located.

Transit to and from Prince William Sound could necessitate the use of at least two tugs for assistance. In addition, the Ship Escort and Response Vessel System provides emergency responders to escort ships in and out of the Port of Valdez.

Coordination would be required with the U.S. Coast Guard to lessen requirements for channel (Valdez Narrows) closure and preclude potential delays of oil tankers utilizing the area, as well as to establish any required security zone. Completion of a vessel response plan, to be approved by the U.S. Coast Guard, could be required.

Some 20 people would be instated at the PSB. As many as 50 personnel could leave the SBX for onshore activities. Assuming a maximum of 50 automobile trips per day, this level would be an approximate 0.9-percent increase over the minimum current AADT level at MP3 on Richardson Highway at Valdez of 5,540 vehicles. No impacts to area roadways are expected.

4.10.6.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to transportation resources in the ROI.

4.10.6.4 Mitigation Measures
No transportation mitigation measures are proposed for GMD ETR activities at the Port of Valdez.

4.10.7 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.7.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. The Port of Valdez would continue its current operations.

Energy
Daily availability of electricity for Valdez via Copper Valley Electric Association is 13 MW, with 9.25 MW of backup power through its diesel station.

Water
Potable water hookups at Port of Valdez allow for demands exceeding approximately 245,185 liters (64,771 gallons).
Wastewater
Recent wastewater generation at the City of Valdez amounted to approximately 3.3 million liters (0.87 million gallons) per day. This amounts to 69.6 percent of the processing capacity of the City of Valdez Wastewater Treatment Plant over 4.73 million liters (1.25 million gallons) per day.

Solid Waste
Solid waste disposal at Port of Valdez is handled by private contractor.

4.10.7.2 Alternatives 1, 2, and 3
All of the alternatives would include SBX as one of the component of the Proposed Action. Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume approximately 7 MW, leaving 14.8 MW available for necessary shipboard operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB or nearby mooring location for crew rotations, re-supply, and maintenance activities. While at an adjacent mooring location, only three of the generators would be used, one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar three hours per day. A supply ship would deliver food, supplies, repair parts, and fuel from the PSB.

Valdez cannot commit to year-round pier space year for the SBX, but allows for numerous mooring locations near the container dock which would suffice for project operations. Thus a re-supply vessel would probably not be required. If the use of power hookups were deemed necessary for basic on-board ship activities, they would have to be constructed, as there are no hookups currently available at the docks. The power plant serving Valdez is well below capacity and could allow for the limited demands of the otherwise self-contained SBX. Potable water levels at the port are capable of sustaining large cruise ships and would likewise accommodate the SBX demands. Wastewater and solid waste needs would be handled by existing services, which charge on a per truck (wastewater) and per dumpster (solid waste) basis. Such services would be considered routine and would pose no impacts to port infrastructure; construction of power hookups would actually have a positive impact.

A new environmentally controlled warehouse would potentially be required for SBX operations to accommodate a maximum 25 personnel. Ongoing logistics and support operations such as re-supply, fueling/maintenance and crew/operator training would also occur at the PSB.
Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water, 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.10.7.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the region of influence that when combined with the relatively minor SBX utility requirements would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.10.7.4 Mitigation Measures

No significant impacts would be anticipated with Alternatives 1, 2, and 3; therefore, no mitigation measures would be required or proposed.

4.10.8 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.8.1 No Action Alternative

Under the No Action Alternative, the SBX would not be located at Valdez. There would be no alteration of the existing visual setting and the adjacent area. No significant impacts to visual and aesthetic resources would occur, and no mitigation measures are proposed.

4.10.8.2 Alternatives 1, 2, and 3

Visual resources could possibly be affected by the proposed SBX at Valdez. The SBX would be approximately 76 meters (250 feet) tall, and the SBX platform would be 119 meters (390 feet) long and 73 meters (238 feet) wide. The SBX would be located at Valdez intermittently for approximately 7 months per year. The remaining 5 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from “Landscape Aesthetics: A Handbook for Scenery Management” (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of
Scenic Attractiveness

The scenic attractiveness of the Port of Valdez is considered to be distinctive (A) due to the surrounding mountain ranges which provide an outstanding visual quality unique to the Valdez area.

Concern Level

The level of concern for the viewers within the Port of Valdez can potentially be high (Level 1) due to recreational and tourist areas.

Distance Zone

The SBX would either be moored at a selected dock or at mooring locations across the port. These locations would potentially result in a foreground (FG) view from the docks, a mid-ground (MG) view from Valdez itself, or a background (BG) view from some of the residential areas.

Scenic Value Class

The scenic value class for the Port of Valdez as determined from the scenic value class table, table 4.10.8-1, would be high (1) for the foreground, mid-ground, and background areas of the ROI, due to the level of scenic attractiveness of the area.

Table 4.10.8-1: Scenic Value Class Determined for the Port of Valdez

<table>
<thead>
<tr>
<th>FG1</th>
<th>MG1</th>
<th>BG1</th>
<th>FG2</th>
<th>MG2</th>
<th>BG2</th>
<th>FG3</th>
<th>MG3</th>
<th>BG3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

Scenic Attractiveness

A – Distinctive, B – Typical, C – Indistinctive

Distance zone and Concern Level

FG1 – Foreground with a high level of concern
MG1 – Mid-ground with a high level of concern
BG1 – Background with a high level of sensitivity
FG2 – Foreground with a moderate level of sensitivity
MG2 – Mid-ground with a moderate level of sensitivity
BG2 – Background with a moderate level of sensitivity
FG3 – Foreground with a low level of sensitivity
MG3 – Mid-ground with a low level of sensitivity
BG3 - Background with a low level of sensitivity

Scenic Value Class

1-2: High public value.
3-5: Moderate public value.
6-7: Low public value.
Scenic Integrity

The scenic integrity for the SBX locations at the Port of Valdez could either be considered “very low,” which means that the area appears heavily altered, or “very high,” which means that the valued landscape is intact with only insignificant if any deviation or disturbance, depending on the view. The mountain ranges surrounding Valdez would particularly be classified as having a “very high” level of scenic integrity.

The size of a midsize oil tanker is approximately 305 meters (1,000 feet) long and 61 meters (200 feet) wide. Because Valdez is the site of the terminus of the Trans-Alaska Pipeline, numerous oil tankers are consistently entering Prince William Sound, which would limit the impacts to visual resources caused by the SBX. However, adverse impacts to visual resources could occur due to a certain amount of sensitive viewers and a high amount of scenic integrity depending on the viewpoint.

4.10.8.3 Cumulative Impacts

The SBX would be moored temporarily and intermittently; therefore, cumulative impacts due to the SBX are not anticipated.

4.10.8.4 Mitigation Measures

No visual resources mitigation measures are proposed for GMD ETR activities at the Port of Valdez.
4.11 BROAD OCEAN AREA

This section describes the potential impacts within the BOA that may occur as a result of the GMD ETR activities. The BOA includes those areas that are outside the U.S. territorial waters, and as such this section of the document complies with Executive Order 12114, *Environmental Effects Abroad of Major Federal Activities*. The information contained in this section is summarized from the *Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement* (U.S. Department of the Air Force, 1998), *PMRF Enhanced Capability Environmental Impact Statement* (Pacific Missile Range Facility, Barking Sands, 1998), *North Pacific Targets Program Environmental Assessment* (U.S. Army Space and Missile Defense Command, 2001b), and the *Development and Demonstration of the Long Range Air-Launch Target Environmental Assessment* (U.S. Department of Defense, 2002). These documents included environmental analysis of potential impacts from missile launches and other military actions in the Gulf of Mexico and the Central and North Pacific. As appropriate, additional information used to develop this section is referenced accordingly.

Airspace, biological resources, health and safety, and transportation were identified as resource areas with potential impacts in the BOA. Water quality and noise are included in the analysis, from the standpoint of potential impacts on marine life.

With the BOA being the ROI, there is no potential for impacts to cultural resources, land use, soils, and groundwater. Similarly, since the BOA is well removed from islands and population centers, no impacts to the human noise environment, socioeconomics, and utilities are anticipated. Impacts to air quality from similar missiles have been determined to be insignificant.

4.11.1 AIRSPACE—BROAD OCEAN AREA

4.11.1.1 Gulf of Mexico

**No Action Alternative**

Under the No Action Alternative, the SBX would not be developed, and the proposed SBX test activities in the Gulf of Mexico would not take place.

**Proposed Action**

The Gulf of Mexico ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace over the Gulf of Mexico. This includes the entire northern Gulf of Mexico within the Houston, Jacksonville, and Miami ARTCCs, and the Houston and Miami Oceanic CTA/FIR. The Proposed Action in the Gulf of Mexico would include sea trials of the SBX platform and full power testing of the SBX. The location of testing has not been determined; however, full power radar testing would be conducted in areas that would minimize impacts to airspace.

A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing.
The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. Table 2.1.4-2 lists the maximum potential interference distances.

**Special Use Airspace**

Full power radar testing would be planned to take place within existing special use airspace such as warning areas, and under conditions controlled to eliminate hazards to non-participating aircraft. Coordination with the FAA would be required before testing.

**En Route Airways and Jet Routes**

Full power radar testing would be planned to take place in an area that would minimize potential impacts to en route airways and jet routes. The specific testing location would be coordinated with the FAA to avoid en route airways and jet routes. By avoiding these routes, the proposed activities would not require a change to an existing or planned IFR minimum flight altitude, a published or special instrument procedure, or an IFR departure procedure; nor would they require a change to a VFR operation from a regular flight course or altitude. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics. Consequently, no impacts to the surrounding low altitude airways or high altitude jet routes would occur from SBX testing.

**4.11.1.2 En Route Gulf of Mexico to Pacific Ocean**

**No Action Alternative**

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed transit of the SBX from the Gulf of Mexico to the Pacific Ocean would not take place.

**Proposed Action**

The en route ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace along the route from the Gulf of Mexico to the Pacific Ocean. The Proposed Action would include transit and testing of the SBX to include full power testing of the SBX. The location of testing has not been determined; however, full power radar testing would be conducted in areas that would minimize impacts to airspace.

As described in the previous section, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing.

Potential impacts to en route airways and special use airspace would be minimal and similar to those described for the Gulf of Mexico.
4.11.1.3 Pacific Ocean

No Action Alternative

Under the No Action alternative, the GMD ETR would not be developed, and the proposed full range of GMD flight test activities in the Pacific BOA would not take place. Ongoing missile flight test activities would continue to use the existing special use airspace and other areas in the Pacific BOA. The continuing activities would not conflict with any airspace use plans, policies, and controls.

Proposed Action

The Pacific BOA ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace over the Pacific Ocean. This includes the entire northern Pacific BOA within the Oakland and Anchorage ARTCCs Oceanic CTA/FIR. The Proposed Action in the Pacific BOA would include missile booster drop zones, missile intercepts, and intercept debris. In addition, the launching of mobile sea launch targets and air launch targets could have airspace use impacts that would be essentially the same as the ground-launched missiles.

The Proposed Action would also include transit of the SBX from a PSB to the appropriate SBX performance region, SBX operations within the performance region in support of GMD flight tests, and transit back to a PSB.

Controlled and Uncontrolled Airspace

The airspace in the ROI outside territorial limits lies in international airspace and, consequently, is not part of the NAS. Because the area is in international airspace, the procedures of ICAO, outlined in ICAO Document 444, *Rules of the Air and Air Traffic Services*, are followed. ICAO Document 444 is the equivalent air traffic control manual to FAA Handbook 7110.65, *Air Traffic Control*. The FAA acts as the U.S. agent for aeronautical information to the ICAO, and air traffic in the overwater ROI is managed by the Honolulu, Oakland, and Anchorage ARTCCs.

After launch, typically the GBI and target missiles would be above 18,290 meters (60,000 feet) within seconds of launch. As such, all other local flight activities would occur at sufficient distance and altitude that the target missile and GBI missiles would be little noticed. However, activation of stationary Altitude Reservation (ALTRV) procedures, where the FAA provides separation between non-participating aircraft and the missile flight test activities, would impact the controlled airspace available for use by non-participating aircraft for the duration of the ALTRV, usually for a matter of a few hours, with a backup day reserved for the same hours. Because the airspace in most of the intercept debris areas is not heavily used by commercial aircraft, and is far removed from the en route airways and jet routes crossing the North Pacific, the impacts to controlled/uncontrolled airspace would be minimal.

However, the intercept scenarios with targets from KLC and GBIs from Vandenberg AFB (figure 2.1.8-3) may have moderate impacts to airspace due to the potential impacts from intercept debris. It has been determined that intercept debris as small as 1 gram could cause significant damage to a commercial aircraft traveling at cruising speed and altitude. The probability of fatality for a 737 aircraft flying through a target missile debris cloud is depicted in figure 4.11.1-1. The figure shows the debris cloud to be approximately 35 kilometers (22 miles) in diameter, and the area
Probability of Fatality Per Cell for 737 (Model Representative Output)

EXPLANATION

- $1.014 \times 10^{-8}$
- $7.411 \times 10^{-5}$
- $1.482 \times 10^{-4}$
- $2.223 \times 10^{-4}$
- $2.964 \times 10^{-4}$
- $3.705 \times 10^{-4}$
- $4.446 \times 10^{-4}$
- $5.187 \times 10^{-4}$
- $5.928 \times 10^{-4}$
- $6.669 \times 10^{-4}$

- $7.41 \times 10^{-4}$
- $8.151 \times 10^{-4}$
- $8.892 \times 10^{-4}$
- $9.633 \times 10^{-4}$

- Probability of Fatality Greater Than 1 in 1 Million.
- (Risk Exceeds Guidelines)

- Risk less than $1.0 \times 10^{-20}$

Note: Overhead View 9,145 meters (30,000 feet) Altitude Commercial Airspace

Source: 3D Research Corporation, 2001a (modified).

Figure 4.11.1-1

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where the probability of fatality is greater than 1 in 1 million is approximately 22 kilometers (13.6 miles) in diameter. This area of higher risk would need to be avoided by all aircraft. The time for the intercept debris to pass through commercial airspace cruising altitudes is approximately 3 hours after the intercept. All en route airways and jet routes that are predicted to pass through the target missile or GBI missile intercept debris areas would need to be identified before a test to allow sufficient coordination with the FAA to determine if the aircraft on those routes would be affected, and if so, if they would need to be re-routed or rescheduled. Routing around the debris areas would be handled in a manner similar to severe weather. The additional time for commercial aircraft to avoid the area would generally be less than 10 minutes at cruising altitudes and speeds.

For sea-launch target launches, it may be necessary to establish a 3.7-kilometer (2-nautical-mile) radius temporary Warning Area, extending from the surface up to 18,290 meters (60,000 feet) mean sea level above the sea-launch platform. Such a restricted area would marginally reduce the amount of navigable airspace in the BOA ROI, but because the airspace is not heavily used by commercial aircraft and is far removed from the en route airways and jet routes crossing the North Pacific, the impacts to controlled and uncontrolled airspace would be minimal.

As described in the section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX operations in the Pacific Ocean. The spectrum certification process would identify coordination requirements that would be followed by the SBX for all operations.

Special Use Airspace
GMD ETR missile intercepts and intercept debris would generally occur outside special use airspace areas. As such, the Proposed Action would not represent a direct special use airspace impact. Similarly, the use of ALTRV procedures as authorized by the Central Altitude Reservation Function, an air traffic service facility, or appropriate ARTCC (in this case, the Oakland ARTCC) for airspace utilization under prescribed conditions would not impact special use airspace. According to the FAA Handbook, 7610.44, ALTRVs may encompass certain rocket and missile activities and other special operations as may be authorized by FAA approval procedures.

The primary responsible test range would coordinate with the Oakland ARTCC military operations specialist assigned to handle such matters and the airspace coordinator at the Honolulu Center or other appropriate Radar Approach Center using ALTRV request procedures. After receiving the proper information on each test flight, a hazard pattern would be constructed and superimposed on a chart depicting the area of operations. Ensuring that the hazard pattern would not encroach on any land mass, this area is then plotted using minimum points (latitude-longitude) to form a rectangular area. This plotted area is then faxed to the military operations specialist at Oakland ARTCC requesting airspace with the following information: area point (latitude-longitude); date and time for primary and backup (month, day, year, zulu time); and altitude. A copy would be sent to the Honolulu Center or other appropriate Radar Approach Center. A follow-up phone call would be made after 48 hours to verify receipt of the fax. When approval of the request of the airspace is received from the military operations specialist at
Oakland ARTCC, the primary responsible test range would submit an ALTRV request to Central Altitude Reservation Function who publishes the ALTRV 72 hours before the flight test.

Full power radar testing would generally not take place within existing special use airspace such as warning areas. However, operations would be conducted in coordination with the FAA to minimize potential hazard to non-participating aircraft.

**En Route Airways and Jet Routes**

The numerous airways and jet routes that crisscross the Pacific BOA airspace use ROI have the potential to be affected by the Proposed Action. However, target and GBI missile launches and missile intercepts would be conducted in compliance with DoD Directive 4540.1 that specifies procedures for conducting missile and projectile firing; namely, “firing areas shall be selected so that trajectories are clear of established oceanic air routes or areas of known surface or air activity” (DoD Directive 4540.1, E5, 1981).

Before conducting a missile launch and/or intercept test, NOTAMs would be sent in accordance with the conditions of the directive specified in the primary responsible test range requirements. In addition, to satisfy airspace safety requirements, the responsible test range would obtain approval from the Administrator, FAA, through the appropriate DoD airspace representative. Provision is made for surveillance of the affected airspace either by radar or patrol aircraft. In addition, safety regulations dictate that hazardous operations would be suspended when it is known that any non-participating aircraft have entered any part of the danger zone until the non-participating entrant has left the area or a thorough check of the suspected area has been performed.

In addition to the reasons cited above, minimal adverse impacts to the en route airways and jet routes are identified because of the required coordination with the FAA. Schedules are provided to the appropriate FAA facility (Honolulu, Anchorage, and Oakland ARTCCs) as agreed between the agencies involved. Aircraft transiting the open ocean ROI on one of the low-altitude airways and/or high-altitude jet routes that would be affected by flight test activities would be notified of any necessary rerouting before departing their originating airport and would therefore be able to take on additional fuel before takeoff. Real-time airspace management involves the release of airspace to the FAA when the airspace is not in use or when extraordinary events occur that require drastic action, such as weather requiring additional airspace.

The FAA ARTCCs are responsible for air traffic flow control or management to transition air traffic. The ARTCCs provide separation services to aircraft operating on IFR flight plans and principally during the en route phases of the flight. They also provide traffic and weather advisories to airborne aircraft. By appropriately containing hazardous military activities by using ALTRV procedures, non-participating traffic are advised or separated accordingly, thus avoiding substantial adverse impacts to the low altitude airways and high altitude jet routes in the ROI.

If a 3.7-kilometer (2-nautical-mile) radius temporary Warning Area, extending from the surface to 18,200 meters (60,000 feet) mean sea level, is proposed over the sea-launch platform, it would not have an impact on the en route airways and jet routes in Pacific BOA. The sea-launch platform would be positioned to avoid the en route airways and jet routes that cross the North Pacific.
SBX operating areas include several air routes as shown on figure 4.11.1-2. As described in section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX operations in the Pacific Ocean. The spectrum certification process would identify coordination requirements that would be followed by the SBX for all operations. The SBX would generally be able to operate from a location within the SBX performance region that does not interfere with the air routes that cross the region. The specific testing location would be coordinated with the FAA to avoid en route airways and jet routes. If the SBX were to operate in an air route location, non-participating aircraft could be routed around the SBX operating area. Such a diversion would generally be less than 20 kilometers (12.4 miles), a minor distance for the routes being flown.

Cumulative Impacts
GMD testing would request clearance of various areas of airspace and may cause rerouting or rescheduling of flights for periods of as much as 3 to 4 hours, five times a year. This could result in as much as 20 hours of direct effect on air traffic access per year. However, most impacts would be in remote areas that would have little effect on air traffic. Other missile test programs could also have similar, minor impacts in the same areas.

Therefore, GMD flight tests with intercepts in the vicinity of en route airways and jet routes, when combined with other missile test programs, could lead to cumulative impacts to airspace in the form of flight delays. The required scheduling process for the use of airspace would help to minimize these potential adverse cumulative impacts.

Mitigations Considered
Coordination with the FAA, scheduling GMD flight tests during hours of low aircraft traffic, and the implementation of positive air traffic control are the primary practices employed to avoid impacts to airspace. Therefore additional airspace mitigation measures are not proposed for GMD ETR activities in the BOA.

4.11.2 BIOLOGICAL RESOURCES—BROAD OCEAN AREA
Potential impacts of construction, building modification, and missile launches on terrestrial and marine biological resources within the Gulf of Mexico and open ocean ROI were addressed in detail in the Theater Missile Defense ETR Supplemental EIS-Eglin Gulf Test Range (U.S. Department of the Air Force, 1998), PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998), USAKA EIS (U.S. Army Strategic Defense Command, 1989a), USAKA Supplemental EIS (U.S. Army Space and Strategic Defense Command, 1993a), Theater Missile Defense Extended Test Range EIS (U.S. Army Space and Strategic Defense Command, 1994), and Kwajalein Atoll Temporary ETR EA (U.S. Army Space and Strategic Defense Command, 1995). The finding of these studies are incorporated by reference and summarized in the following sections. Based on the prior analysis done and the effects of past interceptor and target launch activities, the potential impacts of activities related to missile test flights on biological resources are expected to be minimal, as discussed below. Dual GBI and target missile launches could potentially occur. Impacts from these dual launches would in some cases be slightly greater than, but similar to, those analyzed below for single launches.
High Altitude Air Routes with Potential SBX Performance Regions


EXPLANATION
- High Altitude Air Routes
- SBX Performance Regions

Scale
- 0 571 kilometers
- 0 355 miles

Figure 4.11.1-2
4.11.2.1 Gulf of Mexico

As described in section 4.6.3.2, in terms of the potential for EMR impacts to wildlife, the power densities emitted from the SBX are unlikely to cause any biological effects in marine animals or birds.

4.11.2.2 En Route Gulf of Mexico to Pacific Ocean

Existing shipping routes would be used along the coast of South America to move the SBX from the Gulf of Mexico to the Pacific Ocean. The potential for impacts to marine mammals due to an accidental release of diesel fuel is considered low. There is evidence that dolphins can identify the presence of diesel fuel and lubricating oil and avoid it (U.S. Department of the Navy, 2001). The relatively slow speed of the SBX platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals or other biological resources are anticipated.

4.11.2.3 Pacific Ocean

The proposed flight test operations would have no discernible or measurable effect on the ocean’s overall physical and chemical properties, and thus would have no impacts to the overall marine biology of the Ocean Area ROI for both PMRF and RTS. Moreover, the proposed test flight operations would have no discernible effect on the biological diversity of either the pelagic or benthic marine environments. The proposed activities would take place in the open ocean, or pelagic zone, which is far removed from land and contains approximately 2 percent of marine species. The potential for impacts exists from the GBI and target missile booster's fall to the ocean surface and from the target payload fall to the ocean surface. Of particular concern is the potential for impacts to marine mammals from both auditory and non-auditory effects. Potential auditory effects include behavioral disturbance (including displacement), acoustic masking (elevated noise levels that drown out other noise sources), and (with very strong sounds) temporary or permanent hearing impairment. Potential non-acoustic effects include physical impact by falling debris, entanglement in debris, and contact with or ingestion of debris or hazardous materials. Potential adverse effects could occur from sonic boom overpressures, shock wave impact or direct contact, ingestion of toxic solutions generated from the unburned propellant mixed with seawater, and ingestion of pieces of unburned propellant. The potential effects to marine biological resources from installation and operation of the SBX would be similar to those described in section 4.3.3.3 and 4.6.3.2.

Hazardous Materials Deposition

The National Aeronautics and Space Administration conducted a thorough evaluation of the effects of missile systems that are deposited in seawater. It concluded that the release of hazardous materials aboard missiles into seawater would not be significant. Materials would be rapidly diluted and, except for the immediate vicinity of the debris, would not be found at concentrations identified as producing any adverse effects. The Pacific Ocean depth in the vicinity of the launch area is thousands of meters (feet) deep, and consequently impact from the fuel is expected to be minimal. The rocket components would immediately sink to the ocean bottom, out of reach from marine mammals, sea turtles, and most other marine life (U.S. Department of the Air Force, 2002). Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly
dissolves, its outer layers become spongy, further retarding dissolution. Thus, no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al, 2000) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in section 4.1.14, KLC Water Resources, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water.

Any area affected by the slow dissolution of the propellant would be relatively small due to the size of the rocket motor or propellant pieces relative to the quantity of seawater. (Federal Aviation Administration, 1996)

Under nominal launch conditions when the relative humidity is less than 100 percent, deposition of hydrogen chloride gas on the surface of the sea would not be significant. Analyses for the most conservative case, where rain would be present soon after test firing the advanced solid rocket motor, concluded that acid deposition to surface water would not result in any impacts to larger surface water bodies in the area. This analysis was based on the buffering capacity of fresh water, which is considerably lower than the buffering capacity of sea water; therefore, it is expected that even for the most conservative case condition where all of the hydrogen chloride emission falls over the open ocean area, the pH level would not be depressed by more than 0.2 standard units for more than a few minutes. (U.S. Department of the Navy, 1998)

Mathematical modeling results of advanced solid rocket motor tests indicated the maximum deposition of aluminum oxide would measure about 1.6 milligrams per square meter. Aluminum oxide is not considered toxic under natural conditions but may contribute potentially harmful species of soluble aluminum forms under acidic conditions. It is difficult to quantify the portion of aluminum oxide that reacts with hydrogen chloride to form additional toxic aluminum species. The most conservative approach assumes that all of the aluminum oxide deposited has reacted with hydrogen chloride. With this extremely conservative assumption, the deposition of about 1.6 milligrams per square meter of aluminum oxide equals approximately 0.0054 milligram per liter of aluminum at a water depth of 0.15 meter (0.5 foot). This analysis is based on the assumption that it would not be raining at the time of the test event or within 2 hours after the event. (U.S. Department of the Navy, 1998)

No solid propellant would remain in the spent Long-Range Air Launched Target rocket motors that impact in the ocean. The residual aluminum oxide and burnt hydrocarbon coating the inside of the motor casings would not present any toxicity concerns. However, residual amounts of hydraulic fluid contained in the first-stage motor and the contents of various batteries onboard the rocket motors and the reentry vehicle may mix with the seawater, causing contamination. The release of such contaminants could potentially harm marine life that comes in contact or ingests the toxic solutions. (U.S. Department of the Air Force, 2002)

It is also expected that, even in the most conservative scenario of an on-ship or early flight failure where all of the propellant is ignited and all of the hydrogen chloride and aluminum oxide is deposited, any toxic concentration of these products would be buffered and diluted by sea water to nontoxic levels within minutes. Consequently, any impacts from accidental release would be very transient. (U.S. Department of the Navy, 1998)
Debris

Debris impact and booster drops in the BOA could occur within the 322-kilometer (200-mile) limit of the Exclusive Economic Zone of affected islands. The natural buffering capacity of seawater and the strong ocean currents would neutralize reaction to any release of the small amount of liquid propellant contained within the Divert and Attitude Control System or Liquid Propellant Missile. Analysis in the Marine Mammal Technical Report, prepared in support of the Point Mugu Sea Range EIS, determined that there is a very low probability that a marine mammal would be killed by falling missile boosters, targets, or debris as a result of tests at the Point Mugu Sea Range (less than 0.0149 marine mammals exposed per year). The potential for an object or objects dropping from the air to affect marine mammals or other marine biological resources is less than $10^{-6}$ (1 in 1 million). The probability of a spent missile landing on a cetacean or other marine mammal is remote.

This probability calculation was based on the size of the area studied and the density of the marine mammal population in that area. The analysis concluded that the effect of this missile debris and intact missiles coming down in the open ocean would be negligible. The range area at Point Mugu is smaller (93,200 square kilometers [27,183 square nautical miles]) than the PMRF range area (144,000 square kilometers [42,000 square nautical miles]), and the density of marine mammals at Point Mugu is larger than the density found at PMRF. It is reasonable to conclude that the probability of a marine mammal being injured or killed by missile or debris impact from U.S. Navy testing at PMRF is even more remote than at Point Mugu, since the area at PMRF is larger and the density of marine mammals is smaller. Following formal consultation, the National Marine Fisheries Service concluded that the Proposed Action is not likely to adversely affect any marine mammal species. (U.S. Department of the Navy, 1998)

The splashdown of the first- and second-stage target missile boosters and defensive missile boosters, and the target vehicle’s and defensive missile’s payloads in the case of an unsuccessful intercept, is planned to occur in open ocean waters thousands of meters (feet) deep at considerable distance from the nearest land. The parts of solid rocket motor propellant expelled from a destroyed or exploded rocket motor that fall into the open ocean would most likely sink to the ocean floor at depths of thousands of meters (feet). At such depths, the propellant parts would be out of the way of feeding marine mammals. (U.S. Department of the Navy, 1998)

Following the Long-Range Air Launched Target missile launch, the Booster Extraction System would continue a slow descent by parachute until impacting the water. Although the impact would occur at a reasonably slow velocity, the falling 1,225-kilogram (2,700-pound) pallet could strike and injure or kill a marine mammal or sea turtle. As previously discussed, however, the probability of striking an animal within the ROI is extremely remote. (U.S. Department of the Air Force, 2002)

The eight parachutes used to extract and prepare the Long-Range Air Launched Target missile for launch would sink to the ocean bottom, along with the aluminum pallet. These parachutes, 4.6 to 28.7 meters (15 to 94 feet) in diameter, could cause entanglement of a marine mammal or sea turtle and potential drowning. However, such entanglement would be very unlikely since a parachute would either have to land directly on an animal, or an animal would have to swim blindly into it before it sinks to the ocean floor. The potential for a marine mammal or sea turtle to be in the same area and have physical contact with a parachute is remote. (U.S. Department of the Air Force, 2002)
**Ingestion of Pieces of Unburned Propellant**

Because of the slow rate at which the toxic materials dissolve out of the solid fuel matrix, the concentration and toxicity of dissolved solid rocket motor fuel in the ocean from the unexpended rocket motor, or portions of it, is expected to be negligible and without any substantial effect.

The parts of solid rocket motor propellant expelled from a destroyed or exploded rocket motor that fall into the ocean would most likely sink to the ocean floor at depths of thousands of meters (feet). At such depths the propellant parts would be out of the way of feeding marine mammals.

**Noise**

Potential auditory effects include behavioral disturbance (including displacement), acoustic masking (elevated noise levels that drown out other noise sources), and (with very strong sounds) temporary or permanent hearing impairment. Injury by the shock wave resulting from impact of a large, fast-moving object (such as a missile booster or target vehicle) with the water surface could be considered either an acoustic or non-acoustic effect. TTS, which is the temporary shift in hearing thresholds during and after exposure to high noise levels, is used as a measure of temporary reduction in hearing sensitivity.

For sound levels at or somewhat above the TTS threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. Much greater single noise exposures would be required to result in permanent hearing damage, while lesser noise levels could involve only minor behavioral responses with no effect on hearing sensitivity.

**Sonic Boom Overpressure Impacts**

The missiles could generate a sonic boom upon reentry. Each missile would propagate a unique sonic boom contour depending upon its mass, shape, velocity, and reentry angle, among other variables. The location of the possible impact point would vary depending upon the particular flight test profile. It is therefore difficult to produce the specific location, extent, duration, or intensity of sonic boom impacts upon marine life. These noise levels would be of very short duration.

According to analysis provided in the Navy’s Point Mugu Sea Range EIS, brief transient sounds such as sonic booms are unlikely to result in significant adverse effects to pinnipeds in the water. Pinnipeds seem tolerant of noise pulses from sonic booms, although reactions may occur. Temporary displacement, less than 1 or 2 days, is considered a less than significant impact. Momentary startle or alert reactions in response to a single transient sound such as a sonic boom are not considered a significant adverse effect to whales. Baleen whales (humpback, gray, and bowhead) have often been observed behaving normally in the presence of strong noise pulses from sources such as distant explosions and seismic vessels. Most gray and bowhead whales show some avoidance of areas where these noise pulses with pressures exceeding 170 dB or 1micropascal are repeated. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

The noise level thresholds of impact to marine life in general, and marine mammals in particular, are currently the subject of scientific analysis. However, due to the small open ocean area that could potentially be impacted and the relatively low number of species present it is highly unlikely that sonic booms for the missiles analyzed in this EIS would significantly affect marine
species. In addition, since different species of marine mammals have varying sensitivity to different sound frequencies and may be found at different locations and depths in the ocean, it is difficult to generalize sound impacts to marine mammals from missile impacts in the BOA. Should consensus emerge from the scientific analysis about the effects of underwater noise on marine mammals, it would then be possible to predict the consequences of a particular sonic boom contour upon marine mammals in the vicinity.

Recent analysis by Cheng and Lee has shown that disturbances from acoustic sources produced by interaction of a surface wave train with an incident sonic boom wave would attenuate in deep water at a rate much lower (slower) than those predicted by Sawyer’s theory for a flat (non-wavy) ocean, and would accordingly overwhelm the latter at large depth. Experimental and theoretical research on underwater impact from sonic booms are performed to ascertain the significant influence of wavy ocean surface on sonic boom penetration power and to determine, through application of validated model to aircraft and space-launch examples, if predicted signal intensity and characteristics at depth belong to ranges and types that may allow meaningful impact assessment in the study of marine mammals. (Space and Missile Systems Center, Environmental Management Branch, 2002)

**Shock Wave Impact**

The first-, second-, and third-stage target missile boosters and the target vehicle’s payload, which all fall to the ocean surface, would impart a considerable amount of kinetic energy to the ocean water upon impact. Missiles and targets would hit the water with speeds of 91 to 914 meters (300 to 3,000 feet) per second. It is assumed that the shock wave from their impact with the water would be similar to that produced by explosives. At close ranges, injuries to internal organs and tissues would likely result. However, injury to any marine mammal by direct impact or shock wave impact would be extremely remote (less than 0.0006 marine mammals exposed per year). The splashdown of the target missile boosters and payload is planned to occur in open ocean waters thousands of meters (feet) deep at considerable distance from the nearest land. (U.S. Army Space and Missile Defense Command, 2001b)

Standard range warning and checking procedures would check for visible large concentrations of marine mammals in the area of the target launch, trajectory, and first-stage impact area. Patrol and surveillance aircraft would be dispatched before launch to search the water surface. If contacts are made and confirmed, the Flight Safety Officer would determine whether to continue on schedule, delay the test flight, or postpone it until another day.

**4.11.2.4 Cumulative Impacts**

No substantial impacts to the Gulf of Mexico or to the open ocean area and its wildlife have been identified from current and past missile test activities. Prior analysis has not identified a significant potential for cumulative impacts. It is not likely that the proposed activities, in conjunction with current or anticipated launches, would exceed the current level of activity in these areas. GMD ETR-related tests would be discrete, short-term events, and no adverse cumulative impacts are anticipated.
4.11.2.5 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities conducted in the Gulf of Mexico or the open ocean area. These activities would adhere to the terms and conditions imposed by the National Marine Fisheries Service on missile launches.

4.11.3 HEALTH AND SAFETY—BROAD OCEAN AREA

4.11.3.1 Gulf of Mexico

No Action Alternative

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed test activities in the Gulf of Mexico would not occur.

Proposed Action

The Gulf of Mexico ROI is defined as the overwater area that would be potentially affected by the initial sea trials of the SBX platform and full power testing of the SBX. The sea trials are designed to ensure maneuverability and control of the vessel. The total amount of radar RF radiation would be approximately 5 to 6 hours per week during testing. The location of the testing has not been determined; however, it would be conducted in areas that would minimize impacts to aircraft and marine vessels. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate, and NOTMARs and NOTAMs would be issued to warn aircraft and surface vessels of the testing. Therefore, no health and safety impacts to airspace/aircraft or mariners are anticipated.

As described in section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing. No impact to health and safety is expected.

4.11.3.2 Enroute from Gulf of Mexico to Pacific Ocean

No Action Alternative

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed test activities en route from the Gulf of Mexico to the Pacific Ocean would not occur.

Proposed Action

The SBX would use existing shipping routes along the coast of South America to get from the Gulf of Mexico to the Pacific Ocean. Full power testing of the SBX would occur during this transit period. The total amount of radar RF radiation would be approximately 5 to 6 hours per week during testing. The location of the testing has not been determined; however, it would be conducted in areas that would minimize impacts to aircraft and marine vessels. SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate and NOTMARs and NOTAMs would be issued to warn aircraft and marine surface vessels of the testing. Therefore, no health and safety impacts to airspace/aircraft or mariners are anticipated.

As described in section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD
Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing.

4.11.3.3 Pacific Ocean

No Action Alternative

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed full range of GMD flight test activities in the Pacific BOA would not take place. Ongoing missile flight test activities would continue to use the existing special use airspace and other areas in the Pacific BOA. The continuing activities would not conflict with any commercial shipping lanes or airspace use plans, policies, and controls.

Proposed Action

The Proposed Action in the Pacific BOA would include missile booster drop zones, missile intercepts, and intercept debris. In addition, the launching of mobile sea launch targets and air launch targets could have airspace use or commercial shipping lane impacts that would be essentially the same as the ground launched missiles. The Proposed Action would also include transit of the SBX from a PSB to the appropriate SBX performance region, SBX operations within the performance region in support of GMD flight tests, and transit back to a PSB.

For sea-launch target launches, the airspace is not heavily used by commercial aircraft and is far removed from the en route airways and jet routes crossing the North Pacific, so the impacts to controlled and uncontrolled airspace would be minimal. GMD ETR activities have the potential for intercept and target debris impacts to waters normally occupied by commercial shipping. The majority of international trade crossing the Pacific between Asia and North America uses routes of least distance, usually via the great circle route. Depending upon the individual scenarios, the actual debris impact area would be small.

SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate, and NOTMARs and NOTAMs would be issued to warn aircraft and marine surface vessels of the radar testing/operation. SBX tests would be conducted in areas that would minimize impacts to marine transportation. The SBX would generally be able to operate from a location that does not interfere with the air routes crossing the region. If the SBX were to operate in an air route location, non-participating aircraft could be routed around the SBX operating area. Continued monitoring of testing areas for other marine vessels would take place to ensure such areas remain clear.

As described in the section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX operations in the Pacific Ocean. The spectrum certification process would identify coordination requirements that would be followed by the SBX for all operations.

4.11.3.4 Cumulative Impacts

The Proposed Action would result in up to five launches (target and GBI combined) per year. This would be consistent with current levels of missile activities in the open ocean area. Each launch would result in falling inert debris such as target boosters, target re-entry vehicles,
interceptor missiles, target and intercept missile debris, or pallets and associated debris (metal fragments) and parachutes being deposited into the open ocean. However, each flight test and SBX test is a discrete short-term event, no population centers would be in the affected areas, and the Proposed Action would require the administration of NOTAMs and NOTMARs to warn aircraft and surface vessels of the potentially hazardous areas and allow them ample time to avoid hazards. Other missile test programs that could potentially affect the same area as the GMD ETR would also be short-term events and would not occur at the same time as the GMD ETR tests. Therefore, the potential for additive, incremental cumulative impacts from debris hazards or EMR exposure is extremely limited.

4.11.3.5 Mitigation Measures
Coordination between range personnel and with the FAA, Coast Guard, and other groups or agencies, as well as issuance of NOTMARs and NOTAMs, would be routine part of the Proposed Action. Additional health and safety mitigation measures are not proposed for GMD ETR activities.

4.11.4 TRANSPORTATION—BROAD OCEAN AREA

4.11.4.1 Gulf of Mexico
The initial sea trials would take place in the Gulf of Mexico and are designed to ensure maneuverability and control of the vessel. Since these tests may be run in parallel with the payload installation and checkout tests, mass simulators may be used to represent uninstalled portions during the stability and control evaluations. The emphasis would be on identifying and correcting problem operating conditions, such as vibrations that result from the installation of diesel and electric generators above the main deck or the vessel’s electric thrusters. These activities would not affect commercial shipping routes.

4.11.4.2 Enroute from Gulf of Mexico to Pacific Ocean
The SBX would use existing shipping routes along the coast of South America to get from the Gulf of Mexico to the Pacific Ocean. During this transit period, periodic testing of the SBX at predetermined locations would occur. Appropriate NOTMARs and NOTAMs would be issued to warn aircraft and surface vessels of the testing.

4.11.4.3 Pacific Ocean
GMD ETR activities have the potential for intercept and target debris impacts to waters normally occupied by commercial shipping. The majority of international trade crossing the Pacific between Asia and North America uses routes of least distance, usually via the great circle route. Depending upon the individual scenarios, the actual debris impact area would be small.

Prior warning of GMD ETR activities would enable commercial shipping to follow alternative routes away from the test area. The process is simplified by the lack of any formal shipping lanes in the northern Pacific. Safety procedures would be employed to determine that the impact areas are clear of surface vessels to ensure that no impact to ocean transportation would occur.

During the transit period into and through the Pacific Ocean area, periodic testing by the SBX (satellite and calibration device tracking) at predetermined locations would occur. Appropriate
NOTMARs and NOTAMs would be issued to warn aircraft and surface vessels of the testing, and those tests would be conducted in areas that would minimize impacts to marine transportation. The SBX would generally be able to operate from a location within the SBX performance region that does not interfere with the air routes crossing the region. If the SBX were to operate in an air route location, non-participating aircraft could be routed around the SBX operating area. Continued monitoring of testing areas for other marine vessels would take place to ensure such areas remain cleared. As mentioned previously, a completed DD Form 1494 would be required prior to SBX operations in the Pacific Ocean, and would assist in defining the operating area for the SBX.

4.11.4.4 Cumulative Impacts
Cumulative impacts would be minimized through early notification of aircraft and surface vessels through NOTMARs and NOTAMs, allowing commercial shipping to find alternative routes if necessary.

4.11.4.5 Mitigation Measures
Coordination between range personnel and with the FAA, Coast Guard, and other groups or agencies, as well as the aforementioned issuance of NOTMARs and NOTAMs, would be a routine part of the Proposed Action. No additional transportation mitigation measures are proposed.

4.12 CONFLICTS WITH FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AREA CONCERNED

The proposed program activities at KLC, Midway, RTS, PMRF, Vandenberg AFB, Pearl Harbor, NBVC Port Hueneme/San Nicolas Island, Naval Station Everett, Port Adak, and the Port of Valdez would be consistent with the existing land use. The proposed activities would not alter the use of the sites that currently support missile and rocket testing. Development of the SBX PSB would be in accordance with federal, state, and local planning plans and policies. All activities at RTS would comply with federal laws and regulations, the UES, and the Compact of Free Association between the RMI and the United States, and with regional and local land uses, policies, and regulation agreements. PMRF maintains federal jurisdiction for on-base land use; therefore, state and local land use laws are preempted.

Any potential conflicts with land use plans, policies, and controls would be a primary focus of agreements that would be negotiated with all affected federal, state, regional, and local agencies as applicable before implementation of the Proposed Action. Any closure of state recreational areas would be short-term, episodic events.

4.13 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL
Anticipated energy requirements of the GMD ETR program would be well within the energy supply capacity of all facilities. Energy requirements would be subject to any established energy conservation practices at each facility. No additional power generation capacity other than the potential use of generators would be required for any of the GMD ETR activities.
4.14 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Other than various structural materials and fuels, the program would require no significant natural or depletable resources.

4.15 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

In general, most known adverse effects resulting from implementation of the GMD ETR program would be mitigated through project planning and design measures, consultation with appropriate agencies, and the use of Best Management Practices. As a result, most potential adverse effects would be avoided, and those that could not be avoided should not result in a significant impact to the environment.

Adverse environmental effects that cannot be avoided include removal of vegetation at the proposed construction sites; minor short-term noise impacts to and startling of wildlife; the release of small amounts of pollutants into the atmosphere, the ground, and ocean; and minor increased generation of hazardous materials at program-related sites. Consultation with the appropriate agency would assist in developing mitigation measures to minimize the potential impacts to wetlands. Some short-term program-related impacts to air quality, soils, and water resources may occur. Any hazardous waste generated would be managed in compliance with DoD, and other applicable federal, state, and local regulations.

EMR levels would not exceed safety guidance and would not affect the public. During the construction phase there would be temporary disturbance to the immediate area around new fiber optic cable line routes; however, once the cable is installed, there would be no long-term impacts.

4.16 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Proposed GMD ETR activities would take advantage of existing facilities and infrastructure to the extent practicable. The use of land on Midway for an IDT and COMSATCOM would not eliminate options for continued and future use of the island. The uses of the sites at locations that were, or are, to support missile and rocket launches would not be altered. Therefore, the Proposed Action does not eliminate any options for future use of the environment for the locations under consideration.

4.17 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The Proposed Action is not expected to result in the loss of threatened or endangered species and no loss of cultural resources, such as archaeological or historic sites. There would be the use of irretrievable resources (e.g., construction materials, fuel, and labor). There would be some minor loss of biological habitat and wetlands, but impacts would be minimized through the
implementation of mitigation measures. Sensitive biological habitat would be avoided to the maximum extent practicable. Proposed activities would not irreversibly curtail the range of potential uses of the environment. Moreover, there would be no preclusion of development of underground mineral resources that were not already constrained.

Although the proposed activities would result in some irreversible or irretrievable commitment of resources such as various construction materials, minerals, and labor, this commitment of resources is not significantly different from that necessary for many other defense research and development programs carried out over the past several years. Proposed activities would not commit natural resources in significant quantities.

4.18 FEDERAL ACTIONS TO ADDRESS PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS (EXECUTIVE ORDER 13045, AS AMENDED BY EXECUTIVE ORDER 13229)

This EIS has not identified any environmental health and safety risks that may disproportionately affect children, in compliance with Executive Order 13045, as amended by Executive Order 13229.
4.0 ENVIRONMENTAL CONSEQUENCES

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4.0 ENVIRONMENTAL CONSEQUENCES

This chapter describes the potential environmental consequences associated with each location that may be affected by the Proposed Action, action alternatives, and the No Action Alternative along with the identification of potential cumulative impacts and mitigation measures. To assess the potential for and significance of environmental impacts from the proposed program activities, a list of activities was developed (chapters 1.0 and 2.0) and the environmental setting was described, with emphasis placed on any special environmental sensitivities (chapter 3.0). Program activities were then compared with the potentially affected environmental components to determine the environmental impacts of the proposed activities. To help define the affected environment and determine the significance of program-related effects, personal, written, and telephone contacts were made with applicable agencies.

Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. For this EIS, potential cumulative impacts are addressed for past, present, and future actions. Future actions were identified based on review of installation and regional land use plans and discussions with installation and regional planners.

Consistent with CEQ regulations, the scope of the analysis presented in this section was defined by the range of potential environmental impacts that could result. Resources that have a potential for impacts were considered in the analysis to provide the decision makers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 14 resource areas, which are discussed as applicable for each location.

Sections 4.1 through 4.11 provide discussions of the potential environmental consequences of the proposed GMD ETR program activities and the No Action Alternative. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.12 through 4.18 provide discussions of the following with regard to proposed program activities: conflicts with federal, state, and local land use plans, policies, and controls for the area concerned; energy requirements and conservation potential; natural or depletable resource requirements and conservation potential; adverse environmental effects that cannot be avoided; relationship between short-term use of the human environment and the maintenance and enhancement of long-term productivity; irreversible or irrevocable commitment of resources; Executive Order 13045, Federal Actions to Address Protection of Children from Environmental Health Risks and Safety Risks; and a summary of unresolved issues.
4.1 KODIAK LAUNCH COMPLEX

4.1.1 AIR QUALITY—KODIAK LAUNCH COMPLEX

This section addresses potential environmental impacts from changes in the air quality environment due to the proposed construction and operation of the GBI, target, IDT, and sensor elements of the GMD ETR at KLC, as well as the identification of potential cumulative impacts and mitigation measures. Impacts considered include potential effects from ongoing or planned activities at this site. Potential impacts were determined using the following criteria:

- Operations within attainment areas that could cause a detrimental change in attainment status of the area
- Increases in ambient air pollutant concentration that could cause exceedances of the NAAQS or state AAQS
- The U.S. Air Force standard for hydrogen chloride is 2 parts per million (ppm) for 60 minutes and 10 ppm for a maximum instantaneous level. These standards are based upon measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches (National Research Council, Commission of Life Sciences, Board of Environmental Studies and Toxicology, Committee on Toxicology, Subcommittee on Rocket Emission Toxicants, 1998).
- The standard used for aluminum oxide is 150 micrograms per cubic meter (μg/m³) is based upon the maximum NAAQS level of PM-10 concentrations over a 24-hour period.
- Increases in air pollutant concentrations greater than 1 μg/m³ (averaged over 24 hours) from new or modified major stationary sources within 10 kilometers (6 miles) of a Class I area.

Appendix B includes a detailed description of these air quality standards.

4.1.1.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches of all types covered by the launch site operator’s license would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. Missile propellant information for previous and predicted launches at KLC is shown in table 4.1.1-1.

The KLC EA predicted, under worst-case meteorological conditions, that NAAQS, Alaska AAQS, and U.S. Air Force and Non-criteria Pollutant guidance levels would not be exceeded during up to nine launches per year of the Athena-2, using Castor 120™ motors for propulsion (Federal Aviation Administration, 1996).
Table 4.1.1-1: Missile Propellant Information for Previous and Predicted Launches at KLC

<table>
<thead>
<tr>
<th>Missile</th>
<th>Booster</th>
<th>Propellant Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>ait</td>
<td>Stage I</td>
<td>6,296 (13,880)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>1,658 (3,655)</td>
</tr>
<tr>
<td>QRLV-1</td>
<td>Single Stage</td>
<td>4,705 (10,372)</td>
</tr>
<tr>
<td>QRLV-2</td>
<td>Single Stage</td>
<td>6,235 (13,748)</td>
</tr>
<tr>
<td>Athena-1</td>
<td>Stage I</td>
<td>48,876 (107,754)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>48,876 (107,754)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>9,766 (21,530)</td>
</tr>
<tr>
<td>Athena-2</td>
<td>Stage I</td>
<td>48,876 (107,754)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>9,766 (21,530)</td>
</tr>
<tr>
<td>Strategic Target System</td>
<td>Stage I</td>
<td>9,422 (20,772)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>4,025 (8,874)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>414 (913)</td>
</tr>
</tbody>
</table>


Operational emissions predicted at KLC include existing stationary sources. These stationary sources include three standby diesel generators operating at a maximum of 5 hours during launches, 1 hour per week for testing during non-launch periods and during commercial power outages (approximately 240 hours per year). Air quality impacts from these sources are considered to be temporary. (Federal Aviation Administration, 1996) Table 4.1.1-2 lists the estimated emissions generated by the four standby generators at KLC. KLC currently maintains a Pre-approved Limit Permit for these generators.

Table 4.1.1-2: Existing Generator Emissions at KLC

<table>
<thead>
<tr>
<th>Emissions (240 hours/year)</th>
<th>Oxides of Nitrogen metric tons (tons)/year</th>
<th>Hydrogen Chloride metric tons (tons)/year</th>
<th>Carbon Monoxide metric tons (tons)/year</th>
<th>PM-10 metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.76 (3.04)</td>
<td>0.37 (0.41)</td>
<td>3.46 (3.81)</td>
<td>0.14 (0.15)</td>
</tr>
</tbody>
</table>

Upper Atmosphere
According to the KLC EA, potential contributions to the upper atmosphere include emissions from ground-level operations and exhaust emissions from launch vehicles. Up to nine launches per year of the Athena-2, using the Castor 120™ motors for propulsion, were determined by the KLC EA to have a small impact on the levels of ozone found in the stratosphere; however, the release of chlorine (from the chemical reaction from the release of hydrogen chloride) and alumina (from the chemical reaction from the release of aluminum oxide) into the stratosphere would make a minimal contribution to the overall impact of ozone depletion. (Federal Aviation Administration, 1996)
Federal Aviation Administration
Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, no impacts to air quality would occur from launches at KLC.

4.1.1.2 Alternative 1

4.1.1.2.1 Ground-Based Interceptors

Construction
Construction at KLC, as described in section 2.3.1.1, would disturb approximately 14.4 hectares (35.5 acres). The majority of the ground disturbance would occur within 1 year, and it is projected that construction would take up to 15 months to complete. Construction emissions vary from day to day and activity to activity, with each activity having its own potential to release emissions. Because of the variability in timing and intensity of construction, estimating construction-phase pollutant emissions is difficult. Nevertheless, it is assumed that there would be PM-10 impacts from ground disturbance and other pollutants (carbon monoxide, oxides of nitrogen, volatile organic compounds, and oxides of sulfur) primarily emitted from construction equipment exhaust. Potential construction emissions were determined by using emission factors from various sources including the EPA. Conservative estimates are based on building square footage, acreage disturbed, and duration of construction, as well as general meteorological and soil information. For purposes of determining the level of fugitive dust generated, it was assumed all grading would be accomplished during the first year. Potential fugitive dust amounts were estimated using Air Quality Thresholds of Significance spreadsheets. Table 4.1.1-3 lists estimated carbon monoxide, oxides of nitrogen, volatile organic compounds, oxides of sulfur, and PM-10 emissions from construction equipment, earth moving and commuting workers anticipated during 15 months of construction of GBI facilities. Best Management Practices including proper tuning and preventative maintenance of construction vehicles would serve to minimize exhaust emissions and maximize vehicle performance.

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 (metric tons)</th>
<th>Year 2 (metric tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>9.0 (10.5)</td>
<td>3.4 (3.8)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>13.7 (15.1)</td>
<td>3.0 (3.3)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>1.76 (1.94)</td>
<td>0.58 (0.64)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.78 (0.86)</td>
<td>0.14 (0.15)</td>
</tr>
<tr>
<td>PM-10</td>
<td>34 (37.5)</td>
<td>-</td>
</tr>
</tbody>
</table>

Approximately 68 metric tons (75 tons) of PM-10 could be produced during the construction of the facilities. Best Management Practices would be used to reduced PM-10 emissions by half to approximately 34 metric tons (37.5 tons) using dust suppression measures such as periodically watering the areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near
the work areas, and wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas.

For conservative analytical purposes, it is assumed that 50 of the 100 additional construction personnel would utilize an existing mancamp located approximately 4 kilometers (3 miles) from the construction site. The remaining 50 were assumed to commute to and from the City of Kodiak or to and from accommodations in the area surrounding KLC. Commuting emission levels were based upon federal primary exhaust emission standards for vehicles for an entire day of commuting (to KLC and back). If either the additional mancamp was constructed or the existing mancamp was added to, then all 100 construction personnel would be housed in close proximity to KLC, greatly reducing the potential commuting emissions.

Construction emission levels are below de minimis levels set by the federal government for non-attainment areas. The de minimis thresholds are federal limits listed in 40 CFR 51.583(b)(1). Federal actions with emissions below the de minimis levels are presumed to conform, that is, not cause or contribute to new violations of NAAQS, in areas that are in non-attainment. For the least severe nonattainment areas, the de minimis level for each criteria pollutant (and their precursors, in the case of ozone) is 90.7 metric tons (100 tons) per year.

Construction would be conducted in accordance with applicable federal and state regulations and permits. While the construction would cause an increase in air pollutants, the impact would be both temporary and localized. Once construction ceased, air quality would return to its former level. Since the area is currently in attainment for all federal standards and construction emissions would be within de minimis levels for non-attainment areas, it is anticipated that the proposed construction would not cause exceedances of the NAAQS or Alaska AAQS and would not have a long-term impact to air quality in the area.

Operation

Pre-Launch Activities
The manufacturing of GBI vehicle components would occur offsite in existing facilities that normally perform this type of production, and emissions at these locations have not been included in the scope of this EIS. The components would arrive complete, requiring only final onsite safety and quality checks before assembly.

Pre-launch activities would include the transportation of the interceptor missile boosters, payloads, and support equipment by either air or ship. This transportation would result in some mobile exhaust emission, but these emissions would be intermittent and would not have a measurable impact on regional air quality. The interceptor could arrive at KLC with the EKV attached, or the booster may be shipped separately from the EKV. Either way, integration and assembly operations would be performed at KLC.

Onsite fueling of the interceptor or EKV would not be required; the interceptor motor would utilize pre-loaded solid propellants. Each EKV would contain pre-loaded liquid propellant and oxidizer. The propellants would be delivered to the launch site in pre-filled and sealed tanks that would be ready to be installed onto the vehicle. Installation would only require mechanical tubing connections.
During nominal propellant tank installation, the propellants remain sealed inside their tanks. The likelihood of an accidental release of the liquid fuel or oxidizer would be low. However, if such an accident were to occur, it would most likely occur during missile assembly. Table 4.1.1-4 indicates the results of analysis using the U.S. Air Force Toxic Corridor Model computer model to determine distances at which the Immediately Dangerous to Life and Health (IDLH) health standard could be exceeded assuming all 7.5 liters (2 gallons) of fuel and 5.5 liters (1.5 gallons) of oxidizer were released to the atmosphere during an accident. The IDLH is the level of exposure (not time-weighted) above which it is thought a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment. The IDLH level was the only level of concern as others are based on time weighted averages over prolonged exposures.

Table 4.1.1-4: Potential Exceedances Due to Accidental Oxidizer or Fuel Leak at KLC

<table>
<thead>
<tr>
<th>Propellant</th>
<th>Health Standard</th>
<th>Standard Limit</th>
<th>Exceedance Distance b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine</td>
<td>NIOSH IDLH a</td>
<td>50 ppm (66.5 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Methyl Hydrazine</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (38.4 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (liquid)</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (36 mg /m³)</td>
<td>60 meters (197 feet)</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (gas)</td>
<td>NIOSH IDLH a</td>
<td>20 ppm (36 mg /m³)</td>
<td>30 meters (98 feet)</td>
</tr>
</tbody>
</table>

Source: Center for Disease Control and Prevention, 2002a, b; Asia Pacific Space Launch Centre EIS Site, 2002.

aThe National Institute for Occupational Safety and Health (NIOSH) Immediately Dangerous to Life and Health (IDLH) is the level of exposure (not time-weighted) above which it is anticipated a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment.
bExceedance Distance—Average of U.S. Air Force Toxic Corridor model results for 15-minute and 30-minute averaging time and multiple stability classes

ppm = parts per million by volume.
mg/m³ = milligrams per cubic meter

Actual hazard distances would depend on the propellant released, the amount released, meteorological conditions, and emergency response measures taken. AADC’s approved SOPs would be implemented and would include personal protection equipment procedures. Establishment of and adherence to these SOPs would minimize the potential hazards to personnel in the unlikely event of an unplanned propellant release. The low likelihood of such an event and the implementation of approved emergency response plans would limit the impact of such a release.

Personnel would include a combination of contractor, military, and government civilian. The largest manpower buildup at KLC would be 55 the first month, 120 the second month, and 235 the third month to support a dual interceptor launch. It is assumed that approximately 50 personnel would be housed at the existing mancamp on Kodiak Ranch. If the additional mancamp is not constructed on KLC or the existing mancamp is not added on to, then it is conservatively estimated that the remaining 185 personnel would commute daily to KLC from accommodations in the surrounding areas and within the City of Kodiak during a peak month. Commuting emission levels were based upon federal primary exhaust emission standards for vehicles for an entire day of commuting (to and from KLC) and estimated to be 2.0 metric tons (2.2 tons) of carbon monoxide and 0.24 metric tons (0.26 tons) of oxides of nitrogen.
Offsite power sources are planned for primary use, with emergency generators supplying backup power. The emergency backup generators would be operated under appropriate permits and restrictions. In addition to the generators themselves, appropriate ASTs would be installed adjacent to each generator. Table 4.1.1-5 lists the generator and AST sizes for each facility. Table 4.1.1-6 lists the possible emissions associated with each generator.

Table 4.1.1-5: Potential Generator and Aboveground Storage Tanks for GBI Facilities at KLC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Generator</th>
<th>Aboveground Storage Tanks</th>
<th>Operation hours/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile Assembly Building</td>
<td>500 kW</td>
<td>9,464 (2,500)</td>
<td>250</td>
</tr>
<tr>
<td>Oxidizer Storage</td>
<td>60 kW</td>
<td>2,082 (550)</td>
<td>250</td>
</tr>
<tr>
<td>Mechanical/Electrical</td>
<td>1,650 kW</td>
<td>1,893 (500)</td>
<td>250</td>
</tr>
<tr>
<td>Entry Control</td>
<td>60 kW</td>
<td>2,082 (550)</td>
<td>250</td>
</tr>
</tbody>
</table>

Table 4.1.1-6: Potential Generator Emissions at KLC

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen metric tons (tons)/year</th>
<th>Hydrogen Chloride metric tons (tons)/year</th>
<th>Carbon Monoxide metric tons (tons)/year</th>
<th>PM-10 metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBI Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 kW Diesel Generator</td>
<td>1.2 (1.3)</td>
<td>0.16 (0.18)</td>
<td>1.5 (1.6)</td>
<td>0.06 (0.07)</td>
</tr>
<tr>
<td>60 kW Diesel Generator</td>
<td>0.14 (0.15)</td>
<td>0.020 (0.021)</td>
<td>0.17 (0.19)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>1,650 kW Diesel Generator</td>
<td>3.8 (4.2)</td>
<td>0.54 (0.59)</td>
<td>4.7 (5.2)</td>
<td>0.23 (0.25)</td>
</tr>
<tr>
<td>60 kW Diesel Generator</td>
<td>0.14 (0.15)</td>
<td>0.020 (0.021)</td>
<td>0.17 (0.19)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>Target Facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 kW Diesel Generator</td>
<td>0.14 (0.15)</td>
<td>0.020 (0.021)</td>
<td>0.17 (0.19)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>500 kW Diesel Generator</td>
<td>1.2 (1.3)</td>
<td>0.16 (0.18)</td>
<td>1.5 (1.6)</td>
<td>0.06 (0.07)</td>
</tr>
<tr>
<td>IDT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>275 kW Diesel Generator</td>
<td>0.60 (0.70)</td>
<td>0.09 (0.10)</td>
<td>0.80 (0.90)</td>
<td>0.03 (0.04)</td>
</tr>
<tr>
<td>Sensors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 kW Diesel Generator</td>
<td>0.077 (0.085)</td>
<td>0.011 (0.012)</td>
<td>0.096 (0.106)</td>
<td>0.0045 (0.0050)</td>
</tr>
<tr>
<td>10 kW Diesel Generator</td>
<td>0.077 (0.085)</td>
<td>0.011 (0.012)</td>
<td>0.096 (0.106)</td>
<td>0.0045 (0.0050)</td>
</tr>
<tr>
<td>TPS-X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 MW Diesel Generator</td>
<td>34.8 (38.3)</td>
<td>4.19 (4.62)</td>
<td>43.1 (47.5)</td>
<td>2.04 (2.25)</td>
</tr>
<tr>
<td>Total</td>
<td>42.17 (46.42)</td>
<td>5.22 (5.75)</td>
<td>52.30 (57.58)</td>
<td>2.45 (2.71)</td>
</tr>
</tbody>
</table>

The generators would operate as backup during launches, weekly for testing during non-launch periods, and during commercial outages. The total operating time is estimated at a maximum of 250 hours per year. Use of these generators would require an amendment to the existing Pre-approved Limit Permit.
Table 4.1.1-6 also shows the total emissions from GBI, target, IDT, sensors, and TPS-X at KLC. Although not in a non-attainment area, these totals are below the *de minimis* thresholds and therefore would not cause exceedances of the NAAQS or Alaska AAQS.

**Launch Activities**

Alternative 1 includes up to a total of five missile launches (GBI and target combined) per year at KLC over the duration of the test program. Table 4.1.1-7 lists propellant information for the proposed GBI. Table 4.1.1-8 lists possible emissions from stage one of the proposed single GBI launch.

**Table 4.1.1-7: Propellant Information for Proposed GBI at KLC**

<table>
<thead>
<tr>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>15,069 (33,221)</td>
</tr>
<tr>
<td>Stage II</td>
<td>3,926 (8,655)</td>
</tr>
<tr>
<td>Stage III</td>
<td>772 (1,701)</td>
</tr>
</tbody>
</table>

**Table 4.1.1-8: Potential GBI Stage 1 Exhaust Emissions (Single Launch) at KLC**

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Stage 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide metric tons (tons)</td>
<td>3.01 (3.32)</td>
</tr>
<tr>
<td>Carbon Monoxide metric tons (tons)</td>
<td>0.98 (1.08)</td>
</tr>
<tr>
<td>Carbon Dioxide metric tons (tons)</td>
<td>1.47 (1.62)</td>
</tr>
<tr>
<td>Nitrogen metric tons (tons)</td>
<td>5.77 (6.36)</td>
</tr>
<tr>
<td>Hydrogen Chloride metric tons (tons)</td>
<td>1.77 (1.95)</td>
</tr>
<tr>
<td>Water metric tons (tons)</td>
<td>1.93 (2.13)</td>
</tr>
<tr>
<td>Other metric tons (tons)</td>
<td>0.16 (0.18)</td>
</tr>
</tbody>
</table>

Source: Nyman, 2003

Dual GBI launches were analyzed using Open Burn/Open Detonation Dispersion Model (OBODM) to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. Table 4.1.1-9 lists emission concentrations and standards. As shown on table 4.1.1-9, concentrations produced by dual launches of a dual GBI would remain within NAAQS, Alaska AAQS, and U.S. Air Force standards. It is anticipated that a nominal single launch would also remain within NAAQS and U.S. Air Force standards as fewer emissions would be released during a single launch.

While the area KLC is located in is in attainment for all federal emission standards, federal *de minimis* threshold limits listed in 40 CFR were used to compare oxides of nitrogen and carbon monoxide. In the event that five GBIs were launched in a year, the conservatively estimated annual emissions for oxides of nitrogen were determined to be 28.8 metric tons (31.8 tons), below the 45.4-metric-ton (50-ton) standard. Carbon monoxide was calculated at 4.9 metric tons (5.4 tons) for five launches, which is well below the 90.7-metric-ton (100-ton) annual standard.
Table 4.1.1-9: Potential GBI Exhaust Emissions (Dual Launch) at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Averaging Period</th>
<th>Dual Launch Emissions</th>
<th>On-Pad Dual Accident Emissions</th>
<th>Emissions Standards level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>0.25 ppm</td>
<td>0.009 ppm</td>
<td>35 ppm (1)</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td></td>
<td></td>
<td>35 ppm</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour</td>
<td>3 μg/m³</td>
<td>0.2 mg/m³</td>
<td>150 μg/m³ (2)</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td></td>
<td></td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour</td>
<td>0.3 ppm</td>
<td>3 ppm</td>
<td>2 ppm (3)</td>
</tr>
<tr>
<td></td>
<td>Peak</td>
<td>5 ppm</td>
<td>36 ppm</td>
<td>10 ppm (3)</td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS  
(2) Based upon the maximum NAAQS level of PM-10 concentrations over a 24-hour period  
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

Personnel would be evacuated to a safe distance before a launch according to established launch procedures as stated in section 3.1.7, Health and Safety. Due to the mobile nature of the interceptor itself, only a small portion of the launch exhaust would be emitted near the ground. With typical meteorological conditions, prevailing winds from the northwest, the ground-cloud of exhaust would be carried to the ocean. In all cases of weather conditions, significant air quality impacts due to missile launches are not anticipated.

If flight termination becomes necessary, the potential resulting fire would cause short-term impacts to air quality in the form of combustion byproducts and potentially hazardous fumes. Most or all of the solid propellant fuel would likely burn up before being extinguished. These combustion byproducts would be similar to those previously described for a nominal launch.

Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of an on-pad accident involving dual GBIs. The modeling showed that both the 1-hour and peak hydrogen chloride Air Force standards would be exceeded (table 4.1.1-9). The 8-hour, 24-hour, and IDLH hydrogen chloride standards were not exceeded. All other standards would continue to be within NAAQS and Alaska AAQS. The consequences to regional air quality would be localized for both the 1-hour and peak hydrogen chloride Air Force standard (exceedance out to 1 kilometer [0.6 mile] and 3.7 kilometers [2.3 miles], respectively beyond the KLC boundary) and would be of a short duration. The modeling included both day and nighttime meteorological data. The nighttime data is generally very calm wind conditions which results in higher emission concentrations. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and the conservative nature of the modeling data inputs, the impact to regional air quality is considered minor.

Post-Launch Activities
Post-launch activities would include the removal of all mobile equipment and assets brought to KLC. A negligible impact would be anticipated to air quality resulting from slightly increased vehicular emissions and localized amounts of fugitive dust (PM-10).
4.1.1.2.2 Targets

Construction

Approximately 10.5 hectares (26 acres) of land would be disturbed during the construction of target facilities. Calculation of construction emissions followed the same methodology as described in section 4.1.1.2.1. Table 4.1.1-10 lists estimated carbon monoxide, oxides of nitrogen, volatile organic compounds, and oxides of sulfur emissions anticipated during up to 15 months of construction of target missile facilities. Best Management Practices, including proper tuning and preventive maintenance of construction vehicles, would serve to minimize exhaust emissions and maximize vehicle performance.

Table 4.1.1-10: Potential Construction Emissions for Target Facilities at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 metric tons (tons)</th>
<th>Year 2 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>9.0 (10.3)</td>
<td>3.4 (3.5)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>13.7 (15.1)</td>
<td>3.0 (3.3)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>1.76 (1.94)</td>
<td>0.58 (0.64)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.78 (0.86)</td>
<td>0.14 (0.15)</td>
</tr>
<tr>
<td>PM-10</td>
<td>25 (27.5)</td>
<td></td>
</tr>
</tbody>
</table>

Approximately 50 metric tons (55 tons) of PM-10 could be produced during the construction of the facilities. The use of Best Management Practices would reduce this number by half to approximately 25 metric tons (27.5 tons) using dust suppression measures such as periodically watering the areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near the work areas, and wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas. Impacts due to personnel at KLC for construction of target facilities would be the same as those described in section 4.1.1.2.1 for construction of GBI facilities.

Operation

Pre-Launch Activities

Pre-launch activities include the transportation of the target to KLC and assembly of the target at KLC. The mobile exhaust emissions resulting from transportation of the target would be intermittent and would not have a measurable impact to regional air quality. The targets would be assembled and stored in the Missile Assembly Building until launch.

If used as a target, the fourth stage of a Peacekeeper target would utilize a single liquid propellant (hydrazine), and onsite fueling would be required. Although total vapor emissions can vary depending on the propellant transfer equipment used and how it is assembled, it is anticipated that only very small amounts (approximately 10 grams [0.4 ounce]) of vapors would be released to the atmosphere during the transfer operation. These normal fueling operations would marginally impact air quality for momentary periods of time.

It is unlikely that a propellant release larger than that described above would occur at KLC. However, if such an accidental release were to occur, it would most likely occur during fueling. A reasonable scenario would involve failure of the transfer equipment or valves. The analysis
assumes a leak contained over a 3-minute period that releases up to 17 liters (4.5 gallons) of hydrazine fuel. Analysis indicated no potential exceedances of the IDLH health standard of 50 ppm. The low likelihood of such an occurrence and the implementation of approved emergency response plans would limit the impact of such a release.

Emergency generators would supply backup power to target facilities with offsite commercial power sources. The emergency backup generators would be operated under appropriate permits and restrictions. In addition to the generators themselves, appropriate ASTs would be installed adjacent to each generator. Table 4.1.1-11 lists the generators and the size of ASTs for each facility.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Generator</th>
<th>Aboveground Storage Tank liters (gallons)</th>
<th>Operation (hours/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missile Assembly Building</td>
<td>500 kW</td>
<td>9,464 (2,500)</td>
<td>250</td>
</tr>
<tr>
<td>Movable Missile Building</td>
<td>500 kW</td>
<td>9,464 (2,500)</td>
<td>250</td>
</tr>
<tr>
<td>Missile Storage</td>
<td>60 kW</td>
<td>2,082 (550)</td>
<td>250</td>
</tr>
</tbody>
</table>

The generators would operate as backup during launches, weekly for testing during non-launch periods, and during commercial outages. The total time of operation is estimated at a maximum of 250 hours per year. Emissions produced during the generators’ expected limited operation are listed in table 4.1.1-6. Use of these generators would require an amendment to the existing Pre-approved Limit Permit. These levels of emissions would not be expected to impact regional air quality.

Launch Activities

Proposed target launches would be similar to previous target launches at KLC. These land launched target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. Table 4.1.1-12 lists missile propellant information, and table 4.1.1-13 lists potential emission constituents during Stage I for each proposed missile. A total of five missile launches (GBI and/or target) per year would be anticipated at KLC over the duration of the program.

Each launch is a discrete event. The logistics of the launch would allow sufficient time between launches so that no exhaust from one launch would impact the ambient air quality of another launch. The conclusion presented in the KLC EA was that overall impacts to regional air quality are not expected to be adverse and would remain within NAAQS and state AAQS for a single launch of the Athena 2 missile with the Castor 120™ motor. (Federal Aviation Administration, 1996) The nominal launch of a single Peacekeeper Target is anticipated to remain within NAAQS, Alaska AAQS, and Air Force standards as, the first stage of a Peacekeeper Target is a military version of the Castor 120 motor used in the Athena 2 missile.
### Table 4.1.1-12: Missile Propellant Information for Proposed Targets at KLC

<table>
<thead>
<tr>
<th>Missile</th>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>Stage I</td>
<td>9,422 (20,772)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>4,025 (8,874)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>414 (913)</td>
</tr>
<tr>
<td>Minuteman II Target</td>
<td>Stage I</td>
<td>20,810 (45,877)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>6,296 (13,880)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>1,658 (3,655)</td>
</tr>
<tr>
<td>Peacekeeper Target</td>
<td>Stage I</td>
<td>44,661 (98,459)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>24,556.3 (54,136.5)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>7,068.7 (15,583.9)</td>
</tr>
<tr>
<td></td>
<td>Stage IV</td>
<td>644 (1,420)</td>
</tr>
<tr>
<td>Trident I (C4) Target</td>
<td>Stage I</td>
<td>17,667 (38,948)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>7,924 (17,469)</td>
</tr>
<tr>
<td></td>
<td>AKM</td>
<td>415 (914)</td>
</tr>
</tbody>
</table>

### Table 4.1.1-13: Potential Target Exhaust Emissions (Single Launch) at KLC

<table>
<thead>
<tr>
<th>Missile</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Chlorine metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Hydrogen metric tons (tons)</th>
<th>Water metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>3.56 (3.92)</td>
<td>0.019 (0.020)</td>
<td>2.35 (2.59)</td>
<td>0.19 (0.21)</td>
<td>0.22 (0.24)</td>
<td>0.60 (0.66)</td>
<td>1.58 (1.74)</td>
<td>0.87 (0.96)</td>
</tr>
<tr>
<td>Minuteman II Target</td>
<td>6.29 (6.93)</td>
<td>0.027 (0.030)</td>
<td>5.00 (5.51)</td>
<td>0.77 (0.85)</td>
<td>0.44 (0.48)</td>
<td>1.98 (2.18)</td>
<td>4.47 (4.93)</td>
<td>1.83 (2.02)</td>
</tr>
<tr>
<td>Peacekeeper Target</td>
<td>15.58 (17.17)</td>
<td>0.085 (0.093)</td>
<td>9.75 (10.75)</td>
<td>0.65 (0.72)</td>
<td>0.23 (0.25)</td>
<td>5.04 (5.55)</td>
<td>7.12 (7.85)</td>
<td>3.65 (4.03)</td>
</tr>
<tr>
<td>Trident I (C4) Target</td>
<td>6.71 (&lt;0.010)</td>
<td>&lt;0.009 (6.04)</td>
<td>5.48 (0.39)</td>
<td>0.35 (0.79)</td>
<td>0.72 (0.43)</td>
<td>0.39 (4.06)</td>
<td>NA (4.48)</td>
<td>NA</td>
</tr>
</tbody>
</table>

NA = Not available

Dual Peacekeeper Target launches were analyzed using OBODM to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. Dual emissions were modeled using the Peacekeeper Target as it is the largest of the proposed target vehicles. Emission concentrations and standards are listed in table 4.1.1-14. As shown in table 4.1.1-14, the level of hydrogen chloride would be below the 1-hour Air Force standard, but would exceed the peak hydrogen chloride standard for a short duration (out to a distance of 400 meters (1312 feet) beyond the KLC boundary). The 8-hour, 24-hour, and IDLH hydrogen chloride standards were not exceeded. Other emissions are shown to be within NAAQS standards.
Table 4.1.1-14: Potential Peacekeeper Target Exhaust Emissions (Dual Launches) at KLC

<table>
<thead>
<tr>
<th>Emission</th>
<th>Averaging Period</th>
<th>Dual Launch</th>
<th>Dual On-Pad Accident</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>1.8 ppm</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.014 ppm</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour</td>
<td>16 μg/m³</td>
<td>150 μg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.3 mg/m³</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour</td>
<td>1 ppm</td>
<td>5 ppm</td>
<td>2 ppm</td>
</tr>
<tr>
<td></td>
<td>Peak</td>
<td>13 ppm</td>
<td>67 ppm</td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS
(2) Based upon the maximum NAAQS level of PM-10 concentrations over a 24-hour period
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

KLC is considered to be in attainment for all federal emission standards; however, federal de minimis threshold limits listed in 40 CFR were used to compare levels of carbon monoxide and oxides of nitrogen. In the event that five Peacekeeper Target launches occur in a year, the conservative calculation of annual emissions of carbon monoxide would be 48.8 metric tons (53.8 tons), which is below the 90.7-metric-ton (100-ton) annual standard. Emissions of oxides of nitrogen were estimated to be 18.3 metric tons (20.2 tons), also below the de minimis standard of 45.3 metric tons (50 tons).

Personnel would be evacuated to a safe distance before a launch according to established launch procedures as stated in section 3.1.7, Health and Safety. Due to the mobile nature of the target missiles, only a small portion of the launch exhaust would be emitted near the ground. With typical meteorological conditions, prevailing winds from the northwest, the ground-cloud of exhaust would be carried to the ocean. In all cases of weather conditions, significant air quality impacts due to missile launches are not anticipated.

If flight termination becomes necessary, the potential resulting fire would cause short-term impacts to air quality in the form of combustion byproducts and potentially hazardous fumes. Most or all of the solid propellant fuel would likely burn up before being extinguished. These combustion byproducts would be similar to those previously described for a nominal launch.

Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of on-pad accidents involving dual Peacekeeper Targets. The model results show that both the 1-hour and peak hydrogen chloride Air Force standards would be exceeded (table 4.1.1-14). The 8-hour, 24-hour, and IDLH hydrogen chloride standards were not exceeded. All other standards would continue to be within NAAQS and Alaska AAQS. The consequences to regional air quality would be localized for both the 1-hour and peak hydrogen chloride Air Force standard (exceedance out to 6.5 kilometers [4 miles] and 7 kilometers [4.3 miles], respectively beyond the KLC boundary) and would be of a short duration. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and the conservative nature of the modeling data inputs, the impact to regional air quality is considered minor.
Post-Launch Activities

Post-launch activities would include the removal of all mobile assets brought to KLC. This removal could result in small localized amounts of PM-10, which would have only minor impacts to air quality.

4.1.1.2.3 In-Flight Interceptor Communication System Data Terminal

Construction

Alternative 1 would require the construction of one IDT (among three alternative sites), one COMSATCOM (among four alternatives), and connecting roads. The greatest emissions would be during site preparation activities that include grubbing and clearing of vegetation, site grading and stockpiling of soil and select fill materials. The largest of the IDT sites would require approximately 5.9 hectares (14.6 acres) of land to be disturbed, and one COMSATCOM site would disturb 2.8 hectares (7.0 acres). Potential construction emissions for both the largest IDT site and one COMSATCOM are listed in table 4.1.1-15.

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.72 (0.79)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>3.30 (3.60)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>0.51 (0.57)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.23 (0.25)</td>
</tr>
<tr>
<td>PM-10</td>
<td>20.5 (23.0)</td>
</tr>
</tbody>
</table>

Construction activities for IDT and COMSATCOM facilities could produce approximately 41 metric tons (46 tons) of PM-10. It is anticipated that this PM-10 volume would be reduced by half to 20.5 metric tons (23 tons) through implementation of Best Management Practices for dust suppression during site preparation activities. Only minor impacts would be anticipated to air quality from construction activities. Site preparation activities would be relatively short in duration affect a relatively small footprint, and would employ a variety of Best Management Practices.

Operation

Operation of the IDT and COMSATCOMs would have little effect on regional air quality. Power would be provided by offsite commercial power sources, however in the event of loss of power a 275 kW diesel generator would be utilized along with the 3,785-liter (1,000-gallon) AST for fuel. Emissions produced during the generator’s limited operation are listed in table 4.1.1-6. These levels of emissions would not be expected to impact regional air quality. The generator would be tested weekly during non-launch periods and during power outages, approximately 250 hours a year. Use of this generator would require an amendment to the existing Pre-approved Limit Permit.
Personnel associated with the IDT and COMSATCOMs would be included in the up to 235 personnel needed to support a dual interceptor launch and would not cause an additional air quality impact.

4.1.1.2.4 Sensors

Construction

Alternative 1 would utilize an existing gravel pad area for mobile telemetry and would not require new construction; therefore there would be no air quality impacts.

Operation

Operation of the mobile telemetry would have a minor impact on the regional air quality. Power would be provided by two 10-kW generators for the mobile telemetry. Anticipated emissions from the use of these generators would be for a 1-week period, up to five times per year. Table 4.1.1-6 lists the possible emissions from use of the generators. Use of these generators would require an amendment to the existing Pre-approved Limit Permit.

4.1.1.2.5 TPS-X

Construction

The installation of the TPS-X at KLC would require the construction of a pad for the 38- by 58-meter (125- by 190-foot) hardstand and disturbance of approximately 0.3 hectare (0.8 acre). The potential TPS-X location would be the same as for the potential IDT site south of the Loran-C Station. Table 4.1.1-16 lists estimated emission levels of carbon monoxide, oxides of nitrogen, volatile organic compounds, oxides of sulfur and PM-10.

<table>
<thead>
<tr>
<th>Emission</th>
<th>Year 1 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.039 (0.043)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>0.18 (0.20)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>0.028 (0.031)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.012 (0.013)</td>
</tr>
<tr>
<td>PM-10</td>
<td>0.77 (0.85)</td>
</tr>
</tbody>
</table>

It is anticipated that the volume of PM-10 produced during construction would be reduced by half through the implementation of Best Management Practices for dust suppression during site preparation activities.

Operation

The prime power unit for the TPS-X at KLC would be a 1.5-MW generator that would provide power to the radar during testing. The generator is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during launch activities. The total time of operation is estimated at a maximum of 2,520 hours per year. Potential generator emissions for
the TPS-X are listed in table 4.1.1-6. Use of this generator would require an amendment to the existing Pre-approved Limit Permit.

4.1.1.3 Alternative 2

4.1.1.3.1 Targets
Target activities associated with Alternative 2 would be similar to those of Alternative 1.

Construction
Construction would include a total disturbed area of 10.5 hectares (26 acres), the same as identified for Alternative 1. Construction impacts would be as described for Alternative 1.

Operation
Operation impacts from pre-launch, launch, and post-launch activities of target launches in Alternative 2 would be similar to those described for target launches in Alternative 1 in section 4.1.1.2.2.

4.1.1.3.2 Sensors
Effects from construction and operation of a mobile telemetry at KLC for Alternative 2 would be the same as described for the sensors of Alternative 1 in section 4.1.1.2.4.

4.1.1.4 Alternative 3
Alternative 3 would include all aspects of Alternative 1. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and launch impacts for Alternative 3 would be as described for Alternative 1.

4.1.1.5 Cumulative Impacts
Due to the limited industrialization of Kodiak Island and the surrounding environment, the potential cumulative impacts to air quality due to the proposed interceptor and target facility construction and launches would not be substantial. No other construction is anticipated to occur at the same time as the proposed construction activities. The KLC EA indicated no significant impacts to air quality as a result of nine annual launches and that impacts do not accumulate with multiple launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA.

Dual launches of either interceptors or targets would result in increased exhaust emissions compared to a single launch. However, the emissions would disperse quickly and the overall air quality would continue to remain within NAAQS and Alaska AAQS. Proposed activities along with current activities at KLC, including the use of three standby generators, are not anticipated to result in cumulative impacts to air quality.
4.1.1.6 Mitigation Measures
No air quality mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.2 AIRSPACE—KODIAK LAUNCH COMPLEX
Site preparation activities for interceptor, target missiles, IDT, or the TPS-X would have no impact on controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI. Since site preparation activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from the airport air traffic control tower, decrease airport capacity or efficiency, affect future VFR or IFR, or affect the usable length of an existing or planned runway, they would also not constitute an obstruction to air navigation.

Potential impacts from flight test activities are discussed below for each alternative.

4.1.2.1 No Action Alternative

Missile Defense Agency
Under the MDA’s No Action Alternative, launches would continue to occur at KLC although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. The use of KLC for flight preparation and launches has been analyzed in the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b), the KLC EA (Federal Aviation Administration, 1996) and two U.S. Air Force documents (U.S. Department of the Air Force, 1997a; 2001). These documents concluded that close coordination with the FAA would result in no adverse effects to airspace from launches at KLC.

Under the MDA’s No Action Alternative, KLC would continue to conduct up to nine launches per year through September 2003 as specified in the current launch site operator license. The current license is scheduled for renewal in September 2003. The new license, if issued would outline the terms under which launches would be conducted at KLC. The renewal period would be for another 5 years.

Federal Aviation Administration
Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to airspace from launches at KLC.

4.1.2.2 Alternative 1
Potential airspace impacts from implementation of the Proposed Action include the following activities:

- Potential impacts to controlled and uncontrolled airspace
- Potential impacts to existing special use airspace
- Potential impacts to en route airways and jet routes
- Potential impacts to airports and airfields
Controlled and Uncontrolled Airspace

The ROI, located in international uncontrolled class G airspace, has no formal airspace restrictions governing it. Before launching the GBI or target missile from KLC, NOTAMs would be sent in accordance with FAA protocols and DoD requirements. The U.S. NOTAM System, Sections 3-2n(1)(a) and (b), deals with operations/exercises over the high seas, host nation territory, international airspace, and bare-base locations, and specifies the International NOTAM office coordination requirements and procedures as per U.S. Army Regulation 95-10, Department of Defense Notice to Airmen (NOTAM) System, 1 January 1997.

To satisfy airspace safety requirements in accordance with DoD requirements, the KLC Range Safety Officer would obtain approval from the Administrator, FAA. Provision would be made for surveillance of the affected airspace. In addition, safety regulations dictate that launch operations would be suspended when it is known or suspected that any unauthorized aircraft have entered any part of the surface danger zone until the unauthorized entrant has been removed or a thorough check of the suspected area has been performed. When the probability is less than 1x10^-7 that an aircraft would be in an unsafe proximity to the GBI or target missile, the Range Safety Office may establish segmented safety zones to allow for some unrestricted air routes under the flight path during the launch window.

If the TPS-X radar is located at KLC, EMR hazard zones would be established. The potential interference distances are shown in figure 2.3.1-8. The personnel exclusion area would extend for 150 meters (492 feet) in front of the radar. The FAA would be requested to establish a navigation warning advising aircraft to remain at least 1,500 meters (4,900 feet) from the TPS-X radar site during use. EEDs in the presence and shipping phase, such as a missile mounted on an aircraft, would need to be at least 800 meters (2,625 feet) from the radar. EEDs on the ground in the handling phase would need to be at least 400 meters (1,312 feet) from the radar due to potential sidelobe exposure. The interference areas are directional, and would be centered on the launch azimuth, between 135 degrees and 225 degrees.

A visual survey of the area would be conducted to verify that all personnel are outside the hazard zone before startup. Personnel may not enter these hazard zones while the radar is in operation. The radar is prevented from illuminating in a designated cutoff zone, in which operators and all other system elements would be located. Potential safety consequences associated with radar interference with other electronic and emitter units (flight navigation systems, tracking radars, etc.) would also be examined before startup. Adherence to AADC, FAA, and DoD safety procedures relative to radar operations would preclude significant impact to airspace.

Special Use Airspace

There is no special use airspace in the KLC ROI, and as such there would be no impact on airspace from proposed program activities.

En Route Airways and Jet Routes

Coordination between KLC and the controlling airspace agencies (Anchorage and Oakland ARTCC) would minimize potential impacts to the commercial air corridors entering and exiting Kodiak Airport north of KLC (figure 3.1.2-1), and the flexible tracks south of KLC that are used to transition to the North Pacific route system.
Airports and Airfields
The proposed activities in Alternative 1 would not restrict access to, nor affect the use of, existing airfields and airports in the ROI.

4.1.2.3 Alternative 2
The proposed activities at KLC under Alternative 2 would be similar to those described under Alternative 1. Alternative 2 involves launching only target missiles, but the potential impacts to airspace would be the same.

4.1.2.4 Alternative 3
Alternative 3 would include all aspects of Alternatives 1 and 2. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.2.5 Cumulative Impacts
There is no airspace segregation method such as a warning or restricted area to ensure that international airspace would be cleared of nonparticipating aircraft. However, missile launches are short-term, discrete events. The KLC EA concluded there would be no cumulative impact to airspace for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. The use of the required scheduling and coordination process for international airspace and adherence to applicable DoD directives and U.S. Army regulations concerning issuance of NOTAMs and selection of missile firing areas and trajectories further reduce the potential for incremental, additive, cumulative impacts.

4.1.2.6 Mitigation Measures
The required coordination procedures with the FAA and scheduling requirements of KLC minimize any potential impacts so that no mitigation measures have been identified as necessary for the GMD ETR proposed activities. NOTAMs would be sent in accordance with FAA protocols and DoD requirements.

4.1.3 BIOLOGICAL RESOURCES—KODIAK LAUNCH COMPLEX
The biological resources analytical approach involved evaluating the potential impacts of the Proposed Action and alternatives, such as construction, site preparation activities, use of existing and new sensors, and missile launches, on vegetation, wildlife, threatened and endangered species, and sensitive habitat within the ROI. Impacts that could result from construction and other site preparation activities include disturbance and removal of vegetation and disturbance to wildlife from the accompanying noise and presence of personnel. Impacts could also result from launch-related activities such as noise, air emissions, debris impacts, and the use of radar equipment.
Criteria for assessing potential impacts to biological resources are based on (1) the number or amount of the resource that would be impacted relative to its occurrence at the project site, (2) the sensitivity of the resource to proposed activities, and (3) the duration of the impact. Impacts are considered substantial if they have the potential to result in reduction of the population size of federally listed threatened or endangered species, degradation of biologically important unique habitats, substantial long-term loss of vegetation, or reduction in capacity of a habitat to support wildlife.

All transportation of equipment and materials such as fuels would be conducted in accordance with applicable federal (DOT) and state regulations. Hazardous materials would be inspected prior to accepting a shipment. Bulk hazardous materials drums would be stored in approved containers during transportation that meet National Fire Protection Association industrial fire protection codes and required containment systems. Spill response materials such as sorbents, drain covers, mops, brooms, drum repair materials and tools, warning signs and tapes, and personal protective equipment would be readily available for use in the event of an unplanned release of hazardous materials. These SOPs for spill prevention, containment, and control measures while transporting equipment and materials would preclude impacts to biological resources.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought into the installation. These activities would result in impacts similar to, but less than, those caused by site preparation. All mobile assets would be located on existing gravel pads at KLC.

4.1.3.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. KLC would continue to provide ongoing support to single Strategic Target System launches from the GMD Element; however, test scenarios would be severely limited. The KLC EA (Federal Aviation Administration, 1996) indicated no significant impact to biological resources from nine annual missile launches. The North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b) determined that no significant impacts would occur to biological resources as a result of launching a Strategic Target System Missile. The Strategic Target System launches would continue to be managed within the nine launches previously analyzed in the KLC EA (Federal Aviation Administration, 1996) and no additional impacts to biological resources would be expected to occur.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed, and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to biological resources from launches at KLC.
4.1.3.2 Alternative 1

4.1.3.2.1 Ground-Based Interceptors

Construction

Vegetation

The proposed activities under Alternative 1 would require construction as described in section 2.3.1.1. No significant impacts to vegetation are anticipated, since new construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation (approximately 14 hectares [36 acres]) would represent only a small portion of the total vegetation available within KLC boundaries and the adjacent region.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC. Therefore, there would be no impacts to listed plant species.

Wildlife

Impacts from ground disturbance and equipment noise could include loss of habitat, displacement of wildlife, increased stress to wildlife, and disruption of daily or seasonal behavior. As stated above, new construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. Additional habitat for those species that could potentially be displaced is located adjacent to those areas proposed for disturbance. Site preparation activities would not result in impacts to Essential Fish Habitat since no water bodies would be affected.

Noise rather than the sight of machines appears to cause more disturbance to wildlife. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996). Since there are no absolute standards of short-term noise impacts for potentially noise-sensitive species, a short-term maximum noise exposure of 92 dB was suggested as a significant cut-off for impacts in a noise monitoring study for the HEDI I missile (U.S. Army Strategic Defense Command, 1989b; 1990). This noise level is equivalent to being 1 meter (3 feet) from a power lawnmower. This noise level is similar to the range of 80 to 90 dBA defined as known to disturb waterfowl and wildlife in the KLC EA (Federal Aviation Administration, 1996).

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. Wildlife is known to exhibit a startle response when exposed to short-term noise impacts. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, sufficient foraging and feeding habitat occurs in adjacent areas. Studies (U.S. Department of the Air Force, 1997) indicate that birds usually show signs of disturbance, such as fluttering of wings, when a noise event occurs, but quickly return to normal behavior after the event. Although construction activities could cause flushing (birds suddenly flying up), this is a common reaction to sudden natural sounds that only slightly increases the energy expenditure of individual birds. Some wildlife may leave the area permanently, while others may likely
become accustomed to the increased noise and human presence. Construction is therefore not expected to have a long-term significant adverse effect on wildlife.

**Threatened and Endangered Wildlife Species.** Disturbance from site preparation activities would be restricted mainly to areas within 15 meters (50 feet) from the construction site. The closest federally endangered Steller sea lion haulout area, approximately 5 kilometers (3 miles) away on Ugak Island, would not be affected by site preparation noise. Federally threatened Steller’s eiders and endangered short-tailed albatross offshore would also be outside the range of the highest site preparation noise levels and are not anticipated to be affected.

**Environmentally Sensitive Habitat**

Wetlands can be impacted both directly and indirectly. Direct impacts can result from filling, dredging, or flooding. Indirect impacts can be caused by disturbance to adjacent land that results in degradation of water quality from chemical or sedimentary runoff. Given the lack of practicable alternative sites in combination with the measures taken to minimize wetland impacts, compliance with Executive Order 11990, *Protection of Wetlands*; DOT Order 5660.1A, *Order on Preservation of the Nation’s Wetlands*; and FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts* has been demonstrated.

Most new construction required for the Proposed Action would be located in upland areas. Construction of the GBI launch silos or launch pad and perimeter fencing around the launch area could disturb approximately 0.6 hectare (1.6 acres) of palustrine, emergent, persistent, seasonally flooded wetlands and 0.2 hectare (0.4 acre) of palustrine, scrub/shrub, broad-leaved deciduous, saturated wetlands (figure 4.1.3-1). The fence line layout is preliminary and could likely be altered before construction to avoid the wetlands. Indirect disturbance to wetlands would be minimized by implementing appropriate techniques to control runoff and other Best Management Practices discussed below.

The following examples of Best Management Practices for soil erosion control that AADC applies during construction activities would further minimize impacts to wetlands:

- Site preparation—vegetation preservation and protection, topsoil preservation, dust control, and temporary gravel construction entrance and exit
- Surface stabilization—temporary and permanent seeding and use of mulches and fabric and gravel blankets
- Runoff control and conveyance measures—installation of diversions, dikes, grassed waterways, and temporary slope drains
- Sediment barriers—straw bale and rock barriers, sediment fences
- Sediment traps and basins
- Stream protection—temporary stream crossings and streambank stabilization
- Protection of soil and fill storage piles

(Federal Aviation Administration, 1996)
Wetlands Within the Kodiak Launch Complex and Proposed Facility Locations
Kodiak Island, Alaska

Figure 4.1.3-1
SOPs mentioned above for spill prevention, containment, and control measures while transporting equipment and materials would also preclude impacts to wetlands. Steller sea lion critical habitat is outside the area that could be impacted by site preparation activities.

**Operation**

Dual launch activities could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar, to those analyzed below for single launches.

**Vegetation**

Normal GBI launch activities are not expected to significantly impact vegetation. Blast residue would be contained within the silo or close to the launch site in case of a pad GBI launch, minimizing the potential for impacts on vegetation. Launch exhaust products would include hydrogen, hydrogen chloride, aluminum oxide, carbon dioxide, carbon monoxide, nitrogen, water, and chlorine. Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of this aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited would have little effect. As stated in the air quality section, the concentration levels of exhaust products from a dual launch would be approximately double those of a single launch. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that non-fibrous aluminum oxide as found in solid rocket motor exhaust is nontoxic (U.S. Department of the Air Force, 1997a). Analysis of launch-related deposition of aluminum oxide after six launches from KLC has not shown it to be harmful to vegetation (Alaska Aerospace Development Corporation, 2002b).

The greatest potential for impacts to vegetation comes from hydrogen chloride deposition. Direct effects could include discoloration, foliage loss, and changes in species composition. Rain within 2 hours of a launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid missile launches for very large flight vehicles (such as the Space Shuttle), is known to injure plant leaves and affect wildlife. However, the potential effect on vegetation from the proposed launches of the much smaller GBIs is expected to be slight. Observation of plant communities at other launch sites such as KTF, Cape Canaveral, and Vandenberg AFB indicate that vegetation continues to thrive in the immediate areas within 150 to 240 meters (492 to 787 feet) of the launch pads. Vegetation sampling conducted in the area near active launch pads at KTF has not indicated that hydrogen chloride emissions from launches conducted during the last 20 years resulted in any lasting effects (U.S. Army Space and Strategic Defense Command, 1993a). No obvious additional needle loss or browning of vegetation adjacent to the launch site has been documented through six launches from KLC (Alaska Aerospace Development Corporation, 2002b).

**Threatened and Endangered Plant Species.** No federally listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**

**Noise.** Potential noise effects on wildlife can be categorized as auditory and non-auditory. Auditory impacts to marine mammals would consist of injury effects such as eardrum rupture or behavioral impairments such as temporary threshold shift (TTS). Non-auditory effects could
include stress, behavioral changes, and interference with mating or foraging success. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat. Animals can also be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations. (Larkin, 1996) Informal observation at several launch facilities indicates the increased presence of personnel immediately before a launch tends to cause birds and other mobile species of wildlife to temporarily leave the area that would be subject to the highest level of launch noise. Therefore, no direct physical auditory changes are anticipated.

Wildlife is known to exhibit a startle effect when exposed to short-term noise impacts, such as the launch of a missile. Video camera observations of a wood stork colony located 0.8 kilometer (0.5 mile) south of the Space Shuttle launch pad at Kennedy Space Center showed that birds flew south away from the noise source and started returning within 2 minutes, with a majority of individuals returning within 6 minutes (National Aeronautics and Space Administration, 1997). A rookery at Kennedy Space Center used by wood storks and other species of wading birds located approximately 750 meters (2,461 feet) from a Space Shuttle launch pad continues to be used successfully, even though it has received peak noise levels of up to approximately 138 dB. (American Institute of Aeronautics and Astronautics, 1993) Birds within 250 meters (820 feet) of Titan launch complexes at Cape Canaveral Air Station have shown no mortality or reduction in habitat use. Titan IV vehicles produce noise levels of approximately 170 dB in the immediate vicinity of the launch pad. This attenuates to 125 dB at a distance of 3 kilometers (2 miles) within about 30 seconds following launch. (U.S. Department of the Air Force, 1990b) Noise from Minuteman launches ranges from 98 dBA approximately 4.2 kilometers (2.6 miles) from the launch site to 80 dBA approximately 13 kilometers (8 miles) from the launch site (U.S. Department of the Air Force, 1999). The level of noise for the GBI missile during launch and flight is expected to be less (similar to the 94 dB at 3.0 kilometers [2 miles] from the launch site analyzed in the KLC EA for the Castor 120™) and relatively short in duration.

The KLC EA concluded that, although birds within a 9.7-kilometer (6-mile) radius of the launch pad could be exposed to noise levels above 83 dBA, impacts to birds from launch-related noise would not be severe and would be limited to startle reactions (Federal Aviation Administration, 1996). Peak noise levels in the vicinity of Narrow Cape would be nearly instantaneous, and the entire noise event would last less than 60 seconds. According to monitoring results from the prior six KLC launches, bald eagle habitat use appears to have been unaffected. The Narrow Cape bald eagle nest, which is downrange of the current launch pad, was seasonally occupied and productive during the monitoring period. (Alaska Aerospace Development Corporation, 2002b) Any indication of disturbance to eagle nesting or nesting behavior would be reported immediately to the KLC launch point of contact as specified in the Natural Resources Management Plan (NRMP).

A Biological Opinion (Federal Aviation Administration, 1998) prepared for the FAA and AADC addressed the potential for impacts on the Steller’s eider and short-tailed albatross as a result of operation of the KLC. Interceptor launches would be infrequent, up to five per year over a period of 10 years. Five annual GBI launches would fall within the parameters previously analyzed for KLC and are also not likely to adversely affect listed species. Disturbance to wildlife from single or dual GBI launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Waterfowl driven from preferred feeding areas by aircraft or explosions usually return soon after the
disturbance stops, as long as the disturbance is not severe or repeated (Federal Aviation Administration, 1996).

No evidence has indicated that serious injuries to wildlife have resulted from prior launches, and no long-term adverse effects are anticipated. The brief noise peaks produced by the GBI are comparable to levels produced by close range thunder (120 dB to 140 dB peak). There is no species known to be susceptible to hearing damage following exposure to this noise source (U.S. Department of the Air Force, 2001).

**Emissions.** The KLC area has a high level of rainfall and short steep streams, and small amounts of deposition from launches would be quickly flushed from stream drainages. No long-term impacts to fish in streams or Essential Fish Habitat within the ROI are expected.

Hydrogen chloride, which is emitted during missile launches, is known to affect wildlife. Birds flying through the exhaust plume may be exposed to concentrations that could irritate eye and respiratory systems (Federal Aviation Administration, 1996). However, results of a monitoring program conducted following a Strategic Target System launch from KTF in Hawaii indicated little effect upon wildlife due to the low-level, short-term hydrogen chloride emissions (U.S. Army Space and Strategic Defense Command, 1993a). The program included marine surveys of representative birds and mammals for both pre-launch and post-launch conditions. Studies on representative birds and mammals reviewed in the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992) also indicated that low-level, short-term exposure to hydrogen chloride would not adversely affect threatened or endangered species or other wildlife. Aluminum oxide and hydrogen chloride do not bioaccumulate; therefore, no indirect effects to the food chain are anticipated.

**Debris.** In the unlikely event of a launch mishap during single or dual launches, scattered pieces of burning propellant could enter coastal water and potentially affect seabirds, Essential Fish Habitat, and pinnipeds hauled out along the adjacent coastline. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus, no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water.

The potential impact to Essential Fish Habitat from nominal launch activities (single and dual) would mainly be from missile debris to waters off the coast. Although debris could affect individuals close to the surface, overall species’ population would not be substantially impacted. The Pasagshak River would not be affected by nominal launch activities and is outside the area likely to be affected by a launch anomaly. Anadromous and marine fisheries would not be
affected by proposed launch activities. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. The number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

Debris impact and booster drops in the BOA off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel would be on stand-by status for all launch activities as a protective measure.

**Threatened and Endangered Wildlife Species.** The closest Steller sea lion haul-out sites are at Ugak Island, approximately 5 kilometers (3 miles) southeast of KLC, and Gull Point, approximately 16 kilometers (10 miles) southwest of KLC. Ugak Island is used seasonally by the Steller sea lion during the late summer to early fall postbreeding period (Alaska Aerospace Development Corporation, 1999). As addressed in the KLC EA, studies have indicated that launches are likely to produce some level of alarm response in the sea lions using Ugak Island (Federal Aviation Administration, 1996). These responses could range from a heightened state of alertness to total flight of all sea lions from the haulout site.

According to the U.S. Air Force’s QRLV Program EA (U.S. Department of the Air Force, 2001), while it is expected that Steller sea lions hauled out on Ugak Island would react to a launch by entering the water, there is no biologically significant consequence of this behavior because sea lions routinely spend long hours in the water and have been observed returning to land hours later. Since the sea lions do not breed on Ugak Island, there would be no effect on mother–pup bonding. The National Marine Fisheries Service has concurred with the U.S. Air Force’s opinion that predicted launch and overflight noise would have no significant impact on marine mammals. However, AADC has requested a Letter of Authorization from the National Marine Fisheries Service for the incidental harassment take of marine mammals. The USFWS also concurred that no adverse effects would occur to listed species in the ROI of an ait-2 launch. The predicted launch noise level for the GBI would be similar to or less than the level predicted and measured for ait and QRLV launches and as such, no substantial adverse impacts to listed species are expected.

Foraging shorebirds would be subjected to increased energy demands if flushed by the noise, but this should be a short-term, minimal effect. Waterfowl generally show a pronounced startle effect when exposed to noise levels of 95 to 105 dB. It is unlikely that the short-tailed albatross would be impacted by a GBI missile in flight since the trajectory is almost vertical and the missile would reach an altitude of approximately 3,048 meters (10,000 feet) while still over land, approximately 20 seconds after launch.
Although Steller’s eiders rafting off Narrow Cape may be disturbed by the Proposed Action, since they do not breed within the ROI and the disturbance would be minor and infrequent, GBI launches from KLC are not expected to impact breeding or the nesting success of this species.

According to protocol of the KLC Environmental Monitoring Plan, five pre-launch and five post-launch aerial surveys for Steller’s eiders were supposed to be performed for the first five missile launches at KLC. Inclement weather adversely affected this task during all five KLC launches. However, the data collected were sufficient to show that rocket launches were not adversely affecting either species numbers or habitat use patterns of either the eider or of its designated surrogate for monitoring, the harlequin duck (Environment and Natural Resources Institute and Alaska Aerospace Development Corporation, 2002). Steller’s eiders overwinter in the area from mid-October to March. Since it was not known when the launches would take place and if Steller’s eiders would be in the vicinity, the harlequin duck was used as a surrogate during surveys when the eider was not observed in the area. Steller’s eiders were observed during the 1998 ait-1 and 2001 QRLV launches from KLC. No eiders were observed before the ait-1 launch, but 30 were seen minutes after about 0.40 kilometer (0.25 mile) south of Lone Point. The number fluctuated widely during the QRLV monitoring periods. Harlequin ducks were observed during all monitoring periods with no significant differences between pre- and post-launch time periods. Steller’s eider and harlequin duck numbers and use of habitat appeared unaffected by the six prior launches at KLC. (Alaska Aerospace Development Corporation, 2002b)

Environmentally Sensitive Habitat
Nominal GBI launches are not expected to result in impacts to wetlands on KLC. SOPs for spill prevention, containment, and control measures while transporting equipment and materials would also preclude impacts to wetlands.

4.1.3.2.2 Target Missiles
Construction
Vegetation
Alternative 1 would require construction of additional facilities as discussed in section 2.3.1.1. These new facilities would be located adjacent to the proposed GBI silos or launch pad and included within the same fenced area. Existing facilities, such as the existing launch pad, would be modified. No significant impacts to vegetation are anticipated since new construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation (approximately 10.5 hectares [26 acres]) would represent only a small portion of the total vegetation available within KLC boundaries.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

Wildlife
Impacts to wildlife from site preparation activities described above under vegetation would be the same as those discussed above for the GBI site preparation.
Threatened and Endangered Wildlife Species. Impacts to threatened and endangered wildlife species from site preparation activities would be the same as those discussed above for the GBI site preparation.

Environmentally Sensitive Habitat
Impacts to environmentally sensitive habitat would be the same as those discussed above for GBI site preparation.

Operation
Dual target launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but nonetheless similar, to those analyzed below for single launches.

Vegetation
As discussed above for GBI launches, observation of plant communities at other launch sites such as KTF, Cape Canaveral, and Vandenberg AFB indicate that vegetation continues to thrive in the immediate areas surrounding launch pads. Vegetation sampling conducted in the area near active launch pads at KTF has not indicated that hydrogen chloride emissions from launches conducted during the last 20 years resulted in any lasting effects (U.S. Army Space and Strategic Defense Command, 1993b). Further studies at KLC have shown no adverse effects to sensitive vegetation following the first six launches (Environment and Natural Resources Institute and Alaska Aerospace Development Corporation, 2002).

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

Wildlife
Target missile launches would be infrequent, up to five per year over a period of 10 years. The potential impacts to wildlife from single or dual launches would be similar to those discussed above for GBI launch activities. A Biological Assessment (Federal Aviation Administration, 1998) prepared for the FAA and AADC as part of the construction and operation EA determined that launches of missiles similar to ait, QRLV, and Castor 120™ from KLC are not likely to adversely affect listed species, such as the Steller’s eider and short-tailed albatross, or critical habitat. Five annual launches of the proposed target missiles would fall within the parameters analyzed for KLC and are also not likely to adversely affect listed species.

Using noise contours obtained from the monitoring of actual launches at PMRF and super-imposing them on the launch site at Kodiak Island, a noise level of 54 dBA at 10,699 meters (35,000 feet) is projected for a Strategic Target System launch. However, this information was obtained by noise monitoring in Hawaii (22 degrees north). Air temperature and humidity affect the propagation of noise. The rate of propagation depends on factors such as distance attenuation, ground attenuation, atmospheric absorption, barrier attenuation, wind effects, and temperature gradient effects. Given atmospheric attenuation with correction for temperature and relative humidity, the actual noise impacts, particularly at the longer distances away from the launch site, might be quite different. Inclement weather precluded the use of a helicopter to set up sound monitors on Ugak Island, and thus no sound data was gathered during the
Strategic Target System launch from KLC in 2001. However, the monitoring report (Alaska Aerospace Development Corporation, 2002b) for the Strategic Target System launch concluded that the noise would likely be similar to ait, QRLV, and Athena missile levels of 80 to 90 dB, which would be audible to pinnipeds. The Peacekeeper missile, which would result in the highest noise levels, uses a military version of the Castor 120™ motor that was analyzed in the KLC EA (Federal Aviation Administration, 1996).

**Threatened and Endangered Wildlife Species.** As addressed in the KLC EA, alarm response in the sea lions using Ugak Island could range from a heightened state of alertness to total flight of all sea lions from the haulout site (Federal Aviation Administration, 1996). Using the noise levels modeled for the Strategic Target System launches at PMRF, the maximum noise levels at the haulout sites on Ugak Island would be approximately 81 dBA, which would be below levels known to disturb waterfowl and wildlife. The monitored noise levels at PMRF indicate a level of 54 dBA at 10,668 meters (35,000 feet). This is significantly less than the 69 dBA indicated by modeling. As such, it is possible, although not assumed that actual sound levels at the haulouts would be less than those indicated by modeling. Using noise levels measured during Peacekeeper missile launches at Vandenberg AFB, the maximum noise levels at the haulout sites on Ugak Island would be approximately 97.7 dBA for a single launch and 100.7 for a dual launch. This would be above the 83 dBA level known to disturb wildlife.

No evidence has indicated that serious injuries would result, and no long-term adverse effects are anticipated. Noise from a recent Athena II launch was measured at 101 dBA at the haul-out sites on Ugak Island. The brief noise peaks produced by the Strategic Target System, Peacekeeper target, and other proposed target missiles are comparable to levels produced by close range thunder (120 dB to 140 dB peak). There is no species known to be susceptible to hearing damage following exposure to this noise (U.S. Department of the Air Force, 2001). The predicted launch noise level for the Strategic Target System of 81 dBA would be less than the level predicted and measured for the QRLV-1 (87.2 dBA at Ugak Island) launch and, as such, no substantial adverse impacts to listed species are expected.

To date, no indications of disturbance to the sea lions from survey activities on Ugak Island, which are done in full view of beached sea lions, have been identified. Safety crews and other personnel are briefed on the survey procedures as well as harassment guidelines established by the National Marine Fisheries Service to minimize harassment. The GMD ETR program would adhere to the terms and conditions of the pending harassment/take permit from the National Marine Fisheries Service.

**Environmentally Sensitive Habitat**

Impacts to environmentally sensitive habitat would be similar to those discussed above for GBI launches.

### 4.1.3.2.3 In-Flight Interceptor Communication System Data Terminal Construction

**Vegetation**

The IDT and road at Sites 1, 2, and 3 would require disturbance of approximately 5.9 hectares (14.6 acres) with a fenced area of approximately 3.2 hectares (8 acres). The COMSATCOM
would require a footprint of approximately 0.10 hectare (0.25 acre) within a fenced area of approximately 2.8 hectares (7 acres) to accommodate the COMSATCOM and equipment. The minimal requirements include a concrete base for the COMSATCOM, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide.

Construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation would represent only a small portion of the total vegetation available within KLC boundaries.

**Threatened and Endangered Plant Species.** No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**

Impacts to wildlife from ground disturbance and equipment noise would be similar to those discussed above for GBI site preparation.

**Threatened and Endangered Wildlife Species.** No impacts to threatened and endangered seabirds or marine mammals are anticipated from construction activities at the inland sites proposed for use for the IDT or COMSATCOM.

**Environmentally Sensitive Habitat**

No wetlands or other sensitive habitat would be disturbed during construction and installation of the IDT.

**Operation**

**Vegetation**

No impacts to vegetation would result from operation of the IDT or COMSATCOM.

**Threatened and Endangered Plant Species.** No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC.

**Wildlife**

During normal operations, the IDT would not transmit except for a few minutes during annual testing of the equipment and during the GBI flight tests. Given the short duration of transmission, no adverse impacts to biological resources are anticipated. Most operational impacts to wildlife from the IDT would come from security lighting and noise from electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities required for backup generators or continuously if no commercial power is available.
COMSATCOM primary power is from a commercial source with backup power provided by generator. Communication cable to the Launch Control Center would be required. Equipment would be housed in a military van, a small building, or an existing adjacent facility if available.

**Threatened and Endangered Wildlife Species.** No adverse impacts to threatened and endangered wildlife species are anticipated. As stated above, most operational impacts to wildlife from the IDT would come from security lighting and noise from electrical generators required for the site. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet), which would not adversely affect species offshore.

*Environmentally Sensitive Habitat*

No adverse impacts to environmentally sensitive habitat are anticipated from security lighting or generator noise due to operation of the IDT and COMSATCOM.

**4.1.3.2.4 Sensors**

There are currently no sensors permanently located at KLC. Proposed sensor use at one location on KLC and at one out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. An existing disturbed area would be used to minimize the potential for impacts. Mobile sensors necessary to support GMD ETR activities would also be located on existing disturbed areas. No impacts to biological resources are anticipated.

**4.1.3.2.5 TPS-X Radar**

**Construction**

*Vegetation*

Installation of the TPS-X radar would require disturbance to 0.3 hectare (0.8 acre) of land on KLC for placement of a concrete pad. Construction would occur mainly in upland areas of hairgrass-mixed forb meadow, one of the predominant vegetation types at KLC. This loss of vegetation would represent only a small portion of the total hairgrass-mixed forb meadow habitat available within KLC boundaries.

**Threatened and Endangered Plant Species.** No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC. Thus no impacts to threatened or endangered species would result from installation of the TPS-X radar.

*Wildlife*

Impacts from ground disturbance and equipment noise could temporarily displace terrestrial wildlife as discussed for GBI site preparation. Additional similar habitat is available on KLC to accommodate roosting, nesting, and feeding needs.

**Threatened and Endangered Wildlife Species.** No impacts to threatened and endangered seabirds or marine mammals are anticipated from construction activities at the inland site proposed for use for the TPS-X radar.
Environmentally Sensitive Habitat
No wetlands or other sensitive habitat would be disturbed during construction and installation of the TPS-X radar.

Operation

Vegetation
Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations. Spill control procedures would be established using KLC’s approved SOPs, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

The Cooling Equipment Unit is a closed system, and no emissions of the ethylene glycol solution are planned. However, because of the remote potential for leaks or spills during system hook-up, or the possibility of ruptured hoses or accidental disconnection, impermeable ground cover would be in place as was described for the Prime Power Unit.

Operation of the TPS-X radar would not result in impacts to vegetation since impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species have been observed within the boundaries of KLC. Thus no impacts to threatened or endangered species would result from operation of the TPS-X radar.

Wildlife
The Prime Power Unit is a self-contained trailer with a noise-dampening shroud that would minimize the potential for diesel generator noise impacts.

In terms of the potential for EMR impacts to wildlife, the power densities emitted from the TPS-X radar are unlikely to cause any biological effects in animals or birds. The TPS-X radar is not expected to radiate lower than 5 degrees above horizontal, which would preclude EMR impacts to terrestrial species from either operation of the TPS-X radar during flight tests or later during proposed tactical testing.

The potential for main-beam (airborne) exposure thermal effects to birds exists. In terms of the potential for EMR impacts on wildlife, the Final Ground-Based Radar (GBR) Family of Radars EA (U.S. Army Program Executive Office, Global Protection Against Limited Strikes (GPALS), 1993) analyzed potential impacts on wildlife from EMR. This EA determined that several factors significantly reduce the potential EMR exposure for birds and other wildlife. The radar main beam would normally be located at least 2 degrees above horizontal, which limits the probability of energy absorption by surface-oriented wildlife. The radar beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further
reduces the probability of bird species remaining within this limited region of space, even if the beam were still. (Ballistic Missile Defense Organization, 2000)

The analysis methods used to evaluate potential effects of RF radiation on birds is the MPEL, which defines the maximum time-averaged RF power density allowed for uncontrolled human exposure (and by extrapolation, to birds and other species). The MPEL method is independent of body size or tissue density being exposed. Analysis conducted during preparation of the GBR EA (U.S. Army Program Executive Office, Global Protection Against Limited Strikes (GPALS), 1993) was based on a conservative approach of limiting the microwave energy absorption rate on the Aplomado falcon (*Falco femoralis*), a bird listed as endangered by the USFWS and the State of New Mexico. The energy absorption rate was based on the falcon remaining continuously within the main beam of the ground-based radar. The absorption rate was then compared to the bird’s resting metabolic rate. The analysis indicated power densities would have to exceed 42 mW/cm² to affect the falcon. Power densities of 38 to 61 mW/cm² have been determined necessary to affect other birds weighing up to 3.5 kilograms (7.7 pounds).

The analyses were based on the conservative assumption that the energy absorption rate of a bird’s body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect. Birds in general typically expend energy at up to 20 times their resting metabolic rates during flight. Since birds are not likely to remain continuously within the radar beam and the power density is not expected to exceed levels stated above that could impact birds, the likelihood of harmful exposure is remote. (Ballistic Missile Defense Organization, 2000)

**Threatened and Endangered Wildlife Species.** The potential for impacts to threatened and endangered seabirds would be the same as that discussed above for wildlife. The TPS-X radar is not expected to radiate lower than 5 degrees above horizontal, and since marine mammals would normally be found below the surface of the water, this signal height would be safely above any surfacing mammals. RF radiation does not penetrate the surface of water to any great degree. The power density level just below the surface of the ocean would not exceed the permissible exposure level for uncontrolled environments. (U.S. Department of the Navy, 2002a) No adverse impacts would occur to whales, other marine mammals, or sea turtles at least 1.3 centimeters (0.5 inch) below the surface. It is also highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time within the main beam or side lobe areas when the TPS-X radar would be operating. No impacts to marine mammals offshore are expected as a result of proposed radar operation on KLC since these species would normally be found in the ocean outside the 150-meter (492-foot) personnel exclusion zone. For these reasons, no effects are anticipated on the humpback whale, other marine mammals, or sea turtles that might be present in the vicinity. Therefore, no further action regarding whales is required pursuant to the Endangered Species Act and the Marine Mammal Protection Act.

*Environmentally Sensitive Habitat*

No wetlands or other sensitive habitat would be adversely affected during operation of the TPS-X radar.
4.1.3.3 Alternative 2

No GBI-related construction would be required at KLC under Alternative 2 since GBI launches would occur from Vandenberg AFB and RTS instead of KLC and RTS. Target launch-related impacts would be identical to those described under Alternative 1. As discussed in Alternative 1, proposed sensor use at one location on KLC and at one out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. Mobile sensors necessary to support GMD ETR activities would be located on existing disturbed areas. No impacts to biological resources are anticipated.

4.1.3.4 Alternative 3

For the purposes of the discussion at KLC, the construction and flight impacts for Alternative 3 would be as described above for Alternative 1.

4.1.3.5 Cumulative Impacts

Construction associated with the GMD ETR program would result in the loss of up to approximately 34 hectares (85 acres) of meadow and shrubland within KLC boundaries. When combined with past disturbed areas the total would equal approximately 52 hectares (128 acres). This cumulative total represents approximately 3.5 percent of the total available acreage of KLC. Similar habitat is available adjacent to the proposed locations and no federally threatened or endangered plants have been identified within KLC boundaries. No cumulative changes in plant community composition or structure have been identified at other active launch locations such as Vandenberg AFB and Kennedy Space Center.

The KLC EA indicated no significant impact to biological resources from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. According to the QRLV EA (U.S. Air Force, 2001), multiple failures at the same point in flight during launches would be required to cumulatively affect Essential Fish Habitat or other sensitive biological resources. This scenario is highly unlikely. Combined activities would be performed at different times and locations. No cumulative impacts from launches proposed for the GMD ETR program are anticipated.

4.1.3.6 Mitigation Measures

No biology mitigation measures are proposed for the GMD ETR activities at KLC. GMD ETR proposed activities would adhere to the terms and conditions imposed by the National Marine Fisheries Service on AADC.

4.1.4 CULTURAL RESOURCES—KODIAK LAUNCH COMPLEX

Potential impacts on archaeological and historic resources may result from construction; ground-clearing; off-road traffic activities; sound pressure damage; increased human presence in archaeologically sensitive areas; and/or alteration, modification, renovation, or demolition of existing potentially significant facilities and other activities.
Only those cultural resources determined to be potentially significant under existing legislation are subject to protection from adverse impacts resulting from the Proposed Action or its alternatives. To be considered significant, cultural resources must meet one or more of the criteria established by the National Park Service that would make that resource eligible for inclusion in the National Register. The term eligible for inclusion includes both properties formally determined as such and all other properties that meet the listing criteria. Sites which have not yet been formally evaluated are considered potentially eligible and, as such, are afforded the same consideration as formally nominated properties. Prehistoric (usually referred to as archaeological), historic, or traditional significant cultural resources are referred to as historic properties.

An undertaking is considered to have an effect on a historic property when it may alter characteristics of the property that may otherwise qualify the property for inclusion in the National Register. An effect is considered to be adverse when it diminishes the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include but are not limited to:

- The physical destruction, damage, or alteration of all or part of the property
- Isolation of the property from, or alteration of the character of, the property’s setting when that character contributes to the property’s qualification for the National Register
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting
- Neglect of a property resulting in its deterioration or destruction
- Transfer, lease, or sale of the property

4.1.4.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. These launches could include missions in support of the GMD program. KLC would continue to operate as a licensed launch facility, and, as concluded in the KLC EA (Federal Aviation Administration, 1996), no cultural impacts would be anticipated.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to cultural resources from launches at KLC.
4.1.4.2 Alternative 1

4.1.4.2.1 Ground-Based Interceptors

Construction
The proposed activities under Alternative 1 would require construction of numerous facilities as described in section 2.3.1.1. Potential total disturbed areas due to construction are identified in table 2.3.1-3.

Prehistoric and Historic Archaeological Resources
Previous archaeological surveys have indicated that cultural resources are not present in the upland areas occupied by KLC. As project details are further delineated, additional archaeological surveys may be required to verify the absence of sites within the area of potential effect. Should cultural resources be found during the course of any GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided; therefore, no impacts to archaeological resources are anticipated.

Large GBI components may need to be brought into KLC by barge, as described in section 2.3.1. Figure 2.3.1-1 shows the proposed barge landing sites. If it is determined that a barge landing is required, one of the three potential sites would be selected for use. At that time, an archaeological survey would be conducted to verify the presence of the reported sites described in section 3.1.4.2 and to determine if there are previously unreported sites within the area of potential effect.

Historic Buildings and Structures
There are no structures in the area currently occupied by KLC infrastructure that are listed on the National Register of Historic Places. No construction activities or building modifications are expected to have an effect on any historic properties.

Native Populations/Traditional Resources
The 1994 survey of the KLC area showed no signs of traditional resources within the ROI. Therefore, no impacts to traditional resources are anticipated. As mentioned above, should cultural resources be found during the course of any GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided.

Paleontological Resources
There is the potential that shallow-water marine invertebrate fossils would be disturbed during construction of the GBI facilities. However, these fossils are extremely common throughout the areas in and around KLC, and significant impacts to these resources are not anticipated.

Operation
Proposed GBI operations for Alternative 1 at KLC would consist of single and dual interceptor launches.
Flight Activities
Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. The only potential impacts to cultural resources would be as a result of debris generated by a test failure. However, the possibility of this occurring is extremely remote.

Post-Flight Activities
Debris recovery from unsuccessful launches at KLC is the responsibility of the user and is closely monitored by AADC. If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with KLC procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with KLC range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.

4.1.4.2.2 Target
Construction
Under Alternative 1, site preparation activities overlap somewhat with GBI facilities. Since no cultural resources have been identified within the construction footprint, there would be no adverse effects to cultural resources due to target facility construction.

Operation
Proposed target operations for Alternative 1 at KLC would include single and dual target launches.

Flight Activities
Target launches, from a cultural resources standpoint, would be similar to an interceptor launch. Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed. The only potential impacts to cultural resources would be as a result of debris generated by a test failure. However, the possibility of this occurring is extremely remote.

Post-Flight Activities
If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with KLC procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with KLC range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.
4.1.4.2.3 In-Flight Interceptor Communication System Data Terminal

Construction
Under Alternative 1, proposed construction would include disturbance of 8.7 hectares (21.6 acres) for an IDT and COMSATCOM. Cultural resources have not been identified within the areas and therefore there would be no adverse effects to cultural resources from IDT and COMSATCOM construction.

Operation
Proposed activities for Alternative 1 at KLC include IDT and COMSATCOM operations.

Flight Activities
IDT and COMSATCOM operations are not expected to adversely impact cultural resources. The nature of the operation of these systems combined with the lack of existing cultural resources would result in no impacts.

4.1.4.2.4 Sensors

Proposed sensor use at one location on KLC and at one or more out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. Mobile Systems would likely be parked at pre-existing parking areas and no ground disturbance would be required. Therefore, impacts to cultural resources are not anticipated.

Flight Activities
Operation of sensors of this nature is not expected to produce any short- or long-term effects to cultural resources. Personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed.

4.1.4.2.5 TPS-X

Construction
The installation of the TPS-X at KLC would require the construction of a pad for the 38- by 58-meter (125- by 190-foot) hardstand and disturbance of approximately 0.3 hectare (0.8 acre). The potential TPS-X location would be the same as the potential IDT site south of the Loran-C Station. Previous archaeological surveys have indicated that cultural resources are not present within the upland areas occupied by KLC. As project details are further delineated, additional archaeological surveys may be required to verify the absence of sites within the area of potential effect. Should any culturally related resources be found during the construction of the TPS-X radar, all construction activities would cease and the proper authorities would be notified. Therefore, impacts to cultural resources are not anticipated.

Operation
Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations. Spill
control procedures would be established in accordance with KLC’s approved SPCC SOPs, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

The Cooling Equipment Unit is a closed system, and no emissions of the ethylene glycol solution are planned. However, because of the remote potential for leaks or spills during system hook-up, or the possibility of ruptured hoses or accidental disconnection, impermeable ground cover would be in place as was described for the Prime Power Unit.

Because impermeable ground covering and spill containment berms would be employed and due to the lack of located resources in the area, impacts to cultural resources are not anticipated from the refueling of the Prime Power Unit.

In terms of the potential for EMR impacts to cultural resources, the power densities emitted from the TPS-X radar are unlikely to cause any damaging effects to cultural resources. The TPS-X radar is not expected to radiate lower than 5 degrees, which would preclude EMR impacts to terrestrial artifacts from either operation of the TPS-X radar during flight tests or later during proposed tactical testing. Therefore, the operation of the TPS-X radar is not expected to have any adverse impacts to cultural resources.

4.1.4.3 Alternative 2

4.1.4.3.1 Target

Construction

Proposed target construction for Alternative 2 at KLC is identical to that described in Alternative 1.

Operation

Potential impacts from proposed target operations for Alternative 2 at KLC would be identical to that described in Alternative 1.

4.1.4.3.2 Sensors

Construction

The mobilization and setup activities for mobile telemetry systems at remote locations throughout Alaska would be identical to that described for Alternative 1 and would have negligible adverse impacts.

Operation

The operation of mobile telemetry system would be identical to activities described under Alternative 1; however, the system would be operated for target launches only. No operational aspect of the system poses the potential for adverse effects to cultural resources.
4.1.4.4 Alternative 3

Alternative 3 would be identical to Alternative 1 at KLC. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.4.5 Cumulative Impacts

The KLC EA indicated no significant impact to cultural resources for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Approximately 17 hectares (43 acres) or 1.1 percent of KLC’s 1,504 hectares (3,717 acres) have previously been disturbed. The proposed action could potentially affect up to 26 hectares (64.2 acres). The cumulative disturbed acreage of the existing and proposed actions would be approximately 43 hectares (106 acres) or 2.9 percent of the total acreage of KLC. No other activities have been identified at KLC that, when combined with the past and proposed action would result in cumulative impacts to cultural resources.

4.1.4.6 Mitigation Measures

No cultural resources mitigation measures are proposed for the GMD ETR activities at KLC at this time. As project details are further delineated, coordination would occur with the Alaska State Historic Preservation Officer to ensure that cultural resources would be protected.

4.1.5 GEOLOGY AND SOILS—KODIAK LAUNCH COMPLEX

The proposed program activities have the potential to increase soil erosion due to construction and vehicle traffic on unpaved roads. GBI and target missile launches could affect the chemical composition of site soils. Construction activities could have a direct short-term affect on the availability of selected geologic resources, such as aggregate for road base and high-strength concrete. Program support facilities, IDT, sensors, radar, and other critical equipment would be potentially subject to strong vibratory ground motions from earthquakes and volcanic ash falls. Active fault segments could potentially result in surface ruptures during large earthquakes resulting in damaging facilities and infrastructure along the trace.

4.1.5.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. Maintenance or construction projects proposed by AADC at KLC which would result in ground disturbance would be subject to environmental review by the FAA if that action were a modification to the facilities, facility layout, and operations described in the launch site operator license. KLC is located within a seismically active area, but existing facilities have been designed and constructed to Seismic Zone IV standards (Uniform Building Code, 1994) and should withstand probable levels of vibratory ground motion at the site (appendix D). Further, KLC existing facilities are situated at elevations
that are greater than the limits of maximum wave run-up from a probable tsunami event (seismically generated sea wave).

KLC would continue to conduct launches as specified in the KLC launch site operator license. The KLC EA concluded that there would be no measurable long-term changes in the pH of soils from the exhaust deposition of up to nine launches of the Athena-2, using a Castor 120™ motor for propulsion, per year (Federal Aviation Administration, 1996). Environmental monitoring efforts to date have not indicated any adverse changes in soil chemistry resulting from launches. No adverse changes to soil chemistry would be anticipated under the MDA’s No Action Alternative at KLC.

Federal Aviation Administration
Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to geology and soils from launches at KLC.

4.1.5.2 Alternative 1

4.1.5.2.1 Ground-Based Interceptors

Construction
Alternative 1 would require construction of numerous facilities as described in section 2.3.1.1. Fiber optic cable would be pulled through existing conduit in the fiber-optic cable network, however, additional trenching would be required for selected facilities that are proposed outside of the established backbone. The probable area of soil disturbance for all GBI-related facilities and roads would be approximately 14.4 hectares (35.5 acres), owing largely to grubbing and clearing of vegetation within the perimeter fencing, foundation excavation, stockpile, and equipment maneuver areas.

Minor effects to soils are likely to occur because of the proposed site preparation and construction activities. Most proposed facilities and service roads would be situated at or near local topographic highs in mildly sloping terrain, with little potential for sheet flooding or uncontrolled surface water runoff from higher elevations. The upland soils are generally well drained and not considered to be sensitive to erosion on slopes of less than 7 percent (U.S. Department of the Air Force, 2001). AADC would obtain and review necessary definitive information on surface faulting in the vicinity of the proposed GBI facilities. In making final siting and design determinations, AADC would incorporate all appropriate standards specified by its licensed and bonded A&E contractor. The KLC Natural Resource Management Plan (Alaska Aerospace Development Corporation, 1998) would be referred to for managing laydown areas and topsoil piles before construction, and after construction for providing direction on the disposition of excess topsoil and the selection of plants for revegetation. Best Management Practices would be used for erosion and sediment control. Such Best Management Practices could include storm water diversions, sediment barriers, stream protection, dust palliatives, and other stabilization treatments.

Alternative 1 would not significantly deplete sources of construction material in the region. Tertiary bedrock (the Narrow Cape Formation) underlies most of the KLC property and is suitable as general construction fill material and is readily available (Alaska Aerospace
Development Corporation, 1995b). Surface aggregates have previously been hauled from Pasagshak Point to provide surface course materials over the local sandstone. Sources of structural fill material may need to be imported from existing commercial source areas near the City of Kodiak. Indirect short-term impacts could be created from increased dust and traffic.

Operation

Alternative 1 would result in up to five missile launches per year from KLC over the duration of the test program. GBI launch activities may present minor adverse impacts to local soils due primarily to booster stage exhaust emissions during a nominal test launch, or from unburned or partially burned propellant fuels in the event of a terminated flight. Each EKV would contain approximately 7.5 liters (2.0 gallons) of liquid fuel (monomethylhydrazine) and 5.5 liters (1.5 gallons) of liquid oxidizer (nitrogen tetroxide). Preloaded fuel and oxidizer tanks would be installed on the EKV, so there would be no need for onsite fueling of the GBI and thus no anticipated adverse effect from direct contamination of soils from spills at the Missile Assembly Building, GBI silo, or launch pad.

During a nominal launch, the GBI booster would primarily emit hydrogen chloride, aluminum oxide, chlorine, carbon monoxide, carbon dioxide, hydrogen, nitrogen, oxygen, and water. Most hazardous constituents of the propellant would be completely consumed during the launch. Under this scenario, only small amounts of hydrogen chloride and aluminum oxide emissions would be anticipated to directly contact the soil adjacent to the launch pad and downwind of the flight corridor.

No adverse changes to soil chemistry are predicted to occur as a result of hydrogen chloride or aluminum oxide deposition from interceptor launches. As described in section 4.1.1, soil deposition of hydrogen chloride is expected to be minimal because relatively small amounts of hydrogen chloride are released in the booster ground cloud and the emissions disperse rapidly. Because KLC is near the ocean, a significant fraction of the gas phase hydrogen chloride would condense in the marine aerosol (U.S. Air Force, 1997). This would lower the gas phase concentrations, but would also retard the ground deposition and would re-evaporate in several minutes, leaving downwind concentrations unchanged. Deposition of hydrogen chloride was analyzed for the Athena-2 launch vehicle and it was concluded that there would be no measurable increase in soil pH for up to nine launches per year (Federal Aviation Administration, 1996). The Athena-2 (figure 2.1.2-1) uses a Castor 120™ first stage that is larger than the GBI. The proposed GBI configuration (table 4.1.1-10) has less solid rocket fuel capacity than the Athena-2 and, therefore, would likely produce lower exhaust emissions.

Ground deposition of aluminum oxide is expected to be small and result in minor impacts. Soil deposition of measurable levels of aluminum oxide from a moving exhaust cloud is predicted to be negligible (Pacific Missile Range Facility, Barking Sands, 1998). Typically, no solid propellant missile launches would occur during rain, and the launch system would not use a water deluge system for cooling and noise suppression (a deluge system could increase the potential for ground deposition). The EPA has determined that nonfibrous aluminum oxide as found in solid rocket motor exhaust, is nontoxic. (U.S. Army Space and Strategic Defense Command, 1994)

For analysis of dual GBI launches, the exhaust products from a nominal launch are conservatively estimated to be twice the level of a single launch. The analysis of dual launches
under air quality (section 4.1.2.1) concluded that hydrogen chloride emissions would not exceed U.S. Air Force exposure limits and that the level of aluminum oxide would be expected to remain within the non-criteria pollutant level. Therefore, it is not expected that dual launches would result in significant ground deposition of either pollutant.

In the unlikely event of an on-pad fire or catastrophic missile failure over land, most or all of the solid propellant fuel would likely burn up before being extinguished. Any remaining fuel would be collected and disposed of as a hazardous waste. The total quantities of hydrogen chloride and aluminum oxide released in an on-pad failure of a GBI would be equivalent to that released during a nominal launch of an Athena-2. Therefore, an on-pad failure is not expected to result in significant ground deposition of either pollutant.

Small quantities of hydrazine in the EKV could also be released. Hydrazine is heavier than air and, if not oxidized when airborne, would react and/or possibly ignite with the porous earth or would form dimethylamine and oxides of nitrogen. All of these substances are soluble in water. Airborne nitrogen dioxide would return to earth as nitric acid rains in precipitation events. (U.S. Army Space and Strategic Defense Command, 1995)

Likewise, the nitrogen tetroxide that reached the ground would also react with calcium carbonate soil to form calcium nitrates. Calcium nitrate, a strong oxidizer, is a dangerous fire risk in contact with organic materials. Therefore, depending on the amount of the propellant and/or oxidizer released, soils contaminated with these liquid propellants may require removal to prevent subsequent fires or explosions. The relatively small amount of nitrogen tetroxide on the EKV (5.5 liters [1.5 gallons]) would indicate that such a release would pose a relative minor adverse affect on the site and vicinity soils. Calcium nitrate is also water soluble, so it is anticipated that any residual material or unreacted fuel would be washed into surface drainages and directly out to sea.

4.1.5.2.2 Target

Construction

Alternative 1 would require construction of new facilities as described in section 2.3.1.1. In addition, there would be an addition/alteration to an existing launch pad (Launch Pad-1). Most of the adversely affected soil area related to target facilities would be encompassed by GBI site preparation activities.

The environmental considerations and consequences of constructing target facilities at KLC are similar to those discussed for GBI facilities in section 4.1.5.2.1.

Operation

Alternative 1 could result in up to five target missile launches per year from KLC over the duration of the test program. Unlike GBI, target missiles could consist of several different missile types and configurations including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. All target missiles noted use solid propellants for the booster stage and, as such, during nominal launch scenarios would emit exhaust products from solid fuels at the launch pad and along the flight path. The minor effects to KLC soils anticipated from solid fuel emissions are discussed in section 4.1.5.2.1.
The Peacekeeper Target is the largest of these target vehicles and consists of both solid and liquid fueled stages. For purposes of analysis, Peacekeeper Target also represents the most difficult of the target missiles to handle, store, and refuel. Target missiles would be stored and assembled in missile storage facilities, and liquid fuels and oxidizers would be stored in separate fuel storage facilities. Each of these facilities would have the capability to contain unanticipated releases of liquid fuels, as well as procedures for reacting to such spills to ensure that local soils are not contaminated.

In the highly unlikely event of an on-pad fire or terminated launch, the Peacekeeper Target could potentially release 76,848 kilograms (169,420 pounds) of solid propellant, and 1968 liters (520 gallons) of liquid fuel. As discussed in section 4.1.5.2.1, most of the solid propellant would be expected to burn upon impact with the ground. Unburned components of the fuel would be removed and treated as hazardous waste.

The total quantity of aluminum oxide and hydrogen chloride released in an on-pad failure of a Peacekeeper target would be approximately 26,900 kilograms (59,300 pounds) and (12,300 kilograms (27,100 pounds) respectively. This would be equivalent to that released during three nominal launches of an Athena-2 missile. As discussed in section 4.1.1.2.2, the airborne concentrations of the pollutants would be higher than during a nominal launch, but would return to ambient levels within several hours. Modeling results from the testing of much larger Advanced Solid Rocket Motor program vehicles, which output 196,357 kilograms (432,885 pounds) of aluminum oxide and 115,572 kilograms (254,789 pounds) of hydrogen chloride concluded that there would be no significant impacts to soils as a result of aluminum oxide and hydrogen chloride deposition (National Aeronautics and Space Administration, 1990). Most of the aluminum oxide would be suspended in the air and dispersed over extremely large areas, and the amount of aluminum oxide deposited on the ground would not significantly change the soils chemistry. The hydrogen chloride, under the most conservative rain conditions, would be buffered by the soil and would not significantly change the soil’s pH (National Aeronautics and Space Administration, 1990). The soils in the ROI are expected to have similar alkalinity and a similar buffering capability. Due to the much smaller emission quantities of aluminum oxide and hydrogen chloride from a highly unlikely on-pad accident of a Peacekeeper target, impacts are expected to be minor.

In the highly unlikely case of an on-pad accident, the liquid fuel (hydrazine) from the fourth stage of the Peacekeeper target is heavier than air and, if not oxidized when airborne, would react and/or possibly ignite with the porous earth or would form dimethylamine and oxides of nitrogen. All of these substances are soluble in water. Airborne nitrogen dioxide would return to earth as dilute nitric acid rains in precipitation events. (U.S. Army Space and Strategic Defense Command, 1995)

4.1.5.2.3 In-Flight Interceptor Communication System Data Terminal

Construction

Alternative 1 would require construction of an IDT (one of three optional sites), COMSATCOMs (one of four optional sites), and connecting roads and cables. The probable disturbed area from site preparation would be approximately 5.9 hectares (14.6 acres). Soil disturbance from site preparation activities would be relatively minor and short in duration. Site preparation and construction activities would follow established procedures and Best Management Practices as previously described in section 4.1.5.2.1. AADC would obtain and review necessary definitive
information on surface faulting in the vicinity of the proposed IDT facilities. In making final siting and design determinations, AADC would incorporate all appropriate design standards specified by its licensed and bonded A&E contractor. All IDT facilities would be constructed outside of existing 100-year floodplains and beyond established limits for tsunami wave run-up for a maximum probable tsunami event. Except for localized soil compaction in the construction area, indirect and long-term impacts to the soils resulting from IDT construction would not be anticipated.

Operation
Operation of the IDT would have no direct, short- or long-term effect on surrounding geology or soils. Long-term indirect effects, primarily from vehicle traffic for support and maintenance, would result in very minor soil compaction and dust generation on gravel access roads.

4.1.5.2.4 Sensors
Construction
Alternative 1 would require a single gravel pad area out of seven alternate locations for mobile telemetry. An existing disturbed area would be utilized, and therefore soil disturbance from site preparation activities would be relatively minor and short in duration. Site preparation activities would follow Best Management Practices for soil management and erosion control (see section 4.1.5.2.1).

Operation
Operation of the sensors would have no direct or indirect, short- or long-term effect on surrounding geology or soils. Long-term indirect effects, primarily from vehicle traffic for operational support and maintenance, would result in very minor soil compaction and dust generation on gravel access roads and pads.

4.1.5.2.5 TPS-X Radar
The TPS-X construction and operation requirements and potential impacts to geology and soils would be similar to that described above for the IDT. The alternative location is the same as the potential IDT site south of the Loran-C Station, and the potential impacts would be similar.

4.1.5.3 Alternative 2
4.1.5.3.1 Target
Construction
Under Alternative 2, potential adverse effects to site soils from the construction of new target facilities would be similar to that described for Alternative 1 (see section 4.1.5.2.2).

Operation
Under Alternative 2, target launch operations would be the same as Alternative 1 and would not result in any direct adverse effects on geology and soils at KLC over the short- or long-term.
4.1.5.3.2 Sensors

Construction
Under Alternative 2, potential adverse effects to site soils from the construction of new sensor facilities would be identical to that described for Alternative 1 (see section 4.1.5.2.4).

Operation
Under Alternative 2, sensor operations would be the same as Alternative 1 and would not result in any direct adverse effect on geology or soils at KLC over the short- or long-term.

4.1.5.4 Alternative 3
Alternative 3 would include all aspects of Alternatives 1 and 2. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.5.5 Cumulative Impacts
The KLC EA indicated no significant impact to geology and soils from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Missile launches are discrete short-term events. Sampling programs performed during each launch have not shown any accumulation of missile launch exhaust products and therefore, no substantial impacts are anticipated at KLC. Future operations and improvements at KLC would be similar in scope to those described in prior EAs, with the proposed five launches per year being a part of the planned launches at KLC. Minor alteration of soil chemistry and accumulation of contaminants could occur from the exhaust emissions of multiple missile launches at KLC, but such adverse effects would be highly localized and would not pose a hazard to human health. No long-term cumulative impacts are expected from construction and operation at KLC.

4.1.5.6 Mitigation Measures
No specific mitigation measures are proposed. Standard measures for seismic safety would include provision for proper anchoring and/or dampening of missile components and fuel canisters while in storage. Likewise, missile storage buildings and Missile Assembly Buildings would be inspected to ensure structural integrity of foundation, roof, wall connections, and storage racks would be inspected to reduce risk to program personnel during a design seismic event. Before determining the final site layout and design standards for ETR facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.
4.1.6 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—KODIAK LAUNCH COMPLEX

Potential impacts from hazardous materials would involve their transportation, storage and use. Potential impact from hazardous waste would be related to the generation, accumulation, transportation, and disposal of hazardous wastes used or created in program activities. Impacts relative to hazardous materials and waste are considered significant if they would: (1) increase the potential for exposure to hazardous material or waste; (2) increase the likelihood of a release to the environment; (3) result in noncompliance with applicable regulatory guidelines; or (4) increase the quantities of hazardous materials used or wastes generated beyond available management practices.

Transportation, storage, and use of hazardous materials would be conducted according to applicable OSHA, EPA, DOT, DoD and state regulations and requirements as well as established project and launch complex Standard Safety Operating Plans.

Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint and PCBs have been evaluated and no impacts were identified. Potential impacts from launch activities are addressed under each alternative as applicable.

4.1.6.1 No Action Alternative

Missile Defense Agency

Under the No Action Alternative, KLC would continue to operate as a commercial launch facility and provide ongoing support to single Strategic Target System launches. The Strategic Target System launches would be managed within the nine launches previously analyzed in the KLC EA (Federal Aviation Administration, 1996), and no hazardous materials or hazardous wastes impacts would be anticipated.

Federal Aviation Administration

There would be no impacts expected from hazardous materials and hazardous waste from the FAA’s No Action Alternative because there would be no launch events from KLC.

4.1.6.2 Alternative 1

4.1.6.2.1 Ground-Based Interceptors

Construction

Construction activities in support of GBI launch activities at KLC are generally discussed in section 2.3.1.1 and include GBI silo or launch pad and support facility construction as well as the IDT, COMSATCOM, TPS-X radar, mobile telemetry and C-band radar gravel pad construction; maintenance storage building and Launch Control Complex additions; addition to the existing Narrow Cape Lodge; construction of a new mancamp; and utilities/communication installation. Construction activities would be centralized to the greatest extent possible at the selected project site and on specific construction laydown areas and access roads. Hazardous materials and waste management would be performed in accordance with ongoing KLC procedures, as described in the KLC User’s Manual (Alaska Aerospace Development Corporation, 2001) as well as applicable federal, state and local regulations.
The construction of the GBI launch support infrastructure would use small quantities of hazardous materials, which would result in the generation of some hazardous and nonhazardous wastes (Halliburton NUS Environmental Corporation, 1993). The hazardous materials that are expected to be used are common to construction activities and may include diesel fuel, anti-freeze, hydraulic fluid, lubricating oils, welding gases, and small amounts of paints, thinners, and adhesives.

Substantial impacts to the environment are not expected from the presence of potentially hazardous materials and the generation of wastes during the GBI construction activities. Best practices, lessons learned and expectations indicated in the interim guidance DoD 5000.2R would be incorporated into design and construction plans. The following hazardous materials management techniques may be used during the construction period to minimize (1) the amount of hazardous materials stored, (2) the threat of their accidental and unplanned release into the environment, and (3) the quantity of hazardous waste generated.

- Structures may be prefabricated by manufacturers and shipped for final assembly at the site using bolts to minimize the need for welding, painting, and other activities involving hazardous materials.
- No underground tanks exist at KLC and none would be installed as a result of this activity. Diesel fuel would be stored in ASTs with secondary containment and inspected daily in accordance with the provisions of the KLC SPCC Plan (as appropriate). ASTs may be removed after tests are complete or put in standby condition at KLC to support future activities. Fueling would follow existing procedures to minimize the potential for fuel spills.
- Bulk hazardous materials [e.g., 210-liter (55-gallon) drums of anti-freeze, hydraulic fluid, compressed welding gases] would be stored in approved containers that meet National Fire Protection Association industrial fire protection codes and required containment systems.
- Spill response materials (e.g., sorbents, drain covers, mops, brooms, shovels, drum repair materials and tools, warning signs and tapes, and personal protective equipment) would be readily available for use in the event of an unplanned release.
- Storage of hazardous materials would be in protected and controlled areas designed to comply with site-specific SPCC plans.
- Hazardous materials would be inspected before accepting a shipment (e.g., to validate container integrity, expiration date, etc.).
- Hazardous materials would be purchased in appropriately sized containers (e.g., if the material is used by the can, it would be purchased by the can rather than in bulk-sized containers).
- Over-purchasing of hazardous materials would be avoided.
- Hazardous material containers would be appropriately labeled.
- At the completion of the construction period, unused amounts of hazardous materials would be the responsibility of the construction contractors and would be safely removed from the site.

Nonhazardous and hazardous waste generated during construction activities include construction debris, empty containers, spent solvents, waste oil and anti-freeze, spill cleanup
materials (if necessary), and lead-acid batteries from construction equipment. Hazardous waste would be containerized and properly disposed of by individual contractors in accordance with Alaska Administrative Code, Title 18 - Environmental Conservation, Chapter 16 and KLC requirements. No permitted hazardous waste treatment or disposal facilities exist on Kodiak Island; therefore, all hazardous waste would be transferred by licensed hazardous waste transporters to the mainland for appropriate treatment or disposal.

The volume of nonhazardous, construction generated waste is expected to be small based on past experience. Nonhazardous waste would be removed by individual contractors for appropriate disposal at the Kodiak Island Borough landfill or at a landfill on the Alaska mainland. The construction schedule for the facility is approximately 15 months, with approximately 100 individuals involved in the construction process. Buildings may be constructed of prefabricated metal resulting in relatively small volumes of non-recyclable construction waste. Debris resulting from site preparation such as tree stumps would be burned onsite, and soil excavated during construction activities would be stockpiled for later onsite use.

Operation

Pre-Launch Activities
Missile components would be transported to KLC for temporary storage, pre-launch assembly and checkout, and launch preparation. Like the target missiles, the GBI components would be shipped to KLC as finished products that required only final assembly onsite. The hazardous materials contained within the missiles include solid fuel for the rocket and fuel and oxidizer for the EKV’s Divert and Attitude Control System propellant system. No separate fueling would occur; therefore, the likelihood of release and environmental effect would be small.

The handling and use of hazardous and toxic materials at the launch site during and between launch operations would be limited. Potentially hazardous materials used for maintenance, grounds keeping, and housekeeping activities would normally consist of fuel (external to those preloaded into the missiles) required for emergency power and heat, various solvents and cleaners, paints and primers, adhesives, and lubricants. It is expected that no more than 4 liters (1 gallon) of each of the solvents, cleaners, paints, adhesives, and lubricants would be present at any one time (U.S. Department of the Air Force, 1994b), with no more than 38 liters (10 gallons) in total. Fuel for the emergency generators would be stored in dedicated ASTs with secondary containment. The ASTs would be routinely inspected. The hazardous material and waste management techniques described for construction would also be followed during pre-launch operations. Again, substantial impacts to the environment are not expected from the use of potentially hazardous materials and generation of wastes during launch operations.

Launch Activities
GBI launch activity considerations include the Launch Hazard Area, flight corridor clearance, missile launch, and missile impact.

Emergency response would be required in the event of a pre-launch or post-launch event which resulted in the partial destruction of a missile. Such an event could result in the rupture of a rocket engine and exposure of the solid fuel. In the event of such mishap, spillage of the propellants could occur. The incident would be handled as an explosive ordnance event, and remaining potentially hazardous materials would be regarded as hazardous waste for
management purposes. Removal and disposal of nonhazardous and hazardous waste from KLC would be in accordance with applicable state and federal requirements.

One piece of equipment used on the EKV consists of a klystron tube which contains small quantities of beryllium. Beryllium is listed on the Toxic Substance Control Act Inventory. If maintenance were required, a new tube would be brought onsite and the replaced tube would be returned to the manufacturer for repair.

*Post-Launch Activities*
Following test activities, the GBI facilities would be readied for the next use or placed in standby mode. Post-launch activities would generally occur as discussed under the No Action Alternative target launch operations.

**4.1.6.2.2 Targets**

*Construction*
Construction activities would include target access roads, target launch pad, Movable Missile Building, Missile Assembly Building, Motor Storage Building and access road, existing Narrow Cape Lodge expansion, new mancamp construction, and utilities/communications installation. Generation of potential hazardous waste (e.g., corrosion control coatings, adhesives, and sealants) would be minimal. Management of hazardous materials and hazardous waste would be performed in accordance with AADC requirements, and would not significantly impact existing KLC hazardous materials and hazardous waste management procedures.

*Operation*

*Pre-Launch Activities*
Potential target missiles are described in section 2.1.2. Pre-launch activities include transportation of target missiles to KLC, temporary storage, pre-launch assembly and checkout and preparation of the missiles for launch. Missiles would be transported to KLC as ready-to-use components and assembled onsite. The launch operator would be responsible for transporting the fuel in accordance with DOT requirements. Because of the sealed nature of this mode of transport, the likelihood of release and environmental effect is small. No separate fuel transportation, onsite storage, or fueling operations would be performed.

The handling and use of potentially hazardous materials at the launch site during and between launch operations would be limited. Hazardous materials used for maintenance, grounds keeping, and housekeeping activities would normally consist of various solvents and cleaners, paints and primers, adhesives, and lubricants. It is expected that no more than 4 liters (1 gallon) of each of these types of materials would be present at any one time (U.S. Department of the Air Force, 1994b), with no more than 38 liters (10 gallons) in total.

Onsite waste management practices would include:

- The containerization of waste to prevent discharges of waste or leachate
- The prevention of litter
Controlling access by wildlife or disease vectors
Keeping the premises free of solid waste
The use of best available management practices for the control and prevention of runoff and erosion

Launch Activities
During a normal launch there would be minimal to no hazardous materials or hazardous waste impacts. However, safety procedures would be followed.

Potentially hazardous substances such as hydrogen chloride, aluminum oxide, carbon monoxide, and oxides of nitrogen would be generated from combustion of the solid rocket propellant during launch or in the event of a launch failure or abort. For a nominal launch, propellant would burn to completion. Although unlikely, it is possible that a rocket’s flight could be terminated early. In the event of an on-pad or in-flight launch failure, solid propellant could be expected to scatter over a wide area. The missile debris would impact inside the Launch Hazard Area. In such an impact, the rocket would contain a varying level of propellant that would depend on the flight time. If scattered on the ground, potential pollutant concentrations downwind are expected to be less than with a normal launch, as the solid propellant would burn more slowly in the open air than in a rocket motor. There would be minimal to no impact to mission critical personnel or to the public from such an incident.

There is also the unlikely possibility that an errant missile could impact off target. Should an off-target impact occur, the Range Safety Manager would be notified immediately. The Range Safety Manager would in turn report the incident to the appropriate public officials and initiate appropriate emergency response actions. Emergency response actions would be in accordance with the KLC User’s Manual.

Post-Launch Activities
Small amounts of potentially hazardous and nonhazardous wastes are expected to be generated during launch operations. Wastes would be segregated as nonhazardous, hazardous, and possibly special wastes for collection and disposal.

Nonhazardous waste would be removed for appropriate disposal at the Kodiak Island Borough landfill or on the Alaska mainland. Removal and disposal of nonhazardous and hazardous waste from KLC would be done in accordance with applicable state and federal requirements.

Hazardous materials management would be performed in accordance with ongoing KLC procedures, as described in the KLC User’s Manual (Alaska Aerospace Development Corporation, 2001) and the Alaska Hazardous Waste Management Regulations (Alaska Administrative Code, Title 18, Environmental Conservation, Chapter 16). Hazardous waste management at KLC would be the responsibility of the generator. Hazardous wastes would be collected for disposal in accordance with applicable federal, State of Alaska, and DoD requirements.
Since no permitted hazardous waste treatment or disposal facilities exist on Kodiak Island, all hazardous waste would be shipped to the mainland for appropriate treatment or disposal. Only licensed hazardous waste transporters would be used to transport hazardous wastes off site.

Post-launch activities would involve the release of Launch Hazard Areas, cleanup, and transportation from KLC. Following test activities, the launch facilities would be readied for the next use or placed in standby mode. Specific restoration actions would be determined on a case-by-case basis in coordination with the procedures of KLC and the Alaska Department of Environmental Conservation.

4.1.6.2.3 In-Flight Interceptor Communications Data Terminal

Construction
Alternative 1 would require the construction of one IDT (among three alternative sites), one COMSATCOM (among four alternatives), and connecting roads. Construction would include a gravel pad, concrete pad, security fencing and utilities/communications installation. Generation of potential hazardous waste (e.g., corrosion control coatings, adhesives, and sealants) would be minimal. Management of hazardous materials and hazardous waste would be performed in accordance with AADC requirements, and would not significantly impact existing KLC hazardous materials and hazardous waste management procedures.

Operation
Operation of the IDT and COMSATCOMs would have little effect on hazardous waste and hazardous materials management. A 3,785-liter (1,000-gallon) AST would be used for diesel fuel for the backup generator.

4.1.6.2.4 Sensors

Construction
Alternative 1 would require several gravel pad areas out of seven alternate locations for mobile telemetry. An existing disturbed area would be utilized, and therefore potential impacts related to hazardous materials and hazardous waste would be minimal.

Operation
Operation of the sensors would have minimal direct or indirect, short- or long-term effect on hazardous materials and hazardous waste.

4.1.6.2.5 TPS-X Radar

The TPS-X construction and operation requirements and potential impacts to hazardous materials and hazardous waste management would be similar to that described above for the IDT. The location would be the same as those described for the potential IDT and COMSAT facilities, and the potential impacts would be similar.
4.1.6.3 Alternative 2

Alternative 2 is similar to Alternative 1, except that GBI and IDT construction and operation activities would not occur and sensor operation would support only target missile launches.

4.1.6.4 Alternative 3

Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and operation impacts for Alternative 3 would be as described for Alternative 1.

4.1.6.5 Cumulative Impacts

Adherence to the existing hazardous materials and waste management systems on KLC would preclude the potential accumulation of hazardous materials or waste. The range has implemented an emergency response procedure that would aid in the evaluation and cleanup of any potentially hazardous materials released. The types of hazardous materials used and waste generated would be similar to those currently used at KLC. It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. The proposed launch of GBI or target missiles is not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at KLC. Therefore, proposed activities would not be expected to result in cumulative hazardous materials and hazardous waste impacts.

4.1.6.6 Mitigation Measures

No hazardous materials/hazardous waste mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.7 HEALTH AND SAFETY—KODIAK LAUNCH COMPLEX

Missile launches by their very nature involve some degree of risk and it is for this reason that DoD and AADC has specific launch and range safety policies and procedures to assure that any potential risk to the public and government assets (launch support facilities) are minimized. Potential issues related to health and safety would include the transportation of missile components, the reliability of components during handling/assembly and launch associated debris and emissions. Appendix B includes a detailed discussion of safety policies and regulations. Appendix C contains a discussion of flight test safety.

4.1.7.1 No Action Alternative

Missile Defense Agency

Under the No Action Alternative, KLC would continue to operate as a commercial launch facility and provide ongoing support to single Strategic Target System launches. The Strategic Target System launches would be managed within the nine launches previously analyzed in the KLC EA (Federal Aviation Administration, 1996). Potential health and safety risks from debris impact, toxic chemical dispersion (exhaust emissions), and noise would be associated with pre-launch, launch, and post-launch activities. Planning and execution of target launches would be in compliance with federal, state, and local health and safety requirements and regulations, as
well as DoD and KLC Safety Policy. Adherence to such requirements ensures that potential risk to the general public, workers, and the launch areas do not exceed acceptable limits. Therefore, no increase in potential risk to health and safety would be expected as a result of selecting this alternative.

Federal Aviation Administration
There would be no impacts expected to health and safety from the FAA’s No Action Alternative because there would be no launch events from KLC.

4.1.7.2 Alternative 1

4.1.7.2.1 Ground-Based Interceptors

Construction
Construction activities in support of GBI launch activities at KLC are generally discussed in section 2.3.1.1 and include GBI silo or launch pad and support facility construction as well as the IDT, COMSATCOM, TPS-X radar, mobile telemetry, and C-band radar gravel pad construction, maintenance storage building and Launch Control Complex additions, addition to the existing Narrow Cape Lodge, construction of a new mancamp and utilities/communication installation. Construction activities would be centralized to the greatest extent possible at the selected project site and on specific construction laydown areas and access roads. All new construction or structure modification would be accomplished using the same procedures that AADC used to construct the present KLC infrastructure.

Public access would be restricted in accordance with the KLC’s Interagency Land Management Agreement that encourages public access except in cases where safety is concerned or protection of structures is needed. A health and safety plan would be prepared by the contractor and submitted to KLC/AADC to ensure the health and safety of onsite workers. A formally trained individual would be appointed to act as safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of construction team personnel and visitors to the job site. Compliance with regulations would ensure that construction or modification of facilities would not impact health and safety of workers or range personnel. No impact to public health and safety would be expected.

Operation

Pre-Launch Activities
Pre-launch activities would include transportation of boosters, liquid fuel, and liquid oxidizer tanks for the EKV and missile preparation, assembly, and integration testing. Missile components and support equipment would be transported to Kodiak Island by sea or air from Government storage depots or contractor facilities. The interceptor may arrive at Kodiak with the EKV attached or the booster may be shipped separately from the EKV. All components and equipment would be handled and shipped in accordance with applicable military, state, and DOT regulations. Missile components would be packaged in shipping containers designed according to Alaska, DOT, and military requirements for protection of missile components and reduction of fire/explosion or risk of hazardous materials release in the event of an accident. All containers would have proper placards.
Sections 3.1.11 and 4.1.11 provide detailed discussion on Kodiak Island and KLC established air, ocean, and ground transportation systems. The primary hazard related to the transportation of missile components would be the potential for an accident involving the transport vehicle and a resulting explosion/fire of solid fuel motors and/or small explosive actuation devices (used in missile control and Flight Termination System). Operations involving the transport of explosives (including packaging and handling for movement) would require implementation of written procedures, which would be approved by KLC/AADC. Transport operations would be conducted under the supervision of an approved ordnance officer using explosive-certified personnel as necessary. Consequently, minimal health and safety impacts would be expected during transport of missile components.

Missile components transported by barge to the Port of Kodiak would likely arrive at the Lash Terminal. Lash is a privately owned terminal operated and serviced by Seaport Terminal Services, Inc. The Lash Terminal is licensed for explosive and hazardous materials handling. Lash is located south of the U.S. Coast Guard Station on the main road to KLC. Samson Tug & Barge routinely serves the Port of Kodiak from Seattle and Anchorage, and is familiar with aerospace transport requirements. A sealift accident during transport is considered highly unlikely. The potential for a major accident (sinking or total destruction of the seacraft) is minimal.

Once unloaded at Kodiak Island, missile components and support equipment could be shipped by tractor-trailer transport to KLC or barged to one of the following potential beach landing areas, Burton Ranch Beach (mancamp location), Boulder Beach (near Bear Paw Ranch), and Pasagshak Beach (near the Pasagshak Recreation Area). The Narrow Cape Lodge is an example of direct barge delivery to KLC. Temporary beach closure would be necessary, but would be considered routine and of short duration.

In each of the described cases, the accident probability presented reflects only the potential for an accident involving the transport vehicle. Only a small fraction of such accidents would affect missile propellants or explosives being transported due to the use of specialized shipping containers that protect the shipment. Consequently, minimal health and safety impacts would be expected during transport of missile components.

Appropriate safety measures as established by AADC would be instituted at the receiving terminals or airport. These safety measures include specified receiving and parking areas (for transport vehicles), establishment and enforcement of applicable ESQDs around receiving areas, restricting handling and transportation of missile components to specific and properly trained personnel, and using established and permitted transportation routes from the receiving terminal or airport to KLC.

Use of the Kodiak State Airport shared by commercial pilots and the U.S. Coast Guard would be required to support receipt and transportation of missile components and mission personnel (figure 4.1.7-1), just as has been done for previous rocket motor shipments to KLC. The ESQD would be 434 meters (1,425 feet) to any inhabited buildings and 260 meters (855 feet) to public traffic routes. A designated preferred parking/offloading area has been established at Kodiak Airport that would limit impact to the Buskin River State Recreation Site. An alternative parking/offloading area would be the location used during previous U.S. Air Force missile launches. In the event this alternate location is required, the ESQD would encroach on several campsites within Buskin River State Recreation Site and could require closure of the recreation site for one night while the boosters are at the airport. AADC would provide a 30-day advance
Kodiak Joint Tenant Airport and Buskin River State Recreation Site

Kodiak, Alaska

Figure 4.1.7-1


EXPLANATION

- State Park Property
- Restroom
- Picnic Shelter
- Campsite
- Fee Station
- Visitors Center

- Class 1 Explosive, Division 1.1 Inhabited Building ESQD 434 meters (1,425 feet)
- Class 1 Explosive, Division 1.1 Public Transit ESQD 261 meters (855 feet)
- Class 1 Explosive, Division 1.1 Inhabited Building ESQD Alternate Off-loading Point 434 meters (1,425 feet)
- Class 1 Explosive, Division 1.1 Public Transit ESQD Alternate Off-loading Point 261 meters (855 feet)

notice to Alaska State Parks regarding the closure. Once the boosters have been removed from the area, the ESQD would no longer be in effect and the campsites would again be accessible.

There would be no effect on U.S. Coast Guard Air Station search and rescue operations. Handling and transportation of the missile components would stop, or move, to allow the Coast Guard to proceed in the event of a search and rescue operation, and would resume after the all clear is provided.

For analysis purposes, a quantity of 20,410 kilograms (45,000 pounds) of division 1.1 explosive was assumed. An inhabited building ESQD with a radius of 434 meters (1,425 feet) would be established. The public transportation route ESQD would be 261 meters (855 feet). If the propellant is determined to be Division 1.3 explosive (22,700 kilograms [50,000 pounds]) then the ESQDs would be reduced to 74.7 meters (245 feet) from inhabited buildings and 74.7 meters (245 feet) from public transportation routes. The ESQD is based on information provided in Inhabited Building and Public Traffic Route Distances, DoD 6055.9-STD, Ammunition and Explosives Safety Standards. The ESQD determination would be based on the equivalent explosive force of all propellant and pyrotechnic materials contained in the flight vehicle. Establishment of the ESQD zone represents DoD’s determination that areas outside the zone provide acceptable protection, and requires that areas inside the ESQD zone be cleared of non-mission-essential personnel for the entire period during which the explosives are present. The ESQD would keep unauthorized personnel and individuals at a safe distance until the boosters are unloaded and transported by truck to KLC. The transportation route would be in accordance with the permit application submitted to and approved by the State of Alaska Department of Transportation before shipment of missile components. Transport of missile components is not expected to be a hazard to private properties along the transportation route. The same ESQDs would be established and enforced while the missile components are at KLC.

Access to launch support structures and hazardous materials storage areas would be limited to KLC/mission essential personnel. All personnel associated with the Proposed Action would be properly trained in compliance with applicable health and safety procedures and guidelines. All pre-flight hazardous operations would be conducted in accordance with applicable and routine safety regulations and operations plans.

The solid propellant used in the GBI missiles is very stable in the absence of an ignition source. The boosters would be grounded to help protect against lightning and static electricity. Electrostatic discharge ignition of boosters has been associated with low atmospheric moisture levels. Based on the high-moisture atmospheric conditions in Kodiak, it is unlikely that an electrostatic discharge would occur. To prevent a premature activation of the igniters or the Flight Termination System, the boosters would not be armed until just before launch.

The boosters would be processed and prepared for launch in the same manner as previous and ongoing missile launches from KLC. The major system components (boosters, in-flight destruct package, range safety equipment, and missile instrumentation) would be assembled and tested in the Integration and Processing Facility. All preparation activities would be conducted in accordance with applicable safety regulations and operations plans.
The handling and assembly of missile components, accomplished within enclosed buildings, has the potential to affect worker health and safety. RCC Standard 321-02 limits those collective risks to \(1 \times 10^{-3}\) for non-mission essential personnel and to \(1 \times 10^{-2}\) for mission essential personnel. Due to design of the buildings and implementation of ESQDs, the health and safety of the general public would not be affected. Assembly of missiles is considered routine at KLC. Adherence to appropriate safety regulations and operating plans would serve to maintain health risks to mission personnel within the RCC acceptable levels.

Each GBI missile would have an EKV assumed to contain approximately 7.5 liters (2.0 gallons) of liquid fuel and 5.5 liters (1.5 gallons) of liquid oxidizer (variations of monomethyl hydrazine and nitrogen tetroxide). The transportation of the EKV tanks containing liquid fuels and oxidizers would be conducted in accordance with state and federal regulations (49 CFR 106-180, University of Alaska, Fairbanks [UAF] Policy 902, Bureau of Explosives Tariff No. BOE 6000-1). The tanks would protect against releases in the unlikely event of a transportation accident and therefore would meet DOT requirements. The EKV would have proper placards and only military or commercial carriers licensed to handle or transport hazardous materials would be utilized.

There is the potential of ignition in an accident because the liquid propellants are sensitive to heat. However, the DoD has considerable experience with shipment of missiles and sensitive missile components, including liquid propellants.

On arrival at KLC, the pre-loaded EKV fuel tanks would be stored in the Integration and Processing Facility or would be placed in the existing hypergolic fuel storage building and/or the proposed oxidizer storage building until needed for installation on the EKV. The facility would use appropriate placards, and access would be limited to KLC and authorized mission personnel. All personnel associated with the handling of the tanks and installation on the EKV would be properly trained in compliance with UAF 601 and 29 CFR 1910 procedures and guidelines. Safety zones and personal protective equipment would be available based on the U.S. Air Force Toxic Dispersion Model spill model. Copies of MSDSs would be available. The facility would have fire protection equipment and would be inspected and maintained according to IFC 2000, 40 CFR 264, NSS 1740.12, UAF Document 601 and other applicable standards.

There is the potential of spill or release from damaged or leaking tanks; however, minimal health and safety impacts would be expected due to the small quantity of liquid propellant as well as storage and containment protocol and worker training.

**Launch Activities**

Before each launch at KLC, the Range Integrator and the Missile Flight Safety Officer must approve all flight plans and trajectories and planned impact areas. The Missile Flight Safety Officer would issue range clearance and surveillance for the following designated areas: safety exclusion zone, Launch Hazard Area, flight termination lines and flight safety corridor (figure 4.1.7-2).

**Safety Exclusion Zone.** The duration and size of the actual exclusion zone would be defined for each test and would vary depending on the missile size, altitude and direction and meteorological conditions (wind velocities) at the time of launch.
EXPLANATION

- **Land**
- **Ground Hazard Area** (2,987-meter/9,800-foot Radius)
- **Territorial Limit**
- **Representative Trajectory**
- **Flight Termination Lines**

**Scale**

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**Source:** U.S. Army Space and Missile Defense Command, 2001b.

**Figure 4.1.7-2**

**Kodiak Launch Complex, Alaska**

**GMD ETR Final EIS**

**Warning Area** (Outside 12 NM)

**Flight Safety Corridor**

**Safety Exclusion Zone** (< 12 NM)

**Flight Termination Line**

**Index Map**

Kodiak Island

**NORTH**

00-09-03 Warning Areas
**Launch Hazard Area.** A launch-site malfunction would potentially result in the scattering of the resulting missile debris anywhere within the Launch Hazard Area. The Launch Hazard Area includes those areas within and adjacent to the site within and up to a 2,743-meter (9,000-foot) radius of the launch pad. The public would be excluded well outside the Launch Hazard Area shown (figure 4.1.7-2).

**Flight Termination Line.** The flight termination line defines the limit/boundary at which flight termination would be initiated in order to contain the vehicle and its fragments within predetermined hazard and warning areas, such that the risk to personnel and non-mission aircraft and ships is within the RCC Standard 321-02 limits of $1 \times 10^{-7}$, $1 \times 10^{-7}$ and $1 \times 10^{-6}$, respectively. Warning areas are regions along the vehicle flight corridor where a possible hazard to aircraft and sea vessels exists because of missile flight operations. Figure 4.1.7-2 shows a flight termination line, including the representative exclusion and warning areas.

Failure of a missile guidance system that would cause debris to fall outside the termination line would be detected by the Range Safety Officer, who would terminate the missile flight before it could cross the flight hazard area. The range safety program includes redundant airborne command destruct systems that would permit in-flight tracking of the test missile. Remote area safety aircraft would be used for real-time monitoring of missile performance and evaluation of flight termination criteria. The termination system provides a mechanism by which impact lines would not be violated in the unlikely event of a malfunction during flight. Therefore, potential impacts to health and safety would not be significant.

**Flight Safety Corridor.** A probabilistic risk analysis would be performed before each flight test to determine that the individual risk to the general public is less than the RCC Standard 321-02 criteria of $1 \times 10^{-7}$ per launch. The probabilistic risk assessment would also predict the risk to all areas near the vehicle ground track, both inside and outside the Launch Hazard Area. Debris from booster drops, an in-flight malfunction and termination would potentially impact within the flight corridor footprint shown in figure 4.1.7-3. Additionally, regions within and beyond U.S. territorial waters where the hazard exceeds the limits stipulated in RCC Standard 321-02 (the warning area around KLC and the area along the missile trajectory) would be verified clear of ships and aircraft before launch. KLC would coordinate launch operations with the FAA, U.S. Coast Guard, and the Alaska Department of Fish and Game and issue NOTAMs and NOTMARs before launches.

The proposed launches at KLC would utilize launch azimuths between 125 and 225 degrees. Figure 4.1.7-3 indicates the major inhabited area near the westernmost (225 degree) launch profiles would be Old Harbor. Nominal flight profile data indicates that debris from launches would not reach this area. This risk would be evaluated on a launch-specific basis for each mission and events would be controlled so that the risk would remain below $1 \times 10^{-6}$. Launch azimuths of 125 to 225 degrees were previously analyzed in the KLC EA (Federal Aviation Administration, 1996). This document concluded that KLC takes every reasonable precaution during the planning and execution of these launch operations to prevent injury to human life or property, and no increased risk to health and safety is expected as a result of implementing this alternative.

Figure 4.1.7-3

EXPLANATION

- Water
- Land
- Individual Risk for Debris Impact (1x10^{-5} Flight Hazard Area)
- Individual Risk for Debris Impact (1x10^{-6} Flight Hazard Area)
- Individual Risk for Debris Impact (1x10^{-7} Flight Hazard Area)

The Range Safety Officer would establish the safety zones around the launch site and along the missile flight path no less than 4 hours before each launch. This area would be cleared of non-mission participating aircraft and ships by establishing warning and restricted areas, publishing NOTMARs and NOTAMs and by maintaining close liaison and coordination with agencies controlling both air and surface traffic. The Range Safety Officer would then ensure the safety exclusion zone is verified clear of non-mission essential personnel and vessels out to the territorial limit approximately 20 minutes before launch.

The area of Kodiak Borough in the vicinity of KLC is sparsely populated. The flight corridor, including the booster drop zone, would be mostly over open water. Therefore, proposed flight activities would pose minimal threat to the general public. Personnel inside the safety exclusion zone would be limited to mission essential personnel. Mission essential personnel (specifically those required to be within the evacuation area to conduct the launch) would remain within facilities, such as the Launch Control and Management Center, rated to provide adequate blast and debris protection and to which positive communications would be maintained at all times.

Flight testing evacuations, clearances, and road closures are expressly intended to ensure both worker and public health and safety. Evacuation includes conducting appropriate ground, open ocean, and air surveillance sweeps to ensure that all areas are evacuated.

The implementation of AADC’s safety programs and practices at KLC before and during launch activities would limit the number of personnel exposed to increased hazards and, as a result, no significant health and safety impacts are expected.

The potential effect of launch emissions and noise are discussed in sections 4.1.1 and 4.1.9 respectively.

Post-Launch Activities
Safety exclusion zones would be released or cleared for re-entering when the Missile Flight Safety Officer is assured that missile flight tests are completed and any residual gases, debris, or similar hazardous concerns are no longer a potential threat to worker or public health and safety. Debris would primarily consist of metal fragments. Much of any hazardous material in the missile would be consumed in the case of launch anomaly. If necessary, debris recovery activities would be conducted in accordance with DoD regulations and KLC safety plans and procedures and would not be expected to effect public health and safety.

Any potentially hazardous concerns remaining after a flight or flight termination would be handled in accordance with the KLC Safety Policy and Explosive Ordnance Disposal Plan. Disposal activities would be in accordance with KLC Explosive Ordnance Disposal Plan, NPD 600.1 Transportation Management Guidelines and applicable state and federal regulations. Implementation of these regulations and procedures would to prevent risks to the general public, KLC and program personnel.

Any necessary launch site restoration and maintenance operations would also be considered routine activities on KLC. Restoration and maintenance activities at the proposed launch sites would not have a significant impact on health and safety at KLC.
4.1.7.2.2 Target

Construction

Construction of several new facilities would occur as described in section 2.3.1.1. All construction and structure/infrastructure modification would be accomplished in accordance with the safety plans and procedures and regulations as described in section 4.1.7.2.1.

Operation

Pre-Launch Activities

Pre-launch activities include the transportation and assembly of the target at KLC. The fourth stage of a Peacekeeper target would utilize a single liquid propellant (hydrazine), and onsite loading would be required. A safety briefing would be held prior to loading and hazardous operations checklist would be completed. All persons performing the loading would wear personal protective suits and all non-essential personnel would leave the loading area. Approximately 236 kilograms (520 pounds) of hydrazine would be transferred at a rate of approximately 5.4 kilograms (12 pounds) per minute during fuel loading operations.

If an accidental release were to occur, it would most likely occur during loading. A reasonable scenario would involve failure of the transfer equipment or valves. Any small leaks/spills would be contained in a drip pan partially filled with water. Water would be added to larger leaks/spills to dilute the hydrazine and moist absorbent pads/booms would be used to contain and isolate the release. As discussed in section 4.1.1.2.2, analysis assumes a leak contained over a 3-minute period that releases up to 17 liters (4.5 gallons) of hydrazine fuel. Analysis indicated no potential exceedances of the IDLH health standard of 50 ppm. The low likelihood of such an occurrence and the implementation of approved emergency response plans would limit the impact of such a release. No impact to the general public would be expected.

Launch Activities

Proposed target launches would be similar to previous target launches at KLC. These land launched target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. Table 4.1.1-12 lists missile propellant information, and table 4.1.1-13 lists potential emission constituents during Stage I for each proposed missile. A total of five missile launches (GBI and/or target) per year would be anticipated at KLC over the duration of the program.

As described under section 4.1.7.2.1, Operations, Launch Activities, before each launch at KLC, the Range Integrator and the Missile Flight Safety Officer must approve all flight plans and trajectories and planned impact areas. The Missile Flight Safety Officer would issue range clearance and surveillance for the following designated areas: safety exclusion zone, Launch Hazard Area, flight termination lines and flight safety corridor (figure 4.1.7-2).

Safety Exclusion Zone. The duration and size of the actual exclusion zone would be defined for each test and would vary depending on the missile size, altitude and direction and meteorological conditions (wind velocities) at the time of launch.

Launch Hazard Area. A launch-site malfunction would potentially result in the scattering of the resulting missile debris anywhere within the Launch Hazard Area. The Launch Hazard Area
includes those areas within and adjacent to the site within and up to a 2,743-meter (9,000-foot) radius of the launch pad. The public would be excluded well outside the Launch Hazard Area shown (figure 4.1.7-2). In defining the launch hazard area for a dual Peacekeeper launch, air quality modeling would be conducted to allow consideration of potential air quality impacts from a launch pad accident.

**Flight Termination Line.** The flight termination line would be as discussed for a GBI launch in section 4.1.7.2.1.

**Flight Safety Corridor.** The flight safety corridor would be as discussed for a GBI launch in section 4.1.7.2.1.

**Post-Launch Activities**
Post-launch activities would be as described for the GBI in section 4.1.7.2.1.

**4.1.7.2.3 In-Flight Interceptor Communication System Data Terminal**
Implementation of Alternative 1 would include modification of existing support facilities and structures to increase current communications capability.

**Construction**
Alternative 1 would require the construction of one IDT (among three alternative sites), one COMSATCOM (among four alternatives), and connecting roads. Construction activities would be accomplished in accordance with the safety plans and procedures described in section 4.1.7.2. No adverse effects to health and safety are expected from IDT and COMSATCOM construction.

**Operation**
For communication link equipment, associated RF emissions are considered to be of sufficiently low power so that there would be no exposure hazard. All sensor systems would be sited before operation to ensure that no occupied structures or accessible travel areas would be within any hazard area necessitated by radio frequency emissions. Through the use of these procedures, it has been previously determined that proper exposure control would be achieved, and that operation of these systems would not present a significant health and safety hazard (U.S. Army Space and Strategic Defense Command, 1993b).

Security measures, such as fencing, would prohibit public access to the IDT site and keep the area free from any equipment that could cause electronic interference with the IDT receiving band.

Maintenance of the IDT would require occasional testing of the diesel powered electrical generators and replacement of the Klystron tube, which contains small quantities of beryllium. No hazardous materials or wastes would be generated as a result of generator testing. Potentially hazardous operations such as fueling of the generators would be conducted in compliance with the safety standards of OSHA, AADC’s safety programs and applicable operating procedures. Adherence to these regulations and procedures would minimize the potential for health and safety impacts.
Exposure to beryllium particles, dust, or fumes can cause chronic beryllium disease, a serious lung disease that can be disabling and even fatal. The current OSHA PELs for beryllium allow exposure to 2 \( \mu g/m^3 \) of air as an 8-hour time-weighted average; between 5 \( \mu g/m^3 \) and 25 \( \mu g/m^3 \) exposure for up to 30 minutes at a time; and 25 \( \mu g/m^3 \) as a maximum peak limit that can never be exceeded. Handling and replacement of the tube would not likely result in direct exposure of workers to beryllium, since the beryllium would be contained and any necessary repairs to the tube would be done off range by the tube’s manufacturer. Personal protective equipment would be available. Work practices, worker training and engineering controls, such as ventilation, would be used to further reduce the potential of beryllium exposure. No impact to public health and safety from IDT operation and maintenance would be expected.

4.1.7.2.4 Sensors

Construction

Proposed sensor use at one location on KLC and at one out of seven alternate sites throughout south-central or southwest Alaska would require that sensors be transported to these locations. Mobile systems would likely be parked at pre-existing parking areas. No adverse effects to health and safety are expected.

Operation

For communication link equipment, associated radio frequency emissions are considered to be of sufficiently low power so that there is no exposure hazard. All sensor systems would be sited before operation to ensure that no occupied structures or accessible travel areas are within any hazard area necessitated by radio frequency emissions. Through the use of these procedures, it has been previously determined that proper exposure control would be achieved, and that operation of these systems would not present a significant health and safety hazard (U.S. Army Space and Strategic Defense Command, 1993b).

4.1.7.2.5 TPS-X

Construction

The potential TPS-X location would be the same as described for the potential IDT and COMSATCOM facilities site south of the Loran-C station. Construction activities would be accomplished in accordance with the safety plans and procedures described in section 4.1.7.2.1. No adverse effects to health and safety are expected from construction of the TPS-X pad.

Operation

EMR hazard zones would be established within the beam's tracking space and near emitter equipment. The potential interference distances are shown in figure 2.3.1-8. A visual survey of the area would be conducted to verify that all personnel are outside the hazard zone before startup. Personnel may not enter these hazard zones while the radar is in operation. The radar is prevented from illuminating in a designated cutoff zone, in which operators and all other system elements would be located. Potential safety consequences associated with radar interference with other electronic and emitter units (flight navigation systems, tracking radars, etc.) would also examined before startup. Adherence to AADC, FAA, and DoD safety procedures relative to radar operations would preclude significant impact to health and safety.
4.1.7.3 **Alternative 2**
Alternative 2 is similar to Alternative 1, except that GBI and IDT construction and operation activities would not occur and sensor operation would support only target missile launches.

4.1.7.4 **Alternative 3**
Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts for Alternative 3 would be as described for Alternative 1.

4.1.7.5 **Cumulative Impacts**
There have been six launches as part of various DoD and National Aeronautics and Space Administration programs at KLC. Under these programs, the safety procedures at KLC have developed and matured. The discontinuous launches preclude cumulative health and safety impacts (Department of Energy, 1991c; Strategic Defense Initiative Organization, 1991; U.S. Army Strategic Defense Command, 1991b). The KLC EA indicated no significant impact to health and safety of personnel and the public from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. The maximum number of launches that could occur from KLC would be determined by the FAA and would be mandated in the launch site operator license. Safety and health planning would be done at the earliest stages of each missile test program. Implementation of DoD and range safety and health plans and procedures during all phases of operation would avoid or reduce the probability of potential impact to health and safety. Minor impacts from the Proposed Action, when added to other activities in the area, would not likely result in cumulative impacts to public health and safety.

4.1.7.6 **Mitigation Measures**
No health and safety mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.8 **LAND USE—KODIAK LAUNCH COMPLEX**
Land use is described as the human use of land resources for various purposes including economic production, natural resources protection, or institutional uses. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive uses. Potential issues typically stem from encroachment of one land use or activity on another or an incompatibility between adjacent land uses that leads to encroachment. The purpose of the Land Use Resource section is to addresses potential affects of the proposed action upon the use of land and the compatibility of the proposal and its alternatives with respect to the neighboring land uses and activities within an ROI.

4.1.8.1 **No Action Alternative**
**Missile Defense Agency**
Under the MDA’s No Action Alternative, current operations at KLC with respect to land use would not change. Launches would continue from KLC subject to the terms and conditions of
the FAA’s launch site operator license. KLC’s activities would continue to involve the launching of single target missiles from existing facilities and would not result in any significant impacts to land use. The continuation of launches from KLC would not result in any significant impacts to land use. The AADC will apply for a renewal of their current launch site operator license, which ends in September of 2003. The renewal period would be for another 5 years. This license must be renewed for launch operations to continue at KLC.

The Narrow Cape area is primarily undeveloped and utilized for a number of recreational activities. Since less than 1 percent of Narrow Cape is occupied by KLC and its location is more than 40 kilometers (25 miles) from the Kodiak National Wildlife Refuge, the potential for land use conflicts caused by the existence of KLC is minimized.

Recreational activities along KLC’s coast are available to the public during all times except during a launch or hazardous operations. These short-duration closures of Narrow Cape would not have an appreciable impact on recreation. Under the No Action Alternative, times of non-availability of KLC’s beaches and access to its coastline would continue to be publicized to further minimize the potential for land use conflict.

AADC preserves the coastlines around KLC property in their natural condition. Under the MDA’s No Action Alternative, the continuation of activities at KLC would be compatible with the Alaska CZM Program.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. If the FAA’s No Action Alternative is selected, the land at Narrow Cape may become available for other uses. Therefore, no impacts to land use would occur from launches at KLC.

4.1.8.2 Alternative 1

Under the Proposed Action of Alternative 1, several facilities would be constructed as discussed in section 2.3.1.1. Before construction, a Memorandum of Agreement would be required between AADC and MDA regarding construction, operation, and final disposition of MDA facilities on KLC.

4.1.8.2.1 Ground-Based Interceptors

Construction

The construction of two GBI silos or a GBI launch pad and a Mechanical Electrical Building would be confined to and contribute to the development of the ridge site along the northern boundary of KLC. In addition, necessary access roads and an Entry Control building would occur along the corridor yielding access to the northern ridge.

Construction could also add an additional 465 square meters (5,000 square feet) to the existing Launch Control Center and 1,394 square meters (15,000 square feet) to the nearby Maintenance and Storage Building. Modifications and additions would be considered routinely.
accomplished operations occurring within a compatible and already existing locale for such use. Likewise, no conflicts with land use would occur within or outside the boundaries of KLC.

Construction of an Oxidizer Storage Building would be located within the vicinity of the existing Hypergolic Storage Building and would not alter the overall land use and management of the surrounding facilities. The siting and use of this area would take into account ESQDs and applicable safety criteria preventing incompatible activities or land use conflicts.

Modifications to the Integration and Processing Facility, to serve as the Missile Assembly Building, would require some interior modifications. Since modifications would be confined within the already utilized Missile Assembly Building, neither changes nor impact to land use would occur. Furthermore, ESQDs and other appropriate safety measures would serve to prevent extending hazards areas.

Necessary housing for additional operation personnel may be provided by a mancamp near the Launch Control Center, or at the Narrow Cape Lodge or nearby hotels. Although the possible construction of a mancamp and additions to the Narrow Cape Lodge would alter the land use, such activity would be compatible with KLC’s Interagency Land Management Agreement between the Alaskan Department of Natural Resources and AADC, which encourages public access except in circumstances where safety or protection of structures are a concern. Furthermore, changes in the use of land would be confined within the immediate project area and only restrict access to a small portion of the total grazing lands.

Maximum use would be made of KLC’s existing infrastructure and facilities. General infrastructure improvements may also be required, such as fencing, road improvements, electrical service, and telephone and data transmission line installation. The decision to accomplish general improvements would be decided as needed, and would be considered minor and routine maintenance activities as described under the No Action Alternative.

A Coastal Project Questionnaire for GMD ETR activities would be submitted to the State of Alaska to confirm that construction activities would be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program. Submission of the Coastal Project Questionnaire would be coordinated among AADC, the State of Alaska, the U.S. Army Corps of Engineers, and MDA. As described in section 3.1.8.2, similar actions involving the developmental construction of KLC and the launch of missiles from KLC have previously undergone Coastal Consistency Determinations, resulting in decisions that activities were consistent with the state and local standards and policies. Therefore, it is anticipated that the similar construction and launch activities of the Proposed Action would be determined to be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program.

Operation

**Pre-Launch Activities**

Pre-launch activity would consist of all activities required to transport missile boosters, payloads, support equipment, and essential construction materials to KLC and to assemble the major components before flight. All necessary equipment and missile components would be
transported to KLC from U.S. Government storage depots or contractor facilities by air and or barge using the Kodiak Airport and Port Facilities as the prime delivery points.

The Alternate Strategic Target System Booster Off-loading Point or the original Booster Off-loading Point would be used as a parking area utilized by military transport aircraft transporting missile payloads and/or boosters (figure 4.1.7-1). The original booster off-loading point would require the establishment and enforcement of ESQDs from the plane 434 meters (1,425 feet) to any inhabited buildings, and 260 meters (855 feet) to public traffic routes. Impacts to recreational land use would be significantly reduced by coordination with the Alaska State Parks, Kodiak Division at least 30 days before the arrival of the missile payloads and/or missile boosters to ensure the campsites within the ESQD at Buskin River State Recreation Site would be vacated. Once the boosters and payloads are removed from the immediate vicinity, ESQDs would no longer be in effect and campsites would again be accessible.

The Primary Booster Off-loading Point would be considered the preferred parking area utilized by military transport aircraft transporting missile payloads and/or boosters (figure 4.1.7-1). Although this activity would also require the establishment and enforcement of ESQDs as mentioned above, land use conflicts involving evacuation would be minimal, given that no inhabited buildings exist within the ESQD and public traffic routes would only be subject to an infrequent traffic delay of short duration. In addition, prior planning of such activity for off-peak travel hours would further serve to minimize any traffic delays.

In an effort to transport large, extremely heavy, or over dimensional items and reduce any safety and security concerns involving the use of roads from the town of Kodiak, a beach landing could be performed as a secondary delivery point for barge traffic. All three barge landing sites (shown in figure 2.3.1-1) have ample water depth to allow near shore operation and direct access to roadways that would yield immediate access to KLC. Transportation across the beach would occur over temporary 1-inch thick steel plates placed on the beach. This would help preserve the existing condition of the land and prevent erosion. Changes in land use would be due to restricting access to beach landing areas and road closures during unloading and along roadway transportation routes. Such temporary closures would not significantly affect land use. Furthermore, barge beach landings would comply completely with the standards of the Alaskan Coastal Management Program.

Storage of missiles could occur in the Integration and Processing Facility at KLC. The storage of missile propellants would occur in storage areas designed for such use in accordance with all accepted governing standards. An ESQD area would be established and maintained around facilities where ordnance is stored or handled. These operations would be considered regular actions approved by the DoD Explosive Safety Board and consistent with KLC’s land use and adjacent land use. Only the inhabited building ESQD for the GBI silos or launch pad of 434 meters (1,425 feet) would overlap the northern portion of Fossil Beach. However, public access to the beach would not be restricted due to the ESQDs, and land use would not be impacted.

**Flight Activities**
Launch preparations scheduled at KLC would follow standard evacuation procedures of the launch vicinity. The Range Safety Officer would develop a Launch Hazard Area around the proposed launch site established by AADC in accord with the Interagency Land Management Agreement for the property. All civilian, nonessential contractor, personnel, and general public
would be cleared from the Launch Hazard Area several hours before launch. Agencies that would enforce the clearance of land areas would be notified in preparation for the procedures once a test event is officially scheduled. A notice of intent to clear hazardous areas would be published in the local newspaper and broadcast in local media approximately 1 week in advance. The boundaries of the Launch Hazard Area would also be posted with notifications. Flight safety corridors would be determined for each missile flight and would be verified clear according to range safety requirements.

The availability of recreational opportunities at Narrow Cape would not be significantly impacted by the GMD ETR activities. Only temporary closures during the transportation of missile components to the launch facilities and up to a full day closure on launch days would occur for the Pasagshak Point Road at the KLC site boundary. Public access through KLC to Fossil Beach would be limited or denied for each launch day. Although these safety closures would restrict beach combing, bird and whale watching, and fishing on these days, such temporary closures would not be considered to have an appreciable impact. Furthermore, any activities that could possibly restrict access to any recreational areas would be in the newspaper and announced on the local radio. Submission of a Coastal Project Questionnaire would be coordinated among AADC, the U.S. Army Corps of Engineers, and MDA. The Coastal Project Questionnaire would be submitted to the State of Alaska to confirm that actions would be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program.

**Post-Flight Activities**

As soon as the Range Safety Officer concludes that all hazardous areas are safe, all persons would be allowed to return. Only a preflight or early flight malfunction resulting in flight termination within the ROI would have any impact on surrounding land use by prolonging closures until hazardous conditions are cleared. Security requirements could require some areas to remain closed for several days following a launch.

Post-flight activities would also include removal of blast residue from the silos and/or launch pads and minor facility maintenance. These activities would have no effect on land use.

**4.1.8.2.2 Target Construction**

The construction of target missile facilities is described in section 2.1.2. The immediate vicinity of the construction zone would be temporarily affected by limiting access to only necessary personnel. Nevertheless, such activity is consistent with KLC’s general land use, and would not cause any change in any use of land within or outside of KLC. The only minor conflict to land use would be the limiting of access to small portions of grazing land where the new facilities would be constructed. Therefore, no significant impacts are expected.

Under Alternative 1, internal modification would be made to the already existing Launch Pad 1’s launch service structure. Modifications would be confined to the existing Launch Pad, minimizing any possible land use changes or conflicts to land use.

Possible construction of a new Missile Storage facility, access roads north of Launch Pad 1, a Missile Assembly Building, new target pad, and Movable Missile Building would occur in the
vicinity of the northern ridge. Both construction areas would occur upon undisturbed natural grasslands and alter the land use within the immediate vicinity during construction and operation. However, such activity would not greatly reduce grazing lands and comply with the general land use and would not produce any land use conflicts within the immediate or adjacent vicinity.

Additional general infrastructure improvements such as fencing, minor road improvements, electrical service, and telephone and data transmission line installation may also be required within the construction area. Portions of such activity could be supported by barge landings and would be considered under individual site construction or general facility maintenance activities.

**Operation**

Operation of target missiles concerning land use would be similar to the operation of GBI missiles in section 4.1.8.1.

### 4.1.8.2.3 In-Flight Interceptor Communication System Data Terminal

**Construction**

The construction of a fixed or relocatable IDT at KLC would include a total disturbed area of 5.9 hectares (14.6 acres). Within this area, approximately 3.2 hectares (8 acres) would be fenced. The proposed IDT locations (figures 2.3.1-2 to 2.3.1-4) are within areas that are compliant with KLC’s general land use, and no land use conflicts would occur. Furthermore, safety precautions would be followed during operation to prevent any unidentified land use conflicts from arising.

Construction of the COMSATCOM would require a 2.8-hectare (7-acre) site surrounded by a security fence, a concrete footprint covering 0.14 hectare (0.34 acre) to accommodate the COMSATCOM and equipment, the installation of a communications cable using new and previously installed conduit, and all weather access roads. Each of the proposed locations would be compatible and related to nearby IDT facilities. Similarly, no conflicts with land use would occur.

**Operation**

**Pre-Launch Activities**

IDT components would be transported to the operation site from U.S. Government storage depots or contractor facilities by air, sea, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA and DOT safety standards to minimize any possible impacts to land use.

**Flight Activities**

Although operation of IDT and COMSATCOM facilities would only function during times of GMD exercises, installation would immediately be established and secured after delivery, limiting the access to the surrounding area. This would result in a temporary change in land use within the immediate operation area by restricting access to unauthorized personnel. However, all impacts to land use were considered in the facilities site selection and would not represent a significant impact to land use by decreasing the utilization of land nor change the general land use within or outside the boundaries of KLC.
Post-Flight Activities
Post-flight operation would include the standard maintenance procedures to secure the IDT and COMSATCOM facilities and preparation for possible relocation of the relocatable IDT. Procedures would be confined to areas already used for the establishment of such facilities and would not change or introduce a conflicting use of land within the vicinity.

A Coastal Project Questionnaire for GMD ETR activities would be submitted to the State of Alaska to confirm that construction and operation activities would be consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program. Submission of the Coastal Project Questionnaire would be coordinated between AADC, the U.S. Army Corps of Engineers, and the MDA. The previous developmental construction of KLC and activities involving the launch of missiles have undergone Coastal Consistency Determinations resulting in decisions that current activities were consistent with the state and local standards and policies; as outlined within the KLC EA (Federal Aviation Administration, 1996) and the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b). Therefore, it is anticipated that the similar activities identified in the Proposed Action would be determined consistent with the Alaskan CZM Program and the Kodiak Island Borough Coastal Management Program.

4.1.8.2.4 Sensors

Construction
No construction would be required.

Operation

Pre-Launch Activities
Pre-launch activities would include the transportation and arrangement of four Mobile Telemetry Systems, two inside the boundaries of KLC and two others in appropriate locations on Kodiak Island. Positioning and operation would occur on a preexisting 61-meter (200-foot) by 61-meter (200-foot) level gravel area. Although an exact location of the Mobile Telemetry Systems has yet to be determined, the positioning would occur in a compatible land use area within and outside the boundaries of KLC.

Flight Activities
Operation of Telemetry Systems would be contained within the operational trailers and only occur during times of GMD exercises. Change in land use would be confined to the gravel area necessary for telemetry operations. Access to the telemetry would be limited to authorized telemetry personnel. Adjacent lands would not experience any changes or decrease in land utilization.

Post-Flight Activities
Post-flight activities would involve routine maintenance procedures in preparation for transport and possible relocation. Telemetry System components would be contained within trailers and shipped to suitable U.S. Government storage depots or contractor facilities.
4.1.8.2.5 TPS-X Radar

Construction
Alternative 1 construction would involve minor site preparations to position and create a concrete support pad for the transportable TPS-X radar and its operational components. The potential TPS-X location would be the same as described for the potential IDT and COMSATCOM site south of the Loran-C Station. Necessary EMR hazard exclusion areas would be observed in accordance with DoD and U.S. Air Force standards, and the proposed location would not produce a land use conflict.

Operation

Pre-Launch Activities
TPS-X components would be transported to the operation site from U.S. Government storage depots or contractor facilities by air, sea, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA, and DOT safety standards minimizing any possible impacts to land use.

Flight Activities
The operation of the each sensor during flight activities would only occur during times of GMD exercises. Access to the radar equipment and facilities would be limited to authorized personnel. Under the authority of the Range Safety Officer, each EMR hazard exclusion area would be cleared before operation.

Although operation of the TPS-X radar would temporarily alter land utilization by preventing encroachment into the hazard exclusion area, changes or possible conflicts to land use would be confined to the immediate operational area and the EMR hazard exclusion area. Adjacent lands would not experience any changes or decrease in land utilization.

Post-Flight Activities
Post-flight activities would involve routine maintenance procedures to secure the TPS-X radar equipment. The TPS-X components would be contained within its operational self contained trailers and shipped to suitable U.S. Government storage depots or contractor facilities. Such activity would be confined to and not affect the previously disturbed location.

4.1.8.3 Alternative 2
Alternative 2 would be similar to Alternative 1 without GBI, IDT, and TPS-X facilities.

4.1.8.3.1 Targets
Under Alternative 2, GMD activities and potential impacts involved in the construction and operation of target missile facilities would be the same as described under Alternative 1 in section 4.1.8.2.2.
4.1.8.3 Sensors
Under the Proposed Action of Alternative 2, GMD activities and possible impacts involved in the operation of sensory equipment within and outside the boundaries of KLC would be the same as described under Alternative 1 in section 4.1.8.2.4.

4.1.8.4 Alternative 3
Land use impacts due to construction and operation of GBI, target, IDT, and sensors, and their accompanying facilities for Alternative 3 would be as described for Alternative 1.

4.1.8.5 Cumulative Impacts
The KLC EA indicated no significant impact to land use from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target), in conjunction with other currently planned or anticipated launches at KLC, would exceed nine launches per year, the level of activity analyzed in the KLC EA. The total existing ground disturbances associated with current facilities and activities is approximately 1 percent of the 1,504 hectares (3,717 acres) leased by the AADC for KLC. Site preparation and new construction activities associated with the Proposed Action would disturb less than 2 percent of the total or 26 hectares (64.2 acres). The total cumulative impact of such actions would be less than 3% of the KLC’s total land or approximately 43 hectares (106 acres).

4.1.8.6 Mitigation Measures
No land use mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.9 NOISE—KODIAK LAUNCH COMPLEX
This section addresses the potential impacts to the noise environment due to the construction and operation of the GBI, target, IDT, and sensor elements of the ETR at KLC, as well as the identification of potential cumulative impacts and mitigation measures.

The analysis in this section is concerned with human receptors; noise effects on wildlife are discussed in section 4.1.3, Biological Resources.

4.1.9.1 No Action Alternative
Missile Defense Agency
Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established, and there would be no change to noise at KLC. The GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. Current activities of single target and commercial launches would continue.

Under the KLC site license, an Environmental Monitoring Plan was required as part of the KLC launch site operator license and called for the monitoring of at least the first five launches from KLC. Results from noise monitoring are shown in table 4.1.9-1 for the ait-1, ait-2, QRLV, and
Athena-2 (data were not gathered for the fifth launch, Strategic Target System, due to adverse weather conditions). These levels were recorded at Ugak Island, approximately 5.6 kilometers (3.5 miles) from the launch pad.

<table>
<thead>
<tr>
<th>Noise Metric (dBA)</th>
<th>Rockets Launched</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_{\text{max}} )</td>
<td>ait-1</td>
</tr>
<tr>
<td>78.2</td>
<td>81.5</td>
</tr>
</tbody>
</table>

These levels would be audible for only short periods of time and would not be expected to interfere with the area’s fishing, camping, or other recreational uses. (U.S. Department of the Air Force, 2001)

**Federal Aviation Administration**

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, no impacts from noise from launches would occur at KLC.

4.1.9.2 Alternative 1

Alternative 1 includes the construction of numerous facilities as described in section 2.3.1.1. Construction at KLC would be temporary in nature and similar to any commercial construction site. Noise generated during construction should have minimal impact to offsite areas.

4.1.9.2.1 Ground-Based Interceptors

**Construction**

Construction would result in intermittent, short-term noise effects that would be temporary, lasting for the duration of the noise generating construction activities. Noise-generating construction activities would include excavation and grading, utility construction and paving, and frame building.

The specific types of equipment that would be used during these construction phases are not known at this time. Excavation and grading would normally involve the use of bulldozers, scrapers, backhoes, and trucks. The construction of buildings would likely involve the use of pile drivers, concrete mixers, pumps, saws, hammers, cranes, and forklifts. Typical sound levels from construction equipment are listed in table 4.1.9-2.

It is assumed that construction would take place 24 hours per day during the summer due to the shortened construction season in Alaska. Therefore, due to the 10 dBA penalty added to nighttime noise, the 65 dBA and 75 dBA contours are estimated to occur within approximately 152 meters (500 feet) and 122 meters (400 feet) from the construction site, respectively. Therefore, no impacts to the noise environment would be expected from construction equipment noise.
### Table 4.1.9-2: Typical Construction Noises (dBA) at KLC

<table>
<thead>
<tr>
<th>Source</th>
<th>Noise level (peak)</th>
<th>Distance from Source</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>15 meters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(50 feet)</td>
</tr>
<tr>
<td>Heavy Trucks</td>
<td>95</td>
<td>84-89</td>
</tr>
<tr>
<td>Dump Trucks</td>
<td>108</td>
<td>88</td>
</tr>
<tr>
<td>Concrete mixer</td>
<td>105</td>
<td>85</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>108</td>
<td>88</td>
</tr>
<tr>
<td>Scraper</td>
<td>93</td>
<td>80-89</td>
</tr>
<tr>
<td>Dozer</td>
<td>107</td>
<td>87-102</td>
</tr>
<tr>
<td>Generator</td>
<td>96</td>
<td>76</td>
</tr>
<tr>
<td>Crane</td>
<td>104</td>
<td>75-88</td>
</tr>
<tr>
<td>Loader</td>
<td>104</td>
<td>73-86</td>
</tr>
<tr>
<td>Grader</td>
<td>108</td>
<td>88-91</td>
</tr>
<tr>
<td>Dragline</td>
<td>105</td>
<td>85</td>
</tr>
<tr>
<td>Pile driver</td>
<td>105</td>
<td>95</td>
</tr>
<tr>
<td>Fork Lift</td>
<td>100</td>
<td>95</td>
</tr>
</tbody>
</table>

Source: Federal Aviation Administration, 1996

Due to the exclusion of the public from the immediate vicinity of the construction site, the public would not be exposed to hazardous noise levels. However, the public within a few kilometers (miles) of KLC would be subject to noise that could decrease the existing aesthetic quality. The nearest residence is approximately 3 kilometers (2 miles) from KLC. Individuals living near the Pasagshak Point Road would experience a slight increase in traffic noise.

**Operation**

*Pre-Launch Activities*

Noises produced during pre-launch activities include noise from mechanical equipment such as worker vehicles, trucks, and by the use of the public address systems. Transportation noise would increase, as up to 235 launch support personnel drive to the site and additional trucks bring material to the site. However, this increase is expected to be reduced as some personnel are expected to be housed onsite at the proposed mancamp and at the existing mancamp at Kodiak Ranch. The remainder would commute from accommodations elsewhere on Kodiak. The increase in traffic noise levels due to launch support personnel would be considered temporary and would not permanently impact the aesthetic quality of the surrounding area.

*Launch Activities*

Noise during launch activities includes the GBI launch itself, which is a result of the interaction of the exhaust jet with the atmosphere and the combustion of the fuel. The sound pressure from a missile is related to the engine’s thrust level and other design features.

Personnel would normally be at the Launch Control Center during launches. At approximately 3 kilometers (2 miles) from the launch pad, they would be exposed to approximately 118 dBA.
during a single launch. This value is within the OSHA standard of 118 dBA over 9.6 minutes (U.S. Department of Labor, 2002). In the event of a dual GBI launch, personnel located at the Launch Control Center are anticipated to be exposed to approximately 121 dBA. This level is within the OSHA standard of 121 dBA over 6.6 minutes. Although no standards exist for single-event noise exposure, a time-weighted average of 90 dBA is established as a limit for an 8-hour exposure. However, workers exposed to excessive launch noise would be required to wear hearing protection.

In addition to the noise of the rocket engine, sonic booms are possible. A sonic boom is a sound that resembles rolling thunder, and is produced by a shock wave that forms at the nose of a vehicle that is traveling faster than the speed of sound. However, GBI launches would be in a southerly direction, and a sonic boom would not occur over land. Sonic booms are not expected to impact Kodiak Island or Ugak Island. Vessels impacted by sonic booms would be expected to experience sound resembling mild thunder.

All public, civilian, and nonessential personnel would be required to be outside of the Ground Hazard Area where the expected noise levels would be below the 115 dBA limit for short-term exposure. Given the infrequency of the launches, the short duration of the launch, and the similarity to previous launches, adverse noise impacts from launch activities are not anticipated.

Post-Launch Activities
Noise generated during the removal of all mobile equipment and assets during post-launch activities should have minimal impact to the noise environment on or off of KLC.

4.1.9.2.2 Targets
Construction
Noise caused by construction of target facilities would be similar to that described in section 4.1.9.2.1 for GBI facility construction.

Operation
Pre-Launch Activities
Pre-launch activities would include noise from mechanical equipment and the increase in vehicles for transportation of personnel to KLC. Personnel transportation noise is expected to be moderate due to some personnel being located onsite at the proposed mancamp and the existing mancamp at Kodiak Ranch. The increase in traffic noise levels due to target launch support personnel would be considered temporary and would not permanently impact the aesthetic quality of the surrounding area.

Launch Activities
The launch vehicle boosters are the major source of target operational noises. Based on the duration of a launch, an A-weighted scale is used and dBA measurements are used to adequately characterize the operational noise. $L_{\text{max}}$ is used to compare noise levels due to its ability to cover the entire sound spectrum, especially sounds audible to humans. Table 4.1.9-3 lists previous launch $L_{\text{max}}$ levels as well as predicted levels for proposed targets. Also listed in
the table 4.1.9-3 are $L_{\text{max}}$ levels for the Castor 120™ motor. The Castor 120™ motor was analyzed in the KLC EA and found not to produce adverse noise levels.

Figure 4.1.9-1 shows predicted launch noise levels, including Strategic Target Systems, Peacekeeper Targets, and measured noise levels of a previous Athena-2 launch.

It is expected that these noise levels for single target launches would be audible for only short periods of time and would not be expected to interfere with the area’s fishing, camping, or other recreational uses. Figure 4.1.9-2 depicts calculated noise levels of a simultaneous dual Strategic Target System, Peacekeeper Target, and Athena-2 launches. Dual target launches are expected to occur virtually simultaneously. It is anticipated that noise impacts for dual launches would also fall within OSHA limits.

Table 4.1.9-3: Predicted Noise Levels for Target Launches at KLC

<table>
<thead>
<tr>
<th>Target</th>
<th>$L_{\text{max}}$ (dBA)</th>
<th>Distance (kilometers [miles])</th>
</tr>
</thead>
<tbody>
<tr>
<td>ait-1</td>
<td>78.2</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>ait-2</td>
<td>81.5</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>QRLV</td>
<td>73.3</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>Athena-2</td>
<td>90.8</td>
<td>5.6 (3.5)</td>
</tr>
<tr>
<td>Strategic Target System</td>
<td>107.9</td>
<td>0.8 (0.5)</td>
</tr>
<tr>
<td></td>
<td>91.5</td>
<td>3.2 (2.0)</td>
</tr>
<tr>
<td></td>
<td>81.3</td>
<td>6.4 (4.0)</td>
</tr>
<tr>
<td></td>
<td>69.2</td>
<td>12.9 (8.0)</td>
</tr>
<tr>
<td>Minuteman III</td>
<td>112.6</td>
<td>1.5 (0.94)</td>
</tr>
<tr>
<td></td>
<td>98.2</td>
<td>5.1 (3.2)</td>
</tr>
<tr>
<td></td>
<td>83.3</td>
<td>25.1 (15.6)</td>
</tr>
<tr>
<td>Peacekeeper</td>
<td>125.3</td>
<td>0.65 (0.40)</td>
</tr>
<tr>
<td></td>
<td>104.3</td>
<td>3.7 (2.3)</td>
</tr>
<tr>
<td>Castor 120™</td>
<td>108</td>
<td>1.3 (0.8)</td>
</tr>
<tr>
<td></td>
<td>94</td>
<td>3.0 (1.9)</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>5.6 (3.5)</td>
</tr>
</tbody>
</table>

All public, civilian, and nonessential personnel would be required to be outside of the Ground Hazard Area where the expected noise levels would be below the 115 dBA limit for short-term exposure. Given the infrequency of the launches, the short duration of the launch, and similarity to previous launches, adverse public impacts from launch activities are not anticipated.

Post-Launch Activities
Noise generated during the removal of all mobile equipment and assets should have minimal impact to the noise environment on or off of KLC.
**Explaination**

- Sound levels monitored during:
  - 26 Feb 93 Strategic Target System launch at PMRF.

- Sound levels predicted for Strategic Target System launch using NASA noise model.

- Noise Receptor
- Athena-2 Noise Level (measured at Kodiak Launch Complex)
- Peacekeeper Noise Level (measured at Vandenberg Air Force Base)
- Peacekeeper Noise Level (extrapolated)

- Note: Data depicted are maximum peak sound levels ($L_{max}$)

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**Noise Levels For Single Launch**

**Kodiak Island, Alaska**

**Figure 4.1.9-1**
**Index Map**

Kodiak Launch Complex

Kodiak Island

**EXPLANATION**

*57 dBA sound levels may be low due to sound damping from buildings, walls, and environmental factors at the time of monitoring. (U.S. Army Space and Strategic Defense Command, 1993)

Calculated from sound levels monitored during 26 Feb 93 Strategic Target System launch at PMRF

Calculated from sound levels predicted for Strategic Target System launch using NASA noise model

Noise Receptor

Athena-2 Noise Level

Peacekeeper Noise Level

Note: Data depicted are maximum peak sound levels ($L_{max}$)

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**Noise Levels**

Calculated for Dual Launches

Kodiak Island, Alaska

**Figure 4.1.9-2**
4.1.9.2.3 In-Flight Interceptor Communication System Data Terminal

Construction and operation of an IDT at KLC would have minimal impact to the surrounding environment’s noise levels. Construction noises would include noise from mechanical equipment. Noises involving traffic increases are included in analysis for GBI construction. Operational noise levels of an IDT are anticipated to be from the use of a 275-kW generator in the event of a loss of power. The IDT itself would produce minimal noise levels. Therefore, noise levels from the operation of an IDT would not increase the noise levels of the regional environment.

4.1.9.2.4 Sensors

Noise from the preparation of two gravel pads for mobile telemetry would be from the use of mechanical equipment. Exact types of equipment to be utilized are not known at this time. Typical sound levels from possible construction equipment are listed in table 4.1.9-2. It is expected that the two 10-kW generators to be used for mobile telemetry would produce noise levels less than that of normal speech. Noise levels from the operation of these systems would not increase the noise levels of the regional environment.

4.1.9.2.5 TPS-X

The TPS-X construction and operation requirements and potential impacts to noise levels would be similar to that described previously for sensors. Exact types of equipment to be used for construction are not known at this time; however, typical sound levels from possible construction equipment are listed in table 4.1.9-2. Operational noise levels of an IDT are expected to stem from the use of a 1.5-MW generator. Most 1.5-MW generators are equipped with attenuations equipment to reduce noise levels. Therefore, noise levels from the operation of the TPS-X would not increase the noise levels of the regional environment.

4.1.9.3 Alternative 2

4.1.9.3.1 Targets

Noise impacts due to construction and operation activities for target launches from KLC would be similar to those described in section 4.1.9.2.2 for Alternative 1.

4.1.9.3.2 Sensors

Sensor setup and operation activities would impact the surrounding noise environment as described in section 4.1.9.2.4 for Alternative 1.

4.1.9.4 Alternative 3

Noise impacts due to construction and operation of GBI, target, IDT, and sensors and their accompanying facilities for Alternative 3 would be similar to those described in section 4.1.9.2 for Alternative 1.
4.1.9.5 Cumulative Impacts

Construction at KLC for GMD ETR activities would cause a short-term temporary increase in the noise levels in the immediate vicinity of the construction work. This effect would be localized, and is not anticipated to cause permanent noise level impacts.

Since the sound level generated by each launch is a short, discrete event, the potential cumulative impacts to noise from GMD ETR launches would not be substantial. The KLC EA indicated no significant noise impacts to sensitive receptors for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Therefore, no cumulative noise impact is anticipated at KLC.

4.1.9.6 Mitigation Measures

No noise mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.10 SOCIOECONOMICS—KODIAK LAUNCH COMPLEX

General socioeconomic impacts resulting from the Proposed Action can lead to an economic gain or loss for the community or area. Potential socioeconomic impacts of the project stem from construction or operational activities, the duration and extent of displacement or modification of existing activities, and diversion or temporary suspension of access associated with the Proposed Action. Impact analysis is focused on the following broad areas of economic or social impacts: displacement of populations, residences or businesses; housing/accommodation availability; employment and income; growth inducement; and potential impacts to locally significant industries such as tourism, commercial fishing, or agriculture.

4.1.10.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC, but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. No displacement of populations, residences, or businesses would occur within the Kodiak Island Borough as a result of the MDA’s No Action Alternative. Under the MDA’s No Action Alternative there would continue to be a need for local temporary accommodation of personnel associated with launches. Under the current FAA launch site operator license there could be up to nine launches per year from KLC. Given the extent of local facilities, this is not anticipated to be a significant impact.

Though limited in scope, this alternative would nonetheless have a continued limited positive effect on the local economy of the Borough by the ongoing local service-based employment opportunities and through launch personnel spending money in the local economy. The overall impact would be slight and would not be expected to cause any population growth. No significant impacts to the commercial fishing or fish processing industries, tourism, or logging industries are anticipated. No significant socioeconomic impacts would occur, and no mitigation measures are proposed.
Federal Aviation Administration
Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Any economic benefits to the Kodiak Island Borough from the periodic presence of launch-related personnel would not occur.

4.1.10.2 Alternative 1
4.1.10.2.1 Ground Based Interceptor

Construction
Implementation of Alternative 1 would result in construction of two GBI silos or one launch pad and associated support facilities and ancillary equipment and modifications to some existing facilities. Approximately 100 construction personnel would be required on Kodiak Island during the course of construction of new facilities and modification of existing facilities. Construction equipment and materials would be shipped via sea or air to Kodiak Island. Local procurement of materials and workers is expected to remain very limited, and while positive, would not represent a significant economic impact to the borough.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within Kodiak Island Borough. The duration of construction activities is expected to last 15 months. The accommodation needs of the additional personnel during this period would be met via local hotels and guesthouses. Given the extent of available facilities in Kodiak, this is not considered a potentially significant economic impact. Coordination with existing accommodations would be carried out to maximize their use while minimizing any potential long-term impacts.

The additional construction personnel, by spending money in the local economy, mainly via accommodation and procurement of goods and services, would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as commercial fishing, fish processing, tourism, or logging are anticipated during construction activities. Also, personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 1.

Operation
Pre-Launch, Flight, and Post-Flight Activities
Implementation of Alternative 1 would result in single and dual GBI launches from KLC. Interceptor missile boosters, payloads, and support equipment would be transported by air or ship from Government storage depots or contractor facilities to KLC. There would be a total of five GMD missile launches per year from interceptor and/or target missiles. A typical ramp up over a 3-month period would be 55, 120, and 235 personnel who would be required at KLC to support a dual interceptor launch. After an interceptor launch, the majority of these personnel would immediately depart KLC and Kodiak Island.
As part of pre-launch and flight activities, a Launch Hazard Area and flight safety zone would be established in accord with AADC’s Interagency Land Management Agreement for Narrow Cape, which provides for public access except in cases of danger and for protection of structures. These areas would be cleared approximately 1 to 4 hours before a launch. The actual launch is expected to last approximately 30 minutes. Upon the Range Safety Officer declaring the area safe after a launch, expected to be within hours, the areas can then be reoccupied. The notice given to the local communities via local newspapers, broadcast media, and commercial fishing and tourist boat trade associations would be extensive. As such, entities with an economic interest in the use of these areas such as the commercial fishing, aviation, and tourist industries of Kodiak would not be significantly impacted by the proposed clearance areas.

Personnel would reside offsite at local hotels and guesthouses to support a GBI launch. As outlined in section 3.1.10, Kodiak has approximately 250 hotel, motel, and guesthouse rooms. There are approximately 100 additional rooms within the Narrow Cape Lodge (56) and U.S. Coast Guard accommodation facilities (44). Additional rooms could be obtained through an addition to the Narrow Cape Lodge (approximately 60 rooms) and/or constructing a mancamps on KLC (approximately 60 rooms). Without the construction of additional facilities, the accommodation needs of as many as 235 additional personnel necessary to support a dual interceptor launch would represent a positive economic impact to the local economy during the tourist “off-season” period (from September to March), given both the current supply of rooms in Kodiak and the historically low vacancy rates during this time. With regard to pre-launch periods occurring during tourist “high-season” (from May to September), the accommodation needs of up to 235 personnel, without the construction of additional facilities, would represent a positive economic impact to the community; however, there could be a potential impact to the repeat/returning tourist clientele. In order to minimize any potential negative impacts during these months, every effort would be made to secure as many rooms as possible at alternate facilities to those used by visiting tourists. Coordination with existing accommodations would be carried out to maximize their use while minimizing any potential long-term impacts.

Generally, by spending money in the local economy, mainly via accommodations and the normal procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a positive economic impact to the local community for the duration of their stay. The overall impact would be moderate, and although each launch would represent a positive impact of several million dollars on the Kodiak economy, it would not cause any population growth. No population, housing or businesses would be displaced during operational activities. No significant impacts to locally significant businesses or industries such as commercial fishing, fish processing, tourism, or logging are anticipated during operational activities. Also, personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated. Other than potential shortage of accommodations, no negative socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.1.10.2.2 Target
Construction
Implementation of Alternative 1 would result in construction of a target launch pad and associated support facilities and ancillary equipment and modifications to some existing facilities. Approximately 100 construction personnel would be required on Kodiak Island during
the course of construction of new facilities and modification of existing facilities. Construction equipment and materials would be shipped via sea or air to Kodiak Island. Local procurement of materials and workers is expected to remain limited and while positive would not represent a significant economic impact to the borough.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within Kodiak Island Borough. The duration of construction activities is expected to last 12 to 15 months. The accommodation needs of the additional personnel during this period would be met via local hotels and guesthouses. Given the extent of available facilities in Kodiak, this is not considered a potentially significant economic impact.

No population, housing or businesses would be displaced. An adequate supply of accommodation for construction personnel would be available and would consequentially represent a positive temporary economic impact to the local community. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries are anticipated during construction activities. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 1.

Operation

Pre-Launch, Flight, and Post-Flight Activities

Implementation of Alternative 1 would result in single and dual target launches from KLC. Target missile components would be built in contractor facilities and delivered to KLC via air or boat for system assembly and checkout. When a target missile test flight is planned, the same type of land and water clearance areas that were defined for the GBI would be established and cleared for the target missile. Again, entities with an economic interest in the use of these areas such as the commercial fishing and tourist industries of Kodiak would not be significantly impacted by the proposed clearance areas.

There would be a total of five GMD missile launches per year from interceptor and/or target missiles. A typical ramp-up over a 3-month period for a single target missile launch would be 25, 55, and 110 personnel who would be required at KLC to support a target launch. After a target launch, the majority of these personnel would immediately depart KLC and Kodiak. Requirements for a dual target launch would be 25, 75, and 150 personnel.

Personnel would reside offsite at local hotels and guesthouses to support a target launch. Approximately 250 hotel, motel, or guesthouse rooms are in Kodiak. There are approximately 100 additional rooms within the Narrow Cape Lodge (56) and U.S. Coast Guard accommodation facilities (44). Additional rooms would be obtained through an addition to the Narrow Cape Lodge (approximately 60 rooms) and/or constructing a mancamp on KLC (approximately 60 rooms). Without the construction of additional facilities, the accommodation needs of up to 150 additional personnel during the tourist “off-season” (from September to March) would represent a positive economic impact to the local economy given both the current supply of rooms in Kodiak and the historically low vacancy rates during this time. With regard to pre-launch periods occurring during tourist “high-season” (from May to September), the accommodation needs of up to 150 personnel, without the construction of additional facilities, would represent a positive economic impact to the community; however, there could be a potential impact to the
repeat/returning tourist clientele. In order to minimize any potential negative impacts during these months, every effort would be made to secure as many rooms as possible at alternate facilities to those used by visiting tourists.

Generally, by spending money in the local economy, mainly via accommodations and the normal procurement of goods and services, the additional launch-related personnel would represent both a potential increase in local service-based employment opportunities and a positive economic impact to the local community for the duration of their stay. The overall impact would be moderate, and although each launch would represent a positive impact of several million dollars on the Kodiak economy, it would not cause any population growth. No population, housing, or businesses would be displaced during operational activities. No significant impacts to locally significant businesses or industries such as commercial fishing, fish processing, tourism, or logging are anticipated during operational activities. Also, personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated. Other than the potential shortage of accommodations, no significant socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.1.10.2.3 In-Flight Interceptor Communication System Data Terminal

Construction

Implementation of Alternative 1 would result in the construction of an IDT on KLC. The IDT would be located near the Loran Station, the Oxidizer Storage Facility, or near the entry road. Construction equipment, materials, and personnel would arrive at KLC as part of the construction of the GBI silos and associated support equipment. The construction personnel and related construction equipment identified for GBI would be involved in the construction of the IDT.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within Kodiak Island Borough. The presence of the construction personnel represents both a potential increase in local service based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would however be slight and would not cause any population growth. No significant impacts to businesses or industries such as commercial fishing, fish processing, tourism, or logging, are anticipated during construction activities. No significant socioeconomic impacts would occur due to the construction activities associated with Alternative 1.

Operation

The IDT site would require three onsite support personnel when in operation. The generator would be tested weekly during non-launch periods and during power outages, approximately 250 hours a year. The personnel associated with the permanent IDT would be part of the people required to support an interceptor launch and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within Kodiak Island Borough. Similarly, no significant impacts to businesses or industries are anticipated. No significant socioeconomic impacts would occur thorough the IDT operational activities associated with Alternative 1.
4.1.10.2.4 Sensors

Construction

These systems are mobile and would be brought to the vicinity of the launch site approximately 2 to 6 weeks before the planned launch. No construction activities would be involved and no socioeconomic impacts would occur.

Operation

Implementation of Alternative 1 would include the operation of sensors. Instrumentation associated with the launch of a target missile would include two telemetry sites and a range control support equipment site. These systems would be transported to Kodiak and remain in position until the launch event has been complete. In most cases the equipment would be removed within days after the launch.

The personnel associated with the launch of a target missile would operate these systems; therefore, no personnel in addition to those already involved in target operations would be needed to operate the sensors, and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within Kodiak Island Borough. Similarly, no significant impacts to businesses or industries are anticipated. Under Alternative 1, no significant socioeconomic impacts would occur through the operational activities associated with sensors.

4.1.10.2.5 TPS-X Radar

Construction

The Proposed Action would require minor site preparation to construct a single concrete support pad for the transportable TPS-X radar and its operational components. The proposed location is the potential IDT site south of the Loran-C Station. Construction equipment, materials, and personnel would arrive at KLC as part of the construction of the GBI silos, and associated support equipment. No socioeconomic impacts would occur from such minimal construction activities.

Operation

The TPS-X would be transported to KLC by air or land and then transported to the potential site by truck. The personnel associated with the launch of a GBI missile would operate these systems; therefore, no additional personnel would be needed and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, businesses, or industries are anticipated. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 1.

4.1.10.3 Alternative 2

Under Alternative 2, GBIs would be launched from Vandenberg AFB instead of KLC. Thus, there would be no construction or operations related to either GBI silos and their associated support equipment or an IDT on KLC. However, the other components described in Alternative 1, and the extent of the related impacts, would remain the same.
4.1.10.3.1 Target

The socioeconomic impacts to Kodiak Island from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to what was discussed in section 4.1.10.2.2.

4.1.10.3.2 Sensors

The socioeconomic impacts to the Kodiak Island from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to what was discussed in section 4.1.10.2.4.

4.1.10.4 Alternative 3

For Alternative 3, socioeconomic impacts due to construction and operation of GBI, target, IDT, and sensors, as well as their accompanying facilities, would be the same as described in section 4.1.10.2 for Alternative 1.

4.1.10.4.1 Cumulative Impacts

It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. Other than those activities already described, no other activities have been identified that would combine with the Proposed Action and result in cumulative socioeconomic impacts.

4.1.10.4.2 Mitigation Measures

No socioeconomic mitigation measures are proposed for the GMD ETR activities at KLC. Coordination with the local tourist industry is a typical practice that would be used to reduce the potential impact on tourists during the peak tourist season. The construction of an addition to the existing Narrow Cape Lodge and/or the construction of an additional mancamp at KLC are alternatives that could be implemented. If a decision is made to proceed with proposed activities at KLC, then the housing availability and requirements would be reviewed at that time, and a decision would be made regarding this construction.

4.1.11 TRANSPORTATION—KODIAK LAUNCH COMPLEX

4.1.11.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC, but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. The AADC and the Alaska Department of Transportation and Public Facilities conducted studies of the roads, bridges, and culvert crossing conditions and determined that they are adequate for motor loads as heavy as a Castor 120™ (Alaska Aerospace Development Corporation, 2001).
Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC after September 2003. Therefore, there would be no impacts to transportation from launches at KLC.

4.1.11.2 Alternative 1

4.1.11.2.1 Ground-Based Interceptors

Construction

Implementation of Alternative 1 would result in the construction of facilities as described in section 2.3.1.1. Kodiak Island and KLC have established air, ocean, and ground transportation systems. The construction equipment and materials would be brought to Kodiak Island by ocean carrier or by plane and transported over land or via barge/beach landing to KLC. Kodiak Island is already one of the leading shipping ports in southwest Alaska and as a commercial service facility is equipped to accommodate international cargo receipt and shipment. Scheduled service is in place to support the normal level of traffic; however, peak demands are anticipated and scheduled in advance. In addition, vessels serving the AMHS are rarely booked full to capacity with container vans (Alaska Department of Transportation and Public Facilities, 1998). These activities would be considered normal usage and would not result in an impact to the ocean transportation systems. Approximately 100 construction personnel would be brought to Kodiak Island via the AMHS and/or commercial airliner. Year-round service to Kodiak Island by sea and air currently exists, and movement of project-related people would not impact either of these transportation systems.

Once unloaded at Kodiak Island, construction equipment and material could be shipped by tractor-trailer transport to KLC with beach landings as a possible option. Roadway access to KLC is via Rezanof Drive West. This road is narrow and, in some cases, steep. There are switchbacks and 11 bridge crossings before reaching KLC. Due to the nature of these road conditions, movement of construction equipment and material would cause temporary traffic delays; however, these delays would be minimal and infrequent. Public announcements regarding potential delays would be made, and movements during off-peak travel hours would be scheduled to the greatest extent possible.

The roadways supporting the individual facilities within KLC are designed to accommodate tractor-trailer transport vehicles as well as passenger vehicles and light trucks. Road grades range from 1 percent to over 15 percent. Due to the nature of these road conditions, project-related movements would also cause temporary traffic delays within KLC; however, they would not extend to local roads. Development of these new facilities would result in the construction of new roads, parking for staff vehicles and tractor trailers, and upgrades to existing roads. The approximately 100 construction personnel would be housed in Narrow Cape Lodge and accommodations in the Kodiak area. The proposed Narrow Cape Lodge expansion, and/or the proposed mancamp would further decrease the transportation to and from Kodiak proper; thus the increase in personnel would only minimally change the ADT on key local roads, if at all, and the impact on Level of Service would be negligible.

Potential beach landing areas, for optional barge delivery, include Burton Ranch Beach (mancamp location), Boulder Beach (near Bear Paw Ranch), and Pasagshak Beach (near the
Pasagshak Recreation Area). The Narrow Cape Lodge is an example of direct barge delivery to KLC. For the latter two locations, some modification would be necessary: Boulder Beach would require a temporary ramp; Pasagshak Beach would require widening of a turn to allow access to the main road nearby. Temporary beach closure would be necessary, but would be considered routine and of short duration.

**Operation**

**Pre-Launch Activities**

Implementation of Alternative 1 would result in single and dual GBI launches from KLC. Interceptor missile boosters, payloads, and support equipment would be transported by air or ship/barge from Government storage depots or contractor facilities to KLC. All shipping would be conducted in accordance with DOT regulations. Applicable safety regulations would be followed in the transport and handling of hazardous materials. The interceptor may arrive at Kodiak with the EKV attached, or the booster may be shipped separately from the EKV. In either case, integration and assembly operations would be performed onsite. There would be up to five interceptor launches per year; however, as previously stated, Kodiak Island is one of the leading shipping ports in southwest Alaska and as a commercial service facility is equipped to accommodate this type of cargo and frequency of shipping.

As mentioned in section 4.1.7.2.1, use of the Kodiak State airport could be required to support receipt and transportation of missile components and mission personnel. This is typical procedure for rocket motor shipments to KLC, and, if chosen, appropriate safety measures (as established by AADC) would be instituted at the receiving terminals or airport, including specified receiving and parking areas (for transport vehicles), establishment and enforcement of applicable ESQDs around receiving areas, restricting handling and transportation of missile components to specific and properly trained personnel, and using established and permitted transportation routes from the receiving terminal or airport to KLC.

A Primary or Alternate Booster Off-loading Point (figure 4.1.7-1) could be utilized by military aircraft transporting missile payloads and/or boosters. An ESQD would be established around such aircraft to a distance of 434 meters (1,425 feet) to any inhabited buildings and 260 meters (855 feet) to any public traffic routes. Selection of the Primary Booster Off-loading Point would result in the temporary closure of portions of Airport Terminal Road and possibly a small portion of Buskin River Road. Selection of the alternate scenario would result in the temporary closure of the areas surrounding the junction of Buskin River Road and Buskin Beach Road, as well as the area just southwest of this junction, which includes the eastern portion of Airport Terminal Road.

With either scenario, traffic delays would be discrete and infrequent, and impacts to transportation on these non-primary roads would be significantly reduced by coordination with the Alaska State Parks, Kodiak Division. In keeping with this, AADC would provide a 30-day advance notice regarding any closure prior to the arrival of missile payloads and/or boosters in order to ensure that roadways at or near the recreation site that fall within the ESQD would be vacated. Once the boosters and payloads are removed from the immediate vicinity, ESQDs would no longer be in effect and roadways would again be accessible. Effects on Buskin River Road, Buskin Beach Road, and Airport Terminal Road would be minimal. In addition, prior planning of such activity for off-peak travel hours would further serve to minimize any traffic delays.
Once unloaded at Kodiak Island, the interceptor missile boosters, payloads, and support equipment would be shipped by tractor-trailer transport to KLC in a manner similar to that of the construction equipment and materials; as an option, they could be barged via one of the aforementioned potential beach landing areas. The Alaska Department of Transportation and Public Facilities has evaluated all of the bridges on this road and made improvements to them to support rocket motors in transport to KLC (Alaska Aerospace Development Corporation, 2001). Due to the nature of these road conditions, movement of interceptor missile boosters, payloads, and support equipment would cause temporary traffic delays; however, these delays would be minimal and infrequent. Prior planning of these movements for off-peak travel hours would further serve to minimize these delays. Once at KLC, the interceptor would be placed in secure storage until assembly and launch preparation. Due to the nature of the road conditions within KLC, movement of these vehicles would also cause temporary traffic delays, but they would not extend to local roads. As mentioned, utilizing the beach landing/barging options would require modifications. Temporary beach closure would be necessary, but would be considered routine and of short duration.

A typical manpower build-up over a 3-month period would be 55, 120, and 235 personnel who would be required at KLC to support a dual interceptor launch. They would come to Kodiak via commercial airliner or the AMHS. It is assumed that approximately 50 personnel would be housed at the existing mancamp on Kodi Ranch. If the additional mancamp is not constructed on KLC or the existing mancamp is not added on to, then it is conservatively estimated that the remaining 185 personnel would commute daily to KLC from accommodations in the surrounding areas and within the City of Kodiak during a peak month. This would add approximately 93 vehicles (assuming 2 persons per vehicle) to Rezanof Drive West each day during peak hours. Although the local road system would experience an increase in traffic, the increase would only minimally change the ADT on key local roads, and the impact on Level of Service would be negligible. The use of an onsite mancamp and/or expansion of the Narrow Cape Lodge to house personnel would also help to reduce automobile traffic between the worksite and the city of Kodiak, lowering the potential impacts even further.

**Flight Activities**

When a missile test flight is planned, there are certain areas where missile components and debris are expected to impact: the booster drop zone and the debris impact area. These areas are cleared of personnel as part of the test plan. There are other areas where debris may land if the test does not proceed as planned. These areas of the test event may be subject to the risk of mishap from a flight termination. Each missile flight test event would be modeled using computer predictions of the behavior of the missiles. Specific clearance areas would be defined for each flight test depending upon the profile of that test.

Once a test event is scheduled, there would be a standard sequence of notification and coordination procedures between the Range Safety Office and the agencies (FAA, Coast Guard, AMHS) that would enforce the clearance of land, air, and sea areas. The date and location of scheduled flight tests or training events would be published approximately one week in advance as described below for land, air, and sea areas. Clearances are of a short duration, and effects are anticipated to be negligible.

Land areas would be cleared by KLC Security personnel approximately 4 hours before launch. A Launch Hazard Area would be established around the launch site; however, since the launch
azimuth for KLC is southwest and southeast over the Pacific Ocean and would not be over any public roads, there would be no impact to road transportation.

Impacts to commercial aviation and airspace from missile launches are evaluated in section 4.1.2.

Sea-surface areas that would have to be cleared include the Launch Hazard Area that extends overwater, the predicted booster drop zones, the predicted debris impact area, and the predicted whole body miss impact point for each missile. Sea-surface areas would be cleared with the cooperation of the U.S. Coast Guard. Sea-surface areas would need to be cleared in advance of a planned test event to allow sufficient time to ensure that it is indeed clear; this would be approximately 4 hours before test launch. The U.S. Coast Guard would publish a NOTMAR to clear certain sea-surface areas for safety reasons. Notice of intent to clear certain sea-surface areas for safety reasons would be published in local newspapers, broadcast in local news media, and distributed to commercial fishing and tourist boating trade associations. Subject to the conditions of appropriate Memoranda of Agreement, Coast Guard officials would close the sea-surface area(s) up to 4 hours before the planned launch and then survey them to ensure that they are clear of ships or watercraft. Coast Guard boats and range safety aircraft would patrol the area to ensure that it is clear of ships or watercraft. The AMHS ferry route is north of Kodiak and away from the KLC launch azimuth; therefore, no impacts to vessels traveling these routes would occur. The Pacific Ocean south of Kodiak does contain commercial shipping lanes for vessels traveling from Seattle to and from Nome and Yokohama. These vessels would be required to stay clear of these areas during a launch, which could cause them to be slightly delayed. These delays would be short-term and infrequent (up to five times per year), however, and the advanced notification would serve to further minimize any impact. Commercial and recreational fishing vessels would also be required to relocate their activities during a launch event; however, they would only be required to move for a short period of time and this would only occur infrequently (up to five times per year). Section 4.1.10 includes a more detailed analysis of the impacts to commercial and recreational fishing from the implementation of this alternative.

Post-Flight Activities

After completion of a missile flight test, the clearance areas would be released, or allowed to be re-occupied. The Range Safety Officer would do this as soon as he or she was assured that any hazardous aspect of the test was completed. Such residual hazardous concerns may include the presence of hazardous debris, debris still falling after an intercept, or other potentially dangerous consequences. Notification would be by radio, telephone, or computer to aviation and maritime authorities. If required, debris recovery on land may involve the use of helicopters and off-road vehicles, and the two main parachutes, if used to air-launch targets for interceptor tests, would be recovered from ocean drops. This debris cleanup would not have any impact on land-, air-, or sea-based transportation systems. After an interceptor launch, personnel would depart KLC and Kodiak by commercial air or sea (via the AMHS).

4.1.11.2 Target Construction

Implementation of Alternative 1 would result in the construction of facilities as described in section 2.3.1.1. The construction equipment and personnel associated with the construction of
the target pads and associated support facilities would be similar to the GBI construction. Construction materials for the new target launch pad and its associated support facilities would be transported to KLC via routes and in a manner similar to that utilized for transporting material for the GBI facilities. The transportation impacts from the construction of the target launch pad and its associated support facilities would be the same as for the GBI facilities.

Operation

*Pre-Launch Activities*

Implementation of Alternative 1 would result in single and dual target launches from KLC. Target missile components would be built in contractor facilities and delivered to KLC via air or boat for system assembly and checkout. Target missiles would not be shipped with initiators or other explosive devices. All missile components would be packaged in appropriately designed containers, labeled, and handled in accordance with applicable DOT regulations for the transport of hazardous materials. Trained personnel using only appropriately certified cranes and other materiel handling equipment would handle missile components and handling equipment in accordance with approved SOPs. There would be up to five target launches per year. As stated in section 4.1.11.2.1, Kodiak Island is one of the leading shipping ports in southwest Alaska and, as a commercial service facility, is equipped to accommodate this type of cargo and frequency of shipping; thus, there would be no impacts to transportation.

Once at Kodiak, the target missiles would likely be transported via roadways to KLC in the same manner as the GBIs. The impacts from the transfer of the target missiles to KLC would be similar to what is expected with the transfer of the GBIs, though GBIs could potentially utilize barge landings. Once at KLC, the missile components would be stored in a Missile Assembly Building until they are assembled for launch. The impact of the movement of the target missiles within KLC would be similar to what is expected with the GBIs.

A maximum of approximately 150 personnel would be required to support a dual target launch. They would travel to Kodiak via commercial airliner or the AMHS. It is assumed that approximately 50 personnel would be housed at the existing mancamp on Kodiak Ranch. If the additional mancamp is not constructed on KLC or the existing mancamp is not added on to, then it is conservatively estimated that the remaining 100 personnel would commute daily to KLC from accommodations in the surrounding areas and within the City of Kodiak during a peak month. This would add approximately 50 vehicles (assuming 2 persons per vehicle) to Rezanof Drive West each day during peak hours. Although the local road system could experience an increase in traffic, the increase would only minimally change the ADT on key local roads, and the impact on Level of Service would be negligible. Moreover, the proposed construction of the new mancamp on KLC property (see section 2.3.1.1) or expansion of the existing lodge located near KLC would reduce, if not preclude, this minor impact.

*Flight Activities*

When a target missile test flight is planned, the same type of clearance areas that were defined for the GBI in section 4.1.11.2.1 would be established and cleared for the target missile. These areas would be very similar or the same as the clearance areas for the GBI.
Post-Flight Activities
After a successful test, the clearance areas would be released, or allowed to be re-occupied. Test personnel would depart by commercial airliner or sea (via the AMHS). Thus, the impacts from post-flight target missile activities would be similar to those for the GBI.

4.1.11.2.3 In-Flight Interceptor Communication System Data Terminal

Construction
Implementation of Alternative 1 would result in the construction of an IDT on KLC. The IDT would be located near the Loran Station, the Oxidizer Storage facility, or near the entry road. The IDT would require approximately 0.8 hectare (2 acres) of land with an unobstructed line-of-sight. Construction equipment, material, and personnel for the IDT would arrive at KLC as part of the construction of the GBI and/or target construction efforts. Thus, there would be no additional impact to transportation from construction of an IDT.

One additional COMSATCOM system could be constructed at KLC as part of Alternative 1. Personnel numbers for its construction are included in the GBI construction numbers, and thus no impacts to transportation are expected from construction of this additional COMSATCOM.

Operation
The IDT sites would require three onsite support personnel when in operation. When not in operation, the onsite backup generators would be tested for approximately 45 minutes every 2 months. The personnel associated with the IDT would be part of the people required to support an interceptor launch and would not be an additional impact to transportation systems.

4.1.11.2.4 Sensors

Operation
Instrumentation associated with the launch of a target missile would include mobile telemetry sites, and a range control support equipment site. Representative telemetry sites are shown in figure 2.1.5-5. Telemetry is provided through a real-time data acquisition system. The mobile telemetry systems would consist of an 11-meter (31-foot) truck, two 5.4-meter (17.7-foot) antennas, and dual 10-kW generators. Range control support equipment would include a semi-type van for the Flight Termination System, meteorological, transponder, control, communications, and timing systems. Target telemetry requirements include an up-range, mid-range, and down-range telemetry systems to support launches. One site could be located in a level gravel area 61 by 61 meters (200 by 200 feet) in the vicinity of the entry road and north of the maintenance building on KLC. Other up-range telemetry locations on Kodiak Island that may be used include Pasagshak and Pillar Mountain. Up-range telemetry locations that may be used in other parts of Alaska include Soldotna, Kenai, and Homer on the Kenai Peninsula, in south-central Alaska; Cordova, in southeast Alaska; and King Salmon and Adak Island in southwest Alaska. Examples of this equipment are shown in figure 2.1.5-4.

All of these systems are mobile and would be brought to the vicinity of the launch site approximately 1 to 2 weeks before the launch date. These systems would be transported to Kodiak by air or sea and then driven to KLC or other locations in Kodiak on the existing roads. Systems that would be located in Soldotna, Kenai, and Homer on the Kenai Peninsula would be
brought in by air, land, or sea and transported to their location by motor carrier. Systems that would be located in Cordova in southeast Alaska and King Salmon and Adak Island in southwest Alaska would only be brought in by air or sea and then driven to their location on the existing roads. Once onsite, they would remain in position until the launch event has been complete. In most cases the equipment would be removed within days after the launch. The personnel associated with the launch of a target missile would operate these systems. Since these systems encompass a small number of vehicles (seven), movement of these systems to KLC or other locations in south-central, southeastern, or southwestern Alaska would not have a measurable impact on the air, ocean, or ground transportation systems at any of these locations.

4.1.11.2.5 TPS-X

Construction

TPS-X components could be transported to the operation site from U.S. Government storage depots or contractor facilities by aircraft, sea vessels, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA and DOT safety standards to minimize any possible impacts to transportation. Site preparation would require construction of a gravel pad area of approximately 0.3 hectare (0.8 acre). The limited construction activities would have little to no effect on area transportation levels.

Operation

At KLC, the Prime Power Unit for the TPS-X would be a 1.5-MW generator that would provide power to the radar during testing. The generator is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during launch activities. The total time of operation is estimated at a maximum of 2,520 hours per year. Operation of the Prime Power Unit would require refueling operations. The fuel tank would be filled from a fuel truck, as necessary. The limited trips required by the fuel truck would have no impact on current transportation systems.

4.1.11.2.6 Launch Complex Security

Security procedures would be established in accordance with AADC’s Interagency Land Management Agreement for property, which permits public exclusion during times of danger and assists in protecting structures. When interceptor testing occurs it would be on a periodic basis. It is assumed that testing would be on a campaign basis and the security for these tests would be on a similar basis. It is estimated that the potential security personnel would be on-site for approximately 5 weeks for each campaign. Implementation of this alternative would result in security personnel being brought to KLC during each campaign. The security personnel would travel to KLC via air or sea and would be housed onsite or offsite. Security vehicles would also be used. During the day, security vehicles would be on patrol, and at night additional vehicles would be used as needed. Since the additional security personnel would be working on site during much of the campaign, they would not measurably add to the ADT of the local roads. The addition of security vehicles would not measurably add to the ADT on KLC.

Up to three access control points would be required during a test campaign. One could be located at the entrance of KLC to record vehicles entering and leaving the site. The access control points would not disrupt the flow of traffic; however, they would be able to advise
motorists on the location of Launch Hazard Areas and minimize the potential for them to gain unauthorized access. Public access through KLC to Fossil Beach would be limited or denied only for each launch day. During the 5-week period building up to a launch, delays would be limited to clearance through security checkpoints. For the proposed five launches per year, the 5 days of closure would be less than 2 percent of the year.

4.1.11.3 Alternative 2

Alternative 2 would have GBIs launched from Vandenberg AFB instead of KLC. There would be no construction or operations related to GBI and its associated support equipment as well as an IDT. However the other components described in Alternative 1 would remain the same.

4.1.11.3.1 Target

The impacts to transportation from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to those discussed in section 4.1.11.2.2.

4.1.11.3.2 Sensors

The impacts to transportation from operation of target sensors on KLC or in other parts of southwestern Alaska would be similar to what was discussed in section 4.1.11.2.4.

4.1.11.4 Alternative 3

For the purposes of the discussion at KLC, the construction and flight impacts for Alternative 3 would be as described above for Alternative 1.

4.1.11.5 Cumulative Impacts

The KLC EA indicated no significant impacts to transportation from nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA, and therefore, no substantial cumulative impacts to transportation are expected. At this time, there are no ongoing or foreseeable future programs taking place in the ROI other than those discussed previously that would have an added impact on transportation. Plans on the part of the Alaska Department of Transportation to pave some additional 40 kilometers (25 miles) between the town of Kodiak and KLC would actually have a beneficial effect, reducing risk to both personnel and equipment required to travel this roadway. Paving activities are currently underway.

4.1.11.6 Mitigation Measures

No transportation mitigation measures are proposed for the GMD ETR activities at KLC.
4.1.12 UTILITIES—KODIAK LAUNCH COMPLEX

A project may have substantial effects on infrastructure and utilities if it increases demand in excess of the utility system’s capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

4.1.12.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur at KLC, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under more operationally realistic conditions. These launches could include missions in support of the GMD program. KLC would continue to operate as a licensed launch facility, and, as concluded in the KLC EA (Federal Aviation Administration, 1996), no impacts to area utilities would be anticipated.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to utilities resources from launches at KLC.

There would be no impacts expected to utilities from the FAA’s No Action Alternative because there would be no additional launch events from KLC.

4.1.12.2 Alternative 1

4.1.12.2.1 Ground-Based Interceptors

Construction

Implementation of Alternative 1 would result in construction of several facilities as described in section 2.3.1.1. Kodiak Island and KLC have established air, ocean, and land transportation systems. Approximately 100 construction personnel would be brought to Kodiak Island during the course of construction of new facilities and modification of existing facilities.

Construction equipment and materials would also be shipped via sea or air to Kodiak Island. Once unloaded at Kodiak Island, construction equipment and materials would either be shipped by tractor-trailer transport or via one of the three potential beach landing sites to KLC. Access to KLC is via Rezanof Drive West.

In order to support construction and operations personnel, the creation of a new mancamp on KLC property (see section 2.3.1.1) has been proposed. Per table 2.3.1.2, this would house a maximum of 60 people. As an additional alternative, a similar-sized increase is proposed for the Narrow Cape Lodge, as well.
Energy
The addition of 100 construction personnel and related construction activities would not measurably increase the demand for electricity at KLC, although the housing of up to 60 personnel at the proposed mancamp or in the proposed expansion of the Narrow Cape Lodge would require the installation, or upgrading, of lines to tap into the current KLC electric system.

Water
The addition of 100 construction personnel and related construction activities would increase the demand for potable water. Given 189 liters (50 gallons) per day per worker, demand would be 18,927 liters (5,000 gallons) per day. This would be above the system capacity of 13,060 liters (3,450 gallons) per day. To allow for any additional demand, however, the utilization of portable drinking water systems would be necessary; this would include any potable water system required for the proposed mancamp.

Some water would be pumped from East Twin Lake for temporary use at the project’s cement batch plant and for emergency, fire-fighting purposes. Compared to the lake’s capacity (about 57 million liters [15 million gallons]) and average recharge rate (estimated to be 871 liters [230 gallons] per minute), this temporary use of water would represent a minor impact.

Wastewater
The addition of 100 construction personnel and their related construction activities would increase the demand on existing wastewater treatment services. Given 170 liters (45 gallons) per day per worker, wastewater production would be 17,034 liters (4,500 gallons) per day. This would be above the system capacity of 13,060 liters (3,450 gallons) per day. To allow for any additional demand, however, the utilization of portable septic/toilet systems would be necessary. This would include the installation of a septic/toilet system for the proposed mancamp, as necessary.

Solid Waste
Construction activities and 100 construction personnel would not increase the demand for solid waste disposal services beyond the existing capacity of 11.5 cubic meters (15 cubic yards) per month. Although construction of new facilities, such as the proposed mancamp, and modification of the existing Narrow Cape Lodge, would generate solid waste, this is not expected to exceed the existing capacity. Any increase over and above typical levels and capacity would be negotiated with and handled by the Kodiak Island Borough/Waste Management, Inc.

Operation
Pre-Launch, Flight, and Post-Flight Activities
Implementation of Alternative 1 would result in single and dual GBI launches from KLC. Interceptor missile boosters, payloads, and support equipment would be transported by air or ship from Government storage depots or contractor facilities to KLC. There would be up to five missile launches per year (target and interceptor). A maximum of approximately 235 personnel (contractor, military, and Government civilian) would be required to travel to KLC for a period of up to 2 months to support an interceptor launch. After an interceptor launch, the majority of these personnel would depart KLC and Kodiak.
As part of pre-launch and flight activities, a Launch Hazard Area would be established around the launch site in accord with the AADC Interagency Land Management Agreement has for the property, which allows public access restrictions in cases of public safety and to protect structures. The Launch Hazard Area would result in certain areas of KLC being cleared of personnel in the event of an accident during interceptor launch; however, establishing a Launch Hazard Area would not create an impact related to utility services.

**Energy.** An offsite commercial power supplier would be used to supply primary power to activities associated with missile flight tests, with a backup battery system and onsite backup diesel generators for emergency power. Generators for various GBI-related facilities would range in output from approximately 75 to 900 kW. Each generator would also have its own dedicated AST. Additionally, the new Missile Assembly Building would include wall mounted sodium-vapor lighting, aircraft obstruction lighting, and a 500-kW diesel generator. The integrated assemblies would be electronically tested. Therefore, compared to daily average demand for electricity at KLC of 825 kW, the total increase in demand for electricity would not exceed the existing capacity of 3,100 kW. No adverse impacts would be anticipated.

Additional electricity usage would occur as a result of up to a maximum 235 personnel residing offsite during the operational phase of the GBI. However, it is anticipated that the majority of the personnel would be staying at existing hotels and motels. This would create negligible additional demand on electricity services and would be within existing capacity. Upgrades to Narrow Cape Lodge or electric service for the proposed mancamp would of necessity provide the capacity for the electricity needs of up to 60 personnel.

**Water.** Domestic water usage represents the water consumed by the launch personnel in the ROI. Additional water usage would occur as a result of up to a maximum of 235 personnel at KLC to support a dual launch of the GBI.

Assuming an approximate average water requirement of 189 liters (50 gallons) per person per day, the water requirements for a typical dual launch flight test buildup are shown in table 4.1.12-1.

<table>
<thead>
<tr>
<th></th>
<th>Month 1</th>
<th>Month 2</th>
<th>Month 3</th>
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</thead>
<tbody>
<tr>
<td><strong>GBI Personnel</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td>55</td>
<td>120</td>
<td>235</td>
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<tr>
<td>Water Usage (liters)</td>
<td>10,410</td>
<td>22,712</td>
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<td>(gallons)</td>
<td>(2,750)</td>
<td>(6,000)</td>
<td>(11,750)</td>
</tr>
<tr>
<td><strong>Target Personnel</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Personnel</td>
<td>25</td>
<td>75</td>
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<tr>
<td>Water Usage (liters)</td>
<td>4,732</td>
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<tr>
<td>(gallons)</td>
<td>(1,250)</td>
<td>(3,750)</td>
<td>(7,500)</td>
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As shown in table 4.1.12-1, GMD requirements would exceed existing capacity of 13,060 liters (3,450 gallons) by as much as 31,419 liters (8,300 gallons). It is anticipated that additional
packaged potable water systems would be installed to meet the GMD requirements. The packaged system (well, pump, and AST) would be located within the construction footprint of the proposed GMD facilities. A new potable water system would be required for the proposed mancamp, if constructed. Permits would be obtained from the Alaska Department of Environmental Conservation for construction and use of the water supply systems, and such systems would comply with “new source” provisions as mandated by the Safe Drinking Water Act (see appendix B), as amended.

Wastewater. Assuming an approximate average of 170 liters (45 gallons) per person per day of wastewater production, the launch activities would generate wastewater at the rates shown in table 4.1.12-2.

As shown in table 4.1.12-2, GMD requirements would exceed existing design capacity of 13,060 liters (3,450 gallons) per day by as much as 26,970 liters (7,125 gallons). It is anticipated that new facility construction and additions to existing facilities would include additional wastewater treatment systems that, as with any additional potable water systems, would meet GMD requirements. Proposed construction of the new mancamp would also necessitate the installation of a wastewater system capable of accommodating up to 60 personnel. In keeping with KLC procedures, any septic systems would likely include a mounded absorption bed. Again, appropriate permits would be obtained where required.

<table>
<thead>
<tr>
<th>Table 4.1.12-2: Wastewater Requirements for Dual Launch Missile Flight Tests</th>
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<tr>
<td><strong>GBI Personnel</strong></td>
</tr>
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<td>Personnel</td>
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<tr>
<td>Wastewater Usage</td>
</tr>
<tr>
<td>Target Personnel</td>
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<tr>
<td>Personnel</td>
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<tr>
<td>Wastewater Usage</td>
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</tbody>
</table>

Solid Waste. Municipal solid waste would be generated during the five GMD missile launches. However, the amount of waste is expected to be similar to previous missile launches and is not expected to exceed the existing quantity of 15 cubic yards (11.5 cubic meters), currently handled by Kodiak Island Borough/Waste Management, Inc. Were the amount of solid waste produced to increase over and above typical levels and capacity, however, this would be negotiated with and handled by the Kodiak Island Borough/Waste Management, Inc. Therefore, the total increase would not result in adverse impacts to existing services.
4.12.2.2 Target

Construction
Implementation of Alternative 1 would result in the construction of a new target launch pad and associated support facilities as described in section 2.3.1.1. The construction equipment and personnel associated with the target construction and associated support facilities would be similar to those used for the GBI facilities. The impacts from the construction of the target launch pad and its associated support facilities would be similar to the GBI construction impacts.

Energy
The impact to energy services from target facility construction would be similar to what would be expected for interceptor construction.

Water
The impact to potable water from target facility construction would be similar to what would be expected for interceptor construction.

Wastewater
The impact to wastewater from target facility construction would be similar to what would be expected for interceptor construction.

Solid Waste
The impact to solid waste from target facility construction would be similar to what would be expected for interceptor construction.

Operation

Pre-Launch, Flight, and Post-Flight Activities
Implementation of Alternative 1 would result in single and dual target launches from KLC. Target missile components would be built in contractor facilities and delivered to KLC via air or boat for system assembly and checkout. Trained personnel using only appropriately certified cranes and other materiel handling equipment would handle missile components and handling equipment in accordance with approved SOPs. There would be as many as five target launches per year.

The launch site, for target launches, would be occupied for approximately 3 months. A maximum of approximately 150 personnel (contractor, military, and government civilian) would be required to support a target launch.

Energy. An offsite commercial power supplier would be used to supply primary power to activities associated with the flight tests. Within the proposed Missile Service Structure, emergency power would be supplied from the Integration Processing Facility, and uninterrupted power supply batteries would serve critical loads. The Missile Assembly Building would include a 500-kW diesel generator. Additionally, both the Missile Assembly Building and Missile Service Structure would require wall mounted sodium-vapor lighting. Compared to the daily average
demand for electricity at KLC of 825 kW, the total increase in demand for electricity would not exceed the existing capacity of 3,100 kW. No adverse impacts would be anticipated.

**Water.** Domestic water usage represents the water consumed by the launch personnel in the ROI. Additional water usage would occur as a result of 150 personnel residing offsite during the operational phase of the target. However, it is anticipated that they would be staying at existing hotels/motels. This would not create additional demand on offsite water services, because they would not be exceeding the existing capacity of those facilities.

Table 4.1.12-1 shows water requirements for a typical target flight test buildup. As shown in the table, GMD requirements would eventually exceed existing capacity, but it is anticipated that additional packaged potable water systems would be installed to meet GMD requirements, thus negating the potential impact.

**Wastewater.** Assuming a proportional relationship between potable water consumption and wastewater treatment, the launch activities for targets would generate wastewater at the rates shown in table 4.1.12-2. Additionally, wastewater would be generated by the personnel residing offsite during the operational phase of the targets. However, it is anticipated that they would be staying at existing hotels/motels. Additional demand on wastewater treatment services would occur, but it would not exceed the existing capacity.

Table 4.1.12-2 shows wastewater requirements for a typical target flight test buildup. As shown in the table, GMD requirements would eventually exceed existing capacity, but it is anticipated that additional septic systems would be installed to meet GMD requirements, thus negating the potential impact.

**Solid Waste.** Municipal solid waste would be generated during the five GMD missile launches. However, the amount of waste is expected to be similar to previous missile launches and is not expected to exceed the existing quantity of 11.5 cubic meters (15 cubic yards), currently handled by Kodiak Island Borough/Waste Management, Inc. Were the amount of solid waste produced to increase over and above typical levels and capacity, however, this would be negotiated with and handled by the Kodiak Island Borough/Waste Management, Inc. Therefore, the total increase would not result in adverse impacts to existing services.

### 4.1.12.2.3 In-Flight Interceptor Communication System Data Terminal Construction

Implementation of Alternative 1 would result in the construction of an IDT on KLC. The IDT would be located near either the Loran Station, the Oxidizer Storage facility, or near the entry road. Construction equipment, material, and personnel would arrive at KLC as part of the construction of the GBI and/or target efforts. The different types of IDTs (i.e., re-locatable, mobile, and sea-based) do not require additional preparation (for construction and operation purposes) beyond what is required for land-based IDTs.

The IDT construction personnel and related construction equipment are included in the GBI construction. Potential impacts to energy, water, wastewater, and solid waste are included in section 4.1.12.2.
Operation
The IDT site would require three onsite support personnel when in operation. When not in operation, the onsite backup generators would be tested for approximately 45 minutes every 2 months. The personnel associated with the IDT would be part of the personnel (up to a maximum of 235) required to support an interceptor launch.

4.1.12.2.4 Sensors

Construction
These systems are mobile and would be brought to the vicinity of the launch site approximately 1 to 2 weeks before the launch site. No construction would be involved.

Operation
Implementation of Alternative 1 would include operation of mobile telemetry systems. The telemetry sites would be located in a level gravel area 61 by 61 meters (200 by 200 feet) in the vicinity of the #1 entry road and southwest of the Loran Station on KLC. Other up-range telemetry locations that may be used in other parts of Alaska include Soldotna, Kenai, Cordova, and Homer on the Kenai Peninsula in south-central Alaska and King Salmon and Adak Island in southwest Alaska.

These systems would be transported to Kodiak. Once onsite, they would remain in position until the launch event has been complete. In most cases the equipment would be removed within days after the launch. The personnel associated with the launch of a target missile would operate these systems.

Energy
The mobile telemetry systems would include dual 10-kW generators. Operation of the sensors would not require any additional electricity. Current capacities would not be exceeded. No adverse impacts would be anticipated.

Water
Domestic water usage represents the water consumed by the operation personnel in the ROI. In this case, the target missile launch personnel would operate these systems; therefore, no additional personnel over the 150 personnel already involved in target operations would be needed to operate the sensors.

Wastewater
The target missile launch personnel would operate these systems; therefore, no additional personnel over the 150 personnel already involved in target operations would be needed to operate the sensors.

Solid Waste
The target missile launch personnel would operate these systems; therefore, no additional personnel over the 150 personnel already involved in target operations would be needed to operate the sensors.
4.1.12.2.5 TPS-X

Construction

Installation of the TPS-X radar would require disturbance to 0.3 hectare (0.8 acre) of land on KLC for placement of a concrete pad. Potential impacts to energy, water, wastewater, and solid waste are included in section 4.1.12.2.

Operation

At KLC, the Prime Power Unit for the TPS-X would be a 1.5-MW generator that would provide power to the radar during testing. The generator is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during launch activities. The total time of operation is estimated at a maximum of 2,520 hours per year. Operation of the Prime Power Unit would require refueling operations, the fuel tank being filled from a fuel truck, as necessary. Such operations are routine and would have no impact on area utilities.

4.1.12.3 Alternative 2

Under Alternative 2, GBIs would be launched from Vandenberg AFB instead of KLC. Thus, there would be no construction or operations related to GBI and its associated support. However, the other components described in Alternative 1 would remain the same, and the impacts would be the same.

4.1.12.3.1 Target

The impacts to utilities (energy, water, wastewater, and solid waste) from construction of a target launch pad and associated support facilities and the launch of single and dual targets from KLC would be similar to what was discussed in section 4.1.12.2.2.

4.1.12.3.2 Sensors

The impacts to utilities (energy, water, wastewater, and solid waste) from operation of target sensors on KLC or other parts of southwestern Alaska would be similar to that discussed in section 4.1.12.2.4.

4.1.12.4 Alternative 3

Implementation of Alternative 3 would combine activities proposed for Alternative 1 and Alternative 2 and would include GBI launches from both KLC and Vandenberg AFB and construction of the required facilities. Therefore, the impacts to utilities (energy, water, wastewater, and solid waste) from Alternative 3 would be similar to those found under Alternative 1.

4.1.12.5 Cumulative Impacts

The KLC EA indicated no significant impacts to utility systems from nine annual launches (Federal Aviation Administration, 1996). Although direct impacts from the Proposed Action on potable water and wastewater would eventually exceed current capacity, these impacts would
be localized and this increased demand would be circumvented by the addition of potable water and septic systems to handle any increase over current capacity. It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year; the level of activity analyzed in the KLC EA, and would not result in any cumulative impacts to KLC utilities. In addition, there are no other ongoing or foreseeable future programs taking place in the ROI that would result in cumulative impacts.

4.1.12.6 Mitigation Measures

Direct impacts to water and wastewater demand and capacity, as previously addressed, would be met by the addition of new potable water and septic systems. No significant impacts to utilities systems would be anticipated and additional mitigation measures would not be required or proposed.

4.1.13 VISUAL AND AESTHETIC RESOURCES—KODIAK LAUNCH COMPLEX

4.1.13.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. There would be no alteration of the existing visual setting at KLC and the adjacent area. No significant impacts to visual and aesthetic resources would occur, and no mitigation measures are proposed.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to visual and aesthetic resources from launches at KLC.

4.1.13.2 Alternative 1

Visual impacts may be associated with changes in either the built or natural environment and can be short-term or long-term. The presence of heavy machinery during construction of the project is considered a short-term visual impact. Large trucks, cranes, and other construction equipment would be visible within the construction zone and in surrounding areas only during the construction phase. Long-term visual changes are associated with altering the existing visual environment by constructing buildings, including one with a very high vertical profile. The focus of this analysis is those long-term physical changes that are permanent in nature.

The construction and operation of the proposed GMD facilities at KLC would affect the visual resources of Narrow Cape by introducing new structures into a relatively isolated area that has both natural and man-made elements. The proposed KLC infrastructure for launching targets and interceptors would involve the construction of new structures and facilities to support the GMD program at various locations within the launch complex. Proposed new facilities are described in section 2.3.1.1.
Construction of these facilities would place additional man-made, mostly pre-engineered buildings that are color compatible to the existing facilities into an area that, although regionally scenic, has a somewhat disturbed local viewscape. Several of the proposed structures, including the Missile Assembly Building (18 meters [60 feet] high) and the Movable Missile Building (33.5 meters [110 feet] high), would change the view horizon. Other proposed buildings, such as the IDT, would have a noticeable horizontal presence. There is also the potential for impacts to visual resources due to nighttime lighting, particularly during construction.

In an effort to determine the existing visual quality, the following method was modified from *Landscape Aesthetics: A Handbook for Scenery Management* (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the Proposed Action location at KLC: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.

**Scenic Attractiveness**

The area encompassing KLC would be considered as having a “typical” (B) level of scenic attractiveness and is very similar to other regions of the island.

**Concern Level**

Potential viewers of the Proposed Action at KLC include hikers and other recreational users and would have a high (Level 1) level of concern for the scenic quality of the ROI.

**Distance Zone**

Viewers would be able to observe the Proposed Action over a wide variety of distances including within the foreground (FG) and mid-ground (MG) for the construction and within the background (BG) for launches.

**Scenic Value Class**

The scenic value class for KLC as determined from the Scenic Value Class table 4.1.13-1 is 1 to 2 and equates to a high public value scenic class.

**Scenic Integrity**

KLC has sporadically been altered and would be considered to have a moderate scenic integrity.
### Table 4.1.13-1: Scenic Value Class Determined for KLC

<table>
<thead>
<tr>
<th>FG1</th>
<th>MG1</th>
<th>BG1</th>
<th>FG2</th>
<th>MG2</th>
<th>BG2</th>
<th>FG3</th>
<th>MG3</th>
<th>BG3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>


Scenic Attractiveness
- **A** – Distinctive, **B** – Typical, **C** – Indistinctive

Distance zone and Concern Level
- **FG1** – Foreground with a high level of concern
- **MG1** – Mid-ground with a high level of concern
- **BG1** – Background with a high level of sensitivity
- **FG2** – Foreground with a moderate level of sensitivity
- **MG2** – Mid-ground with a moderate level of sensitivity
- **BG2** – Background with a moderate level of sensitivity
- **FG3** – Foreground with a low level of sensitivity
- **MG3** – Mid-ground with a low level of sensitivity
- **BG3** – Background with a low level of sensitivity

Scenic Value Class
- 1-2: High public value.
- 3-5: Moderate public value.
- 6-7: Low public value.

There are no residences in the immediate vicinity of KLC, and the nearest park is approximately 10 kilometers (6 miles) away. The existing AADC facilities along with the U.S. Coast Guard’s 190-meter-high (625-foot-high) Loran-C navigation transmitter tower and associated white-colored buildings already have a visual presence that alters the natural viewscape of the area. Although the Narrow Cape area is being developed, there is the potential that some sensitive viewers would be affected, particularly hikers, fishermen, and other recreational users; even though the amount of concerned viewers would be somewhat limited, there is a potential for adverse affects to visual resources.

#### 4.1.13.3 Alternative 2

The construction and operation of target facilities at KLC for Alternative 2 would be the same as that for Alternative 1. An IDT and GBI related facilities would not be constructed at KLC. As discussed under Alternative 1, the Proposed Action would not have a significant impact on aesthetic or visual resources.

#### 4.1.13.4 Alternative 3

Alternative 3 would be identical to Alternative 1 at KLC. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts to visual and aesthetics from Alternative 3 would be as described for Alternative 1.
4.1.13.5 Cumulative Impacts

Although construction of new facilities could potentially double the amount of development within and the area and would result in visual cumulative impacts, the area proposed for development is already designated as a commercial launch facility.

4.1.13.6 Mitigation Measures

No visual resources mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.14 WATER RESOURCES—KODIAK LAUNCH COMPLEX

This section addresses potential impacts to surface water and groundwater resources. Both freshwater and marine surface waters are covered. Potential changes in the availability of water supplies for consumptive purposes are also addressed. None of the action alternatives would involve the construction of new facilities in a floodplain; therefore, floodplain-related impacts are not addressed. Wetland-related impacts are addressed in section 4.1.3.

A proposed alternative would cause an adverse and significant impact on water resources if it would cause:

- A violation of applicable state or federal water quality standards, or inconsistencies with related stormwater pollution prevention plans, or other applicable water quality-related plans, policies, or permit conditions
- Major changes in existing drainage and runoff patterns that alter the course of existing waterways or exceed the capacity of existing stormwater drainage systems
- An increase in the use of consumptive water supplies to the point where the capacity of existing supply systems would not be adequate and new water supply sources would be needed
- Or if it would otherwise substantially degrade water quality

Best Management Practices and other SOPs would be used during construction and operational activities to minimize erosion and other types of impacts that could reduce the quality of affected water resources. Water quality-related SOPs that apply to each of the action alternatives are listed below. Mitigation commitments from previous environmental studies that are unique to a site or activity are described under the related alternative.

- Site preparation—vegetation preservation and protection, topsoil preservation, dust control, and temporary gravel construction entrance and exit
- Surface stabilization—temporary and permanent seeding and use of mulches and fabric and gravel blankets
- Runoff control and conveyance measures—installation of diversions, dikes, grassed waterways, and temporary slope drains
- Sediment barriers—straw bale and rock barriers, sediment fences
- Sediment traps and basins
Stream protection—temporary stream crossings and streambank stabilization
Protection of soil and fill storage piles

SOPs related to the handling, disposal, recycling, and other use of hazardous materials and wastes would be followed, including spill prevention, containment, and control measures while transporting equipment and materials. Other water quality-related SOPs to be followed include the use of portable toilets and waste disposal practices during construction, rapid response, control and cleanup activities in the event of unplanned spills or accidents, and worker education and training programs.

4.1.14.1 No Action Alternative

Missile Defense Agency

Under the MDA’s No Action Alternative, launches would continue to occur from KLC but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. Table 4.1.1-1 summarizes the propellant information associated with these launches. The primary exhaust products from launches at KLC to date include hydrogen chloride, carbon monoxide, nitrogen oxide and aluminum oxide. These products would continue to be released and dispersed over large areas, with some of the emissions landing on surface water resources, or soil where they may enter the area’s water resources at a later time. The existing water quality monitoring required by KLC’s 401 Water Quality Assurance Permit (pH, perchlorates, and total aluminum) from the Alaska Department of Environmental Conservation, and the implementation of related components of the KLC NRMP would continue under all of the alternatives assessed in this EIS, including the MDA’s No Action Alternative. Water quality monitoring and the KLC NRMP are described further in section 4.1.14.2.

Federal Aviation Administration

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no impacts to water resources from launches at KLC.

4.1.14.2 Alternative 1

4.1.14.2.1 Ground-Based Interceptors

Construction

Construction of the new GBI-related facilities as described in section 2.3.1.1 has the potential to disturb approximately 14.4 hectares (35.5 acres) and cause adverse water quality impacts to nearby surface waters. These construction-related impacts could include an increase in the discharge of sediments and turbidity levels in receiving waters. Construction crews may accidentally spill some of the material used during construction procedures or by construction vehicles, including fuel, cement, paint, anti-freeze, oil, etc. None of these construction-related impacts are expected to be significant. The SOPs discussed in the beginning of section 4.1.14 and the commitments included in the KLC NRMP (described in the next paragraph) are all expected to minimize the magnitude of adverse water quality impacts. Only minor erosion and turbidity impacts, and insignificant and accidental spillage of petroleum products and other construction materials are expected.
The KLC NRMP commitments include such measures as collecting and disposing of sewage offsite, monitoring of soil conditions, periodic inspection by a designee of AADC to ensure erosion and sediment control structures are working properly, hazardous waste management measures and offsite disposal, post-launch monitoring and revegetation of areas around launch sites if needed (Alaska Aerospace Development Corporation, 1998). All of the SOPs and water quality-related elements of the KLC NRMP would be reviewed with Alaska Department of Environmental Conservation staff during consultations for the project’s required 401 Water Quality Assurance Permit. A related Stormwater Pollution Prevention Plan would be prepared before construction for the Alaska Department of Environmental Conservation (or the existing Plan would be amended) and would specify all of the measures to be used during construction to minimize and avoid adverse water quality impacts.

Potable water would be transported to facility sites during construction. Some water would be pumped from East Twin Lake for temporary use at the project’s cement batch plant and for emergency, fire-fighting purposes. Compared to the lake’s capacity (about 57 million liters [15 million gallons]) and average recharge rate (estimated to be 871 liters [230 gallons] per minute), this temporary use of water would represent a minor impact.

Operation

Pre-Launch, Flight and Post-Flight Activities

This section addresses potential impacts that could occur during any of the operational phases. The next section describes potential impacts unique to the flight operational phase.

Hazardous materials would be used during operational phases and such use has the potential to cause adverse and significant water quality impacts. As described in section 3.1.6, numerous SOPs, a spill prevention plan, and emergency response plan are currently in place and being used at KLC and would continue to be used under this alternative. These measures would minimize the risk of accidental spills to an acceptable level and significant and related water quality impacts would not occur.

The leaching of domestic sewage wastewater from septic tanks would occur as designed during operations.

Potable water used during operations would come in part from the existing water supply system. As noted in section 4.1.12.2, insufficient capacity exists in the current system to handle the increases in demand associated with this alternative. Therefore, new water supply sources would be needed. It is anticipated that packaged potable water systems, similar to the existing water systems, would be installed to meet the GMD requirements. The packaged system (well, pump, and AST) would be located within the construction footprint of the proposed GMD facilities. Permits would be obtained from the Alaska Department of Environmental Conservation for construction and use of the water supply systems.

Flight Activities

The missiles launched from KLC under this alternative would disperse certain exhaust emission products over a large area. These emissions would not cause a significant water quality impact. The primary emission products of concern from a water quality-standpoint are hydrogen chloride, which combines with water or water vapor in the atmosphere and forms hydrochloric
acid and aluminum oxide. Table 4.1.1-8 shows more information regarding the amounts and type of emissions from launched rockets. In any one area of the ROI, only small amounts of these combustion products would be present. For example, the 1996 KLC EA estimated the launching of an Athena-2 rocket would result in a maximum deposition of 0.427 grams of hydrogen chloride per square meter of surface area over a 10-square-kilometer (4-square-mile) area (Federal Aviation Administration, 1996). These small amounts of hydrogen chloride would be transitory given the area’s hydrologic characteristics and climate. The contaminants would be quickly washed out of the area’s relatively short and steep drainages during and after frequent precipitation events.

Aluminum oxide also would be emitted during missile launches and deposited in ROI surface waters. However, aluminum oxide is only a hazard to aquatic life in acidic environments when it dissolves into a free aluminum cation (Federal Aviation Administration, 1996). Aluminum oxide should not dissolve in water with pH levels between 5 and 9.5 because aluminum hydroxide, a much more soluble compound than aluminum oxide, is insoluble between pH levels 5 and 9.5. As summarized in Summary Findings of Environmental Monitoring Studies for the Kodiak Launch Complex 1998–2001 (Alaska Aerospace Development Administration, 2002b), water quality sampling and analysis indicate there have been no discernable effects on water chemistry from KLC launches to date. Water quality was sampled before and after KLC launches, including pH level, total aluminum, and perchlorate concentration. Samples were taken at various locations as shown in figure 3.1.14-1. The levels for pH, measured in streams 2, 4, 7b, and 8, ranged from 6.1 to 7.8. Table 4.1.14-1 provides results of the sampling for total aluminum and perchlorate concentration.

As shown in the table, total recoverable aluminum was detected in very low concentrations in the three water bodies sampled, but these did not exceed levels considered to be toxic to aquatic life and were comparable to values found elsewhere in Alaska. Although not shown, there was no associated decrease in pH to warrant concern from aluminum toxicity. As a result of the monitoring, the Environmental and Natural Resources Institute recommended long-term pH monitoring. AADC is conducting ongoing monitoring for pH, perchlorates (EPA method 314.0 for water), and total aluminum at an observation well adjacent to the existing Launch Pad 1. Results of the monitoring are provided to the Alaska Department of Environmental Conservation.

<table>
<thead>
<tr>
<th>Table 4.1.14-1: Total Aluminum and Perchlorate Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location</strong></td>
</tr>
<tr>
<td>Stream 2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Stream 4</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Stream 7b</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Stream 8</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Measurable or significant impacts to ocean water quality from launches are not expected. Spent rocket cases are composed of inert materials and do not represent a threat to water quality once their propellants are burned (Federal Aviation Administration, 1996). Early termination of a flight would lead to some amount of propellant reaching the ground, surface waters, or the ocean. The propellant is an inert, solid rubber material impregnated with ammonium perchlorate salt. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. Table 4.1.14-2 presents the results.

<table>
<thead>
<tr>
<th>Water Type</th>
<th>Water Temperature °C (°Fahrenheit)</th>
<th>Hours</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deionized water</td>
<td>29 (84)</td>
<td>4,700</td>
<td>196</td>
</tr>
<tr>
<td></td>
<td>20 (68)</td>
<td>8,000</td>
<td>333</td>
</tr>
<tr>
<td></td>
<td>5 (41)</td>
<td>92,000</td>
<td>3,833</td>
</tr>
<tr>
<td>Salt water</td>
<td>29 (84)</td>
<td>6,500</td>
<td>271</td>
</tr>
<tr>
<td></td>
<td>20 (68)</td>
<td>13,000</td>
<td>542</td>
</tr>
<tr>
<td></td>
<td>5 (41)</td>
<td>160,000</td>
<td>6,667</td>
</tr>
</tbody>
</table>

The same report provided an average water temperature at a buoy in Alaska as 8.3°C (47°F). As shown in the table, it would take approximately 18 years for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean. For fresh water areas the temperature would be higher, and it would take about 1 year for 90 percent of the perchlorate to leach out. Even at this higher rate the perchlorate would be expected to be diluted as it mixes with the surrounding water. For an accident involving fresh water areas, larger pieces of propellant would be recovered, further minimizing the potential for perchlorate contamination.

In the unlikely event of an on-pad fire or catastrophic missile failure over land, most or all of the solid propellant fuel would likely burn up before being extinguished. Any remaining fuel would be collected and disposed of as a hazardous waste. The total quantities of hydrogen chloride and aluminum oxide released in an on-pad failure of a GBI would be equivalent to that released during a nominal launch of an Athena-2. Therefore, an on-pad failure is not expected to result in significant ground deposition of either pollutant.

4.1.14.2.2 Targets

Construction

Construction of the new target facilities has the potential to disturb approximately 10.5 hectares (26.0 acres) and cause the same type of construction-related water quality impacts described in section 4.1.14.2.1. Like the GBI-related construction, the SOPs and KLC NRMP commitments discussed in section 4.1.14.2.1 would prevent the target facility-related construction impacts from being significant.
Operation

Pre-Launch, Flight and Post-Flight Activities

The types of operations-related water resource impacts discussed in section 4.1.14.2.1 and common to pre-launch, flight, and post-launch activities would also be associated with the target launches included in this alternative. These impacts would be minor for the same reasons described in section 4.1.14.2.1.

Flight Activities

Target launches under this alternative would be similar to existing target launches at KLC. Table 4.1.1-13 in section 4.1.1.2.2 shows the expected emissions associated with these launches. While some deposition of these emissions would occur on freshwater and ocean surface waters, these depositions would not be a significant impact for the reasons described in section 4.1.14.2.1.

In the event of an on-pad fire or terminated launch, the Peacekeeper Target could potentially release 76,848 kilograms (169,420 pounds) of solid propellant, and 1968 liters (520 gallons) of liquid fuel. As discussed in section 4.1.5.2.1, most of the solid propellant would be expected to burn upon impact with the ground. Unburned components of the fuel would be removed and treated as hazardous waste. The total quantity of aluminum oxide and hydrogen chloride released in an on-pad failure of a Peacekeeper target would be approximately 26,900 kilograms (59,300 pounds) and 12,300 kilograms (27,100 pounds) respectively. This would be equivalent to that released during 3 nominal launches of an Athena-2 missile. As discussed in section 4.1.1.2.2, the airborne concentrations of the pollutants would be higher than during a nominal launch, but would return to ambient levels within several hours. Modeling results from the testing of much larger Advanced Solid Rocket Motor program vehicles, which output 196,357 kilograms (432,885 pounds) of aluminum oxide and 115,572 kilograms (254,789 pounds) of hydrogen chloride concluded that there would be no significant impacts to surface water from aluminum oxide and hydrogen chloride deposition (National Aeronautics and Space Administration, 1990). Most of the aluminum oxide would be suspended in the air and dispersed over extremely large areas, and the amount of aluminum oxide deposited in surface waters would have not significant impacts. The hydrogen chloride, under the most conservative rain conditions, would be buffered by the water and would not significantly change the pH of the water (National Aeronautics and Space Administration, 1990). The effects of hydrogen chloride deposition into surface waters are dependent upon the pH and buffering capability of the water. The buffering capability is a result of the degree of alkalinity in the water. Measurements of alkalinity are expressed in milligrams of calcium carbonate per liter of water. The higher the alkalinity, the greater the buffering capability. Alkalinity values from the Advanced Solid Rocket Motor program ranged from 5 milligrams calcium carbonate equivalent per liter to 124 milligrams calcium carbonate equivalent per liter with a mean value of 25 milligrams calcium carbonate equivalent per liter (National Aeronautics and Space Administration, 1990). The alkalinity values of surface water within the ROI as listed in table 3.1.14-1 have an average value of 19 milligrams calcium carbonate equivalent per liter and would have a similar buffering capability. Deposition of hydrogen chloride would result in a not significant impact to surface water due to the buffering capability of the water and the relatively small amount of hydrogen chloride deposited.

In the highly unlikely case of an on-pad accident, the liquid fuel (hydrazine) from the fourth stage of the Peacekeeper target is heavier than air and, if not oxidized when airborne, would react and/or possibly ignite with the porous earth or would form dimethylamine and oxides of nitrogen.
All of these substances are soluble in water. Airborne nitrogen dioxide would return to earth as dilute nitric acid rains in precipitation events. (U.S. Army Space and Strategic Defense Command, 1995)

4.1.14.2.3 In-Flight Interceptor Communication System Data Terminal

Construction
Construction of the IDT, COMSATCOM, and connecting roads would cause a minor increase in the discharge of sediments to receiving waters. These waters may also receive some construction-related pollutants, especially if materials are accidentally spilled by construction crews. However, the area to be disturbed is relatively small (approximately 5.9 hectares [14.6 acres]), and the SOPs and KLC NRMP-related commitments described in section 4.1.14.2.1 would prevent these impacts from being significant.

Existing water utilities are sufficient to handle the minor increase in demand for potable water during construction. Therefore, new water sources would not be needed.

Operation
Operation of the IDT and COMSATCOMs would have negligible effects on water quality. Potable water demands associated with the operation of these facilities can easily be served by existing infrastructure.

4.1.14.2.4 Sensors

Construction
The construction of two gravel pads for mobile telemetry would have very little impact on water quality. Minor amounts of sediment may enter nearby drainages, but these impacts would be minor.

Operation
Negligible amounts of motor oil or other automotive-related products may enter nearby drainages as vehicles associated with mobile units use the gravel pads and related roads. These impacts would be minor.

4.1.14.2.5 TPS-X Radar

The TPS-X construction, operation requirements, and potential impacts to water resources would be similar to that described above for the IDT. The alternative locations are the same, and the potential impacts would be similar.

4.1.14.3 Alternative 2

4.1.14.3.1 Targets

The impacts of target-related construction and operational activities on water resources under this alternative would be very similar to those described for Alternative 1 in section 4.1.14.2.2.
The total acreage disturbed would be the same as for Alternative 1. None of the impacts would be significant.

4.1.14.3.2 Sensors
The impacts of sensor-related activities at KLC on water resources under this alternative would be the same as those described for Alternative 1 in section 4.1.14.2.4.

4.1.14.4 Alternative 3
Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts to water resources from Alternative 3 would be as described for Alternative 1.

4.1.14.5 Cumulative Impacts
The Proposed Action and its alternatives are not expected to combine with related past, ongoing, or reasonably foreseeable actions to cause substantial cumulative impacts to water resources. Existing missile launches at KLC combined with the launches included in the Proposed Action would result in minor, short-term adverse water quality impacts in those areas where rocket emissions are deposited. For the same reasons described in section 4.1.14.2.1, such impacts would not be significant. Past construction at KLC combined with the new construction included in the Proposed Action and its alternatives would cause cumulative, but minor and temporary, increases in stormwater runoff and related discharges of sediments in affected drainages. These insignificant impacts have and would occur in drainages near paved areas or areas that are proposed to be paved. Such impacts have been and would continue to be minimized by construction SOPs and other commitments included in the related Stormwater Pollution Prevention Plan. Additional ongoing or foreseeable actions that would contribute to cumulative impacts to water resources have not been identified.

4.1.14.6 Mitigation
No water resources mitigation measures are proposed for the GMD ETR activities at KLC.

4.1.15 SUBSISTENCE—KODIAK LAUNCH COMPLEX
The subsistence resources analytical approach involved evaluating the potential impacts of the Proposed Action and alternatives, such as construction, site preparation activities, use of existing and new sensors, and missile launches, on potential subsistence harvest access within the ROI. Several documents were analyzed to determine the effects to subsistence caused by the program.

4.1.15.1 No Action Alternative
Missile Defense Agency
Under the MDA’s No Action Alternative, launches would continue to occur from KLC, but the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. Native Alaskans would continue to be allowed access to KLC for subsistence harvests between launches. According to the KLC EA,
to ensure public safety, access to some areas would be prohibited for a day up to nine times per year before a launch, which would result in minimal impacts to subsistence harvesting.

**Federal Aviation Administration**

Under the FAA’s No Action Alternative, the launch site operator license for KLC would not be renewed and no launches would be allowed to occur from KLC. Therefore, there would be no closure of areas to subsistence harvesting during launches at KLC.

4.1.15.2 Alternative 1

The Proposed Action would require construction at KLC as described in section 2.3.1.1. New construction would occur mainly in upland areas, which would not impact the subsistence harvest of marine species.

Limitation of access for Alternative 1 would be mainly because of safety and security precautions taken before and during a launch to ensure that no unauthorized people are within the Ground Hazard Area around the launch site. Access would be limited for 1 day for each GBI or target missile launch, approximately 5 days per year for GMD launches. Since the Narrow Cape area hosts only a limited amount of subsistence harvesting and the entire coast from Pasagshak Bay to the southern end of the island is a harvesting area, temporarily restricting public access during GMD ETR pre-launch and launch activities as part of the activities would not be significant.

4.1.15.3 Alternative 2

The Proposed Actions at KLC under Alternative 2 would be identical to those described under Alternative 1, except GBI launches would occur from Vandenberg AFB and RTS instead of KLC and RTS. Potential restricted access to KLC would be as described for Alternative 1.

4.1.15.4 Alternative 3

Alternative 3 would be identical to Alternative 1 at KLC and would include GBI launches from both KLC and Vandenberg AFB, and construction of the required support facilities. Because Alternative 1 includes GBIs, targets, and all associated facilities, the construction and flight impacts to from Alternative 3 would be as described for Alternative 1.

4.1.15.5 Cumulative Impacts

The KLC EA indicated no cumulative impact to subsistence harvest for nine annual launches (Federal Aviation Administration, 1996). It is not likely that the Proposed Action of up to five launches (GBI and/or target) in conjunction with other currently planned or anticipated launches at KLC would exceed nine launches per year, the level of activity analyzed in the KLC EA. No other activities have been identified that when combined with any of the alternatives would contribute to cumulative impacts to subsistence on or near KLC.

4.1.15.6 Mitigation Measures

No subsistence mitigation measures are proposed for the GMD ETR activities at KLC.
4.2 MIDWAY

Although Midway was an alternative site in the Draft EIS, MDA has determined that it is no longer a reasonable alternative and would not be a proposed site for ETR activities. The IDT on-board the SBX would perform the function that had been planned for Midway. The discussion of Midway has been retained in the Final EIS, however, in order to preserve the work that has already been performed. The Proposed Action in the mid-Pacific is the same for all three alternatives; therefore, the environmental consequences would be the same for all. Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS for both the No Action Alternative and the Proposed Action alternatives.

4.2.1 AIR QUALITY—MIDWAY

4.2.1.1 No Action Alternative

Under the No Action Alternative, IDT and COMSATCOM facilities would not be constructed for the GMD ETR, and Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS. There would be no impact to air quality.

4.2.1.2 Alternatives 1, 2, and 3

4.2.1.2.1 In-Flight Interceptor Communication System Data Terminal

Construction

Construction activities would include construction of one IDT, COMSATCOM, and fenced areas surrounding the facilities at one of the two proposed sites. Both sites are located on existing paved areas; therefore, ground disturbance would be kept to a minimum with only minimal emissions generated during construction.

Construction would be conducted in accordance with applicable federal and state regulations and permits. Construction air quality impacts would be both temporary and localized in nature. Once construction is completed, air quality would return to its former level.

Operation

Operation of the IDT and COMSATCOM would not result in long term or permanent impacts to the regional air quality. Power would be provided by a commercial source with a 275-kW backup generator. Along with the generator, an external aboveground 3,785-liter (1,000-gallon) fuel tank would be provided. Table 4.2.1-1 lists potential emissions for the generator if it is run up to 250 hours a year for weekly testing and power outages. These levels would not exceed existing standards.
Table 4.2.1-1: Potential Generator Emissions for IDT and COMSATCOM Facilities at Midway

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>PM-10 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>275-kW Diesel Generator</td>
<td>0.6 (0.7)</td>
<td>0.09 (0.10)</td>
<td>0.80 (0.90)</td>
<td>0.03 (0.04)</td>
</tr>
</tbody>
</table>

4.2.1.2.2 Sensors

Construction
Mobile telemetry would utilize an existing gravel pad or paved area and result in no new construction; therefore, there would be no air quality impacts from construction.

Operation
Minor air quality impacts are expected during the operation of the mobile telemetry at Midway. Power would be provided by a 10-kW generator, which is assumed to be in operation for 3 weeks (24 hours a day, 7 days a week) five times a year during test activities. The total operating time is estimated at a maximum of 2,520 hours per year. Table 4.2.1-2 lists the possible emissions that could be generated and are anticipated to remain within existing air standards.

Table 4.2.1-2: Potential Generator Emissions for Mobile Telemetry Facilities at Midway

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen metric tons/year</th>
<th>Hydrogen Chloride metric tons/year</th>
<th>Carbon Monoxide metric tons/year</th>
<th>PM-10 metric tons/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-kW Diesel Generator</td>
<td>0.23 (0.26)</td>
<td>0.036 (0.039)</td>
<td>0.29 (0.32)</td>
<td>0.01 (0.02)</td>
</tr>
</tbody>
</table>

4.2.1.3 Cumulative Impacts
The limited construction and operation of the IDT and COMSATCOM, when combined with current activities on Midway, are not expected to result in significant cumulative air quality impacts.

4.2.1.4 Mitigation Measures
No air quality mitigation measures are proposed for the GMD ETR activities at Midway.
4.2.2 BIOLOGICAL RESOURCES—MIDWAY

The Proposed Action in the mid-Pacific is the same for all three alternatives; therefore, the environmental consequences would be the same for all.

4.2.2.1 No Action Alternative

Under the No Action Alternative, IDT and COMSATCOM facilities would not be constructed for the GMD ETR and Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS. There would be no impact to biological resources.

4.2.2.2 Alternatives 1, 2, and 3

The Proposed Action would require construction and operation of an IDT and two COMSATCOMs, and operation of mobile telemetry. Installation and operation of the IDT and COMSATCOMs, as well as operation of the sea-based IDT, would comply with all applicable regulations, such as the Plant Protection Act of 2000 (7 USC 7701, et seq.); Executive Order 13112, Invasive Species (3 February 1999); and the National Invasive Species Act of 1996 (16 USC 4701, et seq.; see appendix B). The Proposed Action would follow all applicable procedures in place at Midway to prevent the introduction of alien nuisance species, such as removing visible mud, plant, fish, or animals from equipment before transporting it to Midway. Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought onto the island. These activities would result in impacts similar to, but less than, those caused by site preparation. Specific restoration actions, if necessary, would be determined on a case-by-case basis.

Site Preparation Activities

Vegetation

The IDT on Midway would require construction of an IDT on an existing paved area or pad within a fenced area. The fencing would be installed in the smallest area practicable, no more than 2 hectares (5 acres). The IDT would be located in previously disturbed areas to further minimize impacts to vegetation and would avoid areas of beach strand vegetation.

The two COMSATCOMs require a footprint of approximately 0.14 hectare (0.34 acre) each within a fenced area to accommodate the COMSATCOM and equipment. The COMSATCOMs would be placed on existing previously disturbed paved areas to further minimize impacts to vegetation. They would also be located within the IDT fenced area. A communication cable to the IDT would be installed along an existing road. Minimal requirements include a concrete base for the COMSATCOMs, an all-weather road to the site, and a prepared surface around the site at least 4.6 meters (15 feet) wide.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plants are located on Midway Atoll.
Wildlife
Construction activities would occur on previously disturbed ground and would not significantly impact wildlife. Primary power would be from a commercial source with backup power provided by generator. Noise from the generator may temporarily startle adjacent wildlife, but no long-term impacts are anticipated. Any lighting associated with the Proposed Action would be properly shielded following USFWS guidelines to minimize disorientation impacts to birds.

Threatened and Endangered Wildlife Species. No impacts are anticipated to the short-tailed albatross, Hawaiian monk seal, or basking sea turtles, which would all be located along the beach or nearshore water. Personnel would be instructed to stay at least 46 meters (150 feet) away from monk seals on the beach in accordance with current rules.

Environmentally Sensitive Habitat
The small wetland on the island, critical habitat for the Hawaiian monk seal, which is not located on Sand Island, and established Marine Protected Areas would not be affected by site preparation activities.

Operation
Vegetation
No impacts to vegetation would result from operation of the IDT and COMSATCOMs.

Wildlife
During normal operations, the IDT would not transmit except for a few minutes during annual testing of the equipment. Given the short duration of transmission, no adverse impacts to biological resources are anticipated. Most operational impacts to wildlife from the IDT and COMSATCOMs would come from security lighting and noise from backup electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Any lighting associated with the Proposed Action would be properly shielded following USFWS guidelines to minimize disorientation impacts to birds. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities required for backup generators, with minimal impact to wildlife adjacent to the site.

Threatened and Endangered Wildlife Species. No impacts are anticipated to the short-tailed albatross, Hawaiian monk seal, or basking sea turtles, which are all located along the beach or nearshore water outside of the highest noise levels. Personnel would be instructed to stay at least 46 meters (150 feet) away from monk seals on the beach in accordance with current rules.

Environmentally Sensitive Habitat
The small wetland on the island, critical habitat for the Hawaiian monk seal (which is not located on Sand Island), and established Marine Protected Areas would not be affected by site preparation activities.
4.2.2.3 Sensors
Mobile telemetry would be set up on an existing gravel pad or paved area. Operation of a 10 kW generator would cause noise levels of 80 to 85 dBA at up to 344 feet (105 meters). These noise levels would occur 24 hours per day for up to 3 weeks, five times per year, in support of missile flight tests, with minimal impact to wildlife.

4.2.2.4 Cumulative Impacts
The limited operation of the IDT and COMSATCOMs when combined with current activities on Midway is not expected to result in cumulative impacts to vegetation or wildlife.

4.2.2.5 Mitigation Measures
No biological resources mitigation measures are proposed for the GMD ETR activities at Midway.

4.2.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—MIDWAY
A general description of impact on hazardous material and waste management is provided in the beginning of section 4.1.6. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from GMD ETR activities are addressed as applicable.

4.2.3.1 No Action Alternative
Under the No Action Alternative, IDT and COMSATCOM facilities would not be constructed for the GMD ETR and Midway would continue to serve as a National Wildlife Refuge under direction of the USFWS. There would be no impact to hazardous materials and waste management practices at Midway.

4.2.3.2 Alternatives 1, 2, and 3
4.2.3.2.1 In-Flight Interceptor Communication System Data Terminal
Installation and operation of an IDT and COMSATCOMs, in and of itself, would have minimal impact on the atoll with respect to hazardous materials use or hazardous waste generation. In accordance with DoD requirements, hazardous materials management would be planned into the installation and operation activities from conceptual design forward.

Construction
IDT and COMSATCOM construction would essentially be the same as routine commercial construction of a small communications facility and would result in only minor disturbance of the immediate area. Equipment would be fabricated prior to delivery, and only final assembly would be required on site. “Environmentally preferable” materials would be used where possible. Potentially hazardous materials such as adhesives, paints and low-toxicity cleaning products would be used to install and maintain the equipment, and diesel fuel would be used for electrical generator operation. Only the minimum quantity of material necessary to perform the work would be transported to the atoll. Pollution Prevention, Recycling, and Waste Minimization
would be practiced in accordance with applicable EPA, State of Hawaii, DoD, U.S. Army, and USFWS requirements. IRP sites from the Navy CLEAN program would not be affected.

Temporary storage tanks and other facilities for the storage of hazardous materials would be located in protected and controlled areas designed to comply with site-specific spill prevention and countermeasure plans. Hazardous wastes generated during construction would consist of materials such as waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. The minimal quantities of hazardous waste that could potentially be generated would be containerized and returned to Hawaii and/or the continental United States by the individual contractors for disposal.

Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the contractor's Stormwater Pollution Prevention Plan and Project SPCC Plan that would be developed. All hazardous materials used and hazardous waste generated during construction would be handled in accordance with applicable federal, state, and local regulations.

Operation

IDT operation would utilize electrical power for sending and receiving signals. Electrical power could be from the local electrical grid or from a dedicated standby diesel generator. Diesel fuel for the generator would be stored in ASTs. The ASTs would be double walled and have secondary containment to conform to API standards. No USTs would be used.

Although not normally considered hazardous waste (designation varies by state), used POL would be generated in small amounts. Tank bottoms from the ASTs would be withdrawn periodically and the fuel disposed of as used (nonhazardous) POL. Generator engine oil changes would likewise result in generation of small amounts of used motor oil. Also, small amounts of potentially hazardous waste would be generated by maintenance and housekeeping activities at the site. Handling of disposal of the minimal quantities of hazardous waste generated from IDT operation would the same as discussed under IDT construction.

4.2.3.2.2 Sensors

Mobile telemetry operation impacts would be similar to that described above for the IDT. A 10-kW generator would provide power to the mobile telemetry. Handling of POL waste would be as described for the IDT.

4.2.3.3 Cumulative Impacts

The limited operation of the IDT and COMSATCOM when combined with current and planned activities at Midway is not expected to result in cumulative hazardous materials and hazardous waste impacts.

4.2.3.4 Mitigation Measures

No hazardous waste management/hazardous materials mitigation measures are proposed for the GMD ETR activities at Midway.
4.3 REAGAN TEST SITE

Potential impacts of construction, building modification, and missile launches on air quality, biological resources, hazardous materials and waste, and health and safety have been addressed in detail in the applicable NEPA documents listed in appendix A, such as the USAKA Supplemental EIS and the USAKA Temporary ETR EA. Based on the prior analyses in those documents, and the effects of past target and interceptor launch activities, the potential environmental impacts from the proposed GMD activities are expected to be minimal, as discussed in the following sections.

4.3.1 AIR QUALITY—REAGAN TEST SITE

4.3.1.1 No Action Alternative

As described in section 2.2.1, missile flight test activities would continue at RTS. As determined in the Theater Missile Defense ETR EIS (U.S. Army Space and Strategic Defense Command, 1994) and the Supplemental USAKA EIS (U.S. Army Space and Strategic Defense Command, 1993a), emissions from a typical launch at RTS (i.e., one strategic launch vehicle) are assumed to be 7.14 metric tons (7.88 tons) of carbon monoxide, 5.18 metric tons (5.71 tons) of hydrogen chloride, and 9.27 metric tons (10.22 tons) of aluminum oxide. In the USAKA Supplemental EIS, air emission modeling was performed to predict maximum short-term concentration of the previously mentioned exhausts. The exhaust emission presented in the USAKA Supplemental EIS is shown in table 4.3.1-1. The worst-case scenario depicted the simultaneous launch of six strategic launch vehicles. Even with such large amounts of exhausts being emitted, the modeling results predicted that no UES or guidance levels would be exceeded.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging period</th>
<th>UES Ambient Air Quality Standards or Noncriteria Pollutant Guidance Level (milligrams per cubic meter)</th>
<th>Six Simultaneous Launches of Strategic Missiles (milligrams per cubic meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>40</td>
<td>0.00703</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>10</td>
<td>0.00492</td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour</td>
<td>1.5</td>
<td>0.393</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>8-hour</td>
<td>10</td>
<td>5.924</td>
</tr>
</tbody>
</table>

Source: U.S. Army Space and Strategic Defense Command, 1993a

4.3.1.2 Alternative 1

4.3.1.2.1 Ground-Based Interceptors

Construction

Alternative 1 would only require minor interior modifications to existing facilities on Meck; therefore, there would be no air quality impacts to the regional air quality due to construction.
Operation

Pre-Launch Activities

Operation activities for single and dual GBI launches at RTS up to five times a year would be similar to those described in section 4.1.1.2.1 for KLC. An accidental release of liquid fuel and liquid oxidizer from the EKV would be similar to that described for KLC (table 4.1.1-5). The implementation of approved emergency response plans would limit the impact of such a release. While not defined in detail, pre-launch activities would be expected to result in very low, insignificant emissions.

Offsite power sources with backup emergency generators would continue to be used for the existing facilities at RTS. Emissions at RTS are covered under an existing Document of Environmental Protection.

Launch Activities

Launch activities for a single or dual launch would be similar to previous launches at RTS. Possible emissions that would result from a GBI launch are listed in table 4.1.1-8. As described in section 3.3.1, air quality at RTS is considered good. It is expected that background levels would not add significantly to the ambient air concentrations.

Potential GBI exhaust emissions are 0.2 to 0.3 times the level of the launches modeled in the No Action Alternative, as shown in table 4.3.1-2. It is anticipated that the air quality impacts due to the dual launch of GBIs would be less than those modeled for six simultaneous strategic missile launches in the Supplemental USAKA EIS. The proposed GBI missile would not be expected to cause a significant impact to regional air quality surrounding RTS.

<table>
<thead>
<tr>
<th>GBI Configuration</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Aluminum Oxide metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six Strategic Missiles</td>
<td>42.9 (47.3)</td>
<td>31.1 (34.2)</td>
<td>55.6 (61.3)</td>
</tr>
<tr>
<td>Dual Orion GBI</td>
<td>9.6 (10.6)</td>
<td>9.6 (10.6)</td>
<td>16.3 (17.9)</td>
</tr>
</tbody>
</table>

Post-Launch Activities

Activities performed during post-GBI launch would include the removal of all mobile equipment and assets brought to RTS. The removal could result in small localized amounts of fugitive dust, which would have a minor impact to air quality. However, this impact would be minimized further through the use of dust suppression methods previously discussed.
4.3.1.2.2 Targets

Construction

With the implementation of Alternative 1, similar minor modifications to existing facilities at RTS for GBI launches would occur for target launches. An older silo would be modified to accommodate some target missiles. A new launch pad on Meck would be required to support dual target launches. A new launch pad would disturb approximately 0.4 hectare (1.0 acre) during construction. Table 4.3.1-3 shows potential construction emissions.

Table 4.3.1-3: Potential Construction-Related Emissions for Target Facilities at RTS

<table>
<thead>
<tr>
<th>Source</th>
<th>Emission Factor kilograms/hectare (pounds/acre)</th>
<th>Graded Area hectares (acres)/year</th>
<th>Exposed days/year</th>
<th>Emissions kilograms/ year</th>
<th>Emissions metric tons/ year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulldozing</td>
<td>1.046 (933.1)</td>
<td>0.4 (1.00)</td>
<td>NA</td>
<td>423 (933)</td>
<td>0.4 (0.5)</td>
</tr>
<tr>
<td>Grading</td>
<td>1.5 (1.3)</td>
<td>0.4 (1.00)</td>
<td>NA</td>
<td>0.5 (1)</td>
<td>0.0006 (0.0007)</td>
</tr>
<tr>
<td>Vehicle Traffic</td>
<td>1.019 (909)</td>
<td>0.4 (1.00)</td>
<td>NA</td>
<td>412 (909)</td>
<td>0.4 (0.5)</td>
</tr>
<tr>
<td>Erosion of Soil Piles</td>
<td>0.17 per day (0.15 per day)</td>
<td>0.4 (1.00)</td>
<td>90</td>
<td>6 (14)</td>
<td>0.006 (0.007)</td>
</tr>
<tr>
<td>Erosion of Graded Surface</td>
<td>30.0 per day (26.4 per day)</td>
<td>0.4 (1.00)</td>
<td>90</td>
<td>1,078 (2,376)</td>
<td>1.1 (1.2)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,920 (4,233)</strong></td>
<td><strong>2.0 (2.2)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PM-10 produced during construction would be reduced by half through the use of dust suppression measures such as periodically watering areas being graded and wet sweeping or otherwise removing soils and mud deposits from paved roadways and parking areas. Proper tuning and preventive maintenance of construction vehicles would serve to minimize exhaust emissions.

Operation

Pre-Launch Activities

Pre-launch activities at RTS include the transportation and assembly of the target. The mobile exhaust emissions resulting from transportation would be intermittent and would not have a measurable impact to regional air quality.

Launch Activities

Proposed target launches would be similar to previous rocket launches at RTS. These land launched target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II Target, Peacekeeper Target, and Trident I (C4) Target. Table 4.1.1-13 lists missile propellant information and table 4.1.1-14 lists emission constituents for each proposed missile. Up to five launches per year would occur at RTS over the duration of the program.

Potential target exhaust emissions from a dual target launch are anticipated to be, at most, 60 percent of the level of the launches modeled in the No Action Alternative, as shown in table 4.3.1-4. It is expected that the air quality impacts due to the dual launch of any of the targets
listed in table 4.3.1-4 would be less than those modeled for six simultaneous strategic missile launches in the Supplemental USAKA EIS. The proposed target missile would not be expected to cause a significant impact to regional air quality surrounding RTS.

<table>
<thead>
<tr>
<th>Missile</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Aluminum Oxide metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six Strategic Missiles</td>
<td>42.9 (47.3)</td>
<td>31.1 (34.2)</td>
<td>55.6 (61.3)</td>
</tr>
<tr>
<td>Dual Strategic Target System</td>
<td>4.7 (5.2)</td>
<td>3.2 (3.5)</td>
<td>7.1 (7.8)</td>
</tr>
<tr>
<td>Dual Minuteman II Target</td>
<td>10.0 (11.0)</td>
<td>8.9 (9.9)</td>
<td>12.3 (13.9)</td>
</tr>
<tr>
<td>Dual Peacekeeper Target</td>
<td>20.0 (21.9)</td>
<td>18.9 (20.8)</td>
<td>19.4 (21.4)</td>
</tr>
<tr>
<td>Dual Trident I (C4) Target</td>
<td>11.0 (12.1)</td>
<td>0.8 (0.9)</td>
<td>13.4 (14.8)</td>
</tr>
</tbody>
</table>

**Post-Launch Activities**
Activities performed during post-target flight would include the removal of all mobile equipment and assets brought to RTS. The removal could result in small, localized amounts of fugitive dust, which would have a minor impact to air quality. However, this impact would be minimized further through the use of dust suppression methods previously discussed.

**4.3.1.2.3 Sensors**
All sensors to be utilized in Alternative 1 previously exist at RTS and are currently in use. Minor software and interior modifications could be performed to these elements; therefore, there would be no construction air quality impacts at RTS for sensors. Operation of existing range radar at RTS would be covered under the existing Document of Environmental Protection.

**4.3.1.2.4 SBX**

**Construction**
Warehouse and administrative space construction would occur in previously disturbed areas. All construction activities would be conducted in accordance with appropriate regulations and permits. Other than minor, short-term impacts from construction, no adverse effects to regional air quality are expected.

**Operation**
Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would consist primarily of minimal levels of volatile organic compound emissions and are not expected to have a significant impact on air quality.

**65 Percent and Fully Populated SBX**
Based on five tests per year, the SBX would be at the RTS PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with
an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 5 to 6 kilometers (3 to 4 miles) north of the Kwajalein harbor. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. The SBX would not be considered a stationary source at RTS; therefore, the standards and procedures for new stationary sources would not be applicable.

Total time includes 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

4.3.1.3 Alternatives 2 and 3

4.3.1.3.1 Ground-Based Interceptors
Construction and operation of GBI facilities at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.1.2.1 for Alternative 1.

4.3.1.3.2 Targets
Construction and operation of target launches and associated target facilities at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.1.2.2 for Alternative 1.

4.3.1.3.3 Sensors
Construction and operation of range sensors at RTS for Alternatives 2 and 3 would be same as those described in section 4.3.1.2.3 for Alternative 1.

4.3.1.3.4 SBX
Construction and operation of the SBX at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.1.2.4 for Alternative 1.

4.3.1.4 Cumulative Impact
Due to the limited industrialization of USAKA and the surrounding environment, the potential cumulative impacts to air quality due to the proposed interceptor and target facility construction and launches would not be substantial. Missile launches are short-term, discrete events, thus allowing time between launches for emissions products to be dispersed. The 1993 Supplemental USAKA EIS determined that there would be no significant cumulative impacts to air quality under the high level of activity alternative as a direct result of up to 14 launches of six missiles simultaneously per year. The modeling resulted in no predicted annual impacts that exceed UES Ambient Air Quality Standards. It is not likely that the Proposed Action in conjunction with current planned or anticipated launches would exceed this level of activity. The
anticipated number of missile launches from RTS in support of the GMD ETR would be up to five missiles (GBI and targets combined) per year.

4.3.1.5 Mitigation
No air quality mitigation measures are proposed for GMD ETR activities.

4.3.2 AIRSPACE—REAGAN TEST SITE

4.3.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. As described in section 2.2.1, operations currently conducted at RTS would continue.

4.3.2.2 Alternatives 1, 2, and 3
The Proposed Action for all alternatives related to airspace would be full power emissions from the SBX while at the mooring location north of Kwajalein.

4.3.2.2.1 SBX Operation

Controlled and Uncontrolled Airspace
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect aircraft operations. Both the DoD and the FAA have standards for EMR interference to aircraft, which should not be exceeded. DoD uses MIL-STD-464 standards; therefore, military aircraft must be hardened or protected from EMR with a peak power threshold up to 3500 volts per meter (V/m) and 1270 V/m (average power). The SBX would not exceed these levels. Commercial aircraft must be hardened or protected from EMR levels up to 3000 V/m (peak power) and 300 V/m (average power) as mandated by the Federal Aviation Association (FAA) by Notice 8110.71, Guidelines for the Certification of Aircraft Flying through High Intensity Radiated Field Environments. The SBX would not exceed the 3000 V/m peak power threshold. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern here is not interference but is a reduction in life of the aircraft avionics/electronic equipment. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, USAKA, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed
DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and on figure 3.3.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this SBX high energy radiation area would not impose any new flight restriction requirements. The operating area would be similar to the existing operating area for the GBR-P radar at Kwajalein (figure 4.3.2-1). As shown in the figure, the GBR-P is restricted from radiating in several areas. These include the arrival and departure corridors for Bucholz Army Airfield, in the direction of the rest of Kwajalein Island, and in the direction of other nearby islands.

SBX operations would be coordinated with the FAA and Kwajalein and would be scheduled to occur during hours of minimal aircraft operations. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace
There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes
Two en route high altitude airways (R 584 and A 222) enter the 65 percent and fully populated aircraft interference areas and terminate at Kwajalein. There are additional approach and departure routes within the ROI that would also need to be considered when defining the SBX operating area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

Airports and Airfields
Bucholz Army Airfield is located on Kwajalein, approximately 5 to 6 kilometers (3 to 4 miles) south of the proposed mooring location. With the controls placed on the SBX in a manner similar to the GBR-P radar, standard instrument approach and departure procedures at the airfield would continue unhindered. Existing airfield or airport arrival and departure traffic flows would also not be affected and access to the airfield would not be curtailed. All arriving and departing aircraft and all participating military aircraft are under the control of the Bucholz Army Airfield Control Tower; thus, there would be no airfield conflicts in the ROI under the Proposed Action, and no impact.
Emissions from the XBR may also potentially degrade the overall system performance of in-band airborne and ship-based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high-energy radiation area would be configured to avoid impacts to these airborne and ship-based systems.

4.3.2.3 Cumulative Impacts

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. The use of the required scheduling and coordination process, and adherence to applicable DoD directives and U.S. Army regulations concerning radar operations would preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.3.2.4 Mitigation Measures

The SBX high energy radiation area would be configured to mitigate potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition to charting the SBX high energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high energy radiation area.

4.3.3 BIOLOGICAL RESOURCES—REAGAN TEST SITE

Regulations governing endangered species and wildlife resources at RTS are specified in UES Section 3-4. Water quality and reef protection standards at RTS are in UES Section 3-2 (U.S. Army Space and Missile Defense Command 2001)

4.3.3.1 No-Action Alternative

If the GMD ETR is not established, the following activities would still continue at RTS: launch of GBIs, use of extensive range instrumentation, use of the GBR-P ground-based XBR, use of existing IDT facilities, and missile intercepts in the BOAs north and northeast of RTS. Impacts to biological resources would be minimal as described in the applicable NEPA documents listed in appendix A, such as the USAKA Supplemental EIS and the USAKA Temporary ETR EA.
4.3.3.2 Alternative 1

4.3.3.2.1 Ground-Based Interceptors

Alternative 1 would require the use of existing GBI silos on Meck, a Missile Assembly Building, missile storage facility, maintenance and storage facility, and launch control facility to support GBI launches for the GMD ETR.

GMD ETR program personnel would remove all mobile equipment/assets brought to the installation at the conclusion of its testing activities. Transportation for removal of equipment would be the same as when it was brought into the installation. These activities would result in impacts similar to, but less than, those caused by site preparation. Specific restoration actions, if necessary, would be determined on a case-by-case basis.

Construction

Only minor maintenance activities would be required.

Vegetation

No new construction or other ground-disturbing activities are planned; therefore, there would be no impacts to vegetation.

Wildlife

Personnel would be instructed to avoid areas designated as avian nesting or roosting habitat and to avoid all contact with any nest that may be encountered. Sea turtles or turtle nests would also be avoided. No site preparation activities are planned that could impact Essential Fish Habitat.

Environmentally Sensitive Habitat

No site preparation activities are planned that could impact reef slopes and flats or seagrass beds.

Operation

Dual target launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

Vegetation

Meck has been extensively altered by human activity, and little native vegetation remains to serve as wildlife habitat. No additional impacts to vegetation are expected from continued GBI launches.

Wildlife

Results of monitoring conducted for a Strategic Target System launch from KTF at PMRF indicated little effect upon wildlife due to the low-level, short-term hydrogen chloride emissions (U.S. Army Space and Strategic Defense Command, 1993b). The program included marine
surveys of representative birds and mammals for both pre-launch and post-launch conditions. Studies on representative birds and mammals reviewed in the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992) also indicated that low-level, short-term exposure to hydrogen chloride would not adversely affect threatened or endangered species or other wildlife. Aluminum oxide and hydrogen chloride do not bioaccumulate; therefore, no indirect effects to the food chain are anticipated.

An early flight termination or mishap could result in debris impacts along the flight corridor, which may temporarily impact fishing activities in the immediate area. Due to the small amount of propellant involved and the limited number of launches, the project is not anticipated to adversely affect trust marine resources. The potential ingestion of toxins by fish species, which may be used for food sources, would be remote because of the diluting effect of the ocean water and the relatively small area that would be affected. The primary flight test activity that may have an effect on wildlife within the flight test corridor is the actual intercept of the target missile. Debris impact areas for both the interceptor and target vehicles would be located over the Mid-atoll Corridor of the Kwajalein Lagoon or the BOA.

Any debris from mishaps landing in the Kwajalein Lagoon in approximately 50 meters (164 feet) of water would be recovered. The debris is not expected to contain hazardous materials. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water. Larger pieces of propellant would be recovered following a mishap in the lagoon, further minimizing the potential for perchlorate contamination.

Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Wildlife such as waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Waterfowl driven from preferred feeding areas by aircraft or explosions usually return soon after the disturbance stops, as long as the disturbance is not severe or repeated (Federal Aviation Administration, 1996).

**Threatened and Endangered Wildlife Species.** An early flight termination or mishap could result in debris impact along the flight corridor. Sensitive marine species are widely scattered, and the probability of debris striking a threatened or endangered species is considered remote. For example, according to the Strategic Target System EIS, which assessed the low potential in regard to debris striking whale species, the probability of an impact is less than a 4.6 chance in 1 million (4.6 x 10^-6) (U.S. Army Strategic Defense Command, 1992).

Thus, debris impact and booster drops in the BOA are not expected to adversely affect marine mammal species protected by the UES. In addition, the probability is rather low that migratory whales or sea turtles would be within the area to be impacted by falling debris and boosters.
Environmentally Sensitive Habitat
Proposed nominal launch activities would not impact sensitive habitat such as coral reefs.

4.3.3.2.2 Targets
Alternative 1 would require the use of existing facilities on Meck, including a Missile Assembly Building, missile storage facility, maintenance and storage facility, and launch control facility for target launches in support of the GMD ETR. Dual launches of target missiles would occur from a modified Payload Launch Vehicle GBI silo on Meck and a new launch pad on Meck.

Construction
Other than the construction of a new launch pad on Meck, only minor maintenance activities and internal modifications to an existing silo would be required.

Vegetation
Meck has been extensively altered by human activity, and little native vegetation remains to serve as wildlife habitat. The new target launch pad on Meck would require installation of a launch stool on reinforced concrete within a previously disturbed area. No impacts to vegetation are expected.

Wildlife
Disturbance to wildlife from the construction noise and temporary increase in personnel would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Personnel would be instructed to avoid areas designated as avian nesting or roosting habitat and to avoid all contact with any nest that may be encountered. Sea turtles or turtle nests would also be avoided. No site preparation activities are planned that could impact Essential Fish Habitat.

Environmentally Sensitive Habitat
No site preparation activities are planned that could impact reef slopes and flats or seagrass beds.

Operation
Dual target launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

Vegetation
No impacts to vegetation would occur as a result of launch activities on Meck, since the new target launch site would be located within a previously disturbed area.

Wildlife
Impacts to wildlife from target missile launches would be similar to those discussed above for GBI launches.
**Environmentally Sensitive Habitat**

Impacts to sensitive habitat would be the same as those discussed above for GBI launches.

### 4.3.3.2.3 Sensors

Existing range sensors at RTS would be used, including the Advanced Research Project Agency Lincoln C-Band Observable Radar and Long-range Tracking and Instrumentation. Both of these tracking radars are located on Roi-Namur at RTS. Additional radars include the TPS-X, Millimeter Wave Radar, Tracking and Experiment Discrimination Experiment Radar, and two MPS-36 C-band general-purpose instrumentation radars located at RTS. Although the potential for mainbeam exposure thermal effects from these radars to birds exists; mitigating these concerns is the fact that radar beams are relatively narrow and constantly in motion. To remain in the beam for any period requires that a bird fly directly along the beam axis, or that a hovering bird does so for a significant time. Thus, although the potential for adverse effects exists, the probability of such an occurrence happening frequently is considered low. The potential for impacts from the use of these radars have been analyzed in prior environmental documentation and determined to be not significant.

Personnel would be instructed to avoid areas designated as avian nesting or roosting habitat and to avoid all contact with any nest that may be encountered. Sea turtles or turtle nests would also be avoided. No site preparation activities are planned that could impact Essential Fish Habitat.

### 4.3.3.3 SBX

**Construction**

Although the piers at the Kwajalein harbor do not offer adequate depth to accommodate the draft of the SBX, the vessel can enter the Kwajalein lagoon and moor in a protected anchorage. RTS has a full complement of supply and fueling vessels. The mooring site would be approximately 5 to 6 kilometers (3 to 4 miles) north of the Kwajalein harbor. The SBX would enter the lagoon either through South Pass on the west side of the atoll or at Mellu Pass on the north side. Both passes offer sufficient depth to accommodate the vessel; however, Mellu Pass offers a much greater width for maneuverability. Personnel would be ferried to the SBX each day either by watercraft or helicopter.

Existing facilities with 900- to 1,500-square-meters (3,000- to 5,000-square-feet) of environmentally controlled warehouse would potentially be required for SBX operations. Any facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations.

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996). Most wildlife is known to exhibit a startle response when exposed to short-term noise impacts. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, sufficient
foraging and feeding habitat occurs in adjacent areas. Studies (U.S. Department of the Air Force, 1997b) indicate that birds usually show signs of disturbance, such as fluttering of wings, when a noise event occurs, but quickly return to normal behavior after the event. Although construction activities could cause flushing (birds suddenly flying up), this is a common reaction to sudden natural sounds that only slightly increases the energy expenditure of individual birds. Construction is therefore not expected to have a long-term significant adverse effect on wildlife. Other than these minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

**Operation**

The SBX is a high-powered radar system that would use a pulsed microwave beam to perform tracking, discrimination, and kill assessments of incoming ballistic missile warheads. Since this system has the potential for exposing regions in its vicinity to EMR, consideration has been given to the evaluation of the potential for any adverse impacts that EMR may have on biological resources.

As described in section 2.1.4, the SBX would be mounted on a semi-submersible platform. The platform would be self-propelled in open water with a cruising speed of approximately 15 kilometers per hour (8 knots), but assisted by tug(s) while in port. Total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft. The main beam would not be directed toward the ground or water surface, would have a lower limit of 10 degrees above horizontal for calibration and maintenance testing while at the PSB, and thus would not directly illuminate the surface. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. Table 2.1.4-2 lists the EMR potential interference distances. The total amount of RF radiation per week would be approximately 5 to 6 hours. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of the EMR/EMI survey.

In terms of the potential for EMR impacts on wildlife, the GBR Family of Radars EA (U.S. Army Program Executive Office Missile Defense, 1993) analyzed potential impacts on wildlife from EMR. This EA determined that several factors significantly reduce the potential EMR exposure for birds and other wildlife. The radar main beam would normally be located at least 2 degrees above horizontal, which limits the probability of energy absorption by surface-oriented wildlife. The radar beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further reduces the probability of bird species remaining within this limited region of space, even if the beam were still. (Ballistic Missile Defense Organization, 2000)

The analysis methods used to evaluate potential effects of RF radiation on birds is the MPEL, which defines the maximum time-averaged radio frequency power density allowed for uncontrolled human exposure (and by extrapolation, to birds and other species). The MPEL method is independent of body size or tissue density being exposed. Analysis conducted during preparation of the GBR Family of Radars EA (U.S. Army Program Executive Office Missile Defense, 1993) was based on a conservative approach of limiting the microwave energy absorption rate on the Aplomado falcon (*Falco femoralis*), a bird listed as endangered by the USFWS and the State of New Mexico. The energy absorption rate was based on the falcon remaining continuously within the main beam of the GBR. The absorption rate was then
compared to the bird’s resting metabolic rate. The analysis indicated power densities would have to exceed 42 mW/cm² to affect the falcon. Power densities of 38 to 61 mW/cm² have been determined necessary to affect other birds weighing up to 3.5 kilograms (7.7 pounds). Analysis conducted during preparation of the prototype High Power Discrimination Radar at PMRF was based on the potential effects on the Laysan albatross (U.S. Department of the Navy, 2002a).

The analyses were based on the conservative assumption that the energy absorption rate of a bird's body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect. Birds in general typically expend energy at up to 20 times their resting metabolic rates during flight. Since birds are not likely to remain continuously within the radar beam and the power density is not expected to exceed levels stated above that could impact birds, the likelihood of harmful exposure is not great. (Ballistic Missile Defense Organization, 2000)

Potential impacts from EMR from the XBR on wildlife have been compared to the existing Cobra Dane radar operating on Eareckson Air Station on Shemya Island, Alaska. The Cobra Dane operates in the L-band (1,000 to 2,000 MHz), while the proposed SBX would operate in the X-band (8,000 to 12,000 MHz). The X-band has less potential to cause thermal heating in biological resources than the L-band. Like the Cobra Dane, the proposed SBX main beam would be constantly moving and would not be stationary over one area. The USFWS has not noticed die-offs of birds below the Cobra Dane radar (Martin, 1999). Overall, it is expected that no bird deaths would be expected as a result of operation of the SBX. (Ballistic Missile Defense Organization, 2000)

The total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft and the SBX radar main beam would not be directed toward the ocean’s surface. Since marine mammals would normally be found below the surface of the water, this signal height would be safely above any surfacing mammals. RF radiation does not penetrate the surface of water to any great degree. The power density level just below the surface of the ocean would not exceed the permissible human exposure level for uncontrolled environments. (U.S. Department of the Navy, 2002a) No adverse impacts would occur to whales, other marine mammals, or sea turtles at least 1.3 centimeters (0.5 inch) below the surface. It is also highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time during the 3 to 6 hours per week that the SBX radar would be operating. For these reasons, no effects are anticipated on humpback whales, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations. Operation of the SBX would not require delays if whales and other marine mammals are observed. Therefore, no further action regarding whales or sea turtles is required pursuant to the Endangered Species Act and the Marine Mammal Protection Act.

The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the Uniform National Discharge Standards (UNDS) provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. The relatively slow speed of the SBX platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals or sea turtles are anticipated.
4.3.3.4 Alternatives 2 and 3
The Proposed Actions and environmental effects at RTS under Alternatives 2 and 3 are identical to those described under Alternative 1.

4.3.3.5 Cumulative Impacts
The limited amount of facility modification planned on RTS would not likely result in cumulative impacts to biological resources. The 1993 Supplemental USAKA EIS determined that there would be no significant cumulative impacts to biological resources under the intermediate level of activity alternative as a direct result of launching up to 28 strategic launch vehicles per year from Meck. The anticipated number of missiles launches from RTS in support of the GMD ETR could be up to five missile launches (GBI and targets combined) per year. No significant cumulative impacts to biological resources have been identified as a result of prior launch-related activities from RTS. The GMD ETR activities when combined with current and proposed launch activities on RTS would not increase the total number of annual launches currently allowed. These activities would have negligible cumulative impacts on biological resources.

4.3.3.6 Mitigation Measures
As a standard practice, personnel would be instructed to avoid areas designated as avian or sea turtle nesting or avian roosting habitat and to avoid all contact with any nest that may be encountered.

4.3.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—REAGAN TEST SITE
This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with launch operations from the RTS.

A general description of impact on hazardous material and waste management is provided in appendix B. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from GMD ETR activities are addressed under each alternative as applicable.

4.3.4.1 No Action Alternative
If the GMD ETR is not established, the following activities would still continue at RTS: launch of GBIs, use of extensive range instrumentation, use of the GBR-P ground-based XBR, use of existing IDT facilities, and missile intercepts in the BOAs north and northeast of RTS. Impacts to hazardous materials and hazardous waste management practices would be minimal as described in the previous NEPA documents listed in appendix A.
4.3.4.2 Alternative 1

4.3.4.2.1 Ground-Based Interceptors

Under Alternative 1, Meck Island would serve as the location for missile assembly and as well as launch. GBI launches would utilize existing GBI facilities on Meck as described in section 2.3.1.3.

Construction

Alternative 1 would only require minor interior modifications to existing facilities on Meck; therefore, only minor impacts to hazardous materials and waste management practices would be expected.

Operation

Pre-Launch Activities

Missile components would likely be brought to Kwajalein Island as the initial arrival point at the USAKA. Kwajalein Island would also serve as the supply point for consumable materials to be employed during interceptor vehicle preflight assembly and checkout operations, and consumable supplies needed for the maintenance of the ongoing radar operations. Some of the materials in these consumable supplies are considered to be hazardous materials (e.g., contact cleaners for sensor systems). These materials would be stored on Kwajalein in appropriate warehouse facilities before issuance for use on other islands. These materials are similar to hazardous materials already in use for other operations (including standard facility maintenance activities) and represent only a small increase in the total amount of materials to be handled. The quantity of these materials that would be used represents a de minimis increase above those already in use and could, therefore, easily be accommodated by the current hazardous materials management systems.

Launch Activities

GBI launch activities would be similar to ongoing activities. The use of hazardous materials during target launch operations would be limited to small amounts of solvent cleaners (e.g., acetone, isopropyl alcohol), ethylene glycol coolant in the radar, and some handling and storage of motor fuels for use in motor vehicle and/or generator systems. Use and management of hazardous materials associated with missile launch activities would continue to be performed in accordance with the requirements of the UES and the RTS Range Safety office.

No USTs exist on Meck Island. ASTs exist for storage of diesel fuel for the power plant and for MOGAS fuel storage.

As discussed in section 3.3.4, hazardous waste management at USAKA is performed in accordance with the UES, which requires shipment of hazardous waste back to the Continental United States for treatment and/or disposal. In most cases, contractors utilize USAKA Prime Contractor Services for waste packaging, manifesting, shipment, and disposal. If contractors make their own hazardous waste arrangements, shipments have to be arranged through USAKA Shipping and Receiving. Minimal hazardous waste generation would occur.
Personnel trained in the appropriate procedures to handle potentially hazardous materials, including spill containment and cleanup, would be on standby should a mishap occur. Such personnel involved in these operations would wear appropriate protective clothing, as necessary.

During normal flight operations there would be no hazardous materials or waste issues associated with flight corridors. If an in-flight malfunction occurs, the range safety officer may initiate flight termination, resulting in missile debris being deposited beneath the flight path. Debris impacts may occur in the Mid-atoll Corridor within the Kwajalein Atoll Lagoon. The potential effects on the ocean environment from hazardous materials associated with missile debris are discussed in section 4.3.2 and have been analyzed in previous NEPA documents, such as the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992), with the conclusion that impacts would be minimal.

Post-Launch Activities

Specific restoration actions and debris recovery, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

The types of hazardous wastes that would potentially be generated from GBI launches are similar to wastes already handled at the USAKA. The quantity of hazardous waste that may be generated would represent a small increase over current conditions and would be collected in accordance with the KEEP and UES. Collected wastes would be sent first to point of generation accumulation point on Meck, and on to the USAKA Hazardous Wastes Collection Point (Building 1521) on Kwajalein for eventual shipment to the continental United States and final disposition. The de minimis increase in the quantity of hazardous waste would not significantly impact the existing hazardous waste management and disposal system.

4.3.4.2.2 Targets

Construction

Under Alternative 1, similar minor modifications to existing facilities as described for GBI would occur on Meck. An older silo could be modified to accommodate some target missiles. A new target launch pad on Meck would be required to support dual launches. A new launch pad would consist of basic reinforced concrete and structural steel construction, with little hazardous waste generation.

Many facilities at RTS date from the 1950s through the 1970s. Therefore, any structure, such as an existing launch silo, to be modified for target launch activities would be sampled for asbestos or lead-based paint. Meck Island is essentially PCB-free due to an aggressive PCB removal plan pursued during the 1990s. If asbestos, lead-based paint, or PCBs are encountered during the sampling or modification process, then these materials would be contained and removed in accordance with USAKA SOPs. Such activities are routine at RTS. Launch control wiring and instrumentation modification would also be performed as necessary. Installation of trenches for fiber optic cable and fencing around the launch site would not result in the release of a potentially hazardous material or waste.
Minor construction is normally performed by USAKA Facilities Engineering. Major construction at RTS is routinely contracted and managed by the U.S. Army Corps of Engineers—Pacific Ocean Division, Honolulu District, and performed according to U.S. Army Corps of Engineers requirements, as modified to meet USAKA environmental management requirements. USAKA requirements are incorporated into the U.S. Army Corps of Engineers Statement of Work, and all contractors provide an Environmental Compliance Plan demonstrating knowledge of UES requirements. In accordance with DoD regulation 5200.2R, *Personal Security Program Regulation*, pollution prevention, waste minimization and recycling would be incorporated into design and construction plans. Construction activities would be performed in accordance with the USAKA Stormwater Pollution Prevention Plan to minimize potential erosion and stormwater runoff.

**Operation**

Pre-launch, launch, and post-launch activities for target missiles would be similar to that described for the GBI.

### 4.3.4.2.3 SBX

Any facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing protocol and regulations.

**Operation**

*Shipboard Hazardous Materials and Waste Management*

The U.S. Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Discharging hazardous materials overboard is not standard practice and would only be done as a worst case scenario.

Twenty-five liquid discharges, such as clean ballast, deck runoff and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices, in design or routine operation. All vessels containing ballast water taken on outside the territorial waters of the RMI and intending to discharge ballast water in RMI waters shall off-load ballast water outside of 19 kilometers (12 miles) from shore, and two times the volume of the tank of clean sea water shall be taken on and discharged immediately prior to entry within 19 kilometers (12 miles) of shore. Discharge of ballast from the fuel tanks of watercraft within waters of the RMI shall be minimized and only in accordance with the UES. No vessel shall dispose of sewage (blackwater) or discharge from a marine sanitation device in USAKA controlled waters. (U.S. Army Space and Missile Command 2002).
Increased operations that could take place at RTS would be servicing and maintenance of the SBX. This small increase in servicing operations would not significantly affect hazardous materials management or waste disposal. There would be no significant operational impacts, and no mitigation would be required.

4.3.4.3 Alternatives 2 and 3
The Proposed Actions and potential impacts would be the same as those described under Alternative 1. Construction and operation of the SBX at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.4.2.3 for Alternative 1.

4.3.4.4 Cumulative Impacts
Adherence to the hazardous materials and waste management systems on USAKA would preclude the potential accumulation of hazardous materials or waste. The UES establishes emergency response procedures that would aid in the evaluation and cleanup of any hazardous materials released. GMD actions are not expected to result in cumulative hazardous materials and hazardous waste impacts on USAKA. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.

4.3.4.5 Mitigation Measures
Mitigation measures would be employed in accordance with the UES, which incorporates CEQ NEPA requirements, applicable EPA regulatory requirements, and Executive Order (Presidential) requirements for installations outside the continental United States. In addition other DoD and U.S. Army requirements apply, as tiered requirements under the preceding.

4.3.5 HEALTH AND SAFETY—REAGAN TEST SITE
Appendix B includes a description of health and safety issues.

4.3.5.1 No Action Alternative
If the GMD ETR is not established, the following activities would still continue at RTS: launch of GBIs, use of extensive range instrumentation, use of the GBR-P ground-based XBR, use of existing IDT facilities, and missile intercepts in the BOAs north and northeast of RTS. Impacts to health and safety would be minimal as described in the previous NEPA documents listed above and in appendix A.

Planning and execution of GBI launches would be in compliance with federal, state, local, and international health and safety requirements and regulations, as well as RTS standards and procedures. Adherence to such requirements would ensure that potential risks to the general public, workers, and the launch areas do not exceed RCC Standard 321-02 criteria. Therefore, no increase in potential impact to health and safety would be expected as a result of the No Action Alternative.
4.3.5.2 Alternative 1

4.3.5.2.1 Ground Based Interceptor

Construction

Existing RTS missile sites and support facilities on Meck would be used under Alternative 1. Therefore, no potential impact to health and safety from construction activities would be expected.

Pre-Launch

Pre-launch activities, including the transportation, storage and handling of missile components would generally occur as described in sections 3.3.5 and 4.1.7.2.

Missile components would initially be transported to Kwajalein. Kwajalein would also be used as the storage location for all consumable materials (e.g., solvents/cleaners, small parts, tools) that would be used during test flight pre-launch and launch operations. As indicated in section 4.3.4, the primary hazard related to these storage operations would be the potential for explosion/fire of solid fuel motors and/or small explosive actuation devices (used in missile control and the Flight Termination System). At Kwajalein, as at all other USAKA locations, all operations involving explosives (including packaging and handling for movement) would require implementation of a written procedure, which has been approved by the USAKA Safety Office. These operations must be conducted under the supervision of an approved ordnance officer using explosive-certified personnel. All storage and handling of explosives is required to take place in facilities designed to handle explosives and which have been sited in accordance with the requirements of Kwajalein Missile Range Regulation 385-75, Explosive Safety (U.S. Army Kwajalein Atoll, 1993). The regulation specifies the required ESQDs for each facility to ensure safety in the event of explosion, based upon the maximum quantity of explosive material permitted for the facility. This would serve to prevent propagation of explosions to nearby facilities where explosives are also stored.

The explosive devices and materials proposed for use as part of the GBI flight tests would be very similar to those currently stored and used at RTS. Storage operations would not entail any specialized procedures beyond those already in use. Storage facilities (magazines) are available at Kwajalein for proper storage of all explosive materials. Missile assembly buildings, launch silos, launch pads and operations buildings are separated by distances specified in DoD and U.S. Army regulations. The types of facilities, as well as the quantity and type of propellant and other explosives stored in magazines and missile handling areas, are used to determine the distance requirements for structure spacing. In situations such as on Meck where the distance requirements cannot be met by separation, other methods of personnel protection would be implemented. The Meck Control Building and the Systems Technology Testing Facility are hardened and provide protection from fragments.

Launch

Under Alternative 1, launch of GBI missiles would occur at existing RTS facilities on Meck. As lead range, RTS would coordinate with other ranges to track and document safety responsibilities. The principal health and safety concerns would be missile malfunctions on or near the launch silo, potential hazards following a flight termination action and intercept debris impact.
Flight safety studies would be performed to ensure that launches would not compromise range safety requirements and that risk to personnel would be within RCC Standard 321-02 limits. Launches would not be permitted to occur without review and agreement by the Range Safety Officer. Protection circles, based on the payload, missile and launch azimuth, would be established for each launch. Figure 4.3.5-1 indicates the protection circles associated with GMD ETR launch activities. Access to launch sites and the island would be limited to all but mission essential persons. Personnel essential to launch activities would be sheltered in hardened buildings. The GBI flight corridor would be over the islands and BOA. At RTS, thrusted stages that can potentially hazard populated areas must have a flight termination system. (Smith, 2002)

Targets launched from KLC, Vandenberg AFB, air and/or ocean platforms, if not destroyed by intercept, would impact in the BOA. Intercept debris would land in the BOA or possibly on uninhabited islands within the precalculated debris hazard/impact zone. When containment within the debris hazard/impact zone appears impossible, risk analysis based on established RTS Flight Safety risk equation is done to determine if the risk to the public is within acceptable RCC Standard 321-02 criteria. (Smith, 2002) Collective risk to the general public from any potentially hazardous inert debris (debris impacting the earth with a kinetic energy equal to, or greater than, 1.4 kilogram-meters [11 foot-pounds]) during a single launch would be limited to RCC Standard 321-02 criteria of 3x10⁻⁵. Individual risk from potentially hazardous inert debris would be limited to 1x10⁻⁷.

Post-Launch
Post-launch activities at RTS would generally occur as described in sections 3.3.5 and 4.1.7.

4.3.5.2.2 Targets
Dual target launches would occur from RTS under Alternative 1. Such launches would require construction of new launch pad and modification of an existing GBI Payload Launch Vehicle silo. Otherwise, existing facilities on Meck would be used as previously discussed. Potential impacts from pre-launch, launch, and post-launch activities would be similar to those described for the GBI.

4.3.5.2.3 In-Flight Interceptor Communication System Data Terminal
Under Alternative 1, existing communication systems would be used at current levels discussed under the No Action Alternative. Therefore, no increased impact to health and safety from ongoing operations would be expected.

4.3.5.2.4 Sensors
Use of sensors would continue in accordance with ongoing activities at RTS. For communication link equipment, associated RF emissions are considered to be of sufficiently low power so that there is no exposure hazard. All sensor systems would be sited before operation to ensure that no occupied structures or accessible travel areas are within any hazard area necessitated by RF emissions. Through the use of these procedures, it has been previously determined that proper exposure control would be achieved, and that operation of these systems would not present a significant health and safety hazard (U.S. Army Space and Strategic Defense Command, 1993a).
Launch Protection
Circles

Protection Circle - Based on Payload, Missile, and Launch Azimuth

Source: Tybrin Corporation, 2002b.

Scale
0 165 330 kilometers
0 102.5 205 miles

Reagan Test Site

Figure 4.3.5-1

GMD ETR Final EIS
4.3.5.2.5 SBX

Construction
An existing 279- to 465-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse space would potentially be required to support SBX operations. Any facility modification required to support the SBX would occur in accordance with existing RTS safety protocol/plans and applicable UES requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation
The operating area for the SBX would be similar to the existing operating area for GBR-P radar at Kwajalein as described in section 2.1.4.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety hazards associated with operation of similar radars were analyzed in two previous documents: *Ground-Based Radar Family of Radars (GBR) Environmental Assessment* (U.S. Army Program Executive Office Missile Defense, 1993) and *Finding of No Significant Impact* and the *Environmental Assessment for Theater Missile Defense Ground-Based Radar Testing Program at Fort Devens, Massachusetts* (U.S. Army Space and Strategic Defense Command, 1994a). The analysis considered both program operational requirements and restrictions and range-required safety procedures. It was concluded that the required implementation of operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce from exposure to EMR.

Potential EMR effects of the proposed action are described below and in appendix G.

* Radiation Hazards

**Human Exposure.** The analysis method used to evaluate potential effects of RF radiation is the Institute of Electrical and Electronics Engineers Maximum Permissible Exposure Limits (IEEE MPELs), which defines the maximum time-averaged RF power density allowed for uncontrolled human exposure. The MPEL method is independent of body size or tissue density being exposed. EMR hazard zones provide a safety factor 10 times greater than the MPEL. MPELs are capped at 5 mW/cm² for frequencies greater than 1,500 MHz (IEEE C95.1-1999, *Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*). General public exposure is typically limited to one-fifth of the occupational limits.

At X-band frequencies (8,000 MHz-12,000 MHz), the IEEE standard for human exposure is 5.33 mW/cm²-8 mW/cm², respectively. In order for the SBX to have an effect on human health, the
beam operating at full power would have to come in contact with a person and remain on them for 7.5 minutes (at 8,000 MHz) or 11.25 minutes (at 12,000 MHz). With the implementation of software controls on the SBX, there is no radiation hazard area on the deck of the SBX.

**EEDs.** The potential impacts to EEDs from emissions from the XBR are twofold: (1) the EED could be made not to work, or (2) the EED could be inadvertently initiated. The majority of the time, an EED is either installed in its intended application with its leads attached (the presence phase) or is in the shipping/storage phase. Typical EED applications in the presence phase would include fire extinguishers, automotive airbags, a missile attached to the wing of an aircraft, and military aircraft ejection seats. However infrequently, EEDs are sometimes handled without the protection of a storage container (handling/loading phase). Therefore, different susceptibility criteria have been developed for each of these two distinct conditions described above.

As can be seen from table 2.1.4-2, EEDs in the handling/loading phase are substantially more susceptible to EMR hazards; however, main beam illumination on the ground would not occur. As shown in table 2.1.4-2, based upon a grating lobe illumination on the ground from the fully populated SBX, a potential interference distance of 2.3 kilometers (1.4 miles) exists for EEDs in the handling/loading phase. The distances for the 65 percent populated SBX are also shown in the table. It is assumed that the handling/loading of EEDs would not occur when aircraft are airborne. However, main beam illumination of aircraft with EEDs (mainly military aircraft ejection seats) in the presence and shipping phases is possible. There is a potential for EED radiation interference for distances up to 7.5 kilometers (4.6 miles) in the air. Software controls on the SBX and coordination with military and commercial aircraft controllers would be used to ensure that aircraft bearing EEDs are not threatened by main beam interference. Based on the EMR/EMI survey results and coordination with the FAA, DOT, and others, the SBX operating area would be crafted in time and space so as to avoid existing airports, air routes, and airspace users. The SBX operating area would be published on appropriate aeronautical charts to inform pilots of the potential EMI hazard to certain aircraft.

The main beam and side lobes of the SBX could also illuminate EEDs on the ground in the presence/shipping phase. However, the potential radiation hazard would exist only 10 meters (33 feet), in front of the radar, which would be limited to the deck of the SBX. Therefore EEDs in the presence/shipping phase on the ground, including those associated with airbags in vehicles, would not be affected.

**Fuels.** Based upon the threshold of 5,000 mW/cm² from Technical Order 31Z-10-4, the SBX does not present a radiation hazard to fuels because the SBX does not emit radiation levels that exceed 5,000 mW/cm².

**Communications–Electronics Frequency-Related Interference**

In-band frequency interference addressed in this EIS is for the X-band (8,000-12,000 MHz). In-band RF interference occurs when two pieces of communications-electronics equipment are located within the same frequency band. Therefore, equipment with frequencies falling within the X-band would most likely be affected.
Adjacent band RF interference is similar to in-band RF interference. The adjacent bands for the X-band include all frequencies that are within approximately 5 percent of the operating frequency.

Harmonic band interference refers to interference produced in harmonically related receivers or interference caused by sub-harmonically related transmitters. Harmonic frequencies include those frequencies that are integer multiples of the operating frequencies.

Ground-based, airborne, and ship-based systems would be evaluated for in-band, adjacent band, and harmonic band interference during the detailed EMR/EMI survey that is underway. Level 2 surveys are planned to be completed in the summer of 2003.

**Communications–Electronics Non-Frequency-Related Interference**

Non-frequency-related interference from the SBX to the electromagnetic environment is limited to high-power effects. High-power effects typically occur in receivers that are located in proximity to high power transmitters and may be the result of either antenna-coupled signals or equipment case penetration. The accepted levels for high power effects are 1 mW/cm² for military equipment and 0.1 mW/cm² for civilian equipment. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any appreciable period of time, thus the odds of interference from high power effects with any electronic equipment on the ground would be slight, 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than a second, should this occur.

**Aircraft/Avionics.** The potential exists for EMR emissions from the main beam of the SBX to adversely affect aircraft avionics systems as discussed in section 4.3.2.2.1. The potential health and safety related impacts to aircraft is a reduction in life of the aircraft avionics, not a direct impact to the aircraft operation.

Implementation of RTS operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce from exposure to EMR. The total amount of radar RF radiation from SBX operation would be approximately 5 to 6 hours per week. The actual operating area of the SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft, or mariners are anticipated.

**4.3.5.3 Alternatives 2 and 3**

The Proposed Actions and health and safety impacts would be the same as those described under Alternative 1. Construction and operation of the SBX at RTS for Alternatives 2 and 3 would be the same as those described in section 4.3.5.2.5 for Alternative 1.
4.3.5.4 Cumulative Impacts
The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to health and safety. Adherence to RTS safety plans and procedures would preclude potential cumulative impacts to health and safety resulting from the implementation of the GMD ETR.

4.3.5.5 Mitigation Measures
Limitations imposed on the range of azimuth and angles of operation for the SBX and other radar would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control radar operation.

4.3.6 UTILITIES—REAGAN TEST SITE
Appendix B includes a description of utilities issues. A project may have substantial effects on infrastructure and utilities if it increases demand in excess of utility system capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

4.3.6.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Kwajalein would continue their current operations.

Energy
Daily average demand for electricity at Kwajalein is 13,500 kW. This is 46 percent of the maximum capacity of the electrical service to RTS, or 29,200 kW.

Water
Potable water consumption at Kwajalein is 1.1 million liters (300,000 gallons) per day. This is 64.7 percent of the maximum available amount of potable water, 1.7 million liters (450,000 gallons) per day.

Wastewater
Recent wastewater generation at Kwajalein amounted to approximately 560 liters (148 gallons) per capita per day. This would remain below available capacity.
Solid Waste
Solid waste disposal at Kwajalein is handled by landfill and shipping offsite.

4.3.6.2 Alternatives 1, 2, and 3
The Proposed Action related to utilities for all alternatives would be PSB support for the SBX while at the mooring location north of Kwajalein.

4.3.6.2.1 SBX
All of the alternatives would include SBX as one of the component of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW, supplied by six of the eight on-board 3.64-MW generators. The SBX would be self-propelled by four steerable, 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume 7 MW, leaving 14.8 MW available for necessary ship-board operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would amount to only about 1.8 percent of total fuel capacity daily. There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would either return to a PSB or a nearby mooring location for crew rotations, re-supply, and maintenance activities. If at an adjacent mooring location, three of the generators would still be used: one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar 3 hours per day. If necessary, a supply ship would typically deliver food, supplies, repair parts, and fuel from the PSB. In cases wherein pier-side docking is possible, a hookup would be required to provide basic shore power for daily ship functions.

Although the piers at the RTS harbor do not have adequate depth to accommodate the draft of the SBX, the vessel can enter the Kwajalein lagoon and moor in a protected anchorage. An additional re-supply vessel would not be required, as RTS has a full complement of supply and fueling vessels. The mooring site would be approximately 5 to 6 kilometers (3 to 4 miles) north of the RTS harbor. The SBX would enter the lagoon either through South Pass on the west side of the atoll or at Mellu Pass on the north side. Both passes offer sufficient depth to accommodate the vessel. However, Mellu Pass offers a much greater width for maneuverability. Personnel would be ferried to the SBX each day either by watercraft or helicopter. In this case, the self-contained nature of the SBX, particularly its reliance on on-board generators, would ensure that there would be no direct impacts to RTS area utilities.

Existing 900- to 1,500-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse space would potentially be required for SBX operations. This would require
accommodations for a maximum of 25 personnel. Ongoing logistics and support operations such as re-supply, fueling, and maintenance and crew/operator training would also occur at the PSB.

Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,259 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any facility modifications being considered would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.3.6.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.3.6.4 Mitigation Measures

No mitigation measures would be required or proposed.
4.4 PACIFIC MISSILE RANGE FACILITY

Potential impacts of construction, building modification, and missile launches at PMRF have been addressed in detail in the Strategic Target System EIS, the Restrictive Easement EIS, the PMRF Enhanced Capability EIS, and several program-specific EAs. Based on the prior analyses done and the effects of past target and missile launch activities, the potential impacts related to proposed GMD ETR activities are expected to be minimal, as discussed in the following sections. The existing capability to launch four Strategic Target System target missiles per year would be utilized for GMD. There are no new missile launches proposed from PMRF for the GMD ETR.

4.4.1 AIR QUALITY—PACIFIC MISSILE RANGE FACILITY

4.4.1.1 No Action Alternative

Under the No Action Alternative, there would be no change in current air quality impacts at PMRF. The GMD ETR would not be established and GBI and target launch scenarios would not be tested under operationally realistic conditions. Missile flight test activities would continue at PMRF.

Activities associated with the pre-launch of a target missile include the transportation of targets to the PMRF facilities as well as the assembly of the target. The mobile exhaust emissions due to transportation would be intermittent and would not have a measurable impact to air quality.

The exhaust emissions presented in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998) are shown in table 4.4.1-1. As shown, no guidance levels would be exceeded.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Guidance Levels</th>
<th>Hawk(1) mg/m³</th>
<th>Talos/Zest(2) mg/m³</th>
<th>Strategic Target System(3) mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Oxide</td>
<td>10 (8-hour TLV)</td>
<td></td>
<td></td>
<td>8.46(4)</td>
</tr>
<tr>
<td></td>
<td>5 (8-hour TWA)</td>
<td>0.07(5)</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>40 (1-hour TWA)</td>
<td>0.094</td>
<td></td>
<td>0.92(6)</td>
</tr>
<tr>
<td></td>
<td>10 (8-hour TWA)</td>
<td>0.096</td>
<td>0.68(6)</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1.5 (1-hour TWA)</td>
<td>0.087</td>
<td>0.051</td>
<td>0.47(6)</td>
</tr>
</tbody>
</table>

Table 4.4.1-1: Estimated Emissions of Typical Missile Launches at PMRF

Source: Pacific Missile Range Facility, Barking Sands, 1998

(1) Hawk emissions based on EPA approved version of TSCREEN/PUFF model at 1900 meters (6200 feet)
(2) Talos emissions based on commercial version of TSCREEN/PUFF model at 3000 meters (9840 feet)
(3) Strategic Target System used Rocket Exhaust Effluent Dispersion Model to model Hydrogen Chloride
(4) At 190 meters (623 feet)
(5) Value is a 1-hour TWA. Due to near-instantaneous nature of emissions, 8-hour TWA would be lower
(6) At 3,000 meters (9,840 feet)
mg/m³ = milligrams per cubic meter
TLV = Threshold Limit Value
TWA = Time-weighted Average
Previous analysis for target launches at PMRF included the Strategic Target System in the PMRF Enhanced Capability EIS (Pacific Missile Range Facility, Barking Sands, 1998). Table 4.4.1-2 lists the exhaust emissions of the Strategic Target System.

<table>
<thead>
<tr>
<th>Missile</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Chlorine metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Hydrogen metric tons (tons)</th>
<th>Water metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>3.56</td>
<td>0.019</td>
<td>2.35</td>
<td>0.19</td>
<td>0.22</td>
<td>0.60</td>
<td>1.58</td>
<td>0.87</td>
</tr>
</tbody>
</table>

The EIS determined that exhaust emissions from Strategic Target System launches would produce 5.1 metric tons (5.6 tons) of aluminum oxide, 3.8 metric tons (4.2 tons) of carbon monoxide, and 1.8 metric tons (1.9 tons) of hydrogen chloride. These levels were not determined to produce short-term exceedences within a previously determined ground hazard area of 3,048 meters (10,000 feet). This area is evacuated of all personnel before any launch. Therefore, no air quality impacts are anticipated for target launches at PMRF.

Activities performed during post target launch would include the removal of all mobile equipment and assets brought to PMRF. The removal could result in small, localized amounts of fugitive dust, which would have a minor impact to air quality. However, this impact would be minimized further through the use of dust suppression methods previously discussed.

4.4.1.2 Alternatives 1, 2, and 3

4.4.1.2.1 Target

Construction
No modifications to existing facilities would be required, and there would be no impact to regional air quality.

Operation

Pre-Launch Activities
Activities associated with the pre-launch of a target missile would be as described under the No Action Alternative.

Launch Activities
Launch activities at PMRF for Alternative 1, 2, or 3 would include launching up to four Strategic Target System targets per year. Potential impacts would be as described under the No Action Alternative.
Post-Launch Activities
Potential impacts would be as described under the No Action Alternative.

4.4.1.2 TPS-X

Construction
Installation of the TPS-X radar would require 0.3 hectare (0.8 acre) of previously disturbed land on northern PMRF or at Makaha Ridge. There would be no anticipated impacts to regional air quality.

Operation
The prime power unit for the TPS-X at PMRF is a 1.5-MW generator that provides power to the radar during testing. The generator is assumed to be in operation a maximum of 2,520 hours per year. Potential emissions for the TPS-X are listed in table 4.4.1-3. It is anticipated that operation of the TPS-X would have no adverse impacts on regional air quality at PMRF.

<table>
<thead>
<tr>
<th>Generator</th>
<th>Oxides of Nitrogen metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>PM-10 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 Megawatt Diesel Generator</td>
<td>4.6 (5.1)</td>
<td>0.66 (0.72)</td>
<td>5.7 (6.3)</td>
<td>0.27 (0.30)</td>
</tr>
</tbody>
</table>

4.4.1.3 Cumulative Impacts
The annual number of closures of the Restrictive Easement for missile launches from PMRF is currently limited to 30 per year. The Proposed Action of up to four target launches per year would be previously analyzed Strategic Target System missiles and would not introduce any new launches to PMRF. No cumulative impacts to air quality have been identified from past launches at PMRF. Missile launches are short-term, discrete events with temporary impacts that are not expected to result in a cumulative impact on air quality.

4.4.1.4 Mitigation Measures
No mitigation measures would be required.
4.4.2 BIOLOGICAL RESOURCES—PACIFIC MISSILE RANGE FACILITY

4.4.2.1 No Action Alternative

If the GMD ETR is not established, PMRF would still continue to be operated as an LF and would support single launches of target missiles for a less robust GMD program. Missile flight test activities would continue at PMRF. Impacts from launches of Strategic Target System missiles are described below.

Construction

Vegetation

Only minor site preparation activities are required for target launches. The site(s) for the launch activities are previously cleared, improved locations. Any spill or release of hazardous material would likely be restricted to a small, localized area near the source. SOPs and spill plans reduce any potential impact to vegetation. Negligible impacts to vegetation are anticipated.

Threatened and Endangered Plant Species. No adverse impacts are anticipated to the Ohai and Lauʻehu habitat since no ground-disturbing activities would be required.

Wildlife

Disturbance to wildlife, including migratory birds, from minor site preparation activities and increased personnel would be short-term and is not expected to have a lasting impact or a measurable negative effect.

Any spill or release would likely be restricted to a small, localized area near the source. SOPs and spill plans would reduce any potential impact to wildlife in the vicinity of the spill.

Threatened and Endangered Wildlife Species. No impacts from site preparation activities are expected to the Newell’s Townsend’s shearwater, Hawaiian dark-rumped petrel, Hawaiian (American) coot, Hawaiian black-necked stilt, Hawaiian common moorhen, and Hawaiian duck, which have been observed in the drainage ditches and ponds on PMRF. Reflection from outdoor lighting could disorient the Newell’s Townsend’s shearwater, which may fly over PMRF at night (mainly between April and November). Any outdoor lighting associated with site preparation activities is properly shielded, following USFWS guidelines, to minimize reflection and impact to these birds.

Site preparation activities and personnel presence are not anticipated to affect the Hawaiian hoary bat, which has been observed feeding offshore of Polihale State Park north of the Strategic Target System launch pad. Site preparation activities are also not likely to affect marine species such as the Hawaiian monk seal and sea turtles since areas used are not within areas used by the monk seal or sea turtles. Any observed green sea turtle nests near the launch pad would be noted and avoided.
Environmentally Sensitive Habitat
No adverse impacts to the coastal dune systems, marine sanctuary, coral reefs, or critical habitats are anticipated as a result of any minor site preparation activities.

Operation
Up to four Strategic Target System missiles per year may currently be launched from the KTF at PMRF. The current missile trajectories are toward the RTS BOA and toward the BOA off the northwest coast of North America. The RTS trajectory has been successfully used four times in the last 10 years.

Vegetation
Normal launch activities are not expected to impact vegetation. Analysis provided in the Strategic Target System EIS (U.S. Army Strategic Defense Command, 1992) concluded that although vegetation near the Strategic Target System launch pad could suffer some temporary distress from the heat generated at launch and from hydrogen chloride or aluminum oxide emissions, there is no evidence of any long-term adverse effect on vegetation from two decades of launches at PMRF. The continued presence of the adder's tongue, a species removed from the list of federal candidate species, indicates that emissions from Strategic Target System missiles have not had a significant impact on sensitive vegetative species.

Threatened and Endangered Plant Species. The possibility of a spill or other accident involving hazardous materials impacting Ohai and Lau‘ehu habitat is considered remote since these plants have only been observed north of PMRF. Any spill or release of hazardous material would likely be restricted to a small, localized area near the source and would be cleaned up in accordance with PMRF’s spill plan.

Wildlife
No substantial impacts to threatened and endangered species from existing EMR sources on PMRF have been identified.

Noise. Disturbance to wildlife from the launches is brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Wildlife such as waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed.

Potential noise effects on wildlife can be categorized as auditory and non-auditory. Auditory effects would consist of direct physical changes, such as eardrum rupture or TTS. Non-auditory effects could include stress, behavioral changes, and interference with mating or foraging success. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat. Animals can also be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations. (Larkin, 1996) Informal observation at several LFs indicates the increased presence of personnel immediately before a launch tends to cause birds and other mobile species of wildlife to temporarily leave the area that would be subject to the highest level of launch noise. Therefore, no direct physical auditory impacts are anticipated. Wildlife is known to exhibit a startle effect when exposed to short-term noise impacts, such as
the launch of a target missile. Birds usually show signs of disturbance, such as fluttering of wings, when the noise occurs, but quickly return to normal behavior after the event. Video camera observations of a wood stork colony located 0.8 kilometer (0.5 mile) south of the Space Shuttle launch pad at Kennedy Space Center showed the birds flew south away from the noise source and started returning within 2 minutes, with a majority of individuals returning in 6 minutes (National Aeronautics and Space Administration, John F. Kennedy Space Center, 1997).

A rookery at Kennedy Space Center used by wood storks and other species of wading birds is located approximately 750 meters (2,461 feet) from a Shuttle launch pad. This rookery continues to be used successfully, even though it has received peak noise levels of up to approximately 138 dB. (American Institute of Aeronautics and Astronautics, 1993) As mentioned above, monitoring studies of birds during the breeding season indicate that adults respond to Space Shuttle noise by flying away from the nest, but they return within 2 to 4 minutes. Birds within 250 meters (820 feet) of Titan launch complexes at Cape Canaveral Air Station have shown no mortality or reduction in habitat use. Titan IV vehicles produce noise levels of approximately 170 dB in the immediate vicinity of the launch pad. This attenuates to 125 dB at a distance of 3 kilometers (2 miles) within about 30 seconds following launch. (U.S. Department of the Air Force, 1990b)

No evidence has indicated that serious injuries would result, and no long-term adverse effects are anticipated. The brief noise peaks produced by the missiles such as the Strategic Target System are comparable to levels produced by close range thunder (120 dB to 140 dB peak), and there is no species known to be susceptible to hearing damage following intermittent exposure to this common noise source (U.S. Department of the Air Force, 2001).

**Emissions.** Hydrogen chloride, which is emitted during missile launches, is known to affect wildlife. However, results of monitoring conducted following a Strategic Target System launch from the KTF at PMRF indicated little effect upon wildlife due to the low-level, short-term hydrogen chloride emissions (U.S. Army Space and Strategic Defense Command, 1993a). The program included marine surveys of representative birds and mammals for both pre-launch and post-launch conditions. Studies on representative birds and mammals reviewed in the Final EIS for the Strategic Target System (U.S. Army Strategic Defense Command, 1992) also indicated that low-level, short-term exposure to hydrogen chloride would not adversely affect threatened or endangered species or other wildlife. Aluminum oxide and hydrogen chloride do not bioaccumulate; therefore, no indirect effects to the food chain are anticipated.

An early flight termination or mishap could result in debris impact along the flight corridor, which may temporarily impact fishing activities in the immediate area. Due to the small amount of propellant involved and the few number of launches, ongoing launches are not anticipated to adversely affect marine resources. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus, no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al., 2001) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the
perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29 °C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water. The potential ingestion of toxins by fish species, which may be used for food sources, would be remote because of the diluting effect of the ocean water and the relatively small area that would be affected.

**Essential Fish Habitat.** The potential impact to Essential Fish Habitat from nominal launch activities would mainly be from spent boosters and missile debris to waters off the coast within the Temporary Operating Area. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species’ populations. The majority of propellant would be expended before booster drop and impact and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)

In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect Essential Fish Habitat. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

**Threatened and Endangered Wildlife Species.** Impacts from launch noise to the Newell’s Townsend’s shearwater, Hawaiian dark-rumped petrel, Hawaiian (American) coot, Hawaiian black-necked stilt, Hawaiian common moorhen, and Hawaiian duck would be limited to startle or flushing reactions as discussed above. Reflection from outdoor lighting could disorient the Newell’s Townsend’s shearwater; however, any outdoor lighting associated with launch activities would be properly shielded, following USFWS guidelines. Existing range radars and other instrumentation that would be used at PMRF are discussed in section 2.3.1.4. No substantial impacts to threatened and endangered species from existing EMR sources on PMRF have been identified.

No adverse impacts are anticipated to the Hawaiian hoary bat, which has been observed feeding offshore of Polihale State Park, north of the project area. The likelihood that debris from a spent booster or terminated launch would strike a Hawaiian monk seal is considered remote since the waters adjacent to PMRF are used infrequently by this species. The launch would be delayed if monk seals are observed in the launch safety zone or beach portion of the Launch Hazard Area. Green sea turtles nests have been observed in the sand near the Nohili Ditch. Green sea turtles lay eggs only at night, once every 2 to 4 years. Thus, the potential for debris to strike a green sea turtle near or on shore is remote. Access to green sea turtle nesting beaches would be restricted.
**Environmentally Sensitive Habitat**

The *Hawaiian Islands Humpback Whale National Marine Sanctuary FEIS and Management Plan* (U.S. Department of Commerce, National Oceanic and Atmospheric Administration and State of Hawaii, Office of Planning, 1997) recognizes that PMRF plays an important role in national defense training. The EIS includes missile launches as one of the DoD activities that currently occurs within the sanctuary boundaries. The ongoing missile launches would have impacts within the parameters of ongoing missile programs.

According to analysis provided in the PMRF Enhanced Capability EIS, debris from shore-based missile launch programs is not expected to produce any measurable impacts on benthic (sea floor) resources beyond those currently experienced during natural conditions associated with storms.

### 4.4.2.2 Alternatives 1, 2, and 3

Alternatives 1, 2, and 3 would require the use of existing launch pads, Missile Assembly Building, missile storage facility, range radars, and maintenance and storage facility to support target missile launches.

#### 4.4.2.2.1 Targets

**Site Preparation Activities**

Site preparation activities at PMRF for Alternative 1, 2, or 3 would include launching up to four Strategic Target System targets per year. Potential impacts would be as described under the No Action Alternative.

**Launch Activities**

Launch activities at PMRF for Alternative 1, 2, or 3 would include launching up to four Strategic Target System targets per year. Potential impacts would be as described under the No Action Alternative.

**Post-Launch Activities**

Potential impacts would be as described under the No Action Alternative.

#### 4.4.2.2.2 TPS-X Radar

**Construction**

*Vegetation*

Installation of the TPS-X radar would require 0.3 hectare (0.8 acre) of previously disturbed land on northern PMRF or at Makaha Ridge. No impacts to vegetation are anticipated.

**Threatened and Endangered Plant Species.** No impacts to potential Ohai or Lau’e’ahu habitat on PMRF or to the endangered dwarf iliau found within the Makaha Ridge complex are anticipated since no ground-disturbing activities would be required.
Wildlife
Disturbance to wildlife, including migratory birds, from the minor site preparation activities and temporary increase in personnel in the area would be short-term and is not expected to have a lasting impact or measurable negative effect.

Threatened and Endangered Wildlife Species. Site preparation activities could potentially startle any Newell's Townsend's shearwater, Hawaiian dark-rumped petrel, Hawaiian (American) coot, Hawaiian black-necked stilt, Hawaiian common moorhen, or Hawaiian duck, which could be in the drainage ditches adjacent to the TPS-X radar site on northern PMRF, or the Hawaiian goose population present in the Makaha Ridge area. This disturbance would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Wildlife such as waterfowl would quickly resume feeding and other normal behavior patterns. Reflection from outdoor lighting could disorient the Newell's Townsend's shearwater, which may fly over PMRF at night (mainly between April and November). Any outdoor lighting associated with construction activities and permanent structures would be properly shielded, following USFWS guidelines to minimize reflection and impact to these birds.

Site preparation activities and personnel presence are not anticipated to affect the Hawaiian hoary bat, which has been observed feeding offshore north of the Nohili Ditch. Site preparation activities are also not likely to affect marine species such as the Hawaiian monk seal and sea turtles since these animals are normally offshore or on the beach seaward of the berm. Any observed green sea turtle nests near the northern PMRF site would be noted and avoided.

Environmentally Sensitive Habitat
No wetlands or other sensitive habitat would be disturbed during installation of the TPS-X radar.

Operation
Vegetation
Impermeable ground covering material and spill containment berms would be placed for containment of fuel during fueling operations of the Prime Power Unit and Cooling Equipment Unit system hook-up. Spill control procedures would be established in cooperation with the host installation, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

Threatened and Endangered Plant Species. No impacts to potential Ohai or Lau'eahu habitat on PMRF or to the endangered dwarf iliau found within the Makaha Ridge complex are anticipated from operation of the TPS-X radar since no ground-disturbing activities would be required.

Wildlife
The Prime Power Unit is a self-contained trailer with a noise-dampening shroud that would minimize the potential for diesel generator noise impacts.

As discussed in the KLC section, the power densities emitted from the TPS-X radar are unlikely to cause any biological effects in animals or birds. The TPS-X radar is not expected to radiate lower than 5 degrees, which would preclude EMR impacts to terrestrial species from either
operation of the TPS-X radar during flight tests or later during proposed tactical testing. Impacts to wildlife on PMRF or Makaha Ridge would be similar to those discussed above in the KLC TPS-X radar section.

**Threatened and Endangered Wildlife Species.** There have been no reports of birds being affected by EMR from the existing sensors located in the Makaha Ridge complex. Impacts to the threatened and endangered birds on and offshore of PMRF would be similar to those discussed above in section 4.1.3.2.5. The protection provided by the restricted access, and grassy habitat within Makaha Ridge would continue to have a positive effect on the small population of Hawaiian goose (Pacific Missile Range Facility, 2000). Impacts to threatened and endangered marine species offshore of PMRF would be similar to those discussed above in section 4.1.3.2.5.

*Environmentally Sensitive Habitat*

No wetlands or other sensitive habitat would be adversely affected by operation of the TPS-X radar.

### 4.4.2.3 Cumulative Impacts

No cumulative impacts to biological resources have been identified from past launches at PMRF. Combined activities would be performed at different times and locations and therefore, no substantial cumulative impacts to biological resources are anticipated at PMRF.

### 4.4.2.4 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities.

### 4.4.3 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—PACIFIC MISSILE RANGE FACILITY

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with launch operations from PMRF, and construction required to support GMD launch operations. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from launch activities are addressed under each alternative as applicable.

#### 4.4.3.1 No Action Alternative

Implementation of the No Action Alternative would result in the ongoing launch of Strategic Target System missiles from PMRF. Use of PMRF for flight preparation and testing has been previously analyzed in the PMRF Enhanced Capability Final EIS (Pacific Missile Range Facility, Barking Sands, 1998) and the North Pacific Targets Program EA (U.S. Army Space and Missile Defense Command, 2001b). These documents concluded that adherence to PMRF standard SOPs as well as federal, state and local regulations would significantly reduce any impact from hazardous materials handling or waste generation. Impacts from launches of Strategic Target System missiles would be as described below.
Pre-Launch Activities
All elements of the Strategic Target System would be transported, handled and stored at PMRF in accordance with applicable federal, state, U.S. Army and U.S. Air Force regulations and standard range SOPs.

Launch Activities
Potentially hazardous materials (external to those preloaded into the missiles) to be used would be fuel required for electrical power generators, coating, sealants and solvents needed for launch and launch preparation. The types of hazardous materials used and hazardous waste generated would be managed in accordance with existing PMRF procedures and requirements. These procedures and requirements conform to federal and State of Hawaii laws and regulations. Best practices, lessons learned, and expectations indicated in the interim guidance DoD 5000.2R would be incorporated into design and construction plans.

In addition, the PMRF Fire Department and Hazardous Materials Response Team are trained in the appropriate procedures to handle the materials associated with Strategic Target System launches should a mishap occur. All personnel involved in these operations would wear protective clothing and receive specialized training in spill containment and cleanup.

During launches there is the potential for a mishap to occur resulting in potentially hazardous missile debris and propellants falling within the Ground Hazard Area. As addressed for previous launch programs on PMRF, the hazardous materials that result from a flight termination would be cleaned up and any contaminated areas remediated. All hazardous waste generated in such a mishap would be disposed of in accordance with appropriate state and federal regulations.

Post-Flight Test Activities
Specific restoration actions, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

4.4.3.2 Alternatives 1, 2, and 3

4.4.3.2.1 Target
Alternatives 1, 2, and 3 would involve single Strategic Target System launches from PMRF, as described in the No Action Alternative. This is a routine activity for PMRF and is included in current hazardous materials and hazardous waste management plans. No additional activities would be performed, no new potentially hazardous materials would be used, and no significant increase in the amount of hazardous waste currently generated would be expected to occur. Hazardous materials used and hazardous wastes generated would continue to be handled in accordance with existing laws and regulations governing the transportation and disposal of these materials.

4.4.3.2.2 TPS-X Radar
Construction
Alternatives 1, 2, and 3 would require the set up of the TPS-X radar and associated equipment. The site would include a gravel pad, concrete pad, security fencing and utilities/communications
installation. Generation of potential hazardous waste (e.g., corrosion control coatings, adhesives, and sealants) would be minimal. Management of hazardous materials and hazardous waste would be performed in accordance with PMRF requirements and would not significantly impact existing PMRF hazardous materials and hazardous waste management procedures.

**Operation**

Operation of the TPS-X would have little effect on hazardous waste and hazardous materials management. A 3,785-liter (1,000-gallon) AST would be used for diesel fuel for the backup generator.

**4.4.3.3 Cumulative Impacts**

Adherence to the hazardous materials and waste management systems on PMRF would preclude the potential accumulation of hazardous materials or waste. The base has implemented an emergency response procedure that would aid in the evaluation and cleanup of any hazardous materials released. The Proposed Action is equivalent to the No Action Alternative and is not expected to result in cumulative hazardous materials and hazardous waste impacts on PMRF.

**4.4.3.4 Mitigation Measures**

No hazardous materials/hazardous waste management mitigation measures are proposed for GMD ETR activities.

**4.4.4 HEALTH AND SAFETY—PACIFIC MISSILE RANGE FACILITY**

**4.4.4.1 No Action Alternative**

Under the No Action Alternative, Strategic Target System launches would continue at PMRF. Potential health and safety issues associated with Strategic Target System launches include pre-launch, launch, and post-launch activities. Use of PMRF for flight preparation and testing and potential health and safety issues have been previously analyzed in the PMRF EIS and North Pacific Targets Program EA. These documents concluded that PMRF takes every reasonable precaution during the planning and execution of these operations to prevent injury to human life or property. Therefore, no increased risk to health and safety is expected as a result of implementing this alternative. Impacts from launches of Strategic Target System missiles would be as described below.

**Pre-Launch Activities**

Missiles and support equipment may arrive at Pearl Harbor before final shipment to PMRF. Equipment would be available at Pearl Harbor for the loading and unloading of missiles. Storage areas would be available for the temporary storage of any hazardous materials. Missiles and support equipment would be transported by ship to Nawiliwili Harbor, then by DoD/DOT-approved over the road carrier truck to PMRF. Missiles and support equipment may also be transported directly to PMRF by aircraft. Applicable state and federal regulations and range safety plans and procedures are followed in transporting and handling potentially explosive ordnance and hazardous materials. Missile components, including any propellant, are transported in DOT and military designed and approved shipping containers.
The type of protection afforded by shipping containers is sufficient to protect solid rocket motors from receiving the shock required to cause an explosion. In the event of a transportation accident, it is more likely that the solid propellants would burn. The solid propellants would release exhaust components, specifically hydrogen chloride, which would irritate the eyes and skin of persons in the nearby area. Such an accident would not likely occur given the in-place safety procedures used by PMRF during transportation and handling of missile components. ESQDs would be established around transportation corridors.

On arrival at PMRF, support equipment is placed in secure storage until assembly and launch preparation. ESQDs are established around ordnance storage and Missile Assembly Buildings. Access to storage and support facilities is limited to trained and authorized PMRF/mission critical personnel.

Launch Activities

A pre-launch accident on the launcher or in the assembly building would be characterized by either an explosion and/or detonation of missile propellants or burning of the propellants without an explosion or detonation. An ESQD surrounding the launcher would be calculated based on the equivalent explosive force of all propellant and pyrotechnic materials contained on the flight vehicle. Areas outside the ESQD zone provide acceptable protection and require that areas inside the ESQD zone be cleared of non-mission-essential personnel. The ESQD would vary from missile to missile. Fire suppression, hazardous materials emergency response, and emergency medical teams would routinely be provided during the actual launch operations.

Potential health and safety impacts associated with launch operations could occur as a result of inhalation of exhaust products associated with normal operation; impact hazard associated with a launch anomaly (explosion, crash, flight termination); and inhalation hazards from an abnormal launch (fire, crash, flight termination). The primary method for preventing potential adverse safety and health effects associated with these occurrences involves the physical isolation of the area immediately surrounding the launch site, before launch. At no time shall individuals of the public be exposed to a probability of fatality greater than 1 in 10 million for any single mission and 1 in 1 million on an annual basis. This standard maximum risk to the public is less on an annual basis than the risks from accidents occurring in the home or in public. (Range Commanders Council, Range Safety Group, 2002) Before launch, safety clearance areas would be established to provide an area where all potentially hazardous debris from a launch anomaly would be contained. Ground and range safety areas would be determined to protect the general public and private property against potential launch mishap. Non-mission-essential personnel would be excluded from the ground safety area and Launch Hazard Area during launch operations. Personnel working within the Launch Hazard Area would be protected in bunkers or behind berms. Numerous factors determine the shape and dimensions of the ground safety area and Launch Hazard Area, including the following:

- Size and flight characteristics of the missile
- Individual flight profile for each exercise or flight test
- Reaction time between recognition of a flight malfunction and the decision to terminate flight
The ground safety area size is determined by simulating the missile’s capability to travel off course in any direction (360 degrees) from the launch point for a specified period of time. Five seconds would be the commonly used time period, but this period can be modified based on local range procedures, capabilities, and mission requirements. The analysis assumes that at the end of the time period, the missile flight would be terminated by the Flight Termination System, and the associated debris would fall to the ground or sea. The outer perimeter within which this potentially hazardous debris could fall, in any direction, factoring in prevailing wind conditions, defines the boundaries of the ground safety area.

Data processed by ground-based or onboard missile computer systems is used to recognize malfunctions and terminate missile flight. The Safety Officer continuously monitors the flight and would always retain the capability to terminate the flight, if necessary. For a typical aerial target drone, the nominal ground safety area for launches extends to a radius of up to approximately 366 meters (1,200 feet). For ballistic missiles, the nominal ground hazard area is 610 meters (2,000 feet) for unguided rail-launched targets and a modified 3,048 meters (10,000 feet) for larger stool-launch guided missile targets (Pacific Missile Range Facility, Barking Sands, 1998). The Range Safety Officer would use computer models to determine actual ground safety area dimensions and safety procedures for each target missile flight, based on the above factors.

To accommodate launches of larger missiles, PMRF has an existing restrictive easement for a ground safety area of a modified 3,048 meters (10,000 feet) that extends beyond the PMRF property boundary. This restrictive easement is used to set up the Launch Hazard Area to ensure public safety during a launch. The use of the restrictive easement until 2030 was analyzed in the PMRF Enhanced Capability EIS. As described in the PMRF Enhanced Capability EIS, launches from KTF toward the BOA near USAKA/Kwajalein Missile Range used the launch azimuth of 280 degrees to avoid overflight of the Island of Niihau. The North Pacific Targets Program EA analyzed launches for payload impact in the BOA off the northwest coast of North America with initial launch azimuths of 310 to 360 degrees. The Range Safety Officer would use computer models to determine actual ground safety area dimensions and safety procedures for each target missile flight.

In addition to the ground safety area, a Launch Hazard Area is established over water where any potentially hazardous debris from a flight termination or missile stage could fall. The Launch Hazard Area would be determined for each type of flight test, taking into account the same parameters used in determining the ground safety area. Before launch PMRF would issue NOTAMs and NOTMARs. Area surveillance and clearance of the Launch Hazard Area is provided by PMRF aircraft and marine vessels, as part of their routine operations. To further minimize potential launch-associated hazards, emergency response teams are on standby during launch operations for fire suppression, hazardous materials collection and removal, and medical response as necessary.

The potential health and safety impact resulting from a nominal launch includes the inhalation of exhaust products during the first few seconds of the launch operation. Concentrations of exhaust products are expected to be below applicable health-based standards by the time the exhaust plume reaches the boundary of the ground safety area or Launch Hazard Area. Thus the public would not be exposed to concentrations exceeding exposure limits. Modeling conducted for previous Strategic Target System launches has determined that a normal launch would not endanger public health or safety in the vicinity/area of PMRF.
Post-Launch Activities

Potentially hazardous debris would impact the ground or open ocean should a flight termination occur. Debris would primarily consist of metals, solid propellant, and batteries. Much of any hazardous material in the missile would be consumed in launch anomaly. Potentially hazardous debris would be recovered from the ground and disposed of in accordance with applicable state, federal, and range hazardous waste regulations and operating procedures. Most liquid propellant potentially used in upper stages would be consumed in flight termination and would not likely affect health and safety.

4.4.4.2 Alternatives 1, 2, and 3

4.4.4.2.1 Target

Single target launches would occur from PMRF under Alternatives 1, 2, and 3. All launch activities would be conducted as previously analyzed in the PMRF EIS, Strategic Target System EIS, North Pacific Target Program EA, and in compliance with federal, state, local and, if applicable, international health and safety requirements and strict PMRF SOPs. Therefore, no increased risk to health and safety would be expected as a result of selecting these alternatives.

4.4.4.2.2 TPS-X Radar

Construction

The potential TPS-X locations would be northern PMRF or at Makaha Ridge. Construction activities would be accomplished in accordance with the safety plans and procedures described in section 4.1.7.2. No adverse effects to health and safety are expected from construction of the TPS-X pad.

Operation

EMR hazard zones would be established within the beam's tracking space and near emitter equipment. The potential interference distances are shown in figure 2.3.1-8. A visual survey of the area would be conducted to verify that all personnel are outside the hazard zone prior to startup. Personnel may not enter these hazard zones while the radar is in operation. The radar is prevented from illuminating in a designated cutoff zone, in which operators and all other system elements would be located. Potential safety consequences associated with radar interference with other electronic and emitter units (flight navigation systems, tracking radars, etc.) would also examined prior to startup. Adherence to PMRF, FAA, and DoD safety procedures relative to radar operations would preclude significant impact to health and safety.

4.4.4.3 Cumulative Impacts

Potentially hazardous operations at PMRF would continue at levels similar to current conditions. No cumulative impact to the public health and safety would be expected from exposure to EMR emission, hazardous air pollutants, hazardous materials or hazardous waste operations at PMRF. Any long-term exposures to on-base personnel would be minimized due to the strict adherence to regulatory control when handling materials. Based on the PMRF SOPs and other activities in the area, there is minimal potential for cumulative health and safety risk to the public from operations at PMRF. The proposed number of single target launches expected under
Alternatives 1, 2, and 3 would not represent an increase over current conditions and therefore would not increase potential public health and safety risk.

4.4.4.4 Mitigation Measures

No health and safety mitigation measures are proposed for GMD ETR activities.

4.4.5 SOCIOECONOMICS—PACIFIC MISSILE RANGE FACILITY

4.4.5.1 No Action Alternative

Under the No Action Alternative, Strategic Target System launches would continue at PMRF. The use of PMRF for flight preparation and testing and potential socioeconomic issues have been previously analyzed in the PMRF EIS and North Pacific Targets Program EA. These documents concluded that there would be no significant impacts to socioeconomics from the launch of four Strategic Target System missiles per year. Impacts from launches of Strategic Target System missiles would be as described below for the Proposed Action.

4.4.5.2 Alternatives 1, 2, and 3

4.4.5.2.1 Target

Under the implementation of Alternatives 1, 2, and 3, PMRF would be used as a launch site for single Strategic Target System vehicles; the impacts from the launch of these targets have previously been analyzed in the PMRF Enhanced Capability Final EIS (Pacific Missile Range Facility, Barking Sands, 1998) and in the North Pacific Targets EA (U.S. Army Space and Missile Defense Command, 2001b). Potential impacts would be the same as described for the No Action Alternative.

4.4.5.2.2 Sensors

Under the implementation of each alternative, PMRF would be used as a supporting facility for mid-range telemetry during both target and GBI launches and intercepts. This could include the use of existing tracking and surveillance radars, telemetry receivers and recorders, and communications systems. Mobile telemetry systems could also be used at PMRF or at Makaha Ridge.

4.4.5.2.3 Cumulative Impacts

The Proposed Action is equivalent to the No Action Alternative and is not expected to result in cumulative socioeconomic impacts at PMRF.

4.4.5.2.4 Mitigation Measures

No socioeconomic mitigation measures are proposed for GMD ETR activities.
4.5 VANDENBERG AIR FORCE BASE

4.5.1 AIR QUALITY—VANDENBERG AIR FORCE BASE

4.5.1.1 No Action Alternative

Under the No Action Alternative, launch activities would continue at Vandenberg AFB, although the GMD ETR would not be established and GBI and target launch scenarios would not be tested under operationally realistic conditions.

Table 4.5.1-1 lists propellant information for the Titan IV, Delta II and IV, and Atlas V, common launch vehicles at Vandenberg AFB. The exhaust emissions presented in the EIS for the Evolved Expendable Launch Vehicle Program (U.S. Department of the Air Force, 1998a) and the Supplemental EIS for the Evolved Expendable Launch Vehicle (U.S. Department of the Air Force, 2000) for these vehicles are shown in table 4.5.1-2.

<table>
<thead>
<tr>
<th>Missile</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titan IV</td>
<td>631,400.6 (1,392,000)</td>
</tr>
<tr>
<td>Delta II</td>
<td>106,140.6 (234,000)</td>
</tr>
<tr>
<td>Atlas V</td>
<td>&lt;382,106.2 (&lt;842,400)</td>
</tr>
<tr>
<td>Delta IV</td>
<td>&lt;227,063.8 (&lt;500,590)</td>
</tr>
</tbody>
</table>


Table 4.5.1-2: Predicted Pollutant Concentration Levels at Vandenberg AFB

<table>
<thead>
<tr>
<th>Launch Vehicle</th>
<th>Time</th>
<th>Hydrogen Chloride (ppm)</th>
<th>Aluminum Oxide (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titan IV a</td>
<td></td>
<td>3.32</td>
<td>NA</td>
</tr>
<tr>
<td>Delta II a</td>
<td></td>
<td>1.821</td>
<td>NA</td>
</tr>
<tr>
<td>Atlas V b</td>
<td>Peak/Instantaneous</td>
<td>1.896</td>
<td>2.694</td>
</tr>
<tr>
<td></td>
<td>30-minute</td>
<td>0.067</td>
<td>0.116</td>
</tr>
<tr>
<td></td>
<td>60-minute</td>
<td>0.033</td>
<td>0.058</td>
</tr>
<tr>
<td>Delta IV b</td>
<td>Peak/Instantaneous</td>
<td>1.270</td>
<td>1.779</td>
</tr>
<tr>
<td></td>
<td>30-minute</td>
<td>0.045</td>
<td>0.077</td>
</tr>
<tr>
<td></td>
<td>60-minute</td>
<td>0.023</td>
<td>0.039</td>
</tr>
</tbody>
</table>

a U.S. Department of the Air Force, 1998a
b U.S. Department of the Air Force, 2000
ppm = parts per million
mg/m³ = milligrams per cubic meters
NA = Not available
These vehicle emissions are typical of those launched from Vandenberg AFB. The U.S. Air Force standard for hydrogen chloride is 10 ppm for an instantaneous level. The OSHA standard for aluminum oxide is 5 milligrams per cubic meter (mg/m³).

The EELV EIS and Supplemental EIS concluded that up to an additional nine launches per year would not exceed NAAQS, state AAQS, U.S. Air Force, or OSHA standards. Current range activities would continue. Launches from Vandenberg AFB are limited to 30 annually (10 military launches and 20 space launches), including current launching of the Peacekeeper, BV, targets and Minuteman II. Table 4.5.1-3 lists annual emissions from Vandenberg AFB and Santa Barbara County.

Table 4.5.1-3: Vandenberg AFB and Santa Barbara County Emissions

<table>
<thead>
<tr>
<th></th>
<th>Volatile Organic Compounds metric tons (tons)/year</th>
<th>Oxides of Nitrogen metric tons (tons)/year</th>
<th>Carbon Monoxide metric tons (tons)/year</th>
<th>Sulfur Dioxide metric tons (tons)/year</th>
<th>PM-10 metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated 2001 Emissions from Vandenberg AFB</td>
<td>4.5 (5.0)</td>
<td>17.8 (19.6)</td>
<td>47.0 (51.8)</td>
<td>1.0 (1.1)</td>
<td>58.6 (64.6)</td>
</tr>
<tr>
<td>1996 Santa Barbara County</td>
<td>40,333 (44,460)</td>
<td>15,049 (16,589)</td>
<td>93,775 (103,369)</td>
<td>785 (865)</td>
<td>12,295 (13,553)</td>
</tr>
</tbody>
</table>

Source: U.S. Department of the Air Force, 2000

*Upper Atmosphere*

No specific requirements are used for regulating emissions to the upper atmosphere. The Supplemental EELV EIS states launches that would result in local and global impacts to the upper atmosphere. The passage of a lift vehicle through the stratosphere has been shown to cause a temporary, local decrease in a so-called “hole” in the ozone layer; however, these holes only exist for a matter of minutes to hours. According to the EELV EIS and Supplemental EELV EIS, current launches would not result in significant impacts to the upper atmosphere.

4.5.1.2 Alternative 1

4.5.1.2.1 Targets

*Construction*

Construction activities associated with target facilities at Vandenberg AFB would include interior and software modifications to existing facilities. Therefore, there would be no increase to regional air quality emissions at Vandenberg AFB due to construction.

*Operation*

Santa Barbara County is in attainment for all air quality standards except the state ozone and PM-10 standards. Santa Barbara County has recently met the federal standard for ozone and is in the process of being redesignated by the EPA as being in attainment. Alternative 1 would not substantially impact the regional air quality within the Santa Barbara Air Basin.
Pre-Launch Activities

Vandenberg AFB complies with the Santa Barbara County Air Pollution Control District rules and regulations listed below. Alternative 1 would comply with these and any other applicable rules.

- Rule 317, Organic Solvents, provides limits to any solvent materials used in the project.
- Rule 323, Architectural Coatings, provides for coating materials applied to an architectural structure.
- Rule 330, Surface Coating of Metal Parts and Products, applies if metal parts are coated on base before construction.
- Rule 353, Adhesives and Sealants, applies if adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, or any other primers are used during the project unless specifically exempted by this rule.
- Only California Air Resources Board-certified blasting medium would be permitted if abrasive blasting were used.
- Any portable equipment powered by an internal combustion engine of 20 British horsepower or higher used in this project must be registered in the California State-wide Portable Equipment Registration Program or have a valid Santa Barbara County Air Pollution Control District Permit to operate. (Vandenberg Air Force Base, 2001)

Pre-launch activities associated with Alternative 1 at Vandenberg AFB would include the transportation of the target. The mobile emissions resulting from this transportation would be intermittent and would not have a measurable impact to regional air quality.

If used as a target, the fourth stage of a Peacekeeper target would utilize a single liquid propellant and require onsite fueling. Although total vapor emissions can vary depending on the propellant transfer equipment used and how it is assembled, it is anticipated that only very small amounts (approximately 10 grams [0.4 ounce]) of vapors would be released to the atmosphere during the transfer operation. It is not anticipated that normal fueling operations would impact air quality.

It is unlikely that a propellant release larger than that described above would occur at Vandenberg AFB. However, if such an accidental release were to occur, it would most likely occur during fueling. A reasonable scenario would involve failure of the transfer equipment or valves. The analysis assumes a leak contained over a 3-minute period that releases up to 17 liters (4.5 gallons) of hydrazine fuel. Analysis indicated no potential exceedances of the Immediately Dangerous to Life and Health (IDLH) health standard of 50 ppm. The low likelihood of such an occurrence and the implementation of approved emergency response plans would limit the impact of such a release.

Emergency generators would supply backup power to target facilities with offsite commercial power sources providing primary power. The emergency backup generators would be operated under appropriate permits and restrictions. Portable generators that operate less than 200 hours per year currently do not require permits; however, Santa Barbara County Air Pollution
Control District is in process of changing permitting applicability which could require New Source Review permitting, emission offsets, or emission control equipment.

**Launch Activities**

Proposed target missiles could consist of one of several types of missiles including Strategic Target System, Minuteman II target, Peacekeeper target, and Trident I (C4) target. Table 4.5.1-4 lists missile propellant information and table 4.5.1-5 lists emission constituents during Stage I for each proposed missile. In Alternative 1, a total of five target launches per year would be anticipated at Vandenberg over the duration of the program.

### Table 4.5.1-4: Missile Propellant Information for Proposed Targets at Vandenberg AFB

<table>
<thead>
<tr>
<th>Missile</th>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Target System</td>
<td>Stage I</td>
<td>9,422 (20,772)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>4,025 (8,874)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>414 (913)</td>
</tr>
<tr>
<td>Minuteman II Target</td>
<td>Stage I</td>
<td>20,810 (45,879)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>6,296 (13,851)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>1,658 (3,655)</td>
</tr>
<tr>
<td>Peacekeeper Target</td>
<td>Stage I</td>
<td>44,661 (98,462)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>24,556.3 (54,137.7)</td>
</tr>
<tr>
<td></td>
<td>Stage III</td>
<td>7,069 (15,584)</td>
</tr>
<tr>
<td></td>
<td>Stage IV</td>
<td>644 (1,420)</td>
</tr>
<tr>
<td>Trident I (C4) Target</td>
<td>Stage I</td>
<td>17,667 (38,948)</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>7,924 (17,469)</td>
</tr>
<tr>
<td></td>
<td>AKM</td>
<td>415 (914)</td>
</tr>
</tbody>
</table>

### Table 4.5.1-5: Potential Target Exhaust Emissions (Single Launch) at Vandenberg AFB

<table>
<thead>
<tr>
<th>Missile</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Chlorine metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Hydrogen metric tons (tons)</th>
<th>Water metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Target System</td>
<td>3.56 (3.92)</td>
<td>0.019 (0.02)</td>
<td>2.35 (2.59)</td>
<td>0.19 (0.21)</td>
<td>0.22 (0.24)</td>
<td>0.60 (0.66)</td>
<td>1.58 (1.74)</td>
<td>0.87 (0.96)</td>
</tr>
<tr>
<td>Minuteman II Target</td>
<td>6.29 (6.93)</td>
<td>0.027 (0.030)</td>
<td>5.00 (5.51)</td>
<td>0.77 (0.85)</td>
<td>0.44 (0.48)</td>
<td>1.98 (2.18)</td>
<td>4.47 (4.93)</td>
<td>1.83 (2.02)</td>
</tr>
<tr>
<td>Peacekeeper Target</td>
<td>15.58 (17.17)</td>
<td>0.085 (0.093)</td>
<td>9.75 (10.75)</td>
<td>0.65 (0.72)</td>
<td>0.23 (0.25)</td>
<td>5.04 (5.55)</td>
<td>7.12 (7.85)</td>
<td>3.65 (4.03)</td>
</tr>
<tr>
<td>Trident I (C4) Target</td>
<td>6.71 (7.40)</td>
<td>&lt;0.009 (&lt;0.01)</td>
<td>5.48 (6.04)</td>
<td>0.35 (0.39)</td>
<td>NA (0.79)</td>
<td>0.72 (0.43)</td>
<td>0.39 (0.43)</td>
<td>4.06 (4.48)</td>
</tr>
</tbody>
</table>

NA = Not available
Emissions from dual target launches were modeled using the Peacekeeper Target, as it is the largest of the proposed target vehicles. Dual emissions were modeled using OBODM to determine levels of hydrogen chloride, aluminum oxide and carbon monoxide. The modeling for a nominal dual Peacekeeper target launch showed that the peak hydrogen chloride standard would be exceeded out to a distance of approximately 625 meters beyond the Vandenberg AFB boundary (table 4.5.1-6). The 1-hour, 8-hour, and 24-hour hydrogen chloride standards would not be exceeded. Emission levels for both carbon monoxide and aluminum oxide would be within NAAQS and California AAQS. A nominal launch of a single Peacekeeper Target is anticipated to be within the NAAQS, California AAQS, and Air Force standards as fewer emissions would be released.

**Table 4.5.1-6: Potential Peacekeeper Target Exhaust Emissions (Dual Launch) at Vandenberg AFB**

<table>
<thead>
<tr>
<th></th>
<th>Dual Peacekeeper Target Launch</th>
<th>Dual Peacekeeper Target On-Pad Accident</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour 3.5 ppm</td>
<td>35 ppm (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-hour 2.9 ppm</td>
<td>35 ppm</td>
<td></td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour 26 μg/m³</td>
<td>50 μg/m³ (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-hour 0.5 mg/m³</td>
<td>5 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour 1 ppm</td>
<td>4 ppm (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peak 19 ppm</td>
<td>67 ppm</td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

(1) Based upon NAAQS
(2) Based upon the maximum California AAQS level of PM-10 concentrations over a 24-hour period
(3) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

The *de minimis* thresholds are federal limits listed in 40 CFR 51.583(b)(1). In the event that 5 Peacekeeper Targets are launched in a year, the conservatively estimated annual emissions for oxides of nitrogen would total 18.3 metric tons (20.2 tons), below the 45.3-metric-ton (50-ton) limit. Carbon monoxide was calculated to be 48.8 metric tons (53.8 tons), also below the federal limit of 90.7 metric tons (100 tons).

If flight termination becomes necessary, the potential resulting fire would cause short-term impacts to air quality in the form of combustion byproducts and potentially hazardous fumes. Most or all of the solid propellant fuel would likely burn up before being extinguished. These combustion byproducts would be similar to those previously described for a nominal launch. Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of an on-pad accident involving dual Peacekeeper Targets. As shown in table 4.5.1-6, the 1-hour and peak hydrogen chloride Air Force standards would be exceeded. The 8-hour and 24-hour hydrogen chloride standards were not exceeded. All other standards would continue to be within NAAQS and California AAQS. The consequences to regional air quality would be localized (within approximately 3.8 kilometers (2.4 miles) of Vandenberg AFB for the peak hydrogen chloride standard and 1.3 kilometers (0.8 miles) of Vandenberg AFB for the 1-hour hydrogen chloride standard) and would be of a short duration. The modeling included both day and nighttime meteorological data. Nighttime data typically depicts very calm wind conditions which results in higher emission concentrations. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and
the conservative nature of the OBODM inputs, the impact to regional air quality is considered minor.

Potential health and safety impacts due to launch emissions are discussed under section 4.5.6, Health and Safety. Before each launch, the Rocket Exhaust Effluent Diffusion Model is used to locate toxic zones. A toxic risk-assessment-based recommendation to launch or not to launch is based on the results of the LATRA program that evaluates the risk to people, regardless of whether they are mission essential or non-mission essential. Among other criteria in determining whether to launch, the LATRA accounts for (1) whether people are sheltered or unsheltered; (2) whether they are healthy or sensitive individuals; and (3) the probability of a catastrophic launch failure.

**Determination of Non-Applicability**

Santa Barbara County is in non-attainment for the state standards for ozone and PM-10 and is currently in the process of being redesignated by the EPA as being in attainment for the federal ozone standard. The review of the Proposed Action as required by the General Conformity Rule resulted in a finding of presumed conformity. Total foreseeable direct and indirect emissions caused by the proposed action are less than the mandated *de minimis* thresholds as shown in appendix J.

**Post-Launch Activities**

Post-launch activities would include the removal of all mobile equipment and assets brought to Vandenberg AFB. The removal could result in small localized amounts of PM-10, which would be minimized further through dust suppression measures previously discussed.

**4.5.1.2.2 Sensors**

Current range radars (such as High Accuracy Instrument Radar, AN/TPQ-18, AN/FPS-16, AN/MPS, and TPS-X), sensors, fixed and mobile telemetry, and optics equipment would be utilized in Alternative 1 and would require no construction or modifications. Operation of existing range radars at Vandenberg AFB would be covered under existing permits.

**4.5.1.3 Alternative 2**

**4.5.1.3.1 Ground-Based Interceptors**

**Construction**

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant air quality impacts to the regional air. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. The GMD program would perform sampling and abatement for lead-based paint, asbestos, and PCBs as required before modification, using Vandenberg AFB-approved procedures. Facility
modifications and site preparation activities at the locations identified would have a localized, minimal impact on air quality.

For communication among the components at Vandenberg AFB, the proposed action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would have a localized, minimal impact on air quality.

**Operation**

*Pre-Launch Activities*

Pre-launch activities associated with the GBIs would be similar to pre-launch activities for targets at Vandenberg AFB.

An accidental release of liquid fuel or liquid oxidizer from the EKV would be similar to that described for KLC in section 4.1.1.2.1. During nominal propellant tank installation, the propellants remain sealed inside their tanks. The likelihood of an accidental release of the liquid fuel or oxidizer would be low; however, if such an accident were to occur, it would most likely occur during missile assembly. Table 4.5.1-7 indicates the results of analysis using the U.S. Air Force Toxic Corridor Model computer model to determine distances at which IDLH health standard could be exceeded assuming all 7.5 liters (2 gallons) of fuel and 5.5 liters (1.5 gallons) of oxidizer were released to the atmosphere during an accident. The IDLH is the level of exposure (not time-weighted) above which it is thought a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment. The IDLH level was the only level of concern as others are based on time weighted averages over prolonged exposures.

Actual hazard distances would depend on the propellant released, the amount released, meteorological conditions, and emergency response measures taken. However, the low likelihood of such an event and the implementation of approved emergency response plans would limit the impact of such a release.

<table>
<thead>
<tr>
<th>Propellant</th>
<th>Health Standard</th>
<th>Standard Limit</th>
<th>Exceedance Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine</td>
<td>NIOSH IDLH</td>
<td>50 ppm (66.5 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Methyl Hydrazine</td>
<td>NIOSH IDLH</td>
<td>20 ppm (38.4 mg/m³)</td>
<td>Not exceeded</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (liquid)</td>
<td>NIOSH IDLH</td>
<td>20 ppm (36 mg/m³)</td>
<td>60 meters (197 feet)</td>
</tr>
<tr>
<td>Nitrogen Tetroxide (gas)</td>
<td>NIOSH IDLH</td>
<td>20 ppm (36 mg/m³)</td>
<td>30 meters (98 feet)</td>
</tr>
</tbody>
</table>

Source: Center for Disease Control and Prevention, 2002a, b; Asia Pacific Space Launch Centre EIS Site

*The National Institute for Occupational Safety and Health (NIOSH) Immediately Dangerous to Life and Health (IDLH) is the level of exposure (not time-weighted) above which it is anticipated a person would suffer life-threatening or irreversible health effects or other injuries that would impair them from escaping the hazardous environment.

Exceedance Distance—Average of U.S. Air Force Toxic Corridor model results for 15-minute and 30-minute averaging time and multiple stability classes.

ppm = parts per million by volume
mg/m³ = milligrams per cubic meter
Launch Activities

Alternative 2 launch activities include up to five launches (GBI and target combined) per year at Vandenberg AFB over the duration of the test program and would also comply with the rules listed in section 4.5.1.2.1. Table 4.5.1-8 lists propellant information for the proposed GBI configuration and table 4.5.1-9 gives emissions constituents for Stage 1 of the proposed GBI configuration. Emissions from rocket and missile launches are not considered stationary sources by the Santa Barbara County Air Pollution Control District.

<table>
<thead>
<tr>
<th>Booster</th>
<th>Propellant Mass kilograms (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>15,069 (33,227)</td>
</tr>
<tr>
<td>Stage II</td>
<td>3,926 (8,655)</td>
</tr>
<tr>
<td>Stage III</td>
<td>772 (1,701)</td>
</tr>
</tbody>
</table>

Table 4.5.1-9: Potential Stage 1 GBI Exhaust Emissions (Single Launch) at Vandenberg AFB

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Water metric tons (tons)</th>
<th>Other metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.01</td>
<td>0.98</td>
<td>1.47</td>
<td>5.77</td>
<td>1.77</td>
<td>1.89</td>
<td>1.93</td>
</tr>
<tr>
<td></td>
<td>(3.32)</td>
<td>(1.08)</td>
<td>(1.62)</td>
<td>(6.36)</td>
<td>(1.95)</td>
<td>(0.54)</td>
<td>(2.13)</td>
</tr>
</tbody>
</table>

As determined in the Booster Verification Test EA (U.S. Department of the Air Force, 1999) the configuration of the proposed GBI is similar to that of the Athena-2 (formerly the Lockheed Martin Launch Vehicle). However, the Athena-2 has a much larger solid rocket fuel capacity compared to that of the GBI. Air quality emission modeling in the Booster Verification Test EA (U.S. Department of the Air Force, 1999) concluded that a normal launch of an Athena-2 at Vandenberg AFB would not cause a significant impact to regional air quality; therefore, the much lower levels of the GBI exhaust would not be expected to cause a significant impact to air quality.

Dual GBI launches were analyzed using OBODM to determine exhaust emissions of aluminum oxide, hydrogen chloride, and carbon monoxide. Table 4.5.1-10 lists emission concentrations and standards. As shown on the table, all concentrations produced by dual launches of a GBI would remain within NAAQS, California AAQS, and U.S. Air Force standards. It is anticipated that a nominal single launch would also remain within NAAQS, California AAQS, and U.S. Air Force standards for aluminum oxide, hydrogen chloride, and carbon monoxide as fewer emissions would be released.
Table 4.5.1-10: Potential GBI Exhaust Emissions (Dual Launch) at Vandenberg AFB

<table>
<thead>
<tr>
<th></th>
<th>Dual GBI Launch</th>
<th>Dual GBI On-Pad Accident</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour 2.1 ppm</td>
<td>8-hour 2.9 ppm</td>
<td>35 ppm (^{(1)})</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td></td>
<td>35 ppm</td>
</tr>
<tr>
<td>Aluminum Oxide</td>
<td>24-hour 6 μg/m³</td>
<td>8-hour 0.3 mg/m³</td>
<td>50 μg/m³ (^{(2)})</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>Hydrogen Chloride</td>
<td>1-hour 0.3 ppm</td>
<td>8-hour 6 ppm</td>
<td>3 ppm (^{(3)})</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peak 49 ppm</td>
<td>2 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

\(^{(1)}\) Based upon NAAQS  
\(^{(2)}\) Based upon the maximum California AAQS level of PM-10 concentrations over a 24-hour period  
\(^{(3)}\) Based upon Air Force standards that measured and estimated launch emission exposure concentrations and durations in the event of normal and catastrophic launches

The *de minimis* thresholds are federal limits listed in 40 CFR 51.583(b)(1) for non-attainment areas. In the event that 5 GBIs are launched in a year, the conservatively estimated annual emissions for oxides of nitrogen would total 31.8 tons, below the 50 ton *de minimis* limit. Carbon monoxide was calculated to be 5.4 tons, also below the federal limit of 100 tons.

Modeling using the OBODM was also performed to analyze emissions produced in the highly unlikely occurrence of an on-pad accident involving dual GBIs. Results of the modeling show that both the 1-hour and peak hydrogen chloride U.S. Air Force standards would be exceeded (table 4.1.1-10). The 24-hour hydrogen chloride standard was not exceeded. The consequences to regional air quality would be localized (within approximately 2.5 kilometers [1.6 miles] of Vandenberg AFB for both the 1-hour and peak hydrogen chloride U.S. Air Force standards) and would be of short duration (less than 24 hours). The modeling included both day and nighttime meteorological data. Nighttime data typically depicts very calm wind conditions, which result in higher emission concentrations. Due to the highly unlikely potential for a dual accident, the localized short term nature of the air quality exceedence, and the conservative nature of the OBODM inputs, the impact to regional air quality is considered minor.

As described above in 4.5.1.2.1, potential health & safety impacts due to launch emissions are discussed under section 4.5.6, Health and Safety. Models are run before each launch to evaluate the risk to people.

**Determination of Non-Applicability**
Santa Barbara County is in non-attainment for the state standards for ozone and PM-10 and is currently in the process of being redesignated by the EPA as being in attainment for the federal ozone standard. The review of the proposed action as required by the General Conformity Rule resulted in a finding of presumed conformity. Total foreseeable direct and indirect emissions caused by the proposed action are less than the mandated *de minimis* thresholds as shown in appendix J.
Post-Launch Activities

Post-launch activities would include the removal of all mobile equipment and assets brought to Vandenberg AFB. The removal could result in small localized amounts of PM-10, which would be minimized further through dust suppression measures previously discussed.

4.5.1.3.2 Targets

Target construction and operation at Vandenberg AFB for Alternative 2 would be the same as described in section 4.5.1.2.1 for Alternative 1.

4.5.1.3.3 In-Flight Interceptor Communication System Data Terminal Construction

An IDT site would be constructed for Alternative 2, requiring the disturbance of approximately 5.9 hectares (14.6 acres). Construction would last for approximately 7 months. The potential construction emissions are listed in table 4.5.1-11.

<table>
<thead>
<tr>
<th></th>
<th>7 Months metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.36 (0.40)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>1.6 (1.8)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>0.35 (0.39)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.11 (0.13)</td>
</tr>
<tr>
<td>PM-10</td>
<td>4.8 (5.3)</td>
</tr>
</tbody>
</table>

As Vandenberg AFB is within a non-attainment area for the California AAQS 1-hour ozone standard, exhaust emissions of nitrogen oxides and hydrocarbons would be of concern. Construction emission levels would be below de minimis levels set by the federal government as analyzed in appendix J. Limits are set for carbon monoxide (90.7 metric tons [100 tons]), oxide of nitrogen (45.3 metric tons [50 tons]), volatile organic compounds (45.3 metric tons [50 tons]), oxides of sulfur (90.7 metric tons [100 tons]), and PM-10 (90.7 metric tons [100 tons]). Emissions would be monitored in accordance with Memorandum of Agreements between Vandenberg AFB and Santa Barbara County Air Pollution Control District. Therefore, impacts are not expected to be substantial.

Operation

Operation of the IDT at Vandenberg AFB would have little effect on regional air quality. Power would be provided by offsite commercial power sources; however, in the event of a loss of power a 275-kW diesel generator would be used. Along with the generator itself, there would be a 3,785-liter (1,000-gallon) AST for fuel. Table 4.5.1-12 lists the possible emissions associated with the use of this generator. The generator is assumed to be tested weekly during non-launch periods and used during power outages for approximately 200 hours a year.
Table 4.5.1-12: Potential Generator Emissions for IDT Facilities at Vandenberg AFB

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Oxides of Nitrogen metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>PM-10 metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>275-kW Diesel Generator</td>
<td>0.51 (0.56)</td>
<td>0.07 (0.08)</td>
<td>0.63 (0.70)</td>
<td>0.02 (0.03)</td>
</tr>
</tbody>
</table>

All generators, including the proposed 275-kW generator for the IDT, would be operated under appropriate permits and restrictions, which could possibly include New Source Review permitting, emission offsets, or emission control equipment.

4.5.1.3.4 Sensors

Current range radars (such as High Accuracy Instrument Radar, AN/TPQ-18, AN/FPS-16, AN/MPS, and TPS-X), sensors, fixed and mobile telemetry, and optics equipment would be utilized in Alternative 2 and would require no construction or modifications.

4.5.1.4 Alternative 3

Alternative 3 would require the use of pre-existing missile support facilities and range radars. Air quality impacts for these activities are similar to those described for Alternatives 1 and 2.

4.5.1.5 Cumulative Impacts

Launches from Vandenberg AFB are limited to 30 annually (10 military launches and 20 space launches). The prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a; U.S. Department of the Air Force, 1999) indicated no cumulative impact to air quality for up to six GBI launches annually. Based on preliminary planning information through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the 30 annual launches from Vandenberg AFB.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. Backup generator emissions at four GBI LFs, and minor site preparation emissions would be regulated in accordance with MOAs between Vandenberg AFB and the Santa Barbara County Air Pollution Control District and would not result in cumulative impacts to air quality.

4.5.1.6 Mitigation Measures

No air quality mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.2 BIOLOGICAL RESOURCES—VANDENBERG AIR FORCE BASE

The biological resources analytical approach involved evaluating the potential impacts of the Proposed Action and alternatives, such as construction, site preparation activities, use of existing and new sensors, and missile launches, on vegetation, wildlife, threatened and
endangered species, and sensitive habitat within the ROI. Impacts that could result from
construction and other site preparation activities include disturbance and removal of vegetation
and disturbance to wildlife from the accompanying noise and presence of personnel. Impacts
could also result from launch-related activities such as noise, air emissions, debris impacts, and
the use of radar equipment.

All transportation of equipment and materials such as fuels would be conducted in accordance
with applicable federal (DOT) and state regulations. SOPs for spill prevention, containment,
and control measures while transporting equipment and materials would preclude impacts to
biological resources.

GMD ETR program personnel would remove all mobile equipment/assets brought to the
installation at the conclusion of its testing activities. Transportation for removal of equipment
would be the same as when it was brought into the installation. These activities would result in
impacts similar to, but less than, those caused by site preparation. Specific restoration actions,
if necessary, would be determined on a case-by-case basis.

4.5.2.1 No Action Alternative

If the GMD ETR is not established, Vandenberg AFB would still continue to be operated as a
test area for space and missile operations. Other GMD-related activities would continue such
as the GBI test flights addressed in the EA for Booster Verification Tests (U.S. Department of
the Air Force, 1999) and the Alternate Booster Vehicle Verification Tests EA (U.S. Army Space
and Missile Defense Command, 2002c) and single target launches. These activities are
consistent with the ongoing mission of Vandenberg AFB and have been analyzed by the
referenced EAs. No additional impacts to biological resources would occur as a result of the No
Action Alternative.

4.5.2.2 Alternative 1

4.5.2.2.1 Targets

Target missiles are currently launched from LF-6 and LF-3 in support of the GMD program. Up
to five target missiles per year could be launched from Vandenberg AFB to support the GMD
ETR program over the 10-year performance period. Dual target missile launches could
potentially occur.

Construction

Vegetation

Alternative 1 would require the use of existing LFs (LF-6 and LF-3) (figure 3.5.2-1), a Missile
Assembly Building (Building 6816), and missile and maintenance storage facilities. No new
construction would be needed to support target launches for this alternative. The minor site
preparation activities would result in no ground disturbance, and thus there would be no impacts
to vegetation.

Threatened and Endangered Plant Species. No adverse impacts are anticipated to the
Gaviota tarplant and Lompoc yerba santa as a result of site preparation activities since no
ground disturbance is anticipated.
Wildlife
Site preparation activities would implement procedures to minimize the potential for soil erosion if necessary and are not expected to adversely affect waterbodies, including Essential Fish Habitat. Site preparation activities would be limited in duration, and no direct physical auditory changes are anticipated.

California sea lions, northern elephant seals, northern fur seals, and other sensitive marine mammals in adjacent offshore areas would normally be at least 296 meters (970 feet) from the closest launch site (LF-6) and are not expected to be affected by site preparation noise.

Threatened and Endangered Wildlife Species. Site preparation activities would not occur in areas that could result in impacts to water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

The California brown pelican and western snowy plover preferentially forage and roost along the coast approximately 296 meters (970 feet) away and are unlikely to be affected by site preparation noise. Site preparation activities are also not anticipated to result in impacts to the southern sea otter or other sensitive marine mammals in adjacent offshore areas due to the distance from the proposed GMD-related facilities to the shoreline (approximately 296 meters [970 feet]).

Environmentally Sensitive Habitat
The coastal dune systems are outside the area that could potentially be disturbed during site preparation activities at LF-6 or LF-3. Site preparation activities are not anticipated to directly or indirectly impact the nearest wetlands, which are approximately 1.6 kilometers (1 mile) northwest of Building 1819.

Operation
Vandenberg AFB typically supports approximately five Minuteman or Peacekeeper launches per year from northern launch sites on base. Based on previous environmental studies and a Letter of Authorization with the National Marine Fisheries Service, up to 10 Minuteman and Peacekeeper launches per year could occur from northern Vandenberg AFB launch sites. GMD target missiles would be included in this number. Up to five GMD target launches would occur per year from north Vandenberg AFB. Dual target missile launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

Vegetation
Normal launch activities are not expected to impact vegetation. Launch exhaust products would include hydrogen chloride, aluminum oxide, carbon monoxide, nitrogen dioxide, carbon dioxide, water, and chlorine. Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of the aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited in surface waters would have little effect. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that non-fibrous aluminum oxide, as found in solid rocket motor exhaust, is nontoxic (U.S. Department of the Air Force,
Analysis of launch-related deposition of aluminum oxide has not shown it to be harmful to vegetation (Federal Aviation Administration, 1996).

The greatest potential for impacts to vegetation comes from hydrogen chloride deposition. Direct effects could include discoloration, foliage loss, and changes in species composition. Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid propellant missile launches for very large flight vehicles (such as the Space Shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launches of the smaller target missiles is expected to be slight. The hydrogen chloride would cause a change in marine or fresh surface water pH for only a short duration; any alteration of the water’s pH would be almost imperceptible. (U.S. Department of the Air Force, 1997b)

Vandenberg AFB has a wildland fuels management plan, prepared by the U.S. Forest Service, containing measures to help prevent large wildfires (such as prescribed burning activities, which lower the age class of area vegetation). Moreover, emergency fire-fighting personnel are on standby status for all launch activities as a protective measure.

**Threatened and Endangered Plant Species.** No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of nominal launch activities since these plants have not been identified at the proposed target launch sites.

**Wildlife**

**Emissions.** The small quantities of hydrogen chloride that could potentially be deposited are not expected to injure or affect wildlife. The hydrogen chloride would cause a change in surface water pH for only a short duration, and any alteration of the water’s pH would be almost imperceptible. The EPA has determined that non-fibrous aluminum oxide from solid rocket exhaust is non-toxic (Vandenberg Air Force Base, 1999).

**Threatened and Endangered Wildlife Species.** As mentioned above, hydrogen chloride and aluminum oxide deposition is not anticipated to adversely affect wildlife, including threatened or endangered wildlife species.

**Noise.** The primary potential for impacts to wildlife would be from the noise created during the proposed missile launches. Wildlife in general is known to exhibit a startle response when exposed to short-term noise impacts. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Studies indicate that birds usually show signs of disturbance, such as fluttering of wings, when the noise occurs, but quickly return to normal behavior after the event (U.S. Department of the Air Force, 1997b). Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations.

Pacific harbor seals, the main pinniped species using north Vandenberg AFB, would normally be at least 2.0 kilometers (1.2 miles) from the launch site. Other pinnipeds such as California sea lions and northern elephant seals may haul-out temporarily on beaches several kilometers (miles) from the launch facility. Noise from prior launches has not appeared to affect pinniped use of the coastal areas on Vandenberg AFB. Pinniped monitoring has been performed for
launches of larger missiles on north Vandenberg AFB such as the Peacekeeper and Delta II. The effect to harbor seals, which were most susceptible to disturbance, has been a negligible short-term (5- to 30-minute) abandonment of a haul-out area at Spur Road and Purisima Point. No pinniped mother-pup separations have been noted at the harbor seal haul-out sites closest to the launch site. Recent surveys discovered a new harbor seal haul-out site on north Vandenberg AFB that is regularly used by up to three harbor seal mothers and their pups. The U.S. Air Force, 30 SW, Vandenberg AFB began monitoring harbor seals at this site for Minuteman and Peacekeeper launches (launch reports in preparation) that occurred during the harbor seal pupping season (March–June) in accordance with the 5-year programmatic permit and Letter of Authorization issued by National Marine Fisheries Service to the 30 SW.

Noise monitoring would be performed during the initial launch of GMD target missile and harbor seal monitoring would be conducted during the pupping season in accordance with Vandenberg AFB guidelines. The target launches would be included in the number of intercontinental ballistic missile currently allowed under Vandenberg AFB’s 5-year programmatic permit and Letter of Authorization. If the annual launch rates from Vandenberg AFB increase above the levels currently projected and covered under the National Marine Fisheries Service authorization, the Letter of Authorization would be amended accordingly with appropriate analysis of impacts to marine mammals.

Threatened and Endangered Wildlife Species. Prior agency consultations have provided both for regulatory agency assessments of missile programs on Vandenberg AFB and identified monitoring/minimization measures to ensure there are no significant impacts. These consultations have been addressed in several documents: USFWS Biological Opinion for the Theater Ballistic Missile Targets program, May 1998; the Threatened/Endangered Species Monitoring Plan for the Theater Ballistic Missile Targets Program prepared in compliance with the Biological Opinion, September 1999; and the Programmatic Marine Mammal Incidental Harassment Authorization for Space and Missile Launches on Vandenberg AFB, May 2000. (Vandenberg Air Force Base, 2002a)

The California brown pelican and western snowy plover preferentially forage and roost along the coast approximately 296 meters (970 feet) away from the proposed launch area. The California least tern has only nested at Purisima Point (over 11 kilometers [7 miles] from the nearest proposed LF) in recent years and has never been recorded nested north of San Antonio Creek (Vandenberg Air Force Base, 2003). No effects to sensitive bird species have been identified from prior launches in the area. Proposed launch activities are unlikely to adversely affect the long-term wellbeing, reproduction rates, or survival of these listed birds. The level of noise during launch and flight is also expected to be relatively short in duration. Noise monitoring would be performed in accordance with Vandenberg AFB guidelines.

Southern sea otters in adjacent offshore areas would also be at least 296 meters (970 feet) from the launch site. Noise from prior launches has not appeared to affect sea otter use of the coastal areas on Vandenberg AFB. Noise from launches of the larger Delta II missile has not affected use of coastal areas by sea otters with dependent pups. Disturbance as a result of visual stimulus is unlikely because the target missile would be at an altitude of 407 meters (1,335 feet) as it arches past the coastline. The intermittent launches planned for the GMD ETR test flights (up to five target missile flights per year over a 10-year period) are not expected to substantially impact the southern sea otter. (U.S. Department of the Air Force, 1997b; 1999)
Debris. Nominal launch activities are not expected to adversely impact Essential Fish Habitat. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species’ populations. The majority of propellant would be expended before booster drop and impact, and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)

In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect Essential Fish Habitat and pinnipeds hauled out along the adjacent coastline. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would likely strike the water further downrange. Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al, 2000) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in the KLC Water Resources section, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C). The perchlorate would be expected to be diluted as it mixes with the surrounding water. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

Potential exists to disturb biological resources during debris recovery activities; however, recovery efforts would be coordinated with applicable range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts. Negligible adverse effects to biological resources would be expected during debris recovery activities.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure.

In the unlikely event of an accidental release of stored liquid propellant, Vandenberg AFB’s Hazardous Materials Emergency Response Plan and Spill Control and Countermeasures Plan would be implemented in order to prevent impacts to biological resources in the vicinity. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations and OSHA requirements would be followed, which would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to wildlife if an accident were to occur. With the plans mentioned above in place, no impacts to wildlife are expected as a result of accidental release of liquid propellant.
Threatened and Endangered Wildlife Species. Impacts to threatened and endangered species resulting from proposed GMD ETR activities would be similar to those addressed above for wildlife. Debris from nominal launches is not expected to impact water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog. Since the westerly launch trajectory used for most missile launches would carry the missile over snowy plover habitat, fire and debris from an anomaly could potentially impact snowy plovers. However, as stated above, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure. Any required recovery activities would follow Vandenberg AFB SOPs with negligible adverse effects expected to the snowy plovers and their habitat. The reproductive success of the snowy plover does not appear to have been affected by prior launches.

Debris impact and booster drops in the BOA off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote since sensitive marine species in the ocean are widely scattered and occupy relatively small surface areas, and the probability of debris striking a threatened or endangered species is considered remote, $1 \times 10^{-6}$ or less than 1 in 1 million.

Environmentally Sensitive Habitat

No adverse impacts as a result of the GMD ETR activities are anticipated to occur within the current Channel Islands National Marine Sanctuary located off the coast south of Vandenberg AFB. Additional consultation would be performed with the National Oceanographic and Atmospheric Administration following their decision on the sanctuary boundary expansion.

4.5.2.2 Sensors

Existing range sensors at Vandenberg AFB include several range radars (AN/TPQ-18, AN/FPS-16, High Accuracy Instrumentation Radar, AN/MPS-39, TPS-X) as well as fixed and mobile telemetry and optics equipment. Launch control would be located in existing launch control facilities. No additional impacts to biological resources would result from these existing sensors in support of the GMD ETR activities.

4.5.2.3 Alternative 2

Alternative 2 would be similar to Alternative 1 with the exception that GBI launches would be from Vandenberg AFB and RTS instead of KLC and RTS. The GBI launch would require construction of an IDT and modifications of existing support facilities at Vandenberg AFB. The other components described in Alternative 1 would remain the same.

4.5.2.3.1 Ground-Based Interceptors

Under Alternative 2, Vandenberg AFB would continue to be a launch site for GMD target missiles and would support dual GBI launches. The following activities would continue at Vandenberg AFB: dual launch of target missiles, dual launch of GBI missiles, use of the TPS-X radar, and use of existing range instrumentation.
Construction

Vegetation
Facilities located on north Vandenberg AFB that may be required for the GBI tests are listed in table 2.3.2-1 and shown on figures 2.3.2-1 and 3.5.2-1. Minor internal modification and construction (potential expansion of parking areas) could be required as part of proposed site preparation activities for, and thus there would be little to no ground disturbance and resultant impact to vegetation in or around applicable LFs, as well as required support buildings. Some facilities have been used to support GBI booster verification tests and, as such, would require only minor interior modifications to support continued GMD testing, and therefore no vegetation impacts are anticipated.

For communication among the components on the same installation, the ETR would maximize use of available communications assets to include cable. Cables would be installed in existing conduits, where available. If existing conduits are not available, the cable(s) would be installed in new conduits that would be placed in routes along existing roads designed to avoid environmental impacts and approved by 30 CES/CEV. Once communication line routes are selected, biological surveys would be conducted as required. Trenching for the new communications cable/conduit would have a maximum depth of 0.91 meter (3 feet). Slant/directional drilling is also being proposed as a means of minimizing impacts to the environment if required.

Threatened and Endangered Vegetation. No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of site preparation activities since these plants have not been identified in the vicinity of proposed launch facilities.

Wildlife
Site preparation activities, which would include fiber optic cable installation, would implement procedures to minimize the potential for soil erosion, such as the use of slant/directional drilling, and are not expected to adversely affect waterbodies, including Essential Fish Habitat.

Site preparation activities would be limited in duration, and no direct physical auditory changes are anticipated. Typically the noise at 15 meters (50 feet) from a construction site does not exceed an equivalent sound level of 90 dBA. Most of the site preparation noise and human activity would be caused by truck traffic to and from the launch site and the potential short-term use of heavy machinery. Site preparation may disturb wildlife in the immediate area. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996).

Disturbance would be restricted mainly to areas within 15 meters (50 feet) from the construction site. The increased presence of personnel would tend to cause birds and other mobile species of wildlife to temporarily evacuate areas subject to the highest level of noise. Additional ruderal vegetation is nearby for displaced wildlife.
California sea lions, northern elephant seals, northern fur seals, and other sensitive marine mammals in adjacent offshore areas would normally be at least 731.5 meters (2,400 feet) from the launch site and are not expected to be affected by site preparation noise.

**Threatened and Endangered Wildlife.** Site preparation activities would not occur in areas that could result in impacts to water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

The California least tern, California brown pelican, and western snowy plover preferentially forage and roost along the coast approximately 731.5 meters (2,400 feet) or farther away from the proposed launch area and are unlikely to be affected by site preparation noise.

Site preparation activities are also not anticipated to result in impacts to the southern sea otter or other sensitive marine mammals in adjacent offshore areas due to the distance from the launch sites (approximately 731.5 meters [2,400 feet] or farther).

**Environmentally Sensitive Habitat**

The coastal dune systems are outside the area that could potentially be disturbed during site preparation activities at the LFs. Wetlands would be avoided to the maximum extent practicable. The use alternative methods of drilling for installation of required fiber optic cable could minimize the potential for impacts to wetlands or other sensitive habitat.

**Operation**

Dual GBI launches could potentially occur. Dual launches could result in a slightly larger affected area and longer duration of disturbance to wildlife. Impacts would in some cases be slightly greater than, but similar to, those analyzed below for single launches.

**Vegetation**

The majority of the blast residue would be contained within the silo, minimizing the potential for impacts on vegetation. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations and OSHA requirements would be followed. Compliance with these regulations would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to vegetation if an accident were to occur.

Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of the aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited in surface waters would have little effect. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that nonfibrous aluminum oxide, as found in solid rocket motor exhaust, is nontoxic (U.S. Department of the Air Force, 1997b).

Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid propellant missile launches for very large flight vehicles (such as the Space Shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launch of the smaller GBI is expected to be slight. The hydrogen chloride would cause a change in surface...
water pH for only a short duration; any alteration of the water’s pH would be almost imperceptible. (U.S. Department of the Air Force, 1997b)

Vandenberg AFB has a wildland fuels management plan, prepared by the U.S. Forest Service, containing measures to help prevent large wildfires (such as prescribed burning activities which lower the age class of area vegetation). Moreover, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure.

**Threatened and Endangered Vegetation.** No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of nominal launch activities since these plants have not been identified at the proposed launch facilities.

**Wildlife**

**Emissions.** The small quantities of hydrogen chloride that could potentially be deposited are not expected to injure or affect wildlife. The hydrogen chloride would cause a change in pH of only short duration, and any alteration of the water’s pH would be almost imperceptible. The EPA has determined that non-fibrous aluminum oxide from solid rocket exhaust is nontoxic (Vandenberg Air Force Base, 1999).

**Threatened and Endangered Wildlife.** As mentioned above, hydrogen chloride and aluminum oxide deposition is not anticipated to adversely affect wildlife, including threatened or endangered wildlife species.

**Noise.** The primary potential for impacts to wildlife would be from the noise created during the proposed missile launches. Noise from Minuteman launches ranges from 98 dBA approximately 4.2 kilometers (2.6 miles) from the launch site to 80 dBA approximately 13 kilometers (8 miles) from the launch site. The level of noise for the GBI missile during launch and flight is expected to be less and relatively short in duration. At approximately the same distance from the LF, the previous booster vehicle-2 launch (GBI vehicle) was 6 dB less than the Minuteman III launch and 17 dB less than Peacekeeper launches.

Pacific harbor seals, the main pinniped species using north Vandenberg AFB, would normally be at least 2.0 kilometers (1.2 miles) from the launch site. Other pinnipeds such as California sea lions and northern elephant seals may haul-out temporarily on beaches several kilometers (miles) from the launch facility. Noise from prior launches has not appeared to affect pinniped use of the coastal areas on Vandenberg AFB. Pinniped monitoring has been performed for launches of larger missiles on north Vandenberg AFB such as the Peacekeeper and Delta II. The effect to harbor seals, which were most susceptible to disturbance, has been a negligible short-term (5- to 30-minute) abandonment of a haul-out area at Spur Road and Purisima Point. No pinniped mother-pup separations have been noted at the harbor seal haul-out sites closest to the launch site. Recent surveys discovered a new harbor seal haul-out site on north Vandenberg AFB that is regularly used by up to three harbor seal mothers and their pups. The U.S. Air Force, 30 SW, Vandenberg AFB began monitoring harbor seals at this site for Minuteman and Peacekeeper launches (launch reports in preparation) that occurred during the harbor seal pupping season (March-June) in accordance with the 5-year programmatic permit and letter of authorization issued by National Marine Fisheries Service to the 30 SW.
Noise monitoring would be performed during the initial launch of a GBI and harbor seal monitoring would be conducted during the pupping season in accordance with Vandenberg AFB guidelines. The target launches would be included in the number of intercontinental ballistic missile currently allowed under Vandenberg AFB’s 5-year programmatic permit and Letter of Authorization. If the annual launch rates from Vandenberg AFB increase above the levels currently projected and covered under the National Marine Fisheries Service authorization, the Letter of Authorization would be amended accordingly with appropriate analysis of impacts to marine mammals.

The disturbance to pinnipeds as a result of visual stimulus is unlikely due to the approximate altitude of 1,250 meters (4,100 feet) a GBI could reach as it approaches the coastline. The intermittent launches planned for the GBI test flights (up to five per year) are not expected to substantially impact marine species. (U.S. Department of the Air Force, 1999)

Wildlife in general is known to exhibit a startle response when exposed to short-term noise impacts. Studies (U.S. Department of the Air Force, 1997b) indicate that birds usually show signs of disturbance, such as the fluttering of wings, when the noise occurs but quickly return to normal behavior after the event. Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed.

Threatened and Endangered Wildlife. The California brown pelican and western snowy plover preferentially forage and roost along the coast approximately 1,250 meters (4,100 feet) away from the proposed launch area. Noise levels 4.2 kilometers (2.6 miles) from the launch site during previous Minuteman missile launches were 98 dBA. No effects to sensitive bird species have been identified. The GBI is a smaller vehicle with less propellant than a Minuteman, and lower noise levels are anticipated. Proposed launch activities are unlikely to adversely affect the long-term well-being, reproduction rates, or survival of these listed birds. The level of noise for the GBI during launch and flight is also expected to be relatively short in duration. Noise monitoring would be performed for the first launch.

Southern sea otters in adjacent offshore areas would also be at least 1,250 meters (4,100 feet) from the launch site. Noise from prior launches has not appeared to affect sea otter use of the coastal areas on Vandenberg AFB. Noise from launches of the larger Delta II missile has not affected use of coastal areas by sea otters with dependent pups. Disturbance as a result of visual stimulus is unlikely because the GBI would be at an altitude of 1,250 meters (4,100 feet) as it approaches the coastline. The intermittent launches planned for the GBI test flights (up to five flights per year) are not expected to substantially impact the southern sea otter. (U.S. Department of the Air Force, 1997b; 1999)

Debris. Nominal launch activities are not expected to adversely impact Essential Fish Habitat. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species’ populations. The majority of propellant would be expended before booster drop and impact, and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)
In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect pinnipeds hauled out along the adjacent coastline and Essential Fish Habitat. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight, and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species’ populations. (U.S. Department of the Air Force, 2001)

Debris impact and booster drops in the BOA off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel are on standby status for all launch activities as a protective measure.

In the unlikely event of an accidental release of stored liquid propellant, Vandenberg AFB’s Hazardous Materials Emergency Response Plan and Spill Control and Countermeasures Plan would be implemented in order to prevent impacts to biological resources in the vicinity. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations and OSHA requirements would be followed, which would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to wildlife if an accident were to occur. With the above plans in place, no impacts to wildlife are expected as a result of accidental release of liquid propellant.

*Threatened and Endangered Wildlife.* Debris from nominal launches is not expected to impact water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

As discussed above, sensitive marine species in the ocean are widely scattered and occupy relatively small surface areas, and the probability of debris striking a threatened or endangered species is considered remote.

*Environmentally Sensitive Habitat*

No adverse impacts to the coastal dune systems are anticipated as a result of launch activities. Personnel would be instructed to avoid bird nesting and roosting locations and pinniped haul-out areas. Nominal launch activities are not anticipated to impact the wetlands approximately 1.6 kilometers (1 mile) northwest of Building 1819. An early flight termination or mishap would result in widely scattered debris, which could potentially impact the wetlands. Debris would be recovered and removed if practicable.

No adverse impacts as a result of the GMD ETR activities are anticipated to occur within the current Channel Islands National Marine Sanctuary located off the coast south of Vandenberg
AFB. Additional consultation would be performed with the National Oceanographic and Atmospheric Administration following their decision on the sanctuary boundary expansion.

4.5.2.3.2 In-Flight Interceptor Communication System Data Terminal Construction

Once an IDT site is selected, biological surveys would be conducted as required.

Vegetation

The IDT (figure 2.3.2-1) would require disturbance of approximately 5.9 hectares (14.6 acres), including a perimeter road, with a fenced area of approximately 3.2 hectares (8 acres). The minimal requirements include a concrete base for the COMSATCOM, an all-weather road to the site, and a prepared surface within the fence around the site at least 4.6 meters (15 feet) wide. This loss of vegetation would represent only a small portion of the total vegetation available within Vandenberg AFB boundaries.

Threatened and Endangered Plant Species. No federally proposed or listed candidate, threatened, or endangered plant species would be impacted by installation of the IDT.

Wildlife

Impacts from ground disturbance and equipment noise could include loss of habitat, displacement of wildlife, increased stress to wildlife, and disruption of daily or seasonal behavior. However, new construction would occur in previously disturbed areas to the maximum extent practicable. Additional habitat for species that could potentially be displaced is located adjacent to the areas proposed for disturbance. Site preparation activities would not result in impacts to Essential Fish Habitat since no water bodies would be affected.

Noise rather than the sight of machines appears to cause more disturbance to wildlife. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat (Larkin, 1996). As mentioned above, a short-term maximum noise exposure of 92 dB, which level is equivalent to being 1 meter (3 feet) from a power lawnmower, was suggested as a significant cut-off for impacts in a noise monitoring study for the HEDI I missile (U.S. Army Strategic Defense Command, 1990; 1989). This noise level is similar to the range of 80 to 90 dBA defined as known to disturb waterfowl and wildlife.

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 to 98 dBA. Wildlife is known to exhibit a startle response when exposed to short-term noise impacts. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. However, sufficient foraging and feeding habitat occurs in adjacent areas. Studies (U.S. Department of the Air Force, 1997) indicate that birds usually show signs of disturbance, such as fluttering of wings, when a noise event occurs, but quickly return to normal behavior after the event. Although construction activities could cause flushing (birds suddenly flying up), this is a common reaction to sudden natural sounds that only slightly increases the energy expenditure of individual birds. Some wildlife may leave the area permanently, while others may likely become accustomed to the increased noise and human presence.
Locations proposed for IDT use are inland and site preparation would not impact Essential Fish Habitat; wildlife associated with the coast, such as hauled out pinnipeds; or marine mammals offshore. Site preparation activities would be limited in duration. Construction is therefore not expected to have a long-term significant adverse effect on wildlife.

**Threatened and Endangered Wildlife Species.** Disturbance from site preparation activities would be restricted mainly to areas within 15 meters (50 feet) from the construction site. Listed wildlife species such as the California brown pelican and southern sea otters would not be affected by site preparation noise since they are found along the coast or offshore. No waterbodies that support listed species would be affected by site preparation activities.

*Environmentally Sensitive Habitat*

No wetlands or other sensitive habitat would be disturbed during construction and installation of the IDT.

**Operation**

During normal operations, the IDT would not transmit except for a few minutes during annual testing of the equipment. Given the short duration of transmission, no adverse impacts to biological resources are anticipated. Most operational impacts to wildlife from the IDT would come from security lighting and noise from electrical generators required for the site. The lighting and noise could encourage species less tolerant of these disturbances to avoid the area. Generator noise could range from 80 to 85 dBA at up to 105 meters (344 feet). These noise levels would only occur a couple of hours a week during maintenance activities required for backup generators or continuously if no commercial power is available.

4.5.2.3.3 **Targets**

Impacts of site preparation and launch activities in support of target launches from Vandenberg AFB would be the same as those addressed in Alternative 1.

4.5.2.4 **Alternative 3**

Alternative 3 would consist of a combination of Alternative 1 and Alternative 2 with similar or the same potential for impacts to biological resources.

4.5.2.5 **Cumulative Impacts**

Prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a; U.S. Department of the Air Force, 1999) indicated no cumulative impact to biological resources for up to six GBI launches annually. The proposed GMD launches would be included in the number of intercontinental ballistic missile currently allowed under Vandenberg AFB’s 5-year programmatic permit and Letter of Authorization. If the annual launch rates from Vandenberg AFB increase above the levels currently projected and covered under the National Marine Fisheries Service authorization, the Letter of Authorization would be amended accordingly with appropriate analysis of impacts to marine mammals. Missile launches are short-term, discrete events, thus allowing time between launches for emission products to be dispersed and minimizing the potential for cumulative impacts to vegetation and wildlife. Launch activities would also be performed at different times and locations. Debris from
the Proposed Action and other launch operations on Vandenberg would impact different areas of the Pacific Ocean. Therefore no cumulative impacts to biological resources are anticipated from the proposed missile launches when combined with other current and planned activities on Vandenberg AFB.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. The operation of backup generators at each LF would be similar to those described above for the IDT, and would result in minor cumulative impacts.

No cumulative impacts to biological resources are expected as a result of fuel and oxidizer transport operations. Accidental releases or spills of liquid or gaseous materials would be contained or dispersed before reaching sensitive vegetation or wildlife. The amount of gaseous materials dispersed during launch is not expected to result in an increased potential for cumulative impact to marine species when combined with the missile launches currently planned from Vandenberg AFB.

4.5.2.6 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities at Vandenberg AFB since noise monitoring during the initial launch of a GBI and harbor seal monitoring during the pupping season would be performed in accordance with current Vandenberg AFB SOPs.

4.5.3 CULTURAL RESOURCES—VANDENBERG AIR FORCE BASE

4.5.3.1 No Action Alternative

Under the No Action Alternative, GMD ETR activities would not be established and Vandenberg AFB would be operated as a test area for space and missile operations. Other GMD activities would continue, such as the GBI test flights for Booster Verification tests. No additional impacts to cultural resources would occur as a result of the No Action Alternative.

4.5.3.2 Alternative 1

4.5.3.2.1 Target

Construction

Possible minor modifications may be required for both LF-6 and LF-3. Both of these are eligible for listing on the National Register of Historic Places. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure their protection or appropriate mitigation to preserve information concerning the sites.

Operation

Proposed target operations for Alternative 1 at Vandenberg AFB would include single and dual launches of target missiles.
**Flight Activities**

Target launch activities would be similar to interceptor launches. Potential effects could result from debris striking the ground where surface or subsurface archaeological deposits or other cultural resources are located resulting in soil contamination, fire, and/or resource damage, which would all require a reparation effort. These efforts would be coordinated with applicable range representatives and agencies to develop appropriate mitigation measures to avoid impact to sensitive resources and to restore natural areas as necessary. Debris falling offshore would pose no threat to Vandenberg AFB’s cultural resources.

Lastly, potentially adverse effects to area historic and prehistoric resources could also occur as a result of the unauthorized collection of artifacts by flight preparation personnel. Personnel would receive a brief orientation involving a definition of cultural resources and protective federal regulations.

**Post-Flight Activities**

If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in accordance with Vandenberg AFB procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with Vandenberg AFB personnel to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.

**4.5.3.2.2 Sensors**

**Operation**

Existing range sensors at Vandenberg AFB include several range radars (AN/TPQ-18, AN/FPS-16, High Accuracy Instrumentation Radar, AN/MPS-39, TPS-X) as well as fixed and mobile telemetry and optics equipment. Launch control would be located in existing launch control facilities. No additional impacts to cultural resources would result from these existing sensors in support of the GMD ETR activities.

**4.5.3.3 Alternative 2**

**4.5.3.3.1 Ground-Based Interceptors**

**Construction**

Construction would include minor modifications to existing facilities. As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected. The GMD Project Office would be responsible for implementation of any cultural resources avoidance or mitigation measures assigned to this project as a condition of approval for proceeding with any proposed activity. These measures may include, but are not limited to, literature searches, archaeological and American Indian monitoring, flagging or fencing to protect resources, avoidance of resource areas, archaeological testing, data recovery, evaluation of historic structures, and report preparation. If previously undocumented cultural resource items are found during excavation, grading, or other ground-disturbing activities, work would immediately cease. In addition, work would be temporarily suspended within 30 meters (100 feet) of the discovery of the cultural resources until it has been properly evaluated and
secured. Any discovery of previously unidentified cultural resources would be reported to the Vandenberg AFB Historic Preservation Officer.

The modification to LF-21 was covered in detail in the Booster Verification EA (U.S. Department of the Air Force, 1999) and the modification to LF-23 was covered in detail in the Alternate Booster Vehicle Verification Tests EA (U.S. Army Space and Missile Defense Command, 2002c). The Proposed Action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Modifications may be required for Buildings 1819 and 1900, as well as for LF-02, LF-03, and LF-10 described above. All of these facilities are eligible for listing on the National Register of Historic Places. Prior to the reuse of these facilities, consultation would occur with the State Historic Preservation Officer to ensure their protection or appropriate mitigation to preserve information concerning these facilities.

For communication among the components at Vandenberg AFB, the Proposed Action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Trenching for the new communications cable/conduit would have a maximum depth of 0.91 meter (3 feet). Slant/directional drilling is also being proposed as a means of minimizing impacts to the environment if required. Installation of cable would have a localized, minimal impact on cultural resources.

Operation

Flight Activities

Proposed GBI operations for Alternative 2 at Vandenberg AFB would consist of single and dual launches of GBIs. Only in the unlikely event of flight termination over land (necessitating debris recovery within the ROI) would the possibility for impacts to cultural resources from off-road vehicle activity exist. Even then, all areas affected by ground impacts of flight hardware would be cleared of all recoverable debris in strict accordance with current Vandenberg AFB policy.

Other potential effects could result from debris striking the ground where surface or subsurface archaeological deposits are located, resulting in soil contamination, fire, and/or resource damage. The probability of this occurring, however, is considered extremely remote. Debris falling offshore would pose no threat to Vandenberg AFB’s cultural resources.

Lastly, potentially adverse effects to area historic and prehistoric resources could also occur as a result of the unauthorized collection of artifacts by flight preparation personnel. Personnel would receive a brief orientation involving a definition of cultural resources and protective federal regulations.

Post-Flight Activities

If required, debris recovery on land may involve the use of helicopters and off-road vehicles. Recovery of missile and missile components after unsuccessful launches would be conducted in
accordance with Vandenberg AFB procedures. If the potential exists to disturb cultural resources during debris recovery activities, recovery efforts would be coordinated with Vandenberg AFB personnel to avoid impact to sensitive resources and to restore natural areas as necessary following debris recovery efforts.

4.5.3.3.2 Target

Operation

Proposed target operations for Alternative 2 at Vandenberg AFB would be identical as that described for Alternative 1.

4.5.3.3.3 In-Flight Interceptor Communication System Data Terminal

Construction

Proposed IDT construction for Alternative 2 at Vandenberg AFB includes a new IDT with associated roads and cables at one of six alternative locations.

The proposed IDT construction area is located very close to previously paved roads. Approximately 5.9 hectares (14.6 acres) would be disturbed during construction of the IDT. As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected. Records on file at Vandenberg AFB would be consulted to determine whether sites have been identified at this location. Therefore, no archaeological resources are anticipated to be impacted. Should cultural resources be found during the course of any GMD ETR activity, all activities would cease in the area and the proper authorities would be notified. Subsequent actions would follow the guidance provided.

Operation

IDT operations are not expected to adversely impact cultural resources. The nature of the operation of these systems combined with the lack of existing cultural resources would most likely result in negligible impacts. Once again, personnel would be informed of the sensitivity of cultural resources and the types of penalties that could be incurred if sites are damaged or destroyed.

4.5.3.4 Sensors

Proposed sensor operation for Alternative 2 at Vandenberg AFB is the same as that described for Alternative 1.

4.5.3.4 Alternative 3

Alternative 3 at Vandenberg AFB would consist of a combination of both Alternatives 1 and 2.

4.5.3.5 Cumulative Impacts

Construction would occur in new locations with minimal impact and not result in cumulative impacts to cultural resources. The total area disturbed during IDT construction would be
approximately 5.9 hectares (14.6 acres), which is approximately 0.01% of the 39,821 hectares (98,400 acres) owned by Vandenberg AFB. Launches from Vandenberg AFB are limited to 30 annually (10 military launches from north Vandenberg AFB and 20 space launches). The prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002a; U.S. Department of the Air Force, 1999) indicated no cumulative impact to cultural resources for up to six GBI launches annually. Based on preliminary planning information through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the 30 annual launch limit from Vandenberg AFB. Missile launches are short-term, discrete events. Activities would be performed at different times and locations, and therefore no cumulative impact to cultural resources is anticipated.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. Operations would include backup generators at four GBI LFs, and minor site preparation activities. However these actions would not result in cumulative impacts to cultural resources.

4.5.3.6 Mitigation Measures
No cultural resources mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB at this time. However, once specific communication and fiber optic cable routes are identified they would be reviewed to determine if cultural resources mitigations are necessary. As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected.

4.5.4 GEOLOGY AND SOILS—VANDENBERG AIR FORCE BASE
The proposed program activities have the potential to increase soil erosion during construction of IDT facilities. GBI and target missile launches could alter the chemical composition of site soils from exhaust emissions. No known geologic resources exist at any of the proposed program locations and no impacts are anticipated. Program support facilities, IDT, sensors, radar, and other critical equipment would be potentially subject to strong vibratory ground motions from moderate earthquakes.

4.5.4.1 No Action Alternative
If the No Action Alternative were selected, Vandenberg AFB would support single target launches and GBI test flights in support of GMD-related Booster Verification Tests. No additional environmental consequences would be anticipated from the GBI and target launches because Vandenberg AFB is an existing U.S. Air Force test range and, as such, routinely conducts testing similar to the GMD program. Existing environmental documentation, including the Alternate Booster Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c) and the Booster Verification Test EA (U.S. Department of the Air Force, 1999), would cover all environmental aspects of the No Action Alternative.
4.5.4.2 Alternative 1

4.5.4.2.1 Targets

Construction

The proposed activities under Alternative 1 would use existing facilities at Vandenberg AFB to support target operations; therefore, no new construction would be required, and no adverse affects to geology or soils would be expected from proposed activities.

Operation

Vandenberg AFB could support up to five target launches per year over the duration of the test program. Target missile launches could cause minor alteration of local soil chemistry as a result of exhaust emissions and debris from the launch. The potential adverse effects to soil would be minor and would be the same as that described in section 4.1.5.2.1.

There would be a potential for strong, near-field vibratory ground motion at Vandenberg AFB from seismic activity on the active Lion’s Head, Hosgri, Santa Ynez River, and Honda faults that transect Vandenberg AFB, and from other known active faults in Santa Barbara County. Movement on any of these known active faults would potentially affect the project area, as would activity along the regional San Andreas Fault System. Strong ground-shaking could promote mishaps and possible spills during storage and handling. However, the recurrence intervals for major earthquakes (magnitude 5.2 to 7.0 on the Gutenberg and Richter scale) are wide ranging, from every 14 to 115 years (U.S. Department of the Air Force 1999), and the base has not reported historic damage to its facilities from earthquakes (U.S. Department of the Air Force 1999). Although some of these faults have displayed evidence of surface rupture in the last 10,000 years, it is not expected that future earthquakes would cause surface ruptures at or directly adjacent to any of the proposed facility sites. In addition, given the periodic nature of the program testing periods, the risks to program support personnel would be minor.

4.5.4.3 Alternative 2

4.5.4.3.1 Ground-Based Interceptors

Construction

Modifications to LF-21 and LF-23, and upgrades to the Missile Assembly Building and launch control buildings, have been covered under the Alternate Booster Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c) and the Booster Verification Test EA (U.S. Department of the Air Force, 1999), which concluded no adverse effects to geology and soils would be anticipated. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Modifications to existing facilities would not cause adverse effects to geology and soils.

For communication among the components at Vandenberg AFB, the proposed action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to
avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would have a localized, minimal impact on geology and soils.

**Operation**

GBI target launches would create minor adverse affects to the site soils as a result of GBI rocket emissions. The potential effects from a nominal launch as well as possible premature termination are described in section 4.1.5.2.1.

The potential adverse effects from seismic ground shaking of GBI facilities would be the same as that described in section 4.5.4.1.

**4.5.4.3.2 Targets**

Under Alternative 2, target construction would be the same as that described for Alternative 1.

**4.5.4.3.3 In-Flight Interceptor Communication System Data Terminal Construction**

The Alternative 2 action would require new construction for an IDT and a connecting road and cables at one of six alternate locations. The probable area of soil disturbance for the site preparation activities would be approximately 5.9 hectares (14.6 acres), primarily owing to grubbing and clearing of vegetation within the perimeter fence, foundation excavation, stockpile, and equipment maneuver areas. Minor effects to soils would be likely to occur as a result of potential soil erosion, depending on the local relief and soils at the selected alternate site.

Before determining the final site layout and design standards for the IDT facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.

**Operation**

Operation of the IDT at Vandenberg AFB would have no direct or indirect, short- or long-term adverse effects on site geology or soils. The potential adverse effects from seismic ground shaking of IDT facilities would be the same as those described in section 4.5.4.1.

**4.5.4.4 Alternative 3**

Alternative 3 includes all actions as described for Alternatives 2 and 3.

**4.5.4.5 Cumulative Impacts**

The existing mission of Vandenberg AFB is to conduct space and missile test activities similar to those proposed for GMD ETR. The proposed action would pose no cumulative impacts to geology and soils, with the exception of minor residual deposition of exhaust emissions from multiple launches over the duration of the program. This alteration in soil chemistry would be local and would not pose an increased risk to human health, as described in section 4.1.5.2.1.
Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. Operations would include backup generators at four GBI LFs, and minor site preparation activities. Adherence to established procedures would limit potential impacts and not result in cumulative impacts to geology and soils.

4.5.4.6 Mitigation Measures

Although no specific mitigation measures are proposed, standard measures for seismic safety would include special provision for proper anchoring and/or dampening of missile components and fuel canisters while in storage. Likewise, missile storage buildings and Missile Assembly Buildings would be inspected to ensure structural integrity of foundation, roof, wall connections, and storage racks to reduce risk to program personnel during a design seismic event. Before determining the final site layout and design standards for IDT facilities, information bearing on seismic design and construction standards and surface faulting potential would be considered by the design engineer and geotechnical consultant.

4.5.5 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—VANDENBERG AIR FORCE BASE

This section addresses potential impacts that could result from the storage and use of hazardous materials and the generation and disposal of hazardous waste associated with launch operations from Vandenberg AFB, and construction required to support GMD launch operations. Pollution prevention, recycling, waste minimization, IRPs, USTs, ASTs, asbestos, lead-based paint, and PCBs have been considered. Potential impacts from launch activities are addressed under each alternative as applicable. A general description of impact on hazardous material and waste management is provided in the beginning of section 4.1.6.

4.5.5.1 No Action Alternative

Under the No Action Alternative, Vandenberg AFB would continue to be operated as a test area for space and missile operations. GMD-related activities such as the booster verification test flights addressed in the EA for Booster Verification Tests (U.S. Department of the Air Force, 1999) and the Alternate Booster Vehicle Verification Tests EA (U.S. Army Space and Missile Defense Command, 2002c), and single target launches would continue. No new substantive use of hazardous materials or generation of hazardous waste would occur as a result of the No Action Alternative.

4.5.5.2 Alternative 1

4.5.5.2.1 Targets

Alternative 1 would involve single and dual target launches from Vandenberg AFB. This is within the range of launches routinely performed at Vandenberg AFB, as described in chapter 2.0 and under the No Action Alternative, and no new substantive use of hazardous materials or generation of hazardous waste would occur.
Operation

Vandenberg AFB could support the proposed five target launches per year over the duration of the test program. Existing hazardous materials and waste management procedures at Vandenberg AFB would ensure that no adverse environmental impacts occur. MDA would be responsible for the shipment and distribution of hazardous materials to the base. Vandenberg AFB Safety and Environmental offices would provide guidance for the receipt and storage of hazardous materials, and the disposal of hazardous waste generated from implementation of Alternative 1.

Pre-Launch Activities

Pre-launch activities include transportation of target missiles to Vandenberg AFB, temporary storage, pre-launch assembly and checkout, and preparation of the missiles for launch.

Missile components arrive at Vandenberg AFB approximately 4 to 6 weeks before launch. Missile components would be handled and stored in accordance with applicable federal, state, and U.S. Air Force regulations. An ESQD would be established around storage and assembly areas based on the equivalent explosive force of propellant contained within the missile.

As discussed in section 3.5.4, hazardous materials (external to those preloaded into the missiles) that may typically be used as part of missile launch activities include coatings, cleaners, solvents, lubricants, and motor and diesel fuel. Most of these materials would be consumed during use, generating minimal waste. In the unlikely event that a spill or release occurs, the use of procedures outlined in the Vandenberg AFB SPCC Plan and Hazardous Materials Emergency Response Plan would ensure that the potential impact would be minimal. Target launch and launch support activities would not require additional fuel storage tanks or hinder actions at Vandenberg AFB IRP sites.

Facility modifications associated with target launch and launch support activities at Vandenberg AFB may disturb asbestos or lead-based paint. Management and abatement of asbestos and lead-based paint at Vandenberg AFB would be compliant with the Vandenberg AFB Lead-Based Paint Management Plan, Air Force Instruction (AFI) 32-1052, Facility Asbestos Management Plan, the Vandenberg AFB Asbestos Management Plan, the Asbestos Operating Plan, as well as the appropriate state and federal regulatory requirements and standards referenced in appendix B. Best practices, lessons learned, and expectations indicated in the Vandenberg AFB Lead-Based Paint Management Plan, AFI 32-1052, Facility Asbestos Management Plan, the Vandenberg AFB Asbestos Management Plan, and Asbestos Operating Plan would be incorporated into design and construction plans.

Launch Activities

Flight activity considerations include the Launch Hazard Area, flight corridor clearance, missile launch, and missile impact.

An ESQD would be calculated around the launch site based on the equivalent explosive force of all propellant and pyrotechnic materials contained within the missile. Before each launch, the Vandenberg AFB Safety Office computes a toxic hazard corridor to ensure surrounding communities are not at risk in the event of an anomaly. Only when meteorological conditions indicate this corridor does not extend off the base is the operation allowed to proceed.
It is possible for a missile booster to detonate or for the propellant to burn but not explode and terminate the launch at the launch site. It is also possible for missile flight to be terminated at the point of/shortly after liftoff, or to be terminated shortly after the missile has left the launch pad. In the event of such a mishap, the incident would be handled as an explosive ordnance event. In accordance with Range Safety Requirements, EWR 17-1, an emergency response team from Vandenberg AFB would be on standby near the launch site to ensure immediate response and rapid control in the event of such an occurrence. The emergency response team would consist of Vandenberg AFB fire-fighting, safety, medical, and bio-environmental engineering personnel. Any remaining hazardous materials would be regarded as hazardous waste for management purposes. The resulting hazardous waste would be rendered safe by Explosive Ordnance Disposal personnel and disposed of in accordance with applicable federal, state, and base requirements.

If a launch is terminated after the missile has left the launch pad, then hazardous material would remain within the ESQD/evacuation zone and there would be minimal impact to personnel and no impact to the public from an accidental release. Any debris would fall within the Vandenberg AFB Test Ranges and the open ocean west of the base. Areas such as oil rigs and shipping lanes would be cleared before launch in accordance with existing Vandenberg AFB SOPs. Any debris falling on Vandenberg AFB would fall in areas cleared before launch and would be handled in accordance with Vandenberg AFB emergency response plans.

Post-Launch Activities
Post-flight activities involve check of release areas, clean-up, and transportation from Vandenberg AFB. Following test activities, the target launch facilities would be readied for the next use or placed in standby mode. Any waste would be collected and segregated as nonhazardous, hazardous, and possibly special wastes for proper disposal in accordance with federal, State of California, and DoD requirements. Specific restoration actions, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

4.5.5.3 Alternative 2
Alternative 2 would consist of activities described in the No Action and Alternative 1 except as noted herein. Single and dual launch of GBI missiles would also occur under Alternative 2. GBI-related activities would include support facility modification, and IDT construction and operation. Hazardous materials use and hazardous waste generation would be managed as described in section 3.1.6.

4.5.5.3.1 Ground-Based Interceptor

Construction
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant impacts to hazardous materials and hazardous waste. The Proposed Action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require
modifications. The staging areas for any construction materials and equipment associated with the modification of the missile launch silos or buildings would be paved. Since some of the facilities proposed for use were constructed in a period during which lead-based paint was used as exterior and interior coating and asbestos was used in equipment and construction materials, the minor modifications planned could result in disturbance of exterior or interior surfaces.

Prior to the initiation of any construction/structural modification, the contractor responsible for facility modifications would perform surveys and sampling for lead-based paint, asbestos and PCBs using applicable federal, state regulations, the Vandenberg AFB Lead-Based Paint Management Plan, AFI 32-1052, Facility Asbestos Management, the Vandenberg AFB Asbestos Management Plan, the Asbestos Operating Plan, the Vandenberg AFB PCB Management Plan and the Vandenberg AFB Hazardous Waste Management Plan. Any removal/abatement or disposal of these hazardous wastes would be conducted in accordance with applicable federal and state regulations, and the referenced AFI and Vandenberg AFB management plans and requirements. Therefore, there is a low likelihood of the potential release of lead-based paint, asbestos, or PCBs.

The potential installation of new conduit and fiber optic cable would not likely result in the release of a potentially hazardous material or waste.

Missile components would be handled and stored in accordance with applicable federal and state, and U.S. Air Force regulations as discussed in section 3.5.4 and under the No Action Alternative and Alternative 1. No onsite fueling of the GBI would be required. No release or spills of hazardous materials would be expected as a result of pre-launch operations.

**Operation**

GBI launch operations would be conducted as described in section 4.1.6. The proposed launch of GBIs from Vandenberg AFB is not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at Vandenberg AFB. MDA would be responsible for the shipment and distribution of hazardous materials to the base. Transportation and handling of missile components are discussed in section 2.3.2. Vandenberg AFB Safety and Environmental Offices or the MDA contractor would be responsible for the receipt and storage of hazardous materials, and the disposal of hazardous waste.

**4.5.5.3.2 In-Flight Interceptor Communication System Data Terminal**

Hazardous materials use would be minimal for IDT construction and operation and would consist of corrosion control materials (e.g., paints) and low-toxicity cleaning products. These materials are routinely used at Vandenberg AFB and would be handled in compliance with applicable federal, state, and base regulations and requirements.

**4.5.5.4 Alternative 3**

The proposed actions and potential impacts would be the same as those described under Alternatives 1 and 2.
4.5.5.5 Cumulative Impacts
Construction would occur in new locations with minimal impact and not result in cumulative impacts to hazardous waste and hazardous materials management. Launches from Vandenberg AFB are limited to 30 annually (10 military launches from north Vandenberg AFB and 20 space launches). The prior EAs that analyzed GMD activities at Vandenberg AFB (U.S. Army Space and Missile Defense Command, 2002c; U.S. Department of the Air Force, 1999) indicated no cumulative impact to hazardous materials and waste management for up to six GBI launches annually. Based on preliminary planning information through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the 30 annual launch limit from Vandenberg AFB. Adherence to the hazardous materials and waste management systems on Vandenberg would preclude the accumulation of hazardous materials or waste, and therefore no cumulative impact to hazardous material or hazardous waste management practices is anticipated at Vandenberg AFB.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. These actions would also adhere to hazardous materials and waste management systems on Vandenberg and not result in cumulative impacts.

4.5.5.6 Mitigation Measures
No hazardous waste/hazardous materials management mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.6 HEALTH AND SAFETY—VANDENBERG AIR FORCE BASE

4.5.6.1 No Action Alternative
Under the No Action Alternative, single target launches would occur at Vandenberg AFB. Regional safety programs would be the same as safety programs for current launch systems as described in section 3.5.5. Potential issues related to health and safety would be associated with pre-launch, launch, and post-launch activities. Planning and execution of target launches would be in compliance with federal, state, local, and range health and safety requirements. Therefore, no increase in risk to health and safety would be expected as a result of implementing this alternative.

4.5.6.2 Alternative 1

4.5.6.2.1 Target
Construction
Existing launch facilities, support facilities, and equipment would be utilized for the target launches. No construction or facility modification would be necessary under this alternative. Therefore, no increase in potential impact to health and safety would be expected from construction activities.
**Pre-Launch Activities**

Launch preparation activities would consist of transportation and storage of the booster/launch vehicle, target re-entry vehicle, missile components, and support equipment to Vandenberg AFB. Transportation of missile components would be accomplished by aircraft or over road by truck in compliance with applicable state, federal, and U.S. Air Force safety regulations. Hazardous materials and explosives would be packaged in shipping containers designed according to DOT requirements to protect against release in the event of an accident. All containers would have proper placards, and only carriers licensed to handle/transport hazardous materials would be utilized. These transportation procedures would minimize the potential for accidents, as well as provide the means of mitigating potential adverse effects should an accident occur. Therefore, no health and safety effects to the general public or to military and government-employed civilians working on the base are anticipated.

Storage areas would be fenced, and appropriate placards would be used. Access would be limited to mission critical personnel. All personnel associated with the Proposed Action, including material storage, would be properly trained in compliance with 29 CFR 1910 procedures and other applicable state and federal regulations and guidelines. However, the handling and assembly of missile components, accomplished within enclosed areas, has the potential to affect worker health and safety training; adherence to appropriate safety regulations and operating plans and protocol would serve to maintain potential health and safety risks to mission personnel within acceptable levels. Since public access to Vandenberg AFB is limited, and since ESQDs would be established around storage areas and Buildings 1855 and 6816, no impact to public health and safety would be expected.

**Launch Activities**

Compliance with launch safety regulations would be provided through 30 SW/CCC, 30 SW/SE, and the Mission Flight Space Control Officer. A written procedure for all explosive pre-launch activities is required and must be approved by 30 SW/SE. An ESQD would be established around the launch site because of the potential for missile malfunction during a launch. Established procedures to prohibit access to restricted areas would be followed. The restricted areas are based upon the probability of potential hazards involved with malfunction during test flights and would include:

- The impact limit line, which sets the boundary of the protection line for all non-mission-essential personnel
- The launch caution corridor, an area limited to essential personnel
- The Launch Hazard Area, an area around the launch point limited to essential personnel in hardened facilities (approximately 20 essential personnel in the Launch Control Center)
- The stage impact area

For impact limit lines that extend beyond Vandenberg AFB boundaries, an agreement would be made with the appropriate landowners to control the use of these areas during launches. The 30 SW/SE and the 30th Range Squadron Airspace and Offshore Management Section (for offshore oil rigs) would oversee evacuations of surrounding land and water users.
An emergency response team, consisting of fire fighting, safety, medical, and bio-environmental engineering personnel, would be near the proposed project site during launch activities. Additional Vandenberg AFB personnel and resources would be called out if needed. Emergency response would also be provided through local county entities, if needed. The range of acceptable launch azimuths for a Minuteman II from LF-23 was between 260 degrees and 280 degrees. The final range of approved azimuths for target launches would be determined after submittal of the preliminary flight data package, which defines the proposed launch azimuth and all launch vehicle performance characteristics for the proposed launch vehicle configuration. The azimuth would be limited to ensure that potential missile failure would not result in debris outside the azimuthal boundary. Final launch azimuth boundaries would be established after all vehicle performance data and areas of endangerment are reviewed, and Flight Termination System requirements are established.

Target launches would take place in either existing restricted areas or warning area airspace that would be cleared of non-participating aircraft. The launches would be short-term events, after which joint-use airspace would be released to other users; advance scheduling would obviate impacts. The Flight Safety Analyst from 30 SW/SE would define which airspace areas would potentially be affected by the Proposed Action and the Chief of Range Operations would coordinate with the FAA and the U.S. Coast Guard to identify and address any issues of concern. No additional impacts would occur to airspace as a result. With the implementation of the appropriate safety regulations and approvals and coordination with 30 SW/SE, the target launches would not be expected to present a substantial impact to the health and safety of base workers and personnel or the public.

The Western Range has a three-tiered, three-zone deterministic approach plus a probabilistic approach to protecting against harmful toxic exposures of hydrogen chloride. The Western Range implements safety measures that are designed to protect mission essential and non-mission essential persons. Before launch, the Rocket Exhaust Effluent Diffusion Model is used to locate toxic zones.

There are three zones for assessing an individual’s proximity to toxic combustion products, including those that could result from a launch failure. Zone 1 is an area where airborne concentrations of any toxic product are equal to or exceed Tier 1 levels (2 ppm) but are less than Tier 2 levels (10 ppm). Zone 2 is an area where airborne concentrations of any toxic product are equal to or exceed Tier 2 levels (10 ppm) but are less than Tier 3 levels (50 ppm). Zone 3 is an area where airborne concentrations of any toxic product range from a low defined by Tier 3 (50 ppm) to an unknown high. Table 3.5.6-1 describes the Tier levels.

Before launch, the Rocket Exhaust Effluent Diffusion Model is run to ensure that any mission essential persons within a Zone 2 (having predicted hydrogen chloride concentrations exceeding the Tier 2 level [see 30 SWI 91-106, 1998]) are aware of being in a Zone 2, have personnel protection equipment, and have a pre-determined route of departure. If mission essential personnel do not meet these requirements, then they are relocated out of the zone. Any non-mission essential people on-base are also moved, if feasible. If they cannot be moved, or if they are off-base and not subject to being moved, then their locations and exposure are taken into account in the risk assessment procedure.

The Western Range toxic risk-assessment-based recommendation to launch or not to launch is based on the results of the LATRA program (i.e., risk assessment program) that evaluates the
risk to people, regardless of whether they are mission essential or non-mission essential. Among other criteria in determining whether to launch, the LATRA accounts for (1) whether people are sheltered or unsheltered; (2) whether they are healthy or sensitive individuals; and (3) the probability of a catastrophic launch failure.

Post-Launch Activities
Minor facility maintenance would occur after each launch to ensure that the launch site would be operational for the next test. Post-launch procedures would include silo inspection, removal of blast residue, and minor silo refurbishing. Any blast residue generated from the launch would remain within the launch silo and the missile canister. Entry to the silo would be restricted to trained and approved personnel in proper protective equipment. The blast residue would be removed, collected, and properly disposed of according to 40 CFR, California Code of Regulations Title 22, and the Vandenberg AFB Hazardous Waste Management Plan. Should the residue be identified as hazardous, there would be no impact to the health and safety of base personnel or the public.

4.5.6.2.2 Sensors
Sensor operation would continue at current levels. No increased impact to health and safety would be expected as a result of implementing Alternative 1 at Vandenberg AFB.

4.5.6.3 Alternative 2
4.5.6.3.1 Ground-Based Interceptor
Construction
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant safety related impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. Any facility modifications would comply with OSHA, U.S. Air Force safety and health regulations, Range Safety Requirements, and other recognized standards for operations that involve construction. Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers. A formally trained individual would be appointed to act as safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of construction team personnel and visitors to the job site. Compliance with regulations would ensure that no health and safety impacts would result from the silo and building modification.

Operation
Pre-launch, launch, and post-launch activities would generally occur as discussed in section 4.5.4.3.1. No increased impact to health and safety would be expected.
4.5.6.3.2 Target

Construction
Construction of a target launch pad would generally occur as discussed in section 4.5.4.3.1. Adherence to base safety plans and procedures would ensure no increased risk to health and safety.

Operation
Pre-launch, launch, and post-launch activities would generally occur as discussed in section 4.5.4.2.1. No increased impact to health and safety would be expected.

4.5.6.3.3 In-Flight Interceptor Communication System Data Terminal

Construction
Adherence to base safety plans and procedures would ensure no increased risk to health and safety.

Operation
Adherence to base safety plans and procedures would ensure no increased risk to health and safety.

4.5.6.3.4 Sensors
Sensor operation would continue at current levels. No increased impact to health and safety would be expected as a result of implementing Alternative 2 at Vandenberg AFB.

4.5.6.4 Alternative 3
Implementation of Alternative 3 would include all of the components Alternative 1 and Alternative 2. Therefore, no increase in potential risk to health and safety would be expected as a result of selecting this alternative.

4.5.6.5 Cumulative Impacts
Adherence to Vandenberg AFB safety plans and procedures would preclude potential cumulative impacts to health and safety resulting from the implementation of the GMD ETR. Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. These actions would also adhere to Vandenberg AFB safety plans and procedures and not result in cumulative impacts. Based on Vandenberg AFB SOPs and other activities in the area, there is minimal potential for cumulative health and safety risk to the public from operations at Vandenberg AFB.

4.5.6.6 Mitigation Measures
No health and safety mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.
4.5.7 LAND USE—VANDENBERG AIR FORCE BASE

4.5.7.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under operationally realistic conditions. Activities and facilities involved in GBI booster verification launches, single target missile launches, and radar operation would continue and would not change Vandenberg AFB’s general land use. Adjacent lands that exhibit open-type agricultural uses with no development would continue to be compatible with the requirements of Vandenberg AFB. Planning and execution of launches would be in total compliance with federal, state, local, and range land use requirements. Therefore, adverse impacts to the land use would not be expected under the No Action Alternative.

The continuation of activities at Vandenberg AFB is compatible with the California CZM Program under the No Action Alternative. Under the No Action Alternative, closures of recreational areas and adjacent parks would continue during periods of hazardous operation. To minimize the land use conflicts, Vandenberg AFB extensively publicizes Launch Hazard Areas. Coastline, beach, and recreational area availability would continue to be made known to the public through various local media sources. Furthermore, similar coastal opportunities are not unique to Vandenberg AFB and are provided elsewhere along the coast.

4.5.7.2 Alternative 1

Under Alternative 1, Vandenberg AFB would conduct single and dual target missile launches and sensor support facilities.

4.5.7.2.1 Target

Construction

Existing launch facilities, support facilities and equipment would be utilized for the target launches. No construction or facility modification would be necessary under this alternative. Therefore, activities would be accomplished completely within the compatible existing locale for such use and would not produce an adverse impact involving land use.

Operation

Pre-Launch Activities

Pre-launch activities would involve the transportation and storage of missile components and support equipment to Vandenberg AFB. All missile components and support would be handled, labeled, and stored in accordance with all pertinent FAA, DOT, OSHA, and U.S. Air Force safety regulations for transportation by air and/or over land by trucks. Regulations would minimize the potential for adverse impacts to land use and provide a means of mitigating adverse effects should an improbable mishap occur.

Storage of target missiles and their propellants would occur in separate existing storage areas designed for such use in accordance with all accepted governing standards. ESQDs would be established and maintained around storage facilities.
Before each launch, the target missile and necessary components would be moved from storage to a Missile Assembly Building where it would be assembled and checked before being transported to the launch pad. Transportation of assembled target missiles would use on-base roads. Although temporary on-base closures would cause a land use impact to traffic, closures would be of short duration and considered normal base activity.

**Flight Activities**
Launch preparations scheduled at Vandenberg AFB would follow standard evacuation procedures of the launch vicinity. During the time the target missile booster is on the launch pad, potential impacts to land use could occur. Land areas that are within the Launch Hazard Area would be cleared approximately 1 hour before launch and guarded to ensure they remain clear of all non-mission personnel. A Notice of Intent to clear hazardous areas would be published in the local newspaper and broadcast in local media. Clearance and closures are considered normal operations and would be determined by necessary pre-launch missile Launch Hazard Area determinations and flight corridor clearances.

Under Alternative 1, no new Launch Hazard Area would be created or extended that would violate existing or off-base land uses. Launch operations would utilize the already existing LF-6 or its alternate LF-3 launch silos. Potential impacts to the California Coastal Zone would be the same as determined for the No Action Alternative.

Only a preflight or early flight malfunction resulting in flight termination within the ROI would have any impact on Vandenberg AFB. In the unlikely event of an early flight termination within the boundaries of Vandenberg AFB, target missile and/or debris recovery would follow applicable environmental regulations and range procedures as directed by the Range Safety Officer to minimize impacts on land use by the increase number of activities.

**Post-Flight Activities**
As soon as the Range Safety Officer concludes that all hazardous areas are safe, all non-mission essential personnel would be allowed to return. Post-flight activities would also include removal of blast residue from the launch pad or silo and other minor facility maintenance. These activities would be confined to areas currently used for similar launch activities having no affect on land use.

**4.5.7.3 Alternative 2**
Under Alternative 2, Vandenberg AFB would conduct single and dual GBI and target missile launches and operate necessary IDT and sensory support facilities.

**4.5.7.3.1 Ground-Based Interceptors**

**Construction**
The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant impacts to land use. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying
levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Modifications would be accomplished completely within the compatible existing locale for such use and would not produce an adverse impact involving land use.

For communication among the components at Vandenberg AFB, the Proposed Action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would not have an adverse impact on land use.

**Operation**

Under Alternative 2, pre-launch, flight, and post-flight activities of GBI missiles would be similar to the operation of target missiles in section 4.5.6.2.1.

**4.5.7.3.2 Target**

Under Alternative 2, activities involving target missiles at Vandenberg AFB would include all actions and pose the same potential impacts mentioned under Alternative 1 in section 4.5.6.2.

**4.5.7.3.3 In-Flight Interceptor Communication System Data Terminal**

The construction and operation of a fixed, relocatable, or mobile IDT at Vandenberg AFB would require an area of approximately 5.9 hectares (14.6 acres). The IDT site would include several facilities with commercial electrical power, site backup electrical generation, all-weather access road, security fencing, and water and sewer services. The proposed IDT locations are shown on figure 2.3.2-1 and include Tracking E, Titan, Have Stare, Doppler, Borrow Pit, and Talo Road. Construction at any of the proposed locations would be routinely accomplished and the facility would exist within an area compliant with Vandenberg AFB's overall general land use. Likewise, no conflicts with land use would occur. Furthermore, safety precautions would be followed during operation to prevent any unidentified land use conflicts from arising.

**Operation**

*Pre-Launch Activities*

IDT components would be transported to the operation site from U.S. Government storage depots or contractor facilities by air, sea, or over land by trucks. Delivery would be conducted under routine procedures in accordance with applicable FAA and DOT safety standards to minimize any possible impacts to land use.

*Flight Activities*

Although operation of IDT facilities would only function during times of GMD exercises, installation would immediately be established and secured after delivery, limiting the access to the surrounding area. This would result in a change in land use within the immediate operation area by restricting access to unauthorized personnel. However, all impacts to land use were considered in the facilities site selection and would not decrease land utilization nor change the general land use within or outside the boundaries of Vandenberg AFB.
Post-Flight Activities
Post-flight operation would include the standard maintenance procedures to secure the IDT facilities and preparation for possible relocation of the transportable IDT. Procedures would be confined to areas already used for the establishment of such facilities and would not change or introduce a conflicting use of land within the vicinity.

4.5.7.4 Alternative 3
Under Alternative 3, GMD activities would include all actions and pose the same potential impacts as described in Alternatives 1 and 2.

4.5.7.5 Cumulative Impacts
Since the proposed activities would be compatible with existing Vandenberg AFB land use plans and policies, the potential for cumulative impacts with existing activities are avoided. Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. These actions would also adhere to Vandenberg AFB land use plans and policies and not result in cumulative impacts.

Recreational activities along the Vandenberg AFB’s coast and recreational areas are only available to the public during times of non-hazardous operations. The proposed GMD launches would be encompassed in the yearly planning for intercontinental ballistic missile launches at Vandenberg AFB. Furthermore, similar coastal opportunities are not unique to Vandenberg AFB and are provided elsewhere along the coast.

4.5.7.6 Mitigation Measures
No land use mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.8 NOISE—VANDENBERG AIR FORCE BASE
This section is concerned with the potential impacts due to construction and operation of the GBI, target, and sensor elements of the GMD ETR on the regional noise environment at Vandenberg AFB. Also identified are the potential cumulative impacts and possible mitigation measures.

Noise impacts to wildlife are addressed in section 4.5.2.

4.5.8.1 No Action Alternative
The No Action Alternative would not change the level of noise at Vandenberg AFB. Existing facilities already in use would continue, and the GMD ETR would not be established. The GBI and target launch scenarios would not be tested under operationally realistic conditions.
4.5.8.2 Alternative 1

4.5.8.2.1 Targets

Construction

Construction activities involved in the building and silo modification for target launches for Alternative 1 would be minor at Vandenberg AFB. Current facilities would be used and minor interior and software alterations would be made. Noise impacts to the surrounding environment would be minor.

Operation

Pre-Launch Activities

Noise from launch preparation, including silo and building modifications, would comply with the Occupational Safety and Health Act, the U.S. Air Force Occupational Safety and Health regulations, Range Safety Requirements, and other recognized standards for operations that involve construction or facility modifications. Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan requiring the use of hearing protection when appropriate would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers.

Launch Activities

OSHA has established noise limits to protect workers at their work places. According to these standards, no worker can be exposed to noise levels higher than 115 dBA. The exposure level of 115 dBA is limited to 15 minutes or less during an 8-hour work shift (U.S. Air Force 1992). The OSHA standards are the maximum allowable noise levels for the personnel in the vicinity of the launch pad. Workers exposed to excessive launch noise would be required to wear hearing protection.

Noise from missile launches can range from 60 to 100 dBA in the vicinity of the launch including areas near Lompoc and Santa Maria. The noise from a Minuteman launch is 80 dBA approximately 13 kilometers (8 miles) from the launch site. Figure 4.5.7-1 depicts noise levels for a Minuteman launch from Vandenberg AFB. However, because the launches occur infrequently, the resulting noise has little impact on the L_{dn} or CNEL in these areas. Therefore, ambient noise levels would not be affected substantially on an annual basis from the proposed GMD ETR tests. Noise impacts would also be short in duration.

Since the flight pattern of a target launch would be over the open ocean to the west, the flight would not cross populated areas such as nearby Lompoc or Santa Maria. Therefore, impacts from noise to populated areas would be minor. Noise impacts from prior Vandenberg AFB missile launches have been determined to be short term and therefore insignificant. Based on these results and compliance with regulations, the proposed launches would not cause or contribute to noise impacts.

Post-Launch Activities

Noise generated during the removal of all mobile equipment/assets should have minimal impact to the noise environment.
No substantial noise would be expected from post-launch activities. However, any noise would likely fall within or below the noise level measurements of post-launch noise associated with the previously approved Minuteman launch vehicles. Noise impacts would also be short in duration. Post-launch activities would not cause or contribute to noise impacts.

4.5.8.3 Alternative 2

4.5.8.3.1 Ground-Based Interceptors

Construction

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant noise impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas.

Noise from launch preparation, including silo and building modifications, would comply with the Occupational Safety and Health Act, the U.S. Air Force Occupational Safety and Health regulations, the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), Range Safety Requirements, and other recognized standards for operations that involve construction or facility modifications. Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan, requiring the use of hearing protection when appropriate would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers.

Operation

Pre-Launch Activities

Noises produced during pre-launch activities include noise from mechanical equipment such as worker vehicles and trucks and by the use of the public address systems. Transportation noise would increase as launch support personnel drive to the site and additional trucks bring material to the site.

Launch Activities

All public, civilian, and nonessential personnel would be required to be outside of the ground hazard area where the expected noise levels would be below the 115-dBA limit for short-term exposure.

Personnel would normally be at the Launch Control Center during launches. Although no standards exist for single-event noise exposure, a time-weighted average of 90 dBA is established as a limit for an 8-hour exposure. However, workers exposed to excessive launch noise would be required to wear hearing protection.
The GBI launch noise level is expected to fall within or below the noise level of previously measured Minuteman III launches. Figure 4.5.8-1 depicts the noise levels produced during a Minuteman III launch as well as a Peacekeeper from Vandenberg AFB. Figure 4.5.8-2 depicts the noise levels calculated for a dual launch from the single launch data. Dual launches are expected to occur virtually simultaneously. It is anticipated that noise impacts for dual launches would also fall within OSHA limits.

The flight patterns of GBI launches would be over the open ocean area and would not cross populated areas. Noise impacts from prior Vandenberg AFB launches have been previously determined to be short-term and insignificant. Based on these results and compliance with regulations, the proposed launches would not cause or contribute to noise impacts.

In addition to the noise of the rocket engine, sonic booms are possible. However, GBI launches would be in a western direction and would not occur over land. They are not expected to impact Vandenberg AFB or surrounding communities. Vessels impacted by sonic booms would be expected to experience sound resembling mild thunder.

During operations, it is estimated that up to 300 personnel would be involved in supporting a dual launch. The increase in noise associated with these personnel traveling to and from Vandenberg AFB is expected to be a minor impact.

**Post-Launch Activities**
Noise generated during the removal of all mobile equipment/assets should have minimal impact to the noise environment.

**4.5.8.3.2 Targets**
Under Alternative 2, construction and operation of target facilities and target launches from Vandenberg AFB would be the same as those described in section 4.5.6.3.2 for Alternative 1.

**4.5.8.3.3 In-Flight Interceptor Communication System Data Terminal**
Construction and operation of an IDT at Vandenberg AFB would have minimal impact to the surrounding environment’s noise levels. Construction noises would include noise from mechanical equipment. Noises involving traffic increases are included in analysis for GBI construction.

**4.5.8.4 Alternative 3**
Construction and operation of GBI facilities, target facilities, GBI launches, target launches, and range radars for Alternative 3 would be the same as those described in Alternative 1.
Noise Levels for a Single Launch (LF-03)

Vandenberg Air Force Base, California

Figure 4.5.8-1
Calculated Noise Levels of Dual Launches (LF-03 and LF-06)

Vandenberg Air Force Base, California

Figure 4.5.8-2

EXPLANATION
- Vandenberg Air Force Base
- Water
- California
- Urban Areas
- Roads in Vandenberg Air Force Base
- Railroads
- Major Highways

Noise contours calculated from noise levels monitored during previous Minuteman launches

- Peacekeeper Noise Level (measured at Vandenberg Air Force Base)
- Note: Noise levels from Minuteman launch comparable to GBI and Minuteman target

Source: Berg, 2003

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4.5.8.5 Cumulative Impacts

Since the sound level generated by each launch is a short, discrete event, the potential cumulative impacts to noise from GMD ETR launches would not be substantial. It is not likely that the Proposed Action, in conjunction with current planned or anticipated launches, would result in cumulative noise impacts.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. The operation of backup generators at each LF would be similar to those described above for the IDT, and would not result cumulative impacts.

4.5.8.6 Mitigation Measures

No noise mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.9 SOCIOECONOMICS—VANDENBERG AIR FORCE BASE

4.5.9.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not be tested under operationally realistic conditions. The activities at Vandenberg AFB would continue their current operations. No significant socioeconomic impacts from the No Action Alternative would occur.

4.5.9.2 Alternative 1

Under the implementation of Alternative 1, target launches would occur from Vandenberg AFB.

4.5.9.2.1 Target Operation

Target missile components would be built in contractor facilities and delivered to Vandenberg AFB via air or road for system assembly and checkout. Target launch facilities would include existing launch pads/silos, Missile Assembly Building, missile storage, maintenance and storage, and target launch. There would be up to five missile launches per year. Integration and assembly operations would be performed onsite. A typical ramp up over a 3-month period would be 25, 75, and 150 personnel who would be required to support a target launch. After a launch, a portion of these personnel would immediately depart Vandenberg AFB.

As part of pre-launch and flight activities, a Launch Hazard Area would be established around the launch site. The Launch Hazard Area would result in certain areas of Vandenberg AFB being cleared of personnel in the event of an accident during interceptor launch. Similarly, certain sea-surface areas would also have to be cleared. While the closure areas in question are significant in size, their nature is decidedly temporary; land areas would need to be cleared approximately 1 hour before a launch, with sea surface areas cleared approximately 4 hours before a launch. The actual launch is expected to last approximately 30 minutes. Upon the Range Safety Officer declaring the area safe after a launch, expected to be within hours, the areas can then be reoccupied. Also, the notice given to the local communities via local
newspapers, broadcast media, and commercial fishing and tourist boat trade associations would be extensive. As such, entities with an economic interest in the use of these areas such as the commercial fishing and tourist industries would not be significantly impacted by the proposed clearance areas.

For a dual target launch, up to 175 support personnel would be housed in motels or hotels within the surrounding cities of Vandenberg AFB during the operational phase of the launch. Activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. As outlined in section 3.5.8, there are numerous hotels and motels situated within the surrounding cities of Lompoc, Santa Maria, and Guadalupe, and the availability of temporary accommodation is considered to be adequate.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local communities. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as services, agriculture or manufacturing are anticipated during operational activities. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 1.

### 4.5.9.2.2 Sensors

**Operation**

Instrumentation associated with the launch of a target missile would include existing range control radar and telemetry equipment.

The personnel associated with the launch of a target missile would operate these systems; therefore, no additional personnel other than those associated with a target launch would be needed to operate the sensors and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. Similarly, no significant impacts to businesses or industries are anticipated. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 1.

### 4.5.9.3 Alternative 2

Under the implementation of Alternative 2, GBI launches would be from Vandenberg AFB instead of KLC. The GBI would require construction of an IDT and modifications to existing support facilities at Vandenberg AFB. The other components described in Alternative 1, including the launch of target missiles, would remain the same.
4.5.9.3.1 Ground-Based Interceptor

Construction

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant environmental impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the construction personnel would represent a small but positive temporary economic impact to the local community. Given that construction activities are limited and short-term, the overall impact would be slight and would not cause any significant impacts to local businesses or industries. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 2.

Operation

The impact from the launch of interceptor missiles would be similar to the impact from the launch of target missiles. There would be up to five missile launches per year (combined interceptor and target). Integration and assembly operations would be performed onsite. A typical ramp up over a 3-month period would be 65, 150, and 300 personnel who would be required to support a launch. After a launch, a portion of these personnel would immediately depart Vandenberg AFB.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional personnel would represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local communities. The overall impact would be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as services, agriculture or manufacturing are anticipated during operational activities. Activities related to the implementation of Alternative 2 would not cause any displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 2.

4.5.9.3.2 In-Flight Interceptor Communication System Data Terminal

Construction

Implementation of Alternative 2 would result in the construction of an IDT on Vandenberg AFB. One COMSATCOM would be used as part of the IDT. Approximately 35 construction personnel and related construction equipment and would be involved in the construction of the IDT.

Construction activities related to the implementation of Alternative 2 would not cause any displacement of populations, residences, or businesses. The presence of the construction personnel represents both a potential increase in local service based employment opportunities and a small but positive temporary economic impact to the local community. The overall impact would, however, be slight and would not cause any population growth. No significant impacts to
businesses or industries are anticipated during construction activities. No significant socioeconomic impacts would occur through the construction activities associated with Alternative 2.

**Operation**

An IDT site would require approximately 10 permanent onsite support personnel when in operation. When not in operation, the onsite backup generators would be tested for approximately 200 hours per year. The personnel associated with the IDT would be part of the approximately 300 people required to support an interceptor launch and the extent of the related economic impacts would remain the same. The proposed activities would not cause any population growth or displacement of populations, residences, or businesses within the areas surrounding Vandenberg AFB. Similarly, no significant impacts to businesses or industries are anticipated. No significant socioeconomic impacts would occur through the operational activities associated with Alternative 2.

**4.5.9.4 Alternative 3**

Alternative 3 would combine activities proposed for Alternatives 1 and 2 and would result in impacts that are similar to those discussed under Alternative 1 and Alternative 2.

**4.5.9.5 Cumulative Impacts**

Based on preliminary planning information for fiscal year 2002 through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches would not exceed the current limit of 30 launches per year. The addition of the GMD ETR launches to the identified ongoing and future programs in the ROI would result in a positive cumulative socioeconomic impact.

**4.5.9.6 Mitigation Measures**

No socioeconomic mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

**4.5.10 TRANSPORTATION—VANDENBERG AIR FORCE BASE**

**4.5.10.1 No Action Alternative**

Under the No Action Alternative, the GMD ETR would not be established, and GBI and target launch scenarios would not be tested under operationally realistic conditions. All existing launch areas would continue their current operations. Transportation-related impacts from current operations have been evaluated in previous environmental documents, and no significant impacts were identified.

**4.5.10.2 Alternative 1**

Under the implementation of Alternative 1, target launches would occur from Vandenberg AFB.
4.5.10.2.1 Target Operation

Implementation of Alternative 1 would result in single and dual target launches from Vandenberg AFB. Target missile components would be built in contractor facilities and delivered to Vandenberg AFB via air or road for system assembly and checkout. Target missiles would not be shipped with initiators or other explosive devices. All missile components would be packaged in appropriately designed containers, labeled, and handled in accordance with applicable DOT regulations for the transport of hazardous materials. Some missile components may be shipped to a military airfield near the launch site and transferred to the launch site by vehicle. Trained personnel using only appropriately certified cranes and other materiel-handling equipment would handle missile components and handling equipment in accordance with approved SOPs. There would be as many as five target launches per year. Once at Vandenberg, the missile components would be stored in a Missile Assembly Building until they are assembled for launch.

A maximum of approximately 150 contractor, military, and government civilian personnel would be required to support a single target launch at Vandenberg AFB, whereas a dual target launch would require roughly 175 personnel. They would travel to Vandenberg AFB via commercial airliner or motor vehicle. Target missile contractor personnel would be housed in motels or hotels in the vicinity and would commute to the launch site daily. Government and military test personnel may use military or commercial lodging if available. Assuming 4 persons per vehicle, this would add approximately 40 to 45 vehicles, during peak hours, to the key local roads providing access to Vandenberg AFB such as SR-1, SR-135, Santa Lucia Canyon Road, SR-246, U.S. 101, and Central Avenue. Although the local road system would experience a slight increase in traffic, the increase would only minimally change the ADT on key local roads and would not result in an unacceptable Level of Service.

Target missile launches would not require the temporary closure of any roads off Vandenberg AFB. Roads near the launch pads on Vandenberg are all on U.S. Air Force property. Consequently, no off-base traffic would be affected. Thus, no adverse impact to the area’s transportation infrastructure is anticipated. Target missile launch activity would have no impact on air traffic in the immediate ROI but has the potential to affect rail traffic and marine traffic. However, at Vandenberg AFB, train movement through the base is monitored by electronic surveillance and radio communication between train engineers, station masters, and Vandenberg AFB launch personnel to minimize the possibility of a launch vehicle overflight (U.S. Army Space and Strategic Defense Command, 1994). This is done routinely at Vandenberg AFB, so the target missile launches would not represent a significant new impact. Similarly, ocean vessels would be notified in advance of launch activity by the appropriate safety office as part of their routine operations through a NOTAM by the 11th Coast Guard District. Again, since this is done on a regular basis already, impacts are expected to be not significant.

4.5.10.3 Alternative 2

Under the implementation of Alternative 2, GBI launches would be from Vandenberg AFB instead of KLC. The GBI would require construction of an IDT and possibly minor modifications of existing support facilities at Vandenberg AFB. Were any new communications cable/conduit required, they would be buried along existing roads, insofar as possible. The other components described in Alternative 1 would remain the same.
4.5.10.3.1 Ground-Based Interceptors

Construction

The modification of LF-21 and LF-23 to support GBI launches, and the modification of associated facilities to be used at Vandenberg AFB was analyzed in the Booster Verification EA and the Alternate Booster Vehicle EA and determined to cause no significant environmental impacts. The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. Transportation impacts would be negligible.

For communication among the components at Vandenberg AFB, the proposed action would maximize use of available communications assets, to include cable. If communication cable is not available, new cable would be installed in new conduits. Cable routes would be designed to avoid environmental impacts and would be approved by 30 CES/CEV. Installation of cable would have a localized, minimal impact on transportation.

Operation

The impact from the launch of interceptor missiles would be similar to the impact from the launch of target missiles. Since existing transportation facilities at Vandenberg AFB would be utilized for the GMD ETR program, the presence of approximately 260 GMD program personnel during a single launch or 300 GMD program personnel during a dual launch test flight at Vandenberg AFB, would not adversely impact the transportation facilities at Vandenberg AFB.

4.5.10.3.2 In-Flight Interceptor Communication System Data Terminal

Construction

Implementation of Alternative 2 would result in the construction of an IDT on Vandenberg AFB. An all-weather road would be constructed as part of this alternative. Construction equipment, material, and personnel would arrive at Vandenberg AFB via air or road. Site preparation activities and construction of the IDT would have minimal impact on transportation.

Operation

An IDT site would normally be unmanned, except during acceptance/flight testing, preventative maintenance, corrective maintenance, and future upgrades; this could require support of up to ten personnel. When not in operation, the onsite, diesel-powered backup generators would be tested for approximately 200 hours per year.

Access to the IDT compound would be via an all-weather road from the nearest existing service road through a lockable service gate. There would be a similar road from the gate in the perimeter fence to the IDT building, and a patrol road circumnavigating the fence would be required. A hardened surface of 9.1 meters (30 feet), surrounding the concrete pad, would permit access for a crane or other required equipment where necessary. The personnel associated with the IDT would be a part of approximately 260 GMD program personnel required during a single launch or 300 GMD program personnel required during a dual GBI launch, and thus there would not be an additional impact to transportation systems.
4.5.10.4 Alternative 3

Alternative 3 would combine activities proposed for Alternatives 1 and 2 and would include GBI launches from both KLC and Vandenberg AFB and construction of the required support facilities. The impacts from construction of IDTs and minor modifications to existing facilities at Vandenberg AFB would be the same as the impacts described under Alternative 1 and Alternative 2. The impacts from single and dual GBI and single and dual target launches, as well as operation of range support equipment, would also be the same as described under Alternative 1 and Alternative 2.

4.5.10.5 Cumulative Impacts

Based on preliminary planning information for fiscal year 2002 through fiscal year 2007, the Proposed Action of up to five launches (interceptor and target), in conjunction with current planned or anticipated launches, would not exceed the current limit of 30 launches per year. Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. The addition of the GMD ETR launches to the identified ongoing and future programs in the ROI would result in a minor cumulative impact on transportation.

4.5.10.6 Mitigation Measures

No transportation mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.

4.5.11 WATER RESOURCES—VANDENBERG AIR FORCE BASE

4.5.11.1 No Action Alternative

Existing operations would continue at Vandenberg AFB under the No Action Alternative and any new impacts associated with the GMD ETR would not occur. Water resources-related impacts from current operations have been evaluated in previous environmental documents, and no significant impacts were identified.

4.5.11.2 Alternative 1

4.5.11.2.1 Targets

Construction

Target missile-related construction activities at Vandenberg AFB under Alternative 1 would only consist of minor modifications to the interior of launch silos and associated support facilities. Therefore, there would not be any adverse construction-related water resource impacts under this alternative.

Operation

Deposition of rocket emission products onto surrounding surface waters would occur as a result of target missile launches; however, these impacts would not be significant. These types of impacts are further described in section 4.1.14.2.1. This same issue was assessed for
Vandenberg AFB rocket launches in each of the NEPA-related documents listed below. All of these studies reached the conclusion that related water quality impacts would be adverse but not significant.

- EA for Booster Verification Tests (U.S. Department of the Air Force, 1999)
- Final EIS Evolved Expendable Launch Vehicle (U.S. Department of the Air Force, 1998a)
- Theater Missile Defense Extended Test Range, Supplement to the Draft EIS (U.S. Army Space and Strategic Defense Command, 1994)

4.5.11.3 Alternative 2

4.5.11.3.1 Ground-Based Interceptors

The potential water resource impacts of GBI alternate booster verification construction activities at Vandenberg AFB were addressed by the Alternate Booster Vehicle Verification Test EA (U.S. Army Space and Missile Defense Command, 2002c). The Alternate Booster Vehicle EA concluded that potential impacts from construction and launches of these types of missiles would not be significant. Minor modifications to other support facilities would result in negligible impacts to water resources.

The proposed action would include the use of up to two GBI silos. LF-21 and LF-23 could be used with very minor modifications. LF-02, LF-03, LF-10, and LF-24 would require varying levels of modification. Modifications would include those described in section 2.3.2.1.2. Additional facilities listed in table 2.3.2-1 would also require modifications. All construction staging areas would be located on paved or previously disturbed graded areas. The GMD program would perform sampling and abatement for lead-based paint, asbestos, and polychlorinated biphenyls (PCBs) as required before modification, using Vandenberg AFB-approved procedures. Facility modifications and site preparation activities at the locations identified would have a negligible impact to water resources.

4.5.11.3.2 Targets

The target missile-related impacts associated with Alternative 2 would be the same as those described for Alternative 1 in section 4.5.10.2.1.

4.5.11.3.3 In-Flight Interceptor Communication System Data Terminal

Construction of an IDT under Alternative 2 would disturb approximately 5.9 hectares (14.6 acres) at Vandenberg AFB. Construction projects that disturb 1 acre or greater require a Construction Activities Storm Water General Permit from the California State Water Resources Control Board, or its local Central Coast Regional Water Quality Control Board. A related Stormwater Pollution Prevention Plan would also need to be prepared before the commencement of any soil-disturbing activities. All appropriate water quality-related Best Management Practices would be followed during construction, and related water quality impacts would not be significant. Operation of the IDT would not cause water quality impacts and potable water supplies are sufficient to handle the minor increase in potable water demand.
4.5.11.4 Alternative 3

Alternative 3 would require minor modifications to existing GBI launch sites, and the use of existing missile support facilities and radars. These types of impacts are described under Alternatives 1 and 2.

4.5.11.5 Cumulative Impacts

The major cumulative water resource impact in the Vandenberg AFB ROI is an overdraft condition in the Lompoc Terrace aquifer, caused by the groundwater pumping of a number of communities and water users, including Lompoc and Vandenberg AFB. As Vandenberg AFB continues to rely on imported surface water from the California Department of Water Resource's State Water Project, Vandenberg AFB’s contribution to this cumulative impact would continue to diminish over time and overdraft conditions in the aquifer should improve.

Cumulative, but minor and temporary, increases in stormwater runoff and related discharges of sediments have also occurred in base drainages. These insignificant impacts have typically occurred near areas that have been paved during past construction projects and where runoff rates have increased. Such impacts have been and would continue to be minimized by construction SOPs and the other commitments included in the related Stormwater Pollution Prevention Plans.

Initial defensive operations capabilities being developed at Vandenberg AFB would not include missile launches. However, operations would include backup generators at four GBI LFs, and minor site preparation activities. The operation of backup generators at each LF would be similar to those described above for the IDT, and would result in no cumulative impacts to water resources.

The proposed action of up to five missile launches per year, in combination with other planned launches and activities, would not result in cumulative impacts to surface water, ground water, or ocean water quality.

4.5.11.6 Mitigation

No water resources mitigation measures are proposed for the GMD ETR activities at Vandenberg AFB.
4.6 PEARL HARBOR—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.6.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Current air emission levels would remain the same, as listed in table 4.6.1-1. Operations currently conducted at Pearl Harbor would continue.

Table 4.6.1-1: Emissions Recorded Near Barbers Point

<table>
<thead>
<tr>
<th>Emissions</th>
<th>Averaging Time</th>
<th>Hawaii Standards (μg/m³)</th>
<th>Federal Primary Standards (μg/m³)</th>
<th>West Beach Monitoring Station (μg/m³)</th>
<th>Kapolei Monitoring Station (μg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-10</td>
<td>24-hour</td>
<td>150</td>
<td>150</td>
<td>21</td>
<td>121</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>50</td>
<td>50</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>3-hour</td>
<td>1,300</td>
<td>-</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>365</td>
<td>365</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>80</td>
<td>80</td>
<td>0.1</td>
<td>2</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>1-hour</td>
<td>10,000</td>
<td>40,000</td>
<td>1026</td>
<td>2280</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>5,000</td>
<td>10,000</td>
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<td>1596</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>Annual</td>
<td>70</td>
<td>100</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: State of Hawaii, Department of Health, Clean Air Branch, 2001

4.6.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Construction activities would be conducted in accordance with all appropriate regulations and permits. Other than minor, short-term impacts from construction, no exceedances of the NAAQS or state AAQS would be anticipated.

Operation

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Air quality impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.
Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Pearl Harbor PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 4.8 kilometers (3 miles) from Barbers Point. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the Barbers Point mooring site, only three of the generators would be used. One would operate continually while at the mooring location for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at Pearl Harbor; therefore neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas in the BOA.

4.6.1.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to the air quality in the ROI.

4.6.1.4 Mitigation Measures

No air quality resources mitigation measures are proposed for GMD ETR activities.

4.6.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.2.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Pearl Harbor would continue.

4.6.2.2 Alternatives 1, 2, and 3

The Proposed Action related to airspace would be full power emissions from the SBX while at the mooring location south of Barbers Point. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Airspace impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation. A location outside the approach/departure area for Honolulu International Airport would probably reduce the potential restrictions on SBX operations and simplify the coordination process.
Operation

Controlled and Uncontrolled Airspace

Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect aircraft operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and are shown on figure 3.6.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a radio frequency radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations, EEDs, and communications equipment. The establishment of this SBX high energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations. In addition, the SBX would utilize a real-time link to the FAA operations radar to insure the airspace is clear of any aircraft prior to operating the SBX. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace

There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes

Several en route low altitude airways (V15, V12, V4, V16, V8, V2, V20, and V21) cross the 65 percent and fully populated aircraft interference areas. There are additional approach and departure routes within the ROI that would also need to be considered when defining the SBX
high energy radiation operating area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

**Airports and Airfields**

Honolulu International Airport is located approximately 19 kilometers (11.8 miles) east of the SBX mooring. Kalaeloa (Rodgers) Airport is located approximately 7 kilometers (4.3 miles) northeast of the mooring site, and Wheeler Army Airfield is located several kilometers (several miles) northeast of the ROI. Traffic control radars at these locations would be major factors in the EMR/EMI survey and analysis and subsequent operating permit. Operation of the SBX has the potential to interfere with both aircraft systems and air navigation systems. However, the SBX high-energy radiation area would be configured not to impose any flight restriction requirements and would not change any airfield/airport arrival and departure traffic flows.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the mHz range) than the X-band SBX and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.6.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high power effects).

Emissions from the SBX may also potentially degrade the overall system performance of in-band airborne and ship based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high energy radiation area would be configured to minimize impacts to these airborne and ship based systems.

**4.6.2.3 Cumulative Impacts**

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, the frequency allocation operating permit process would take into consideration potential impacts on other resources in the region and would preclude the potential for cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports.

**4.6.2.4 Mitigation Measures**

The SBX high-energy radiation area would be configured to mitigate potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition to charting the SBX high energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high energy radiation area.
4.6.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Pearl Harbor would continue.

4.6.3.2 Alternatives 1, 2, and 3

Section 2.1.4 includes a description of the SBX.

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Biological impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.

Section 4.3.3.3 includes a general description of the potential for impacts from operation of the SBX. As described in section 2.1.4, the SBX would be mounted on a semi-submersible sea platform. The sea platform would be self-propelled in open water with a cruising speed of approximately 15 kilometers per hour (8 knots), but towed while in port. Total height of the SBX above the water line including the XBR radome would be approximately 76.3 meters (250 feet) at transit draft. The SBX main beam would not be directed toward the ground or water surface and would have a lower limit of 10 degrees above horizontal for calibration and maintenance testing while at the Primary Support Base. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total amount of RF radiation per week would be approximately 5 to 6 hours. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of the EMR/EMI survey.

The radar main beam would not be directed toward the ground, which, when combined with the height of the SBX, limits the probability of energy absorption by surface-oriented wildlife. The main beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further reduces the probability of bird species remaining within this limited region of space, even if the beam were still. (Ballistic Missile Defense Organization, 2000)

Analyses based on the conservative assumption that the energy absorption rate of a bird’s body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect
determined that birds are not likely to remain continuously within the radar beam, and the power density is not expected to exceed levels stated above that could impact birds; thus, the likelihood of harmful exposure is not great. (Ballistic Missile Defense Organization, 2000)

Humpback whales forage and calve during the winter months beyond the 183-meter (600-foot) depth contour. As stated earlier, the SBX main beam would not be directed toward the surface of the ocean, and marine mammals would normally be found below the surface of the water. The power density level just below the surface of the ocean would not exceed the permissible exposure level for uncontrolled environments. (U.S. Department of the Navy, 2002a) No adverse impacts would occur to whales, other marine mammals, or sea turtles at least 1.3 centimeters (0.5 inch) below the surface. It is also highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time within the main beam or side lobe areas when the SBX would be operating. For these reasons, no effects are anticipated on the humpback whale, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations. Operation of the SBX would not require delays if humpback whales and other marine mammals are observed. Therefore, no further action regarding humpback whales is required pursuant to the Endangered Species Act and the Marine Mammal Protection Act.

The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. The potential for impacts to marine mammals or sea turtles due to an accidental release of diesel fuel is considered low. It is unlikely that the Hawaiian monk seal would be present at the offshore location of the SBX platform. There is evidence that dolphins can identify the presence of diesel fuel and lubricating oil and avoid it (U.S. Department of the Navy, 2001). The relatively slow speed of the SBX platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals are anticipated.

4.6.3.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on the humpback whale, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations.

4.6.3.4 Mitigation Measures
No biological resources mitigation measures are proposed for GMD ETR activities.

4.6.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.4.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Pearl Harbor would continue.
4.6.4.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing protocol and regulations.

Operation

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Hazardous materials and hazardous waste impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.

Shipboard Hazardous Materials and Waste Management

The Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Discharging hazardous materials overboard is not standard practice and would only be done as a worst case scenario.

Twenty-five liquid discharges, such as clean ballast, deck runoff and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation.

Increased operations that could take place on Pearl Harbor would be servicing and maintenance of the SBX. The supply barge that would service the SBX vessel would transport potentially hazardous materials and hazardous waste from the SBX to the pier at Pearl Harbor. The quantity of hazardous materials and hazardous waste is not expected to significantly affect the PSB generator status or significantly affect current hazardous materials management or waste disposal practices. There would be no significant operational impacts, and no mitigation would be required.

4.6.4.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.

4.6.4.4 Mitigation Measures

No hazardous materials/waste management mitigation measures are proposed.
4.6.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.5.1 No Action Alternative

Under the No Action Alternative, the primary support base for the SBX would not be located at Pearl Harbor/Barbers Point. Operations currently conducted at Pearl Harbor would continue.

4.6.5.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to support the SBX would occur in accordance with existing host installation safety protocol/plans and applicable state and federal requirements. Public access to Pier Victor 3 would be limited. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operations

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Health and safety impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified before SBX operation.

Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

The actual operating area of the SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft, or mariners are anticipated.
4.6.5.3 **Cumulative Impacts**

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.

4.6.5.4 **Mitigations**

Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.6.6 **UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR**

This section addresses potential environmental impacts caused by changes to the utilities services due to the proposed construction and operation of the SBX element. Potential impacts considered include potential effects from ongoing or planned activities at these sites.

4.6.6.1 **No Action Alternative**

Under the No Action Alternative, the GMD ETR would not be established, and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Pearl Harbor would continue their current operations.

4.6.6.2 **Alternatives 1, 2, and 3**

If the SBX were to use Pearl Harbor as a PSB, the current plan would be to moor the SBX off of Barbers Point as shown in figure 2.3.1-13. If an alternate mooring location is identified for Pearl Harbor, additional siting studies would be performed. Utilities impacts at an alternate location off of Oahu are expected to be similar to those described below for the Barbers Point location, and would be verified prior to SBX operation.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.84 MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume approximately 7 MW, leaving 14.8 MW available for necessary shipboard operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.
There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would typically return to a PSB, or an adjacent mooring station, for crew rotations, re-supply, and maintenance activities. If at the adjacent mooring location, three of the six generators would still be used, one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar 3 hours per day.

When the SBX is at the Barbers Point mooring site, about 4.8 kilometers (3 miles) off Barbers Point (figure 2.3.1-13), a supply ship would deliver supplies, repair parts, and fuel. The most likely area to dock the supply ship would be at Pier Victor 3. Personnel would be ferried to the SBX each day either by watercraft or helicopter. There would be no direct impacts to area utilities from the self-contained SBX.

A utility hookup would be required for the supply ship to run onboard lighting and other basic needs. Supply ships would utilize Pier Victor 3. The pier is currently supplied with a 15-centimeter (6-inch) potable water line (Noborikawa, 2002) and jet fuel, and although there are no shore power dock outlets, power lines run near enough to allow relatively easy modification to provide the platform with primary shore power. Electricity requirements are typically supplied by power lines linking to nearby buildings; as an option, a temporary transformer, tapped into a primary line, can be provided (Noborikawa, 2002). Due to the possibility of cross-contamination, regulations prevent the Public Works Center from providing a wastewater line at Pier Victor 3 (Noborikawa, 2002), and wastewater, as well as solid waste, would have to be containerized and arrangements made with local authorities on an as-needed basis to provide for their disposal.

Should existing facilities at Pearl Harbor be unavailable or inadequate at the PSB to accommodate approximately 25 personnel, construction of new storage and administration facilities would be necessary. If existing facilities were used, security upgrades, environmental controls for storage areas, fueling capability, ship gases handling facilities, computer networks, phone systems, and hazardous material storage and disposal may be added. Ongoing logistics and support operations such as re-supply, fueling and maintenance and crew/operator training would also occur at the PSB. Warehouses in the same fenced compound as Pier Victor 3 would possibly be renovated for SBX use, or new warehouses and administrative facilities could be constructed.

Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.
4.6.6.3 Cumulative Impacts
At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.6.6.4 Mitigation Measures
No utilities mitigation measures are proposed for the GMD ETR activities.

4.6.7 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PEARL HARBOR

4.6.7.1 No Action Alternative
Under the No Action Alternative, the SBX would not be located off-shore at Barbers Point. There would be no alteration of the existing visual setting and the adjacent area. The SBX facilities at Pearl Harbor would be visually synonymous with historic and present military activities that occur there. The SBX would have a very minor impact on views from Barer's Point. No significant impacts to visual and aesthetic resources would occur.

4.6.7.2 Alternatives 1, 2, and 3
In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from "Landscape Aesthetics: A Handbook for Scenery Management" (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.

Scenic Attractiveness
Several areas such as residential areas, resort locations, and recreational areas at Barbers Point where the SBX would be visible can be classified as having a “Distinctive” (A) scenic attractiveness because of the unique visual quality and the strong positive attributes.

Concern Level
The concern level of the viewers at Barbers Point would be considered to be “high” (Level 1) due to the recreational and residential use of the adjacent and surrounding areas.
**Distance Zone**
The mooring area would be approximately 5 kilometers (3 miles) away from shore, which is the mid-ground (MG), but could potentially be viewed in the foreground (FG) by recreational boaters and fishermen.

**Scenic Value Class**
The scenic value class for Pearl Harbor as determined from the scenic value class table, table 4.6.7-1, is 1, which equates to a high public value.

**Scenic Integrity**
The SBX mooring site has a very high scenic integrity level, which is defined as a landscape where the valued landscape is intact with only insignificant if any deviation or disturbance. This would contribute to the area’s high scenic value.

Visual resources would be slightly affected by the proposed SBX off-shore at Barbers Point. The radar would be approximately 5 kilometers (3 miles) away from the beach and approximately 76 meters (250 feet) tall. These figures would account for a 1-degree line-of-sight with the horizon for the SBX if the viewer were standing on the shore. This measurement would be comparable to boats and ships passing along the horizon. The SBX would be moored at an adequate distance away from the shore and would not obstruct panoramic views.

Visual resources could also be affected by the SBX if it is in the line-of-sight from boats to the island. However, the SBX would only inhibit the view of the island temporarily, as the boat passes by.

**Table 4.6.7-1: Scenic Value Class Determined for Pearl Harbor**

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>Distance Zones and Concern Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FG1</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

Scenic Attractiveness
- A – Distinctive
- B – Typical
- C – Indistinctive

Distance zone and Concern Level
- FG1 – Foreground with a high level of concern
- MG1 – Mid-ground with a high level of concern
- BG1 – Background with a high level of sensitivity
- FG2 – Foreground with a moderate level of sensitivity
- MG2 – Mid-ground with a moderate level of sensitivity
- BG2 – Background with a moderate level of sensitivity
- FG3 – Foreground with a low level of sensitivity
- MG3 – Mid-ground with a low level of sensitivity
- BG3 – Background with a low level of sensitivity

Scenic Value Class
- 1-2: High public value.
- 3-5: Moderate public value.
- 6-7: Low public value.
4.6.7.3  Cumulative Impacts
The SBX would be at the mooring location intermittently throughout the year. No other activities have been identified that would contribute to cumulative impacts.

4.6.7.4  Mitigation Measures
No visual resources mitigation measures are proposed for the GMD ETR activities.
4.7 NBVC PORT HUENEME—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.7.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

4.7.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue. Table 4.7.1-1 lists the existing emissions at San Nicolas Island.

<table>
<thead>
<tr>
<th>Emissions (metric tons [tons]/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
</tr>
<tr>
<td>NOx</td>
</tr>
<tr>
<td>ROG/HC</td>
</tr>
<tr>
<td>SOx</td>
</tr>
<tr>
<td>PM-10</td>
</tr>
<tr>
<td>30.77 (33.92)</td>
</tr>
<tr>
<td>137.67 (151.75)</td>
</tr>
<tr>
<td>10.39 (11.45)</td>
</tr>
<tr>
<td>4.69 (5.170)</td>
</tr>
<tr>
<td>10.57 (11.65)</td>
</tr>
</tbody>
</table>

Source: Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002

4.7.1.2 Alternatives 1, 2, and 3

Construction

Warehouse and administrative space may be available at NBVC Port Hueneme. If required, construction and facility modification to provide the needed space would occur in previously disturbed areas. All construction activities would be conducted in accordance with appropriate regulations and permits. Other than minor, short-term impacts from construction, no adverse effects to regional air quality are expected.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the NBVC Port Hueneme PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 1.6 kilometers (1 mile) east of San Nicolas Island. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the mooring location at San Nicolas Island, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at San Nicolas Island; therefore neither a Prevention of Significant Deterioration review nor a Title V permit would be required.
The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

Under the provisions of the 40 CFR Parts 51 and 93, federal actions are required to be in conformity with the State Implementation Plan for those areas categorized as nonattainment or maintenance areas for an criteria pollutant. While San Nicolas Island is within Ventura County, which is in nonattainment for federal and state ozone levels and state PM-10 levels, San Nicolas’ regional air quality is considered to be in attainment or unclassifiable. The provisions of the General Conformity Rule do not apply to activities occurring at San Nicolas Island. (Department of the Navy, Naval Air Warfare Center, Weapons Division, 2002)

4.7.1.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to regional air quality in the ROI.

4.7.1.4 Mitigation Measures
No air quality mitigation measures are proposed for GMD ETR activities.

4.7.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME

4.7.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme and San Nicolas Island would continue.

4.7.2.2 Alternatives 1, 2, and 3
The Proposed Action related to airspace would be full power emissions from the SBX while at the mooring location southeast of San Nicolas Island.

Operation

Controlled and Uncontrolled Airspace
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

To avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and
other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and are shown on figure 3.7.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The operating area would be similar to the existing operating area for the GBR-P radar at Kwajalein (figure 4.3.2-1).

SBX operations would be coordinated with the FAA and NAWCWD and would be scheduled to occur during hours of minimal aircraft operations if possible. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace
The airspace over San Nicolas Island is within the Point Mugu Sea Range and is located within Warning Area W-289. This Warning Area is active on an intermittent basis and is activated in coordination with the FAA. Notification is made through NOTAMs issued by the FAA. There is also a restricted airspace R222 located above San Nicolas Island and extending outward approximately 6 kilometers (3.7 miles). The SBX high-energy radiation area would be partially contained within this restricted area and wholly contained within Warning Area W-289. Coordination between the FAA, NAWCWD, and the SBX would mitigate potential conflicts between users of the special use airspace. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes
En route airways that cross the Point Mugu Sea Range north and south of the proposed mooring area are within special CAE airways. Neither CAE is within the ROI; therefore, impacts to the en route airways are not anticipated.

Airports and Airfields
The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics. There is one runway on San Nicolas Island. Other runways in the region are located more than 97 kilometers (60 miles) from the mooring location. With the controls placed on the SBX in a manner similar to the GBR-P radar, standard instrument approach and departure procedures at the San Nicolas Island would continue unhindered. Existing airfield arrival and departure traffic flows would also not be affected, and access to the airfield would
not be curtailed. All arriving and departing aircraft and all participating military aircraft are under the control of the military tower at NAS Point Mugu; thus, there would be no airfield conflicts in the ROI under the Proposed Action, and no impact.

4.7.2.3 Cumulative Impacts

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. The use of the required scheduling and coordination process, and adherence to applicable DoD directives and regulations concerning radar operations would preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.7.2.4 Mitigation Measures

The SBX high energy radiation area would be configured to mitigate potential impacts to aircraft and other potentially affected systems, and would be published on aeronautical charts. In addition to charting the SBX high energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high energy radiation area.

4.7.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME

4.7.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue.

4.7.3.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

Impacts to biological resources from operation of the SBX at NBVC Port Hueneme/San Nicolas would be similar to those described in section 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to
seabirds and shorebirds, Guadalupe fur seals, California sea lions, northern elephant and harbor seals, and sea otters or to widely distributed, open-water species such as gray and killer whales.

No adverse impacts as a result of the SBX activities are anticipated to occur within the current Channel Islands National Marine Sanctuary located off the coast south of Vandenberg AFB. Additional consultation would be performed with the National Oceanographic and Atmospheric Administration following their decision on the sanctuary boundary expansion.

4.7.3.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations.

4.7.3.4 Mitigation Measures
No biological resources mitigation measures are proposed for the GMD activities.

4.7.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NBVC PORT HUENEME

4.7.4.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue.

4.7.4.2 Alternatives 1, 2, and 3
Construction
Construction of new or modification of existing facilities may result in temporary use of potentially hazardous materials and the generation of small amounts of hazardous waste. The small increases in the amount of potentially hazardous materials used during construction activities would result in an added throughput in the Supply Department. However, this increase is not expected to be significant. The Environmental Materials Management Division has a model facility which would be able to accommodate the increased hazardous materials in accordance with existing regulations.

There is an existing less-than-90-day accumulation area. If it is not adequate to handle construction requirements, other temporary areas may be designated and operated according to RCRA and state regulations. Any temporary sites would be removed at the completion of construction. There would be no significant impact on hazardous waste management from construction activities.
Operation

Shipboard Hazardous Materials and Waste Management

The U.S. Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Since all portions of the Point Mugu Sea Range are within 370 kilometers (200 nautical miles) of the California coast, shipboard discharge of hazardous materials is prohibited within range. Any hazardous waste disposal at beyond 370 kilometers (200 nautical miles) would comply with OPNAVINST 5090.1 Appendix L. Discharging hazardous materials overboard is not standard practice and would only be done as a worst-case scenario. Twenty-five liquid discharges, such as clean ballast, deck runoff and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices, in design or routine operation.

Hazardous Materials Management

Range support operations would increase, resulting in a minor increase of hazardous materials use. The support units handling the SBX would have the capacity to do so. The small increases in the amount of hazardous materials used due to increased support operations would result in an added throughput in the Supply Department. However, this increase is not expected to be significant. The Environmental Materials Management Division has a model facility which would be able to accommodate the increased hazardous materials in accordance with existing regulations.

Fuels (jet fuel and unleaded gasoline) are stored in ASTs on San Nicolas Island. Current throughput is approximately 15,142 liters (4,000 gallons) of unleaded gasoline and 189,271 liters (50,000 gallons) of jet fuel per month. Impacts from the Proposed Action are most likely to arise from an increase in the amount of fuel required for SBX support and operation. Impacts to fuel storage and throughput from implementation of the Proposed Action would be less than significant.

Hazardous Waste Management

San Nicolas Island manages approximately 29,813 kilograms (65,689 pounds) of hazardous waste annually (Naval Air Weapons Center, Point Mugu, 1998). Hazardous waste generated by the SBX would be stored at one of the eight satellite hazardous waste accumulation areas on the island before being transported to the less-than-90-day accumulation area. It is expected that these accumulation areas would be able to accommodate the quantity of hazardous waste generated by the SBX. No significant long-term adverse impacts are anticipated to current hazardous waste management practices.

4.7.4.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.
4.7.4.4 Mitigation Measures
No hazardous materials/hazardous waste management mitigation measures are proposed for the GMD ETR activities.

4.7.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME

4.7.5.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at NBVC Port Hueneme/San Nicolas would continue.

4.7.5.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to support the SBX would occur in accordance with existing installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation
The SBX operating area would be in the vicinity of the mooring location at San Nicolas Island, as shown in figure 2.3.1-14. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

Implementation of SBX operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar units, would preclude any potential safety hazard to either the public or workforce from exposure to EMR. SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate.
Therefore, no health and safety impacts to coastal areas, airspace/aircraft, or mariners are anticipated.

4.7.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to health and safety.

4.7.5.4 Mitigations

Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.7.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT HUENEME

4.7.6.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. NBVC Port Hueneme and San Nicolas Island would continue their current operations.

Energy

Daily average demand for electricity at NBVC Port Hueneme is 8,000 kW, amounting to only 18.2 percent of total capacity. During summer peaks, the typical demand of 13,000 kW equates to approximately 30 percent of capacity.

Water

Potable water consumption at NBVC Port Hueneme is an average of 6.1 million liters (1.6 million gallons) per day, or 27.7 percent of the City of Port Hueneme’s total 22.0-million-liter (5.8-million-gallon) per day capacity; this accounts for approximately 30 percent of the total daily demand on the city system of 20.06 million liters (5.3 million gallons).

Wastewater

Wastewater generation at NBVC Port Hueneme is 1.8 million liters (480,000 gallons) per day, or 12 percent of its total capacity of 22.0 million liters (5.8 million gallons) per day.

Solid Waste

Solid waste disposal at NBVC Port Hueneme is handled by landfill and shipping offsite. It is anticipated the landfill in question would operate for another 30 years at the present rate of
waste generation, with its capacity currently at 4 million cubic meters (30 million cubic yards). NBVC Port Hueneme generation levels are at 16 metric tons (18 tons) per day.

### 4.7.6.2 Alternatives 1, 2, and 3

All of the alternatives would include SBX as one of the components of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8-MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume approximately 7 MW, leaving 14.8 MW available for necessary shipboard operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11, 350 liters (3,000 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB or adjacent mooring location for crew rotations, re-supply, and maintenance activities. While at an adjacent mooring location, three of the six generators would still be used, one operating continually while in port for daily ship functions, while the remainder would power the half- or fully populated radar 3 hours per day.

The latter scenario would apply at NBVC Port Hueneme, which is not deep enough to permit SBX entry; however, the harbor can host a resupply ship to service the SBX (delivering food, supplies, repair parts, and fuel), which would be moored just off San Nicolas Island. NBVC Port Hueneme routinely provides underway replenishment operations in support of test operations. Personnel would be ferried to the SBX each day either by watercraft or helicopter. Currently there is no fuel pier at San Nicolas Island. Fuel is delivered by pipeline from a moored location. There is a Military Construction Project for a pier due to be complete in late 2003 that would be suitable for SBX resupply vessel operations.

Existing warehouses at NBVC Port Hueneme would possibly be renovated for SBX use. Should these nearby facilities prove inadequate to accommodate a maximum of 25 personnel, construction of new storage and administration facilities would be necessary. If existing facilities are used, security upgrades, environmental controls for storage areas, fueling capability, ship gases handling facilities, computer networks, phone systems, and hazardous material storage and disposal may be added. Ongoing logistics and support operations such as re-supply, fueling and maintenance, and crew/operator training would also occur at the PSB.
Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.7.6.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.7.6.4 Mitigation Measures

No utilities mitigation measures are proposed for the GMD ETR activities.
4.8 NAVAL STATION EVERETT—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.8.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue. Table 4.8.1-1 lists the existing emissions in the vicinity of Naval Station Everett.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>Standard</th>
<th>Location</th>
<th>2000</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>8-hour</td>
<td>9 ppm</td>
<td>Everett</td>
<td>6.1 ppm</td>
<td>3.9 ppm</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>35 ppm</td>
<td>Everett</td>
<td>10.5 ppm</td>
<td>6.2 ppm</td>
</tr>
<tr>
<td>PM-10</td>
<td>Annual</td>
<td>50 μg/m³</td>
<td>Marysville</td>
<td>19 μg/m³</td>
<td>17.5 μg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lake Sammamish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ozone</td>
<td>Maximum 1-hour</td>
<td>0.12 ppm</td>
<td>Getchell Lake</td>
<td>0.094 ppm</td>
<td>0.079 ppm</td>
</tr>
<tr>
<td></td>
<td>Maximum 8-hour</td>
<td>0.08 ppm</td>
<td>Sammamish</td>
<td>0.073 ppm</td>
<td>0.65 ppm</td>
</tr>
</tbody>
</table>

Source: Puget Sound Clean Air Agency, 2000, 2001

4.8.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Frequent rains common to the area would minimize dust and PM-10 formation. Dust suppression measures such as periodic watering of areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near the work areas, and wet sweeping, or otherwise removing soil and mud deposits from paved roadways and parking areas, would be used as required. All construction would be conducted in accordance with the appropriate permits and regulations. No exceedences of the NAAQS or state AAQS would be anticipated.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Naval Station Everett PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 1,650 hours per year (3 hours a day for 9 months) docked at Naval Station Everett. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB, only two of the generators would be
used. These generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 1,650 hours (825 hours each) of operation for the two generators that would be in operation while the SBX is at Naval Station Everett. Total power output for the two 3.64-MW generators would be 6,006 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at Naval Station Everett; therefore, neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas in the BOA.

4.8.1.3 Cumulative Impacts

Cumulative impacts at Naval Station Everett would include the use of generators while the SBX is docked, as well as the possible increase in vehicle trips due to the number of personnel and deliveries required for the SBX. Since Snohomish County has been identified as being in non-attainment, it must be assumed that any emissions have the potential to impact the surrounding area. The Clean Air Act, as amended in 1990, requires that, in non-attainment areas, federal actions conform to the appropriate State Implementation Plan; however the SBX is not considered a stationary source as defined in the Clean Air Act and would not require permitting.

4.8.1.4 Mitigation Measures

No air quality mitigation measures are proposed for GMD ETR activities.

4.8.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.2.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue.

4.8.2.2 Alternatives 1, 2, and 3

The Proposed Action related to airspace would be full power emissions from the SBX while at the pier location at Naval Station Everett.

Operation

Controlled and Uncontrolled Airspace

Unrestricted operation of the SBX at the pier location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.
In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and are shown on figure 3.8.2-1.

The actual SBX operating area at the pier location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this high energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations if possible. In addition, the SBX would utilize a real-time link to the FAA operations radar to ensure the airspace is clear of any aircraft. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

**Special Use Airspace**

There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

**En Route Airways and Jet Routes**

Two low altitude air routes (V-23 and V-287) enter the ROI and terminate at Paine Airport.

Both air routes cross the 65 percent and fully populated radar aircraft interference areas. There may be additional approach and departure routes within the ROI that would also need to be considered when defining the SBX operating area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the onboard electronics.

**Airports and Airfields**

Seattle-Tacoma International Airport is located approximately 60 kilometers (37 miles) south of Naval Station Everett outside the ROI. Snohomish County (Paine) Airport is about 8 kilometers (5 miles) southwest of Naval Station Everett. Class D airspace above Paine Airport extends to near Naval Station Everett, with the edge of a class E airspace extension above Naval Station Everett.
Everett. Several other airfields are located within the ROI including Harvey, Heineck, Large, Frontier, Arlington, and Whidbey.

Airports with traffic control radars would be major factors in the EMR/EMI survey and analysis and subsequent operating permit. Operation of the SBX has the potential to interfere with both aircraft systems and air navigation systems. However, the establishment of the high-energy radiation area would not impose any flight restriction requirements and would not change any airfield/airport arrival and departure traffic flows.

Most air navigation facilities within the airspace ROI would operate at lower frequencies (in the megahertz range) than the X-band SBX, and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.8.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high power effects).

Emissions from the XBR may also potentially degrade the overall system performance of in-band airborne systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high-energy radiation area would be configured to minimize impacts to these airborne and ship-based systems.

**4.8.2.3 Cumulative Impacts**

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, the frequency allocation operating permit process would take into consideration potential impacts on other resources in the region and would preclude the potential for cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

**4.8.2.4 Mitigation Measures**

The actual SBX operating area at the pier location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. In addition to charting the SBX high-energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued to notify pilots of the high-energy radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high-energy radiation area.
4.8.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue.

4.8.3.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Although eel grass areas could be impacted by the shadow of the SBX, this would not be an issue at the depths to which the SBX is limited. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

Impacts to biological resources from operation of the SBX at Naval Station Everett would be similar to those described above in sections 4.3.3.3 and 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to seabirds, shorebirds (bald eagle), Chinook salmon, bull trout, or widely distributed, open-water species such as humpback, blue, fin, sei, and sperm whales; green, leatherback, and loggerhead sea turtles; and steller sea lions.

4.8.3.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or sea turtles that might be present in the vicinity of the homeport and transit locations.

4.8.3.4 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities.

4.8.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.4.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Naval Station Everett would continue.
4.8.4.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents, and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing protocol and regulations.

Operation
Shipboard Hazardous Materials and Waste Management
The Navy requires that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. If hazardous materials are discharged overboard, this must occur more than 370 kilometers (200 nautical miles) from land. Any hazardous waste disposal beyond 370 kilometers (200 nautical miles) would comply with OPNAVINST 5090.1 Appendix L. Discharging hazardous materials overboard is not standard practice and would only be done as a worst-case scenario.

Twenty-five liquid discharges, such as clean ballast, deck runoff, and dirty ballast, from the normal operation of Armed Forces vessels are required to be controlled by installation of control technologies or use of management practices (marine pollution control devices) under the UNDS provisions of the Clean Water Act. In compliance with UNDS, the SBX vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices, in design or routine operation.

Range
Increased operations that could take place at Naval Station Everett would be servicing and maintenance of the SBX. This small increase in servicing operations would not significantly affect hazardous materials management or waste disposal. There would be no significant operational impacts.

4.8.4.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to existing hazardous materials and waste management practices.

4.8.4.4 Mitigation Measures
No hazardous materials/hazardous waste management mitigation measures are proposed for GMD ETR activities.
4.8.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.5.1 No Action Alternative

Under the No Action Alternative, the primary support base for the SBX would not be located at Naval Station Everett. Operations currently conducted at Naval Station Everett Harbor would continue.

4.8.5.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to support the SBX would occur in accordance with existing installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation

The SBX operating area would be in the vicinity of Pier Alpha or Pier Bravo at Naval Station Everett, as shown in figure 2.3.1-15. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

The actual operating area of SBX at the pier location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated.

4.8.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental
exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.

4.8.5.4 Mitigations
Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.8.6 SOCIOECONOMICS—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.6.1 No Action Alternative
Under the No Action Alternative, the primary support base for the SBX would not be located at Naval Station Everett. Operations currently conducted at Naval Station Everett would continue. No displacement of populations, residences, or businesses would occur within the City of Everett or adjacent areas as a result of the No Action Alternative. The facilities would continue to be utilized as currently designated.

This alternative would not provide a positive impact upon the local economy through additional ongoing test based employment opportunities and related resultant infusion of monies through a variety of channels into the local economy. No significant impacts to locally significant businesses or industries such as aerospace, technology, or shipping are anticipated with the No Action Alternative. No significant socioeconomic impacts would occur, and no mitigation measures are proposed.

4.8.6.2 Alternatives 1, 2, 3

Construction
Implementation of Alternative 1 would result in limited construction and facility modification to provide support to the SBX, to occur at existing pier and warehouse facilities within Naval Station Everett. Since the extent of construction required at Naval Station Everett would be limited, and the SBX platform would be constructed entirely in Europe and then towed to the operational base, the economic impact of construction to the surrounding community in the form of local expenditure on basic building materials, limited use of local contractors, and also related spending through wages by specialist contractors would be positive but relatively limited.

Construction activities related to the implementation of Alternative 1 would not cause any displacement of populations, residences, or businesses within the city of Everett and surrounding areas. The duration of construction activities would be temporary and would be expected to last several months. The accommodation needs of the non-local construction personnel during this period would be adequately met via local hotels and guesthouses. Given the extent of available lodging facilities within the City of Everett, the presence of additional construction personnel would not be considered a potentially significant impact.

By spending money in the local economy, mainly via accommodation and procurement of goods and services, the additional construction personnel associated with the Proposed Action would
represent both a potential increase in local service-based employment opportunities and a small but positive temporary economic impact to the local economy. The overall impact would however, be slight and would not cause any population growth. No significant impacts to locally significant businesses or industries such as aerospace, technology, or shipping are anticipated. No significant socioeconomic impacts would occur through the construction activities associated with Alternatives 1, 2, or 3.

Operation

Implementation of Alternative 1, 2, or 3 would result in a large sea-based platform located at Pier Alpha or Bravo at Naval Station Everett. Based on an assumption of a total of five tests per year, the SBX would be at the Naval Station Everett for a total of approximately 7 months annually. For a given test, the SBX would have a basic crew of 50 people, which currently includes approximately 20 marine crewmembers and 30 GMD mission support personnel. In addition, the SBX could accommodate an additional 50 people associated with the SBX on a temporary basis to support testing. Approximately 10 to 12 days before a GMD test mission, the SBX would leave the PSB to travel to the designated performance region.

While in port prior to a test operation, personnel would reside offsite at local hotels and guesthouses. The accommodation needs of approximately 50 additional personnel would be adequately met through the numerous lodging facilities within the city of Everett. Generally, by spending money in the local economy mainly via accommodations and the normal procurement of goods and services, the additional test related personnel would represent both a potential increase in local service based employment opportunities and a positive economic impact to the local community for the duration of time spent at the facility. The overall economic impact through this, while moderate regionally, would still represent a positive cumulative economic impact of several million dollars to the Everett economy. The proposed project would not cause any population growth. No population, housing, or businesses would be displaced during operational activities.

The SBX would be approximately 76 meters (250 feet) tall with the platform 119 meters long (390 feet) and 73 meters (238 feet) wide and moored at Naval Station Everett for about 6 weeks at a time for a total of 7 months of the year. Given the physical proportions, proposed location, and duration of time in port of the SBX, the proposed project could represent potentially adverse visual impacts to the waterfront view of a number of residential areas and businesses surrounding the base, potentially leading to commercial and residential property value impacts, as well as an influence on tourism.

As outlined in section 4.8.8.2 (Visual and Aesthetic Resources), Naval Station Everett is also home to the naval aircraft carrier USS Abraham Lincoln. USS Abraham Lincoln has a much greater length than the SBX; however, the SBX is taller and not as sleek as the aircraft carrier. The SBX would be moored at Pier Alpha or Pier Bravo, either in the location currently occupied by USS Abraham Lincoln when it is at sea or on the other side of Pier Alpha when USS Abraham Lincoln is in port. Also, Naval Station Everett is adjacent to several industrial land uses, such as a large paper mill and manufacturing areas. Visual impacts to the surrounding area would be partially mitigated by the fact that the SBX would be an additional structure on an existing military base immediately surrounded by industrial land uses, thereby reducing the potential impacts to commercial and residential property values.
Other potential project-related economic impacts concern impacts to property values of residences and businesses within the areas surrounding the base, pertaining to the in port use, and perceived threats to human health by EMR associated with the proposed project.

The proposed SBX operating conditions would include full power operation to track objects in space. The beam would be pointed up and constantly moving along with the object. Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. Similar software controls have been proven and effectively used on the large X-band radar operating at Kwajalein Island in the RMI. The disruption of pacemakers via RF radiation has been studied extensively by the U.S. Air Force and Georgia Technical Research Institute, and the SBX would not exceed the 10 mW/cm² those agencies determined would be required to affect pacemakers.

The SBX would not exceed the 3,000 volts per meter peak power threshold for commercial aircraft as established by the Federal Aviation Administration. The SBX can exceed the 300 volts per meter average power threshold; however, the concern here would not be interference but rather a reduction in life of the aircraft avionics.

As outlined in section 4.8.5, Health and Safety, based on the current standards and documented analysis referenced above, the proposed operation of the SBX in port, with appropriate controls and coordination, would not pose a hazard to personnel or equipment.

Everett is also in the process of redeveloping an area on the northern side of the marina. The Port of Everett North Marina Redevelopment Master Plan (Maritime Trust Company, 2002) would include the addition of residential, commercial, and recreational areas within the northern part of the marina near the existing North Marina. Figure 4.8.6-1 shows where the Redevelopment Plan project study area is in relation to the potential SBX locations. While it is possible that those that visit and reside in this area may be affected by the SBX, the effects would be minimal. The potential SBX site is over 1 mile (1.6 kilometers) from the North Marina and the view of the SBX would be obstructed by existing and proposed buildings, vegetation, and docked ships. It is possible, however, that those within the southwest corner of this area would have an unobstructed view of the SBX along the channel. Due to the distance from the SBX to the redevelopment location, and the partially obstructed views, it is anticipated that the SBX would have a minimal economic impact on the redevelopment plan.

It is, however, worth noting that the perception held by many persons that project-related use of EMR does indeed pose a health risk could potentially lead to a diminished level of desirability, and therefore demand for certain properties within the areas perceived to be affected, thereby having the potential to adversely affect property values within those areas. Given that this impact would be solely attributable to individual interpretation of a perceived risk, the extent and nature of the potential fall in property values, if any, and the areas affected are unable to be determined. The assumption that the SBX would result in a reduction in property values is conjecture and does not present any quantifiable statistics or other information that can be readily or credibly analyzed. In addition, real estate values in an area are more directly related to the levels of income and employment that occur in the area. Socioeconomic studies prepared by the U.S. Air Force and the military's experience during several rounds of base closures have shown that housing values and military programs are generally positively related.
EXPLANATION

- North Marina Redevelopment Plan Project Study Area
- Existing Marina
- Naval Station Everett
- Potential SBX Locations

Source: Maritime Trust Company, 2002 (Modified).

Figure 4.8.6-1

North Marina Redevelopment Plan Project Study Area and Potential SBX Locations
Particularly in a port area where the mooring of ships and other Navy activities are a normal incidence of the military presence, a reduction of property values from the visual effect of large vessels in the harbor, or a perceived risk, does not seem likely.

In transit to and from the test site, coordination with marine traffic would be adequately advertised through a NOTMAR in order to prevent any conflicts with tribal fishing areas, and to prevent any impacts on current shipping schedules, ship-borne commerce, recreational boating, or general transit. As outlined in section 4.8.6.1 Naval Station Everett is located close to the port and provides easy access to the main channel of Puget Sound. Commercial tugboats would be utilized for this purpose.

At the test site, and while in port, SBX operations would be coordinated with the FAA and would be scheduled, if possible, to occur during hours of minimal aircraft operations. There would no reduction in the amount of the navigable airspace, no disruption of existing aircraft operation would be foreseen, and no resultant economic impacts are expected.

4.8.7 TRANSPORTATION—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.7.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations at Port Everett would continue as currently conducted.

4.8.7.2 Alternatives 1, 2, and 3

All of the alternatives would include SBX as one of the components of the Proposed Action.

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas, and in accordance with host installation guidelines and regulations. As excess warehouse and administrative space is available, there is the possibility that no new construction would be necessary. No adverse effects to transportation resources are anticipated.

Operation

The SBX would be required to meet environmental requirements for commercial vessels.

At Naval Station Everett, both Pier Alpha (the primary ship berthing facility) and Pier Bravo could be used for the SBX and would be coordinated with the naval station. USS Abraham Lincoln, a Nimitz-class aircraft carrier that utilizes the naval station as a homeport, is out of port approximately 6 months out of each year.

Naval Station Everett provides easy access to the main channel of Puget Sound. At least two tugboats would be required to assist the SBX when in port. However, Naval Station Everett has no tugboat complement of its own, and thus tugs used at the port are primarily commercial (GlobalSecurity.org, 2002b).
Such activities are typical for Port Everett and, as with all such shipping issues, would require coordination with the U.S. Coast Guard. Requests for tugs must be made 72 hours in advance of anticipated time of movement, and are handled by the Senior Officer Present Afloat Puget Sound (GlobalSecurity.org, 2002b). Adequate coordination with the Tulalip Tribes would prevent any conflicts with tribal fishing areas (Naval Station Everett, 2003). Coordination with the Coast Guard and the Port of Everett would prevent any impacts on current shipping schedules, ship-borne commerce, or general transit (Miller, 2002).

No additional security standoff would be required while the SBX is at Naval Station Everett. The SBX would be within the existing exclusion zone that varies from no standoff along the western side of Pier Bravo to a 91 meter (300 foot) standoff along the southern end of Pier Alpha and Pier Bravo, to a 182 meter (600 foot) standoff along the eastern side of Pier Alpha. Once underway, the SBX security zone would be similar to the Navy vessel protection zone that applies to Navy vessels that are underway. This moving zone includes a 91.4-meter (100-yard) security exclusion zone around the vessel and a slow speed zone between 91.4 and 457 meters (100 and 500 yards) from the vessel.

Some 20 people would be instated at the PSB. As many as 50 personnel could leave the SBX for onshore activities. Even given a maximum, and extreme case, of 50 automobile trips per day, this level would be less than a 0.59 percent over the current level of 8,520 vehicle trips generated by Naval Station Everett per day. No impacts to area roadways are expected.

Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to transportation in the ROI.

Mitigation Measures

No transportation mitigation measures are proposed for GMD ETR activities.

4.8.8 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.8.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Naval Station Everett would continue their current operations.

Energy

Daily average demand for electricity at the Naval Station Everett waterfront site is 36,000 kVA, some 45 percent of the available 80,000 kVA.

Water

Potable water consumption at the Naval Station Everett waterfront site is typically 3.4 million liters (900,000 gallons) per day, or 33.3 percent of the total available capacity of 10.2 million liters (2.7 million gallons) per day.
**Wastewater**

Wastewater generation at Naval Station Everett’s sanitary sewer system is typically 3.8 million liters (990,000 gallons) per day, or 33.3 percent of the available capacity of 11.4 million liters (3 million gallons) per day.

**Solid Waste**

Solid waste disposal at Naval Station Everett is handled by landfill and shipping offsite. The average level generated at the waterfront site and by transient Navy ships is 4.6 metric tons (4.5 tons) per day.

**4.8.8.2 Alternatives 1, 2, and 3**

All of the alternatives would include SBX as one of the components of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8-MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively propel and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume 7 MW, leaving 14.8 MW available for necessary ship-board operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3.1 million liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the Naval Station Everett pier would be approximately 2,270 liters (600 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB for crew rotations, re-supply, and maintenance activities.

The current plan would be to moor the SBX at Pier Alpha or Bravo to allow the SBX to conduct pier-side operations. A utility hookup would be required for the SBX to run onboard lighting and other basic needs and would be utilized in lieu of a continually operating generator. Utility levels would be typical of that for other ships supplied by the Naval Station Everett piers and would be considered routine.

Currently, there is no excess warehouse or administrative space available for the PSB; however, there is adequate space for the construction of new storage and administration facilities for a maximum of 25 personnel. Due to this limited space, a new 900- to 1,500-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse would potentially be required for SBX operations.
Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water; 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.8.8.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that, when combined with the relatively minor SBX utility requirements, would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.8.8.4 Mitigation Measures

No utilities mitigation measures are proposed for GMD ETR activities.

4.8.9 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, NAVAL STATION EVERETT

4.8.9.1 No Action Alternative

Under the No Action Alternative, the SBX would not be located at Naval Station Everett. There would be no alteration of the existing visual setting and the adjacent area. No significant impacts to visual and aesthetic resources would occur.

4.8.9.2 Alternatives 1, 2, and 3

Visual resources could be affected by the proposed SBX at Naval Station Everett. The SBX would be approximately 76 meters (250 feet) tall, and the SBX platform would be 119 meters (390 feet) long and 73 meters (238 feet) wide. The SBX would be located at Naval Station Everett for about 6 weeks at a time, a total of 7 months per year.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from “Landscape Aesthetics: A Handbook for Scenery Management” (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.
The potential location for the SBX at Naval Station Everett would be pier-side at Pier Alpha or Pier Bravo. Primarily, the areas from which the SBX can be seen include residential areas, recreational areas, industrial areas, and also the Naval Base itself.

**Scenic Attractiveness**

Due to the development of the area and the lack of visual attributes the area is considered to be indistinctive (C).

**Concern Level**

The concern level of the viewers at Naval Station Everett would be considered to be “high” (Level 1) due to the recreational and residential use of the adjacent and surrounding areas.

**Distance Zone**

The potential SBX location would be within the foreground (FG) of the shoreline, the mid-ground (MG) for the residential areas, and the background (BG) for the residents of Whidbey Island. However, it is very unlikely that residents of Whidbey Island would be able to distinguish between the SBX and Everett itself.

**Scenic Value Class**

The scenic value class for Naval Station Everett, as determined from the scenic value class table, table 4.8.9-1, would be high (1) within the foreground, moderate (2) within the mid-ground, and low (3) within the background, depending on the distance between the viewer and the SBX.

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>FG1</th>
<th>MG1</th>
<th>BG1</th>
<th>FG2</th>
<th>MG2</th>
<th>BG2</th>
<th>FG3</th>
<th>MG3</th>
<th>BG3</th>
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<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

Scenic Attractiveness
A – Distinctive, B – Typical, C – Indistinctive

Distance zone and Concern Level
FG1 – Foreground with a high level of concern
MG1 – Mid-ground with a high level of concern
BG1 – Background with a high level of sensitivity
FG2 – Foreground with a moderate level of sensitivity
MG2 – Mid-ground with a moderate level of sensitivity
BG2 – Background with a moderate level of sensitivity
FG3 – Foreground with a low level of sensitivity
MG3 – Mid-ground with a low level of sensitivity
BG3 – Background with a low level of sensitivity

Scenic Value Class
1-2: High public value.
3-5: Moderate public value.
6-7: Low public value.
**Scenic Integrity**

It should also be noted that the area appears heavily altered resulting in a “very low” ranking for the level of scenic integrity.

The potential impacts to visual and aesthetics related to the SBX would be the view across the waterfront from nearby residential, recreational, and commercial areas. Aside from an area immediately adjacent to the SBX, the SBX would occupy only a small part of the horizon and panoramic views would not be inhibited. Naval Station Everett is home to USS Abraham Lincoln, a naval aircraft carrier, and is a port area where the mooring of ships and other Navy activities are a normal incidence of the military presence. In addition, Naval Station Everett is adjacent to industrial areas which inhibit the view of the waterfront. While there is a high amount of viewer concern, the SBX would be considered visually synonymous with the port and present military uses; therefore, only moderate impacts are expected to visual resources.

**4.8.9.3 Cumulative Impacts**

The SBX would be at the pier-side location intermittently throughout the year. No other activities have been identified that would contribute to cumulative impacts.

**4.8.9.4 Mitigation Measures**

No visual resources mitigation measures are proposed for GMD ETR activities.
4.9 PORT ADAK—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.9.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.1.1 No Action Alternative

Under the No Action Alternative, the home port for the SBX would not be located at Port Adak. Current air emission levels would remain the same, stemming primarily from regional volcanic activity.

4.9.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Construction activities would be conducted in accordance with all appropriate regulations and permits. Other than minor, short-term impacts from construction, no exceedances of the NAAQS or state AAQS would be anticipated.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Port Adak PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months) at a single location, approximately 3.5 kilometers (2.2 miles) from Port Adak in Finger Bay. The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB mooring location, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 (825 hours each) hours of operation for the other two generators that would be in operation at the PSB. Total power output for the three 3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. The SBX would not be considered a stationary source at Port Adak; therefore, neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

It is also anticipated that the emissions would not impact the Maritime National Wildlife Refuge located on the southern portion of Adak. Due to the speed and frequency of wind on and around the island, it is expected that the emissions would disperse quickly before reaching this area.
4.9.1.3 Cumulative Impacts
Due to the limited industrialization of Adak and the surrounding environment, the potential cumulative impacts to air quality due to the proposed mooring of the SBX would not be substantial. No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to the air quality in the ROI.

4.9.1.4 Mitigation Measures
No air quality mitigation measures are proposed for GMD ETR activities.

4.9.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.2.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions.

4.9.2.2 Alternatives 1, 2, and 3
The Proposed Action related to airspace would be full power emissions from the SBX while at the mooring location at Finger Bay, south of Port Adak.

Operation

Controlled and Uncontrolled Airspace
Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the 300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and on figure 3.9.2-1.
The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this SBX high energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations. Coordination with the Anchorage ARTCC would occur prior to and during each test. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

**Special Use Airspace**

There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

**En Route Airways and Jet Routes**

The two en route low altitude airways (G8 and G1), three high altitude jet routes (J 115, J600, and J120), two great circle routes from North America to the Far East (R 336 and R451), and one military route (V 480) would be considered in defining the SBX operating area. There are additional approach and departure routes within the ROI that would also need to be considered when defining the SBX operating area. The SBX would be programmed to limit RF emissions in the airways that pass through the ROI. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

**Airports and Airfields**

Adak Airfield is located approximately 5.5 kilometers (3.4 miles) north of the proposed mooring location. With the restrictions placed on the SBX in a manner similar to the GBR-P radar at RTS, standard instrument approach and departure procedures at the airfield would continue unhindered. Existing airfield or airport arrival and departure traffic flows would also not be affected and access to the airfield would not be curtailed. All arriving and departing aircraft are under the control of the Adak Airfield Control Tower; thus, there would be no airfield conflicts in the ROI under the Proposed Action, and no impact.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the megahertz range) than the X-band SBX, and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.9.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high-power effects).

Emissions from the SBX may also potentially degrade the overall system performance of in-band airborne and ship-based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12...
GHz). However, the SBX high energy radiation area would be configured to minimize impacts to these airborne and ship based systems.

4.9.2.3 Cumulative Impacts
Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. The use of the required scheduling and coordination process, and adherence to applicable DoD directives and U.S. Army regulations concerning radar operations would preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.9.2.4 Mitigation Measures
The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. In addition to charting the SBX high-energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued to notify pilots of the high-energy radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high-energy radiation area.

4.9.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.3.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Port Adak would continue.

4.9.3.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation
Impacts to biological resources from operation of the SBX at Port Adak would be similar to those described above in sections 4.3.3.3 and 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to
area seabirds and water fowl or widely distributed, open-water species such as Steller sea lions, sea otters, harbor seals, and whales that occur around Adak Island.

4.9.3.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or birds that might be present in the vicinity of the homeport and transit locations.

4.9.3.4 Mitigation Measures
No biological resources mitigation measures are proposed for GMD ETR activities at Adak.

4.9.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.4.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Port Adak would continue.

4.9.4.2 Alternatives 1, 2, and 3
Construction
Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with Port Adak guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents, and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing Port Adak protocol and applicable state and federal regulations.

Operation
Increased operations that could take place at Port Adak would be servicing and maintenance of the SBX. Purchase and use of potentially hazardous materials associated with SBX operation and maintenance would be handled in accordance with ongoing materials management practices. Routine and preventative maintenance activities associated with the SBX would result in the generation of small quantities of potentially hazardous waste. The types of waste generated are not expected to dramatically differ from existing waste generated at the Port Adak, and these wastes would be handled in accordance with ongoing Port Adak procedures. SBX operation is not expected to significantly impact ongoing hazardous waste management or disposal practices.

4.9.4.3 Cumulative Impacts
The use of the required scheduling and coordination process and adherence to applicable Port Adak and APSC procedures and DoD directives concerning radar operations would preclude
the potential for significant incremental, additive cumulative impact to hazardous materials and waste management practices.

4.9.4.4 Mitigation Measures
No hazardous materials/hazardous materials management mitigation measures are proposed for GMD ETR activities at Port Adak.

4.9.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.5.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at Port Adak would continue.

4.9.5.2 Alternatives 1, 2, and 3

Construction
Any construction or facility modification required to support the SBX would occur in accordance with existing host installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation
The SBX operating area would be in the vicinity of the mooring location at Finger Bay, as shown in figure 2.3.1-16. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.
The actual operating area of SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated.

4.9.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.

4.9.5.4 Mitigation Measures

Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar’s operation.

4.9.6 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

A project may have substantial effects on infrastructure and utilities if it increases demand in excess of utility system capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

4.9.6.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. Port Adak would continue their current operations.

Energy

Daily average demand for electricity at the City of Adak is 1 MW. This is 6.9 percent of the maximum capacity of the electrical service, 14.5 MW.

Water

Potable water consumption at Adak is approximately 1.1 million liters (300,000 gallons) per day. This is 30 percent of the maximum available amount of potable water, 3.8 million liters (1 million gallons) per day.

Wastewater

Recent wastewater generation at Adak amounted to approximately 1 percent of the total water flow into Kuluk Bay, or 30,283 liters (8,000 gallons) per day.
Solid Waste
Solid waste disposal at Adak is handled by landfill and burning.

4.9.6.2 Alternatives 1, 2, and 3

All of the alternatives would include SBX as one of the components of the Proposed Action. The operation of SBX would require BOA and a PSB.

Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume 7 MW, leaving 14.8 MW available for necessary ship-board operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to only approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB or nearby mooring area for crew rotations, re-supply, and maintenance activities. While at an adjacent mooring location, only three of the generators would be used, one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar 3 hours per day. A supply ship would deliver food, supplies, repair parts, and fuel from the PSB.

The latter scenario would apply at Port Adak. Although Adak piers do not offer adequate depth to accommodate the draft of the SBX, the vessel can potentially moor at nearby Finger Bay. A re-supply vessel could be required. Personnel would be ferried to the SBX each day either by watercraft or helicopter. There would be no direct impacts to area utilities from the self-contained SBX.

Should existing facilities at Port Adak be unavailable or inadequate at the PSB to accommodate approximately 25 personnel, construction of new, environmentally controlled storage and administration facilities would be necessary. A potential location for a new warehouse would be adjacent to Building 2310. Ongoing logistics and support operations such as re-supply, fueling and maintenance, and crew/operator training would also occur at the PSB.

Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum
25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water, or 0.125 percent of current capacity; 4,258 liters (1,125 gallons) wastewater, or 0.125 percent of current capacity; and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed at Port Adak would be required to facilitate this level of use, as well as to accommodate any energy demand. Utilities at Adak were originally designed for a much larger population than that currently residing in the ROI since base closure took place. Consequently, current demand levels, as opposed to capacity, remain comparatively low and utilities systems would easily be able to accommodate the increased demand from SBX-related activities.

4.9.6.3 Cumulative Impacts

At this time, there are no ongoing or foreseeable future programs/plans identified in the ROI that when combined with the relatively minor SBX utility requirements would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.9.6.4 Mitigation Measures

No utilities mitigation measures are proposed for GMD ETR activities at Adak.

4.9.7 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT ADAK

4.9.7.1 No Action Alternative

Under the No Action Alternative, the SBX would not be located at Adak. There would be no alteration of the existing visual setting and the adjacent area. No significant impacts to visual and aesthetic resources would occur, and no mitigation measures are proposed.

4.9.7.2 Alternatives 1, 2, and 3

Visual resources could possibly be affected by the proposed SBX at Adak. The radar would be approximately 76 meters (250 feet) tall and the SBX platform would be 119 meters (390 feet) long and 73 meters (238 feet) wide. Potentially the SBX would be located at Adak intermittently over a period of 7 months per year.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from “Landscape Aesthetics: A Handbook for Scenery Management” (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.
**Scenic Attractiveness**

The potential mooring location for the SBX at Port Adak is within Finger Bay, where the viewing areas are considered to be typical (B) of the area.

**Concern Level**

Although the visual resources at Port Adak may be considered significant by some viewers, most of those affected would be associated with the port and would be accustomed to this type of activity. Therefore, the level of concern of the viewers would be considered to be low (Level 3).

**Distance Zone**

The SBX would be moored within the foreground (FG) view of the shoreline.

**Scenic Value Class**

The scenic value class for Port Adak as determined from the scenic value class table, table 4.9.7-1, would be moderate (3) due a lack of viewer concern and a typical level of scenic attractiveness.

<table>
<thead>
<tr>
<th>Distance Zones and Concern Levels</th>
<th>FG1</th>
<th>MG1</th>
<th>BG1</th>
<th>FG2</th>
<th>MG2</th>
<th>BG2</th>
<th>FG3</th>
<th>MG3</th>
<th>BG3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenic Attractiveness A</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Scenic Attractiveness B</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Scenic Attractiveness C</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

Scenic Attractiveness

- A – Distinctive
- B – Typical
- C – Indistinctive

Distance zone and Concern Level
- FG1 – Foreground with a high level of concern
- MG1 – Mid-ground with a high level of concern
- BG1 – Background with a high level of sensitivity
- FG2 – Foreground with a moderate level of sensitivity
- MG2 – Mid-ground with a moderate level of sensitivity
- BG2 – Background with a moderate level of sensitivity
- FG3 – Foreground with a low level of sensitivity
- MG3 – Mid-ground with a low level of sensitivity
- BG3 – Background with a low level of sensitivity

Scenic Value Class

- 1-2: High public value.
- 3-5: Moderate public value.
- 6-7: Low public value.

**Scenic Integrity**

Alteration of the area has been greatly limited and the level of scenic integrity is currently considered to be “very high”, which means that the valued landscape is intact with only insignificant if any deviation or disturbance.

The potential mooring site is located within Finger Bay, which is separated from Adak by a small peninsula known as Lucky Point. This peninsula has an elevation of approximately 150 meters.
(492 feet), which would inhibit the view of the SBX from Adak. Also, due to weather conditions the visibility in Adak is typically limited to 1.6 kilometers (1 mile) horizontally, and the potential SBX mooring site is approximately 3.7 kilometers (2.3 miles) from Port Adak. These factors, along with a moderate scenic value and low viewer concern, would result in minimal adverse impacts to the visual resources at Adak.

4.9.7.3 Cumulative Impacts
The SBX would be moored temporarily and intermittently; therefore, cumulative impacts due to the SBX are not anticipated.

4.9.7.4 Mitigation Measures
No visual resources mitigation measures are proposed for GMD ETR activities at Adak.
4.10 PORT OF VALDEZ—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE

4.10.1 AIR QUALITY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.1.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Current air emission levels would remain the same, as listed in table 4.10.1-1. Operations currently conducted at the Port of Valdez would continue.

Table 4.10.1-1: Summary of Emissions of Regulated Air Pollutants in the Port of Valdez

<table>
<thead>
<tr>
<th></th>
<th>PM-10 metric tons (tons)/year</th>
<th>Sulfur Dioxide metric tons (tons)/year</th>
<th>Carbon Monoxide metric tons (tons)/year</th>
<th>Nitrogen Dioxide metric tons (tons)/year</th>
<th>Volatile Organic Compounds metric tons (tons)/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valdez Marine Terminal</td>
<td>252.2 (278)</td>
<td>1593.9 (1,757)</td>
<td>124.3 (137)</td>
<td>1,431.5 (1,578)</td>
<td>3142.5 (3,464)</td>
</tr>
<tr>
<td>Adjacent Facilitiesa</td>
<td>27.2 (30)</td>
<td>116.1 (128)</td>
<td>NA</td>
<td>100.7 (111)</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: U.S. Department of the Interior, Bureau of Land Management, 2002b

a = Includes the Petro Star Refinery, the City of Valdez and the Valdez Airport

NA = Not Available

4.10.1.2 Alternatives 1, 2, and 3

Construction

Construction and facility modification required to provide support to the SBX would occur in previously disturbed areas. Construction activities would be conducted in accordance with all appropriate regulations and permits. Other than minor, short-term impacts from construction, no exceedances of the NAAQS or state AAQS would be anticipated.

Operation

Operational emissions aboard the SBX would be limited to the exhaust produced by generators and maintenance. Maintenance-related emissions would include minimal levels of volatile organic compound emissions that are not expected to have a significant impact on air quality.

65 Percent and Fully Populated SBX

Based on five tests per year the SBX would be at the Port of Valdez PSB for 7 months. For conservative analysis purposes, 9 months will be used. The SBX is being analyzed as a mobile source with an expected use of 6,600 hours per year (24 hours a day for 9 months). The SBX on-board power plant planned for use would include eight 3.64-MW diesel driven generators. While at the PSB, only three of the generators would be used. One would operate continually while in port for daily ship functions. The other two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. This represents 6,600 hours of operation of one 3.64-MW generator and 1,650 hours (825 hours each) of operation for the other two generators that would be in operation at the PSB. Total power output for the three
3.64-MW generators would be 30,030 MW hours for the time the SBX is at the PSB. During the times the SBX is able to moor at the dock at Valdez, only two generators would be used for 3 hours per day to power the radar. The SBX would connect to shore power for normal ship functions. The SBX would not be considered a stationary source at the Port of Valdez; therefore, neither a Prevention of Significant Deterioration review nor a Title V permit would be required.

The remaining 3 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

**4.10.1.3 Cumulative Impacts**

Other emission sources within the proposed ROI include the Valdez Marine Terminal, which is the largest emission producer in the area. The TAPS owners have recently completed an EIS for a 30-year continuation of an Agreement and Grant of Right-of-Way for the Trans-Alaska Pipeline, which includes the Valdez Marine Terminal. The analysis has determined that current and future levels of emissions at the Valdez Terminal would be within Alaska Department of Environmental Conservation operating permits. It is anticipated that the addition of emissions from the SBX in the vicinity of the Valdez Marine Terminal would not exceed NAAQS or AAQS levels.

**4.10.1.4 Mitigation Measures**

No air quality mitigation measures are proposed for GMD ETR activities.

**4.10.2 AIRSPACE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ**

**4.10.2.1 No Action Alternative**

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions.

**4.10.2.2 Alternatives 1, 2, and 3**

The Proposed Action related to airspace would be full-power emissions from the SBX while at the mooring location south of Valdez in the Port of Valdez.

**Operation**

*Controlled and Uncontrolled Airspace*

Unrestricted operation of the SBX at the mooring location would have the potential to adversely affect air operations. As discussed in section 4.3.2.2.1, the SBX would not exceed military aircraft interference standards or the FAA standard for peak power levels. The SBX could exceed the 300 V/m average power threshold. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics. As shown in table 2.1.4-2, the fully populated radar has a potential for interference with aircraft (exceeding the
300 V/m average power threshold) out to a distance of 19 kilometers (11.8 miles) from the SBX.

In order to avoid or minimize adverse effects from EMR/EMI, DoD has established a coordination process with responsible agencies and airspace users. A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. The maximum potential interference distances are listed in table 2.1.4-2 and on figure 3.10.2-1.

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. A high-energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a RF radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. The establishment of this SBX high-energy radiation area would not impose any new flight restriction requirements.

SBX operations would be coordinated with the FAA and would be scheduled to occur during hours of minimal aircraft operations. Coordination with the Anchorage ARTCC would occur prior to and during each test. Consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace
There is no special use airspace within the ROI. Consequently, there would be no impacts to special use airspace.

En Route Airways and Jet Routes
The two en route low altitude airways (A7, V 481), one high altitude jet route (J167), and two great circle routes from North America to the Far East (NCA 13 and NCA 20) would be considered in defining the SBX operating area. There are additional approach and departure routes for the Valdez Pioneer Airport that would also need to be considered when defining the SBX high energy radiation area. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics.

Airports and Airfields
Valdez Pioneer Airport is located approximately 12 kilometers (7.5 miles) northeast of the proposed mooring location. With the restrictions placed on the SBX in a manner similar to the
GBR-P radar at RTS, standard instrument approach and departure procedures at the airfield would continue unhindered. Existing airfield or airport arrival and departure traffic flows would also not be affected and access to the airfield would not be curtailed.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the MHz range) than the X-band SBX, and would not normally experience any interference from the SBX. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.10.5 (Health and Safety) provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band RF interference, as well as non-frequency-related interference (high-power effects).

Emissions from the SBX may also potentially degrade the overall system performance of in-band airborne and ship based systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-band (8 to 12 GHz). However, the SBX high-energy radiation area would be configured to minimize impacts to these airborne and ship-based systems.

4.10.2.3 Cumulative Impacts

Because the SBX operates in different frequency ranges than most aircraft radars, there would be limited potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, the frequency allocation operating permit process would take into consideration potential impacts on other resources in the region and would preclude the potential for cumulative impacts. The use of the required scheduling and coordination process, and adherence to applicable DoD directives concerning radar operations would also preclude the potential for significant incremental, additive, cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI.

4.10.2.4 Mitigation Measures

The actual SBX operating area at the mooring location would be restricted in order to minimize impacts to aircraft operations, EEDs, and communication equipment. In addition to charting the SBX high-energy radiation area notice, information would be published in the Airport Facility section of the FAA Airport Guide, and local NOTAMs would be issued to notify pilots of the high-energy radiation area. The boundaries of the SBX high-energy radiation area would be configured to minimize impacts to aircraft operations and other potentially affected systems. Additionally, flight service personnel would brief pilots flying in the vicinity about the SBX high-energy radiation area.
4.10.3 BIOLOGICAL RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.3.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.

4.10.3.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term impacts from noise, such as startling and temporary displacement, no adverse effects to biological resources are anticipated.

Operation

Impacts to biological resources from operation of the SBX at the Port of Valdez would be similar to those described above in sections 4.3.3.3 and 4.6.3.2. The SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts are anticipated to Essential Fish Habitat, area seabirds and water fowl, or widely distributed, open-water species such as humpback, killer, and minke whales, sea otters, Steller sea lions, harbor seals, and Dall and harbor porpoises that occur in Prince William Sound.

4.10.3.3 Cumulative Impacts

No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to biological resources in the ROI. As stated above, no effects are anticipated on whales, other marine mammals, or birds that might be present in the vicinity of the homeport and transit locations.

4.10.3.4 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities at the Port of Valdez.

4.10.4 HAZARDOUS MATERIALS AND HAZARDOUS WASTE—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.4.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.
4.10.4.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas in accordance with host installation guidelines and regulations. Other than minor, short-term increase from the use of potentially hazardous materials such as paints, solvents and fuels, no adverse effects to ongoing hazardous materials storage and handling are anticipated. The small increases in the amount of potentially hazardous materials used during construction activities would result in generation of added wastes. However, this increase is not expected to be significant and would be accommodated in accordance with existing APSC protocol and applicable state and federal regulations.

Operation

Increased operations that could take place at the Port of Valdez would be servicing and maintenance of the SBX. Purchase and use of potentially hazardous materials associated with SBX operation and maintenance would be controlled within the APSC HAZCORE system. Recycling and reuse of spent and excess materials can be expected to maintain the level of hazardous material usage at or near current conditions. Routine and preventative maintenance activities associated with the SBX would result in the generation of small quantities of potentially hazardous waste. The quantity of waste generated would not change the port’s generator status. The types of waste generated are not expected to dramatically change. Wastes would be handled in accordance with TAPS Environmental Protection Manual, EN-43-2 procedures. SBX operation is not expected to significantly impact ongoing hazardous waste management or disposal practices.

4.10.4.3 Cumulative Impacts

The use of the required scheduling and coordination process and adherence to applicable Port and APSC procedures and DoD directives concerning radar operations would preclude the potential for significant incremental, additive cumulative impact to hazardous materials and waste management practices.

4.10.4.4 Mitigation Measures

No hazardous materials/hazardous waste management mitigation measures are proposed for GMD ETR activities at the Port of Valdez.

4.10.5 HEALTH AND SAFETY—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.5.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.
4.10.5.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to support the SBX would occur in accordance with existing host installation safety protocol/plans and applicable state and federal requirements. No adverse effects to health and safety of construction contractors or the public are anticipated.

Operation

The SBX operating area would be in the vicinity of the mooring location in the Port of Valdez, as shown in figure 2.3.1-17. Configuration and general operation of the SBX would occur as described in section 2.1.4. The transmit/receive RF emission pattern would be mostly contained within a narrow main beam. The total duration of RF radiation per week would be approximately 5 to 6 hours.

An EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center that considers HERP, HERF, and HERO. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required prior to SBX testing.

The analysis provides recommendations for sector blanking and safety systems to minimize exposures. The proposed systems would have the appropriate safety exclusion zones established before operation, and warning lights to inform personnel when the system is in operation and emitting EMR. Mechanical and software stops would be used to prevent the main beam from being directed in specified sectors where it may present a hazard.

Potential health and safety impacts related to human exposure, EEDs, fuels, communications—electronics interference, and aircraft avionics would be similar to those described in section 4.3.5.2.5. Appendix G also provides summary information regarding potential SBX EMR issues.

The actual operating area of SBX at the mooring location would be restricted to minimize impacts. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore, no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated.

4.10.5.3 Cumulative Impacts

The concept of time averaging is important in consideration of the potential cumulative exposures that might occur near operating radars. Because tracking and search radar beams move rapidly, depending on the particular mission or exercise, it is unlikely that environmental exposures would ever consist of continuous, constant values of power density. Rather, almost universally, exposures would be intermittent and, when the radars are transmitting, the electromagnetic fields would be constantly changing in intensity. Thus, the potential for additive, incremental cumulative impacts from EMR exposure is extremely limited.
4.10.5.4 Mitigation Measures

Limitations imposed on the range of azimuth and angles of operation would preclude potential impacts related to health and safety. Mechanical and software stops would be used to control the radar's operation.

4.10.6 TRANSPORTATION—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.6.1 No Action Alternative

Under the No Action Alternative, the GMD ETR would not be established, and interceptor and target launch scenarios would not require the SBX for testing under operationally realistic conditions. Operations currently conducted at the Port of Valdez would continue.

4.10.6.2 Alternatives 1, 2, and 3

Construction

Any construction or facility modification required to provide support to the SBX would occur in previously disturbed areas, such as the Container Dock staging area or the “Old Town” area, in accordance with guidelines and regulations. No adverse effects to transportation resources are anticipated.

Operation

The SBX would be required to meet environmental requirements for commercial vessels.

At the Port of Valdez, the City Dock is incapable of accommodating either cruise ships or the SBX, although the City of Valdez is upgrading this dock to allow its usage by the former. At high tide, the nearby North Pacific Fuel Dock is deep enough to accommodate the SBX. At the Container Dock, pier-side operations could be carried out in areas wherein depths exceed 15.2 meters (50 feet).

Pier space would not be available year-round at the Container Dock, however, as the space would be yielded to cruise shipping during the May-September tourism season. Other activities at the Container Dock could also interfere with the SBX potential for utilizing it, including occasional barge use. However, there are mooring locations near the Container Dock and across the port near the terminus of the Alaska Pipeline.

A security area or restricted area could be required for the mooring location at Valdez and would require coordination with the U.S. Army Corps of Engineers; a secure area currently exists near the oil tanker site. An Alaska Department of Natural Resources permit would be required for all actions within 4.8 kilometers (3 miles) of the shoreline, including mooring sites. Once underway, the SBX security zone would be similar to the Navy vessel protection zone that applies to Navy vessels that are underway. This moving zone includes a 91.4-meter (100-yard) security exclusion zone around the vessel and a slow speed zone between 91.4 and 457 meters (100 and 500 yards) from the vessel.
Coordination with local Native American groups such as the Tatitlek would be necessary to prevent any impacts to native fishing areas, particularly during the August salmon run and during other peak fishing seasons (such as halibut). Mooring locations would also be required to avoid the area wherein two major communication cables are located.

Transit to and from Prince William Sound could necessitate the use of at least two tugs for assistance. In addition, the Ship Escort and Response Vessel System provides emergency responders to escort ships in and out of the Port of Valdez.

Coordination would be required with the U.S. Coast Guard to lessen requirements for channel (Valdez Narrows) closure and preclude potential delays of oil tankers utilizing the area, as well as to establish any required security zone. Completion of a vessel response plan, to be approved by the U.S. Coast Guard, could be required.

Some 20 people would be instated at the PSB. As many as 50 personnel could leave the SBX for onshore activities. Assuming a maximum of 50 automobile trips per day, this level would be an approximate 0.9-percent increase over the minimum current AADT level at MP3 on Richardson Highway at Valdez of 5,540 vehicles. No impacts to area roadways are expected.

4.10.6.3 Cumulative Impacts
No other projects in the ROI have been identified that would have the potential for incremental, additive cumulative impacts to transportation resources in the ROI.

4.10.6.4 Mitigation Measures
No transportation mitigation measures are proposed for GMD ETR activities at the Port of Valdez.

4.10.7 UTILITIES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.7.1 No Action Alternative
Under the No Action Alternative, the GMD ETR would not be established and the SBX would not be developed to support interceptor and target launch scenarios, needed for operationally realistic test conditions. The Port of Valdez would continue its current operations.

Energy
Daily availability of electricity for Valdez via Copper Valley Electric Association is 13 MW, with 9.25 MW of backup power through its diesel station.

Water
Potable water hookups at Port of Valdez allow for demands exceeding approximately 245,185 liters (64,771 gallons).
Wastewater

Recent wastewater generation at the City of Valdez amounted to approximately 3.3 million liters (0.87 million gallons) per day. This amounts to 69.6 percent of the processing capacity of the City of Valdez Wastewater Treatment Plant over 4.73 million liters (1.25 million gallons) per day.

Solid Waste

Solid waste disposal at Port of Valdez is handled by private contractor.

4.10.7.2 Alternatives 1, 2, and 3

All of the alternatives would include SBX as one of the component of the Proposed Action. Electrical power requirements for the SBX platform and its various payloads would be approximately 21.8 MW, supplied by six on-board 3.64-MW generators. The SBX would be self-propelled by two of four steerable 3.4-MW electric thrusters that would effectively drive and maneuver the SBX without assistance. During transportation, these retractable, Z-drive thrusters would consume approximately 7 MW, leaving 14.8 MW available for necessary shipboard operations, as well as the XBR.

The SBX has a fuel capacity of approximately 3,100,000 liters (818,000 gallons). The approximate fuel consumption for transit and radar operation is 54,800 liters (14,500 gallons) per day, which would only amount to approximately 1.8 percent of total fuel capacity daily. Fuel consumption at the mooring site would be approximately 11,350 liters (3,000 gallons) per day.

There would be a total of 50 crew members, including 20 marine crew and 30 GMD mission support personnel. Additionally, up to 50 people could be accommodated on board on a temporary daytime basis.

At the intervals between GMD test missions, the SBX would return to a PSB or nearby mooring location for crew rotations, re-supply, and maintenance activities. While at an adjacent mooring location, only three of the generators would be used, one operating continually while in port for daily ship functions while the remainder would power the half- or fully populated radar three hours per day. A supply ship would deliver food, supplies, repair parts, and fuel from the PSB.

Valdez cannot commit to year-round pier space year for the SBX, but allows for numerous mooring locations near the container dock which would suffice for project operations. Thus a re-supply vessel would probably not be required. If the use of power hookups were deemed necessary for basic on-board ship activities, they would have to be constructed, as there are no hookups currently available at the docks. The power plant serving Valdez is well below capacity and could allow for the limited demands of the otherwise self-contained SBX. Potable water levels at the port are capable of sustaining large cruise ships and would likewise accommodate the SBX demands. Wastewater and solid waste needs would be handled by existing services, which charge on a per truck (wastewater) and per dumpster (solid waste) basis. Such services would be considered routine and would pose no impacts to port infrastructure; construction of power hookups would actually have a positive impact.

A new environmentally controlled warehouse would potentially be required for SBX operations to accommodate a maximum 25 personnel. Ongoing logistics and support operations such as re-supply, fueling/maintenance and crew/operator training would also occur at the PSB.
Studies have shown an average 189 liters (50 gallons) per capita per day water consumption and 170 liters (45 gallons) per capita per day of wastewater production. Recent figures indicate that in the United States, the per capita generation of municipal solid waste in 1998 was 2 kilograms (4.46 pounds) per capita per day (U.S. Environmental Protection Agency, Region 9, 2002). Average daily demand for water, wastewater, and municipal solid waste for a maximum 25 personnel would be estimated as follows, based on typical usage: 4,725 liters (1,250 gallons) water, 4,258 liters (1,125 gallons) wastewater and 50 kilograms (112 pounds) of solid waste. Any new facilities being constructed would be required to facilitate this level of use, as well as to accommodate any energy demand.

4.10.7.3 Cumulative Impacts
At this time, there are no ongoing or foreseeable future programs/plans identified in the region of influence that when combined with the relatively minor SBX utility requirements would result in cumulative impacts to utilities. Therefore, no cumulative impacts are anticipated with Alternatives 1, 2, and 3.

4.10.7.4 Mitigation Measures
No significant impacts would be anticipated with Alternatives 1, 2, and 3; therefore, no mitigation measures would be required or proposed.

4.10.8 VISUAL AND AESTHETIC RESOURCES—SEA-BASED TEST X-BAND RADAR PRIMARY SUPPORT BASE, PORT OF VALDEZ

4.10.8.1 No Action Alternative
Under the No Action Alternative, the SBX would not be located at Valdez. There would be no alteration of the existing visual setting and the adjacent area. No significant impacts to visual and aesthetic resources would occur, and no mitigation measures are proposed.

4.10.8.2 Alternatives 1, 2, and 3
Visual resources could possibly be affected by the proposed SBX at Valdez. The SBX would be approximately 76 meters (250 feet) tall, and the SBX platform would be 119 meters (390 feet) long and 73 meters (238 feet) wide. The SBX would be located at Valdez intermittently for approximately 7 months per year. The remaining 5 months of the year it is expected the SBX would be in transit or at one of the SBX operating areas.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was modified from “Landscape Aesthetics: A Handbook for Scenery Management” (U.S. Department of Agriculture, U.S. Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: scenic attractiveness, viewer concern, and distance zones. Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. The distance zone is a principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone. In addition, scenic integrity is included to determine the current level of
modification to an area. A description of the scenic value rating criteria and scenic attractiveness can be found in appendix B.

**Scenic Attractiveness**

The scenic attractive of the Port of Valdez is considered to be distinctive (A) due to the surrounding mountain ranges which provide an outstanding visual quality unique to the Valdez area.

**Concern Level**

The level of concern for the viewers within the Port of Valdez can potentially be high (Level 1) due to recreational and tourist areas.

**Distance Zone**

The SBX would either be moored at a selected dock or at mooring locations across the port. These locations would potentially result in a foreground (FG) view from the docks, a mid-ground (MG) view from Valdez itself, or a background (BG) view from some of the residential areas.

**Scenic Value Class**

The scenic value class for the Port of Valdez as determined from the scenic value class table, table 4.10.8-1, would be high (1) for the foreground, mid-ground, and background areas of the ROI, due to the level of scenic attractiveness of the area.

### Table 4.10.8-1: Scenic Value Class Determined for the Port of Valdez

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>Distance Zones and Concern Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FG1</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: (U.S. Department of Agriculture, U.S. Forest Service, 1995)

Scenic Attractiveness
- A – Distinctive, B – Typical, C – Indistinctive

Distance zone and Concern Level
- FG1 – Foreground with a high level of concern
- MG1 – Mid-ground with a high level of concern
- BG1 – Background with a high level of sensitivity
- FG2 – Foreground with a moderate level of sensitivity
- MG2 – Mid-ground with a moderate level of sensitivity
- BG2 – Background with a moderate level of sensitivity
- FG3 – Foreground with a low level of sensitivity
- MG3 – Mid-ground with a low level of sensitivity
- BG3 - Background with a low level of sensitivity

Scenic Value Class
- 1-2: High public value.
- 3-5: Moderate public value.
- 6-7: Low public value.
Scenic Integrity

The scenic integrity for the SBX locations at the Port of Valdez could either be considered “very low,” which means that the area appears heavily altered, or “very high,” which means that the valued landscape is intact with only insignificant if any deviation or disturbance, depending on the view. The mountain ranges surrounding Valdez would particularly be classified as having a “very high” level of scenic integrity.

The size of a midsize oil tanker is approximately 305 meters (1,000 feet) long and 61 meters (200 feet) wide. Because Valdez is the site of the terminus of the Trans-Alaska Pipeline, numerous oil tankers are consistently entering Prince William Sound, which would limit the impacts to visual resources caused by the SBX. However, adverse impacts to visual resources could occur due to a certain amount of sensitive viewers and a high amount of scenic integrity depending on the viewpoint.

4.10.8.3 Cumulative Impacts

The SBX would be moored temporarily and intermittently; therefore, cumulative impacts due to the SBX are not anticipated.

4.10.8.4 Mitigation Measures

No visual resources mitigation measures are proposed for GMD ETR activities at the Port of Valdez.
4.11 BROAD OCEAN AREA

This section describes the potential impacts within the BOA that may occur as a result of the GMD ETR activities. The BOA includes those areas that are outside the U.S. territorial waters, and as such this section of the document complies with Executive Order 12114, *Environmental Effects Abroad of Major Federal Activities*. The information contained in this section is summarized from the *Theater Missile Defense Extended Test Range Supplemental Environmental Impact Statement* (U.S. Department of the Air Force, 1998), *PMRF Enhanced Capability Environmental Impact Statement* (Pacific Missile Range Facility, Barking Sands, 1998), *North Pacific Targets Program Environmental Assessment* (U.S. Army Space and Missile Defense Command, 2001b), and the *Development and Demonstration of the Long Range Air-Launch Target Environmental Assessment* (U.S. Department of Defense, 2002). These documents included environmental analysis of potential impacts from missile launches and other military actions in the Gulf of Mexico and the Central and North Pacific. As appropriate, additional information used to develop this section is referenced accordingly.

Airspace, biological resources, health and safety, and transportation were identified as resource areas with potential impacts in the BOA. Water quality and noise are included in the analysis, from the standpoint of potential impacts on marine life.

With the BOA being the ROI, there is no potential for impacts to cultural resources, land use, soils, and groundwater. Similarly, since the BOA is well removed from islands and population centers, no impacts to the human noise environment, socioeconomics, and utilities are anticipated. Impacts to air quality from similar missiles have been determined to be insignificant.

4.11.1 AIRSPACE—BROAD OCEAN AREA

4.11.1.1 Gulf of Mexico

No Action Alternative

Under the No Action Alternative, the SBX would not be developed, and the proposed SBX test activities in the Gulf of Mexico would not take place.

Proposed Action

The Gulf of Mexico ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace over the Gulf of Mexico. This includes the entire northern Gulf of Mexico within the Houston, Jacksonville, and Miami ARTCCs, and the Houston and Miami Oceanic CTA/FIR. The Proposed Action in the Gulf of Mexico would include sea trials of the SBX platform and full power testing of the SBX. The location of testing has not been determined; however, full power radar testing would be conducted in areas that would minimize impacts to airspace.

A full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process. The completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing.
The results of the survey would also be used to define the operating area for the SBX (acceptable azimuths and operating angles). The maximum operating area would be all azimuths (360 degrees), and all angles up to 90 degrees. Table 2.1.4-2 lists the maximum potential interference distances.

**Special Use Airspace**

Full power radar testing would be planned to take place within existing special use airspace such as warning areas, and under conditions controlled to eliminate hazards to non-participating aircraft. Coordination with the FAA would be required before testing.

**En Route Airways and Jet Routes**

Full power radar testing would be planned to take place in an area that would minimize potential impacts to en route airways and jet routes. The specific testing location would be coordinated with the FAA to avoid en route airways and jet routes. By avoiding these routes, the proposed activities would not require a change to an existing or planned IFR minimum flight altitude, a published or special instrument procedure, or an IFR departure procedure; nor would they require a change to a VFR operation from a regular flight course or altitude. The SBX would be programmed to limit RF emissions in the direction of airways that pass within the potential interference distance. In addition, since the radar beam is in constant motion, should an aircraft enter the interference area, it is highly unlikely that the SBX would illuminate an aircraft long enough to affect the on-board electronics. Consequently, no impacts to the surrounding low altitude airways or high altitude jet routes would occur from SBX testing.

**4.11.1.2 En Route Gulf of Mexico to Pacific Ocean**

**No Action Alternative**

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed transit of the SBX from the Gulf of Mexico to the Pacific Ocean would not take place.

**Proposed Action**

The en route ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace along the route from the Gulf of Mexico to the Pacific Ocean. The Proposed Action would include transit and testing of the SBX to include full power testing of the SBX. The location of testing has not been determined; however, full power radar testing would be conducted in areas that would minimize impacts to airspace.

As described in the previous section, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing.

Potential impacts to en route airways and special use airspace would be minimal and similar to those described for the Gulf of Mexico.
4.11.1.3 Pacific Ocean

No Action Alternative

Under the No Action alternative, the GMD ETR would not be developed, and the proposed full range of GMD flight test activities in the Pacific BOA would not take place. Ongoing missile flight test activities would continue to use the existing special use airspace and other areas in the Pacific BOA. The continuing activities would not conflict with any airspace use plans, policies, and controls.

Proposed Action

The Pacific BOA ROI is defined as the overwater area that would be potentially affected by the Proposed Action using portions of the international airspace over the Pacific Ocean. This includes the entire northern Pacific BOA within the Oakland and Anchorage ARTCCs Oceanic CTA/FIR. The Proposed Action in the Pacific BOA would include missile booster drop zones, missile intercepts, and intercept debris. In addition, the launching of mobile sea launch targets and air launch targets could have airspace use impacts that would be essentially the same as the ground-launched missiles.

The Proposed Action would also include transit of the SBX from a PSB to the appropriate SBX performance region, SBX operations within the performance region in support of GMD flight tests, and transit back to a PSB.

Controlled and Uncontrolled Airspace

The airspace in the ROI outside territorial limits lies in international airspace and, consequently, is not part of the NAS. Because the area is in international airspace, the procedures of ICAO, outlined in ICAO Document 444, *Rules of the Air and Air Traffic Services*, are followed. ICAO Document 444 is the equivalent air traffic control manual to FAA Handbook 7110.65, *Air Traffic Control*. The FAA acts as the U.S. agent for aeronautical information to the ICAO, and air traffic in the overwater ROI is managed by the Honolulu, Oakland, and Anchorage ARTCCs.

After launch, typically the GBI and target missiles would be above 18,290 meters (60,000 feet) within seconds of launch. As such, all other local flight activities would occur at sufficient distance and altitude that the target missile and GBI missiles would be little noticed. However, activation of stationary Altitude Reservation (ALTRV) procedures, where the FAA provides separation between non-participating aircraft and the missile flight test activities, would impact the controlled airspace available for use by non-participating aircraft for the duration of the ALTRV, usually for a matter of a few hours, with a backup day reserved for the same hours. Because the airspace in most of the intercept debris areas is not heavily used by commercial aircraft, and is far removed from the en route airways and jet routes crossing the North Pacific, the impacts to controlled/uncontrolled airspace would be minimal.

However, the intercept scenarios with targets from KLC and GBIs from Vandenberg AFB (figure 2.1.8-3) may have moderate impacts to airspace due to the potential impacts from intercept debris. It has been determined that intercept debris as small as 1 gram could cause significant damage to a commercial aircraft traveling at cruising speed and altitude. The probability of fatality for a 737 aircraft flying through a target missile debris cloud is depicted in figure 4.11.1-1. The figure shows the debris cloud to be approximately 35 kilometers (22 miles) in diameter, and the area
Probability of Fatality Per Cell for 737 (Model Representative Output)

Source: 3D Research Corporation, 2001a (modified).

EXPLANATION
- $1.014 \times 10^{-4}$
- $7.411 \times 10^{-5}$
- $1.482 \times 10^{-5}$
- $2.223 \times 10^{-5}$
- $2.964 \times 10^{-5}$
- $3.705 \times 10^{-5}$
- $4.446 \times 10^{-5}$
- $5.187 \times 10^{-5}$
- $5.928 \times 10^{-5}$
- $6.669 \times 10^{-5}$

- $7.41 \times 10^{-4}$ (Risk Exceeds Guidelines)
- $8.151 \times 10^{-4}$
- $8.92 \times 10^{-4}$
- $9.633 \times 10^{-4}$

Note: Overhead View 9,145 meters (30,000 feet)
Altitude Commercial Airspace

Risk less than $1.0 \times 10^{-20}$

Scale
- 0 km
- 3.35
- 6.7 kilometer
- 2.1
- 4.2 miles

Figure 4.11.1-1

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where the probability of fatality is greater than 1 in 1 million is approximately 22 kilometers (13.6 miles) in diameter. This area of higher risk would need to be avoided by all aircraft. The time for the intercept debris to pass through commercial airspace cruising altitudes is approximately 3 hours after the intercept. All en route airways and jet routes that are predicted to pass through the target missile or GBI missile intercept debris areas would need to be identified before a test to allow sufficient coordination with the FAA to determine if the aircraft on those routes would be affected, and if so, if they would need to be re-routed or rescheduled. Routing around the debris areas would be handled in a manner similar to severe weather. The additional time for commercial aircraft to avoid the area would generally be less than 10 minutes at cruising altitudes and speeds.

For sea-launch target launches, it may be necessary to establish a 3.7-kilometer (2-nautical-mile) radius temporary Warning Area, extending from the surface up to 18,290 meters (60,000 feet) mean sea level above the sea-launch platform. Such a restricted area would marginally reduce the amount of navigable airspace in the BOA ROI, but because the airspace is not heavily used by commercial aircraft and is far removed from the en route airways and jet routes crossing the North Pacific, the impacts to controlled and uncontrolled airspace would be minimal.

As described in the section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX operations in the Pacific Ocean. The spectrum certification process would identify coordination requirements that would be followed by the SBX for all operations.

Special Use Airspace

GMD ETR missile intercepts and intercept debris would generally occur outside special use airspace areas. As such, the Proposed Action would not represent a direct special use airspace impact. Similarly, the use of ALTRV procedures as authorized by the Central Altitude Reservation Function, an air traffic service facility, or appropriate ARTCC (in this case, the Oakland ARTCC) for airspace utilization under prescribed conditions would not impact special use airspace. According to the FAA Handbook, 7610.44, ALTRVs may encompass certain rocket and missile activities and other special operations as may be authorized by FAA approval procedures.

The primary responsible test range would coordinate with the Oakland ARTCC military operations specialist assigned to handle such matters and the airspace coordinator at the Honolulu Center or other appropriate Radar Approach Center using ALTRV request procedures. After receiving the proper information on each test flight, a hazard pattern would be constructed and superimposed on a chart depicting the area of operations. Ensuring that the hazard pattern would not encroach on any land mass, this area is then plotted using minimum points (latitude-longitude) to form a rectangular area. This plotted area is then faxed to the military operations specialist at Oakland ARTCC requesting airspace with the following information: area point (latitude-longitude); date and time for primary and backup (month, day, year, zulu time); and altitude. A copy would be sent to the Honolulu Center or other appropriate Radar Approach Center. A follow-up phone call would be made after 48 hours to verify receipt of the fax. When approval of the request of the airspace is received from the military operations specialist at
Oakland ARTCC, the primary responsible test range would submit an ALTRV request to Central Altitude Reservation Function who publishes the ALTRV 72 hours before the flight test.

Full power radar testing would generally not take place within existing special use airspace such as warning areas. However, operations would be conducted in coordination with the FAA to minimize potential hazard to non-participating aircraft.

**En Route Airways and Jet Routes**

The numerous airways and jet routes that crisscross the Pacific BOA airspace use ROI have the potential to be affected by the Proposed Action. However, target and GBI missile launches and missile intercepts would be conducted in compliance with DoD Directive 4540.1 that specifies procedures for conducting missile and projectile firing; namely, “firing areas shall be selected so that trajectories are clear of established oceanic air routes or areas of known surface or air activity” (DoD Directive 4540.1, E5, 1981).

Before conducting a missile launch and/or intercept test, NOTAMs would be sent in accordance with the conditions of the directive specified in the primary responsible test range requirements. In addition, to satisfy airspace safety requirements, the responsible test range would obtain approval from the Administrator, FAA, through the appropriate DoD airspace representative. Provision is made for surveillance of the affected airspace either by radar or patrol aircraft. In addition, safety regulations dictate that hazardous operations would be suspended when it is known that any non-participating aircraft have entered any part of the danger zone until the non-participating entrant has left the area or a thorough check of the suspected area has been performed.

In addition to the reasons cited above, minimal adverse impacts to the en route airways and jet routes are identified because of the required coordination with the FAA. Schedules are provided to the appropriate FAA facility (Honolulu, Anchorage, and Oakland ARTCCs) as agreed between the agencies involved. Aircraft transiting the open ocean ROI on one of the low-altitude airways and/or high-altitude jet routes that would be affected by flight test activities would be notified of any necessary rerouting before departing their originating airport and would therefore be able to take on additional fuel before takeoff. Real-time airspace management involves the release of airspace to the FAA when the airspace is not in use or when extraordinary events occur that require drastic action, such as weather requiring additional airspace.

The FAA ARTCCs are responsible for air traffic flow control or management to transition air traffic. The ARTCCs provide separation services to aircraft operating on IFR flight plans and principally during the en route phases of the flight. They also provide traffic and weather advisories to airborne aircraft. By appropriately containing hazardous military activities by using ALTRV procedures, non-participating traffic are advised or separated accordingly, thus avoiding substantial adverse impacts to the low altitude airways and high altitude jet routes in the ROI.

If a 3.7-kilometer (2-nautical-mile) radius temporary Warning Area, extending from the surface to 18,200 meters (60,000 feet) mean sea level, is proposed over the sea-launch platform, it would not have an impact on the en route airways and jet routes in Pacific BOA. The sea-launch platform would be positioned to avoid the en route airways and jet routes that cross the North Pacific.
SBX operating areas include several air routes as shown on figure 4.11.1-2. As described in section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX operations in the Pacific Ocean. The spectrum certification process would identify coordination requirements that would be followed by the SBX for all operations. The SBX would generally be able to operate from a location within the SBX performance region that does not interfere with the air routes that cross the region. The specific testing location would be coordinated with the FAA to avoid en route airways and jet routes. If the SBX were to operate in an air route location, non-participating aircraft could be routed around the SBX operating area. Such a diversion would generally be less than 20 kilometers (12.4 miles), a minor distance for the routes being flown.

**Cumulative Impacts**

GMD testing would request clearance of various areas of airspace and may cause rerouting or rescheduling of flights for periods of as much as 3 to 4 hours, five times a year. This could result in as much as 20 hours of direct effect on air traffic access per year. However, most impacts would be in remote areas that would have little effect on air traffic. Other missile test programs could also have similar, minor impacts in the same areas.

Therefore, GMD flight tests with intercepts in the vicinity of en route airways and jet routes, when combined with other missile test programs, could lead to cumulative impacts to airspace in the form of flight delays. The required scheduling process for the use of airspace would help to minimize these potential adverse cumulative impacts.

**Mitigations Considered**

Coordination with the FAA, scheduling GMD flight tests during hours of low aircraft traffic, and the implementation of positive air traffic control are the primary practices employed to avoid impacts to airspace. Therefore additional airspace mitigation measures are not proposed for GMD ETR activities in the BOA.

### 4.11.2 BIOLOGICAL RESOURCES—BROAD OCEAN AREA

Potential impacts of construction, building modification, and missile launches on terrestrial and marine biological resources within the Gulf of Mexico and open ocean ROI were addressed in detail in the *Theater Missile Defense ETR Supplemental EIS-Eglin Gulf Test Range* (U.S. Department of the Air Force, 1998), *PMRF Enhanced Capability EIS* (Pacific Missile Range Facility, Barking Sands, 1998), *USAKA EIS* (U.S. Army Strategic Defense Command, 1989a), *USAKA Supplemental EIS* (U.S. Army Space and Strategic Defense Command, 1993a), *Theater Missile Defense Extended Test Range EIS* (U.S. Army Space and Strategic Defense Command, 1994), and *Kwajalein Atoll Temporary ETR EA* (U.S. Army Space and Strategic Defense Command, 1995). The finding of these studies are incorporated by reference and summarized in the following sections. Based on the prior analysis done and the effects of past interceptor and target launch activities, the potential impacts of activities related to missile test flights on biological resources are expected to be minimal, as discussed below. Dual GBI and target missile launches could potentially occur. Impacts from these dual launches would in some cases be slightly greater than, but similar to, those analyzed below for single launches.
EXPLANATION

- High Altitude Air Routes
- SBX Performance Regions

High Altitude Air Routes with Potential SBX Performance Regions

Pacific Ocean

Figure 4.11.1-2

4.11.2.1 Gulf of Mexico

As described in section 4.6.3.2, in terms of the potential for EMR impacts to wildlife, the power densities emitted from the SBX are unlikely to cause any biological effects in marine animals or birds.

4.11.2.2 En Route Gulf of Mexico to Pacific Ocean

Existing shipping routes would be used along the coast of South America to move the SBX from the Gulf of Mexico to the Pacific Ocean. The potential for impacts to marine mammals due to an accidental release of diesel fuel is considered low. There is evidence that dolphins can identify the presence of diesel fuel and lubricating oil and avoid it (U.S. Department of the Navy, 2001). The relatively slow speed of the SBX platform would preclude the potential for collision with a free-swimming marine mammal. Overall, no adverse impacts to marine mammals or other biological resources are anticipated.

4.11.2.3 Pacific Ocean

The proposed flight test operations would have no discernible or measurable effect on the ocean’s overall physical and chemical properties, and thus would have no impacts to the overall marine biology of the Ocean Area ROI for both PMRF and RTS. Moreover, the proposed test flight operations would have no discernible effect on the biological diversity of either the pelagic or benthic marine environments. The proposed activities would take place in the open ocean, or pelagic zone, which is far removed from land and contains approximately 2 percent of marine species. The potential for impacts exists from the GBI and target missile booster's fall to the ocean surface and from the target payload fall to the ocean surface. Of particular concern is the potential for impacts to marine mammals from both auditory and non-auditory effects. Potential auditory effects include behavioral disturbance (including displacement), acoustic masking (elevated noise levels that drown out other noise sources), and (with very strong sounds) temporary or permanent hearing impairment. Potential non-acoustic effects include physical impact by falling debris, entanglement in debris, and contact with or ingestion of debris or hazardous materials. Potential adverse effects could occur from sonic boom overpressures, shock wave impact or direct contact, ingestion of toxic solutions generated from the unburned propellant mixed with seawater, and ingestion of pieces of unburned propellant. The potential effects to marine biological resources from installation and operation of the SBX would be similar to those described in section 4.3.3.3 and 4.6.3.2.

Hazardous Materials Deposition

The National Aeronautics and Space Administration conducted a thorough evaluation of the effects of missile systems that are deposited in seawater. It concluded that the release of hazardous materials aboard missiles into seawater would not be significant. Materials would be rapidly diluted and, except for the immediate vicinity of the debris, would not be found at concentrations identified as producing any adverse effects. The Pacific Ocean depth in the vicinity of the launch area is thousands of meters (feet) deep, and consequently impact from the fuel is expected to be minimal. The rocket components would immediately sink to the ocean bottom, out of reach from marine mammals, sea turtles, and most other marine life (U.S. Department of the Air Force, 2002). Unburned solid fuel is hard and rubber-like, and any ammonium perchlorate would dissolve slowly out of the rubber-like binder, producing ammonia and chlorine that would disperse into the marine waters. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly
dissolves, its outer layers become spongy, further retarding dissolution. Thus, no toxic levels of ammonia, chlorine, or aluminum would be expected. A recent study conducted for the U.S. Air Force (Lang, et al, 2000) measured the amount of perchlorate lost from solid propellant samples immersed in fresh and salt water. From the measurement of the concentration of the perchlorate ion in solution, the mass fraction loss of the propellant sample due to perchlorate leaching was calculated. The results are presented in section 4.1.14, KLC Water Resources, table 4.1.14-2. As shown in the table, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that lands in the ocean (at 29°C [84°F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water.

Any area affected by the slow dissolution of the propellant would be relatively small due to the size of the rocket motor or propellant pieces relative to the quantity of seawater. (Federal Aviation Administration, 1996)

Under nominal launch conditions when the relative humidity is less than 100 percent, deposition of hydrogen chloride gas on the surface of the sea would not be significant. Analyses for the most conservative case, where rain would be present soon after test firing the advanced solid rocket motor, concluded that acid deposition to surface water would not result in any impacts to larger surface water bodies in the area. This analysis was based on the buffering capacity of fresh water, which is considerably lower than the buffering capacity of sea water; therefore, it is expected that even for the most conservative case condition where all of the hydrogen chloride emission falls over the open ocean area, the pH level would not be depressed by more than 0.2 standard units for more than a few minutes. (U.S. Department of the Navy, 1998)

Mathematical modeling results of advanced solid rocket motor tests indicated the maximum deposition of aluminum oxide would measure about 1.6 milligrams per square meter. Aluminum oxide is not considered toxic under natural conditions but may contribute potentially harmful species of soluble aluminum forms under acidic conditions. It is difficult to quantify the portion of aluminum oxide that reacts with hydrogen chloride to form additional toxic aluminum species. The most conservative approach assumes that all of the aluminum oxide deposited has reacted with hydrogen chloride. With this extremely conservative assumption, the deposition of about 1.6 milligrams per square meter of aluminum oxide equals approximately 0.0054 milligram per liter of aluminum at a water depth of 0.15 meter (0.5 foot). This analysis is based on the assumption that it would not be raining at the time of the test event or within 2 hours after the event. (U.S. Department of the Navy, 1998)

No solid propellant would remain in the spent Long-Range Air Launched Target rocket motors that impact in the ocean. The residual aluminum oxide and burnt hydrocarbon coating the inside of the motor casings would not present any toxicity concerns. However, residual amounts of hydraulic fluid contained in the first-stage motor and the contents of various batteries onboard the rocket motors and the reentry vehicle may mix with the seawater, causing contamination. The release of such contaminants could potentially harm marine life that comes in contact or ingests the toxic solutions. (U.S. Department of the Air Force, 2002)

It is also expected that, even in the most conservative scenario of an on-ship or early flight failure where all of the propellant is ignited and all of the hydrogen chloride and aluminum oxide is deposited, any toxic concentration of these products would be buffered and diluted by sea water to nontoxic levels within minutes. Consequently, any impacts from accidental release would be very transient. (U.S. Department of the Navy, 1998)
Debris

Debris impact and booster drops in the BOA could occur within the 322-kilometer (200-mile) limit of the Exclusive Economic Zone of affected islands. The natural buffering capacity of seawater and the strong ocean currents would neutralize reaction to any release of the small amount of liquid propellant contained within the Divert and Attitude Control System or Liquid Propellant Missile. Analysis in the Marine Mammal Technical Report, prepared in support of the Point Mugu Sea Range EIS, determined that there is a very low probability that a marine mammal would be killed by falling missile boosters, targets, or debris as a result of tests at the Point Mugu Sea Range (less than 0.0149 marine mammals exposed per year). The potential for an object or objects dropping from the air to affect marine mammals or other marine biological resources is less than $10^{-6}$ (1 in 1 million). The probability of a spent missile landing on a cetacean or other marine mammal is remote.

This probability calculation was based on the size of the area studied and the density of the marine mammal population in that area. The analysis concluded that the effect of this missile debris and intact missiles coming down in the open ocean would be negligible. The range area at Point Mugu is smaller (93,200 square kilometers [27,183 square nautical miles]) than the PMRF range area (144,000 square kilometers [42,000 square nautical miles]), and the density of marine mammals at Point Mugu is larger than the density found at PMRF. It is reasonable to conclude that the probability of a marine mammal being injured or killed by missile or debris impact from U.S. Navy testing at PMRF is even more remote than at Point Mugu, since the area at PMRF is larger and the density of marine mammals is smaller. Following formal consultation, the National Marine Fisheries Service concluded that the Proposed Action is not likely to adversely affect any marine mammal species. (U.S. Department of the Navy, 1998)

The splashdown of the first- and second-stage target missile boosters and defensive missile boosters, and the target vehicle’s and defensive missile’s payloads in the case of an unsuccessful intercept, is planned to occur in open ocean waters thousands of meters (feet) deep at considerable distance from the nearest land. The parts of solid rocket motor propellant expelled from a destroyed or exploded rocket motor that fall into the open ocean would most likely sink to the ocean floor at depths of thousands of meters (feet). At such depths, the propellant parts would be out of the way of feeding marine mammals. (U.S. Department of the Navy, 1998)

Following the Long-Range Air Launched Target missile launch, the Booster Extraction System would continue a slow descent by parachute until impacting the water. Although the impact would occur at a reasonably slow velocity, the falling 1,225-kilogram (2,700-pound) pallet could strike and injure or kill a marine mammal or sea turtle. As previously discussed, however, the probability of striking an animal within the ROI is extremely remote. (U.S. Department of the Air Force, 2002)

The eight parachutes used to extract and prepare the Long-Range Air Launched Target missile for launch would sink to the ocean bottom, along with the aluminum pallet. These parachutes, 4.6 to 28.7 meters (15 to 94 feet) in diameter, could cause entanglement of a marine mammal or sea turtle and potential drowning. However, such entanglement would be very unlikely since a parachute would either have to land directly on an animal, or an animal would have to swim blindly into it before it sinks to the ocean floor. The potential for a marine mammal or sea turtle to be in the same area and have physical contact with a parachute is remote. (U.S. Department of the Air Force, 2002)
Ingestion of Pieces of Unburned Propellant

Because of the slow rate at which the toxic materials dissolve out of the solid fuel matrix, the concentration and toxicity of dissolved solid rocket motor fuel in the ocean from the unexpended rocket motor, or portions of it, is expected to be negligible and without any substantial effect.

The parts of solid rocket motor propellant expelled from a destroyed or exploded rocket motor that fall into the ocean would most likely sink to the ocean floor at depths of thousands of meters (feet). At such depths the propellant parts would be out of the way of feeding marine mammals.

Noise

Potential auditory effects include behavioral disturbance (including displacement), acoustic masking (elevated noise levels that drown out other noise sources), and (with very strong sounds) temporary or permanent hearing impairment. Injury by the shock wave resulting from impact of a large, fast-moving object (such as a missile booster or target vehicle) with the water surface could be considered either an acoustic or non-acoustic effect. TTS, which is the temporary shift in hearing thresholds during and after exposure to high noise levels, is used as a measure of temporary reduction in hearing sensitivity.

For sound levels at or somewhat above the TTS threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. Much greater single noise exposures would be required to result in permanent hearing damage, while lesser noise levels could involve only minor behavioral responses with no effect on hearing sensitivity.

Sonic Boom Overpressure Impacts

The missiles could generate a sonic boom upon reentry. Each missile would propagate a unique sonic boom contour depending upon its mass, shape, velocity, and reentry angle, among other variables. The location of the possible impact point would vary depending upon the particular flight test profile. It is therefore difficult to produce the specific location, extent, duration, or intensity of sonic boom impacts upon marine life. These noise levels would be of very short duration.

According to analysis provided in the Navy’s Point Mugu Sea Range EIS, brief transient sounds such as sonic booms are unlikely to result in significant adverse effects to pinnipeds in the water. Pinnipeds seem tolerant of noise pulses from sonic booms, although reactions may occur. Temporary displacement, less than 1 or 2 days, is considered a less than significant impact. Momentary startle or alert reactions in response to a single transient sound such as a sonic boom are not considered a significant adverse effect to whales. Baleen whales (humpback, gray, and bowhead) have often been observed behaving normally in the presence of strong noise pulses from sources such as distant explosions and seismic vessels. Most gray and bowhead whales show some avoidance of areas where these noise pulses with pressures exceeding 170 dB or 1micropascal are repeated. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

The noise level thresholds of impact to marine life in general, and marine mammals in particular, are currently the subject of scientific analysis. However, due to the small open ocean area that could potentially be impacted and the relatively low number of species present it is highly unlikely that sonic booms for the missiles analyzed in this EIS would significantly affect marine
species. In addition, since different species of marine mammals have varying sensitivity to
different sound frequencies and may be found at different locations and depths in the ocean, it
is difficult to generalize sound impacts to marine mammals from missile impacts in the BOA.
Should consensus emerge from the scientific analysis about the effects of underwater noise on
marine mammals, it would then be possible to predict the consequences of a particular sonic
boom contour upon marine mammals in the vicinity.

Recent analysis by Cheng and Lee has shown that disturbances from acoustic sources
produced by interaction of a surface wave train with an incident sonic boom wave would
attenuate in deep water at a rate much lower (slower) than those predicted by Sawyer’s theory
for a flat (non-wavy) ocean, and would accordingly overwhelm the latter at large depth.
Experimental and theoretical research on underwater impact from sonic booms are performed
to ascertain the significant influence of wavy ocean surface on sonic boom penetration power
and to determine, through application of validated model to aircraft and space-launch examples,
if predicted signal intensity and characteristics at depth belong to ranges and types that may
allow meaningful impact assessment in the study of marine mammals. (Space and Missile
Systems Center, Environmental Management Branch, 2002)

**Shock Wave Impact**

The first-, second-, and third-stage target missile boosters and the target vehicle’s payload,
which all fall to the ocean surface, would impart a considerable amount of kinetic energy to the
ocean water upon impact. Missiles and targets would hit the water with speeds of 91 to 914
meters (300 to 3,000 feet) per second. It is assumed that the shock wave from their impact with
the water would be similar to that produced by explosives. At close ranges, injuries to internal
organs and tissues would likely result. However, injury to any marine mammal by direct impact
or shock wave impact would be extremely remote (less than 0.0006 marine mammals exposed
per year). The splashdown of the target missile boosters and payload is planned to occur in
open ocean waters thousands of meters (feet) deep at considerable distance from the nearest
land. (U.S. Army Space and Missile Defense Command, 2001b)

Standard range warning and checking procedures would check for visible large concentrations
of marine mammals in the area of the target launch, trajectory, and first-stage impact area.
Patrol and surveillance aircraft would be dispatched before launch to search the water surface.
If contacts are made and confirmed, the Flight Safety Officer would determine whether to
continue on schedule, delay the test flight, or postpone it until another day.

**4.11.2.4 Cumulative Impacts**

No substantial impacts to the Gulf of Mexico or to the open ocean area and its wildlife have
been identified from current and past missile test activities. Prior analysis has not identified a
significant potential for cumulative impacts. It is not likely that the proposed activities, in
conjunction with current or anticipated launches, would exceed the current level of activity in
these areas. GMD ETR-related tests would be discrete, short-term events, and no adverse
cumulative impacts are anticipated.
4.11.2.5 Mitigation Measures

No biological resources mitigation measures are proposed for GMD ETR activities conducted in the Gulf of Mexico or the open ocean area. These activities would adhere to the terms and conditions imposed by the National Marine Fisheries Service on missile launches.

4.11.3 HEALTH AND SAFETY—BROAD OCEAN AREA

4.11.3.1 Gulf of Mexico

No Action Alternative

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed test activities in the Gulf of Mexico would not occur.

Proposed Action

The Gulf of Mexico ROI is defined as the overwater area that would be potentially affected by the initial sea trials of the SBX platform and full power testing of the SBX. The sea trials are designed to ensure maneuverability and control of the vessel. The total amount of radar RF radiation would be approximately 5 to 6 hours per week during testing. The location of the testing has not been determined; however, it would be conducted in areas that would minimize impacts to aircraft and marine vessels. SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate, and NOTMARs and NOTAMs would be issued to warn aircraft and surface vessels of the testing. Therefore, no health and safety impacts to airspace/aircraft or mariners are anticipated.

As described in section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing. No impact to health and safety is expected.

4.11.3.2 Enroute from Gulf of Mexico to Pacific Ocean

No Action Alternative

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed test activities en route from the Gulf of Mexico to the Pacific Ocean would not occur.

Proposed Action

The SBX would use existing shipping routes along the coast of South America to get from the Gulf of Mexico to the Pacific Ocean. Full power testing of the SBX would occur during this transit period. The total amount of radar RF radiation would be approximately 5 to 6 hours per week during testing. The location of the testing has not been determined; however, it would be conducted in areas that would minimize impacts to aircraft and marine vessels. SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate and NOTMARs and NOTAMs would be issued to warn aircraft and marine surface vessels of the testing. Therefore, no health and safety impacts to airspace/aircraft or mariners are anticipated.

As described in section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD
Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX testing.

4.11.3.3 Pacific Ocean

No Action Alternative

Under the No Action Alternative, the GMD ETR would not be developed, and the proposed full range of GMD flight test activities in the Pacific BOA would not take place. Ongoing missile flight test activities would continue to use the existing special use airspace and other areas in the Pacific BOA. The continuing activities would not conflict with any commercial shipping lanes or airspace use plans, policies, and controls.

Proposed Action

The Proposed Action in the Pacific BOA would include missile booster drop zones, missile intercepts, and intercept debris. In addition, the launching of mobile sea launch targets and air launch targets could have airspace use or commercial shipping lane impacts that would be essentially the same as the ground launched missiles. The Proposed Action would also include transit of the SBX from a PSB to the appropriate SBX performance region, SBX operations within the performance region in support of GMD flight tests, and transit back to a PSB.

For sea-launch target launches, the airspace is not heavily used by commercial aircraft and is far removed from the en route airways and jet routes crossing the North Pacific, so the impacts to controlled and uncontrolled airspace would be minimal. GMD ETR activities have the potential for intercept and target debris impacts to waters normally occupied by commercial shipping. The majority of international trade crossing the Pacific between Asia and North America uses routes of least distance, usually via the great circle route. Depending upon the individual scenarios, the actual debris impact area would be small.

SBX operations would be coordinated with the FAA, Coast Guard, and other groups or agencies as appropriate, and NOTMARs and NOTAMs would be issued to warn aircraft and marine surface vessels of the radar testing/operation. SBX tests would be conducted in areas that would minimize impacts to marine transportation. The SBX would generally be able to operate from a location that does not interfere with the air routes crossing the region. If the SBX were to operate in an air route location, non-participating aircraft could be routed around the SBX operating area. Continued monitoring of testing areas for other marine vessels would take place to ensure such areas remain clear.

As described in the section 4.11.1.1, an EMR/EMI survey and analysis and DD Form 1494 would be required as part of the spectrum certification and frequency allocation process. A completed DD Form 1494 that has been processed and approved by the appropriate national and international authorities would be required before SBX operations in the Pacific Ocean. The spectrum certification process would identify coordination requirements that would be followed by the SBX for all operations.

4.11.3.4 Cumulative Impacts

The Proposed Action would result in up to five launches (target and GBI combined) per year. This would be consistent with current levels of missile activities in the open ocean area. Each launch would result in falling inert debris such as target boosters, target re-entry vehicles,
Interceptor missiles, target and intercept missile debris, or pallets and associated debris (metal fragments) and parachutes being deposited into the open ocean. However, each flight test and SBX test is a discrete short-term event, no population centers would be in the affected areas, and the Proposed Action would require the administration of NOTAMs and NOTMARs to warn aircraft and surface vessels of the potentially hazardous areas and allow them ample time to avoid hazards. Other missile test programs that could potentially affect the same area as the GMD ETR would also be short-term events and would not occur at the same time as the GMD ETR tests. Therefore, the potential for additive, incremental cumulative impacts from debris hazards or EMR exposure is extremely limited.

4.11.3.5 Mitigation Measures

Coordination between range personnel and with the FAA, Coast Guard, and other groups or agencies, as well as issuance of NOTMARs and NOTAMs, would be routine part of the Proposed Action. Additional health and safety mitigation measures are not proposed for GMD ETR activities.

4.11.4 TRANSPORTATION—BROAD OCEAN AREA

4.11.4.1 Gulf of Mexico

The initial sea trials would take place in the Gulf of Mexico and are designed to ensure maneuverability and control of the vessel. Since these tests may be run in parallel with the payload installation and checkout tests, mass simulators may be used to represent uninstalled portions during the stability and control evaluations. The emphasis would be on identifying and correcting problem operating conditions, such as vibrations that result from the installation of diesel and electric generators above the main deck or the vessel’s electric thrusters. These activities would not affect commercial shipping routes.

4.11.4.2 Enroute from Gulf of Mexico to Pacific Ocean

The SBX would use existing shipping routes along the coast of South America to get from the Gulf of Mexico to the Pacific Ocean. During this transit period, periodic testing of the SBX at predetermined locations would occur. Appropriate NOTMARs and NOTAMs would be issued to warn aircraft and surface vessels of the testing.

4.11.4.3 Pacific Ocean

GMD ETR activities have the potential for intercept and target debris impacts to waters normally occupied by commercial shipping. The majority of international trade crossing the Pacific between Asia and North America uses routes of least distance, usually via the great circle route. Depending upon the individual scenarios, the actual debris impact area would be small.

Prior warning of GMD ETR activities would enable commercial shipping to follow alternative routes away from the test area. The process is simplified by the lack of any formal shipping lanes in the northern Pacific. Safety procedures would be employed to determine that the impact areas are clear of surface vessels to ensure that no impact to ocean transportation would occur.

During the transit period into and through the Pacific Ocean area, periodic testing by the SBX (satellite and calibration device tracking) at predetermined locations would occur. Appropriate
NOTMARs and NOTAMs would be issued to warn aircraft and surface vessels of the testing, and those tests would be conducted in areas that would minimize impacts to marine transportation. The SBX would generally be able to operate from a location within the SBX performance region that does not interfere with the air routes crossing the region. If the SBX were to operate in an air route location, non-participating aircraft could be routed around the SBX operating area. Continued monitoring of testing areas for other marine vessels would take place to ensure such areas remain cleared. As mentioned previously, a completed DD Form 1494 would be required prior to SBX operations in the Pacific Ocean, and would assist in defining the operating area for the SBX.

4.11.4.4 Cumulative Impacts

Cumulative impacts would be minimized through early notification of aircraft and surface vessels through NOTMARs and NOTAMs, allowing commercial shipping to find alternative routes if necessary.

4.11.4.5 Mitigation Measures

Coordination between range personnel and with the FAA, Coast Guard, and other groups or agencies, as well as the aforementioned issuance of NOTMARs and NOTAMs, would be a routine part of the Proposed Action. No additional transportation mitigation measures are proposed.

4.12 CONFLICTS WITH FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AREA CONCERNED

The proposed program activities at KLC, Midway, RTS, PMRF, Vandenberg AFB, Pearl Harbor, NBVC Port Hueneme/San Nicolas Island, Naval Station Everett, Port Adak, and the Port of Valdez would be consistent with the existing land use. The proposed activities would not alter the use of the sites that currently support missile and rocket testing. Development of the SBX PSB would be in accordance with federal, state, and local planning plans and policies. All activities at RTS would comply with federal laws and regulations, the UES, and the Compact of Free Association between the RMI and the United States, and with regional and local land uses, policies, and regulation agreements. PMRF maintains federal jurisdiction for on-base land use; therefore, state and local land use laws are preempted.

Any potential conflicts with land use plans, policies, and controls would be a primary focus of agreements that would be negotiated with all affected federal, state, regional, and local agencies as applicable before implementation of the Proposed Action. Any closure of state recreational areas would be short-term, episodic events.

4.13 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Anticipated energy requirements of the GMD ETR program would be well within the energy supply capacity of all facilities. Energy requirements would be subject to any established energy conservation practices at each facility. No additional power generation capacity other than the potential use of generators would be required for any of the GMD ETR activities.
4.14 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND
CONSERVATION POTENTIAL

Other than various structural materials and fuels, the program would require no significant
natural or depletable resources.

4.15 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE
AVOIDED

In general, most known adverse effects resulting from implementation of the GMD ETR program
would be mitigated through project planning and design measures, consultation with appropriate
agencies, and the use of Best Management Practices. As a result, most potential adverse
effects would be avoided, and those that could not be avoided should not result in a significant
impact to the environment.

Adverse environmental effects that cannot be avoided include removal of vegetation at the
proposed construction sites; minor short-term noise impacts to and startling of wildlife; the
release of small amounts of pollutants into the atmosphere, the ground, and ocean; and minor
increased generation of hazardous materials at program-related sites. Consultation with the
appropriate agency would assist in developing mitigation measures to minimize the potential
impacts to wetlands. Some short-term program-related impacts to air quality, soils, and water
resources may occur. Any hazardous waste generated would be managed in compliance with
DoD, and other applicable federal, state, and local regulations.

EMR levels would not exceed safety guidance and would not affect the public. During the
construction phase there would be temporary disturbance to the immediate area around new
fiber optic cable line routes; however, once the cable is installed, there would be no long-term
impacts.

4.16 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE HUMAN
ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF
LONG-TERM PRODUCTIVITY

Proposed GMD ETR activities would take advantage of existing facilities and infrastructure to
the extent practicable. The use of land on Midway for an IDT and COMSATCOM would not
eliminate options for continued and future use of the island. The uses of the sites at locations
that were, or are, to support missile and rocket launches would not be altered. Therefore, the
Proposed Action does not eliminate any options for future use of the environment for the
locations under consideration.

4.17 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF
RESOURCES

The Proposed Action is not expected to result in the loss of threatened or endangered species
and no loss of cultural resources, such as archaeological or historic sites. There would be the
use of irretrievable resources (e.g., construction materials, fuel, and labor). There would be
some minor loss of biological habitat and wetlands, but impacts would be minimized through the
implementation of mitigation measures. Sensitive biological habitat would be avoided to the maximum extent practicable. Proposed activities would not irreversibly curtail the range of potential uses of the environment. Moreover, there would be no preclusion of development of underground mineral resources that were not already constrained.

Although the proposed activities would result in some irreversible or irretrievable commitment of resources such as various construction materials, minerals, and labor, this commitment of resources is not significantly different from that necessary for many other defense research and development programs carried out over the past several years. Proposed activities would not commit natural resources in significant quantities.

4.18 FEDERAL ACTIONS TO ADDRESS PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS (EXECUTIVE ORDER 13045, AS AMENDED BY EXECUTIVE ORDER 13229)

This EIS has not identified any environmental health and safety risks that may disproportionately affect children, in compliance with Executive Order 13045, as amended by Executive Order 13229.
a. Lead Agency: Missile Defense Organization

b. Preparing Agency: U.S. Army Space and Missile Defense Command

c. Cooperating Agencies: Federal Aviation Administration, Office of the Associate Administrator for Commercial Space Transportation

d. Proposed Action: Provide operationally realistic testing for GMD ETR.

e. Affected Jurisdictions: Kodiak Launch Complex, Kodiak Island Borough, Alaska; Vandenberg Air Force Base (AFB), Santa Barbara County, California; Reagan Test Site, United States Army Kwajalein Atoll; Pacific Missile Range Facility, Barking Sands, Kauai, Hawaii; Eareckson Air Station, Shemya Island, Alaska; Midway Atoll; King Salmon, Bristol Bay Borough, Alaska; Cordova, Valdez-Cordova Census Area, Alaska; Pillar Mountain, Kodiak Island Borough, Alaska; Pashagshak Point, Kodiak Island Borough, Alaska; Homer, Kenai Peninsula Borough, Alaska; Adak, Adak Island, Alaska; Pillar Point, San Mateo County, California; Wake Island, Oceania Atoll; Bremerton, Kitsap County, Washington; Pearl Harbor, Honolulu County, Hawaii; Port Hueneme/San Nicolas Island, Ventura County, California; Naval Station Everett, Snohomish County, Washington; Valdez, Valdez-Cordova Census Area, Alaska; Beale Air Force Base, Yuba County, California; Clear Air Force Station, Denali Borough, Alaska

f. Inquiries on this document may be directed to: U.S. Army Space and Missile Defense Command, ATTN: SMDC-EN-V (Ms. Julia Elliott), 106 Wynn Drive, Huntsville, AL 35805, by e-mail at gmdetreis@smdc.army.mil, or by phone at 1-800-823-8823.

g. Designation: Final Environmental Impact Statement

h. Distribution/Availability: DISTRIBUTION A. Approved for public release; distribution is unlimited.

i. Abstract: The Missile Defense Agency is proposing to develop the capability to conduct more realistic interceptor flight tests in support of GMD. The extension of the existing GMD test range would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, and speeds of target and interceptors that closely resemble those in which an operational system would be required to provide an effective defense. Extended range testing would include pre-launch activities, launch of targets and Ground-Based Interceptors from a number of widely separated locations, and missile intercepts over the Pacific Ocean. Target missiles would be launched from Vandenberg AFB, Kodiak Launch Complex, Pacific Missile Range Facility, Reagan Test Site (RTS), or from mobile platforms in the western Pacific Ocean. Interceptor missiles would be launched from Vandenberg AFB, Kodiak Launch Complex, or RTS. Dual target and interceptor missile launches would occur in some scenarios. Existing, modified, or new launch facilities and infrastructure would support these launch activities at the various locations.

Missile acquisition and tracking would be provided by existing test range sensors, ship-borne sensors, a Sea-Based Test X-Band Radar, and a mobile sensor (TPS-X) positioned at Vandenberg AFB, Kodiak Launch Complex, or RTS; and existing/upgraded radars at Beale AFB, California, Clear Air Force Station, and Eareckson Air Station, Alaska. In-Flight Interceptor Communications Data Terminals would be constructed near the proposed Ground-Based Interceptor launch sites. Commercial satellite communications terminals would be constructed at launch locations that do not have fiber optic communications links.
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6.0 Glossary of Terms
6.0 GLOSSARY OF TERMS

A-weighted Sound Level—a number representing the sound level which is frequency-weighted according to a prescribed frequency response established by the American National Standards Institute (S1.4-1971) and accounts for the response of the human ear.

Adjacent Band—all frequencies that are within approximately 5 percent of the operating frequency of the interfering transmitter.

Advisory Council on Historic Preservation—a 19-member body appointed, in part, by the President of the United States to advise the President and Congress and to coordinate the actions of Federal agencies on matters relating to historic preservation, to comment on the effects of such actions on historic and archaeological cultural resources, and to perform other duties as required by law (Public Law 89-655; 16 U.S. Code 470).

Aeronautical Chart—a map used in air navigation containing all or part of the following: topographic features, hazards and obstructions, navigation aids, navigation routes, designated airspace, and airports.

Aesthetic—a pleasing appearance, effect, or quality that allows appreciation of character-defining features, such as of the landscape.

Aggregate—materials such as sand, gravel, or crushed stone used for mixing with a cementing material to form concrete or alone as railroad ballast or graded fill.

Air Basin—a region within which the air quality is determined by the meteorology and emissions within it with minimal influence on and impact by contiguous regions.

Air Defense Identification Zone—the area of airspace over land or water, extending upward from the surface, within which the ready identification, the location, and the control of aircraft are required in the interest of national security.

Air Quality Control Region—a contiguous geographic area designated by the Federal government in which communities share a common air pollution status.

Air Route Traffic Control Center (ARTCC)—a facility established to provide air traffic control service to aircraft operating on Instrument Flight Rules flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to aircraft operating under Visual Flight Rules.

Air Shed—a volume of air with boundaries chosen to facilitate determination of pollutant inflow and outflow.

Air Traffic Control—a service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

Airspace—the space lying above the earth or above a certain land or water area (such as the Gulf of Mexico); the space lying above a nation and coming under its jurisdiction.
Airspace, Controlled—airspace of defined dimensions within which air traffic control service is provided to Instrument Flight Rules flights and to Visual Flight Rules flights in accordance with the airspace classification. Controlled airspace is divided into five classes, dependent upon location, use, and degree of control: Class A, B, C, D, and E.

Airspace, Special Use—airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon non-participating aircraft.

Airspace, Uncontrolled—uncontrolled airspace, or Class G airspace, has no specific definition but generally refers to airspace not otherwise designated and operations below 365.7 meters (1,200 feet) above ground level. No air traffic control service to either Instrument Flight Rules or Visual Flight Rules aircraft is provided other than possible traffic advisories when the air traffic control workload permits and radio communications can be established.

Airway—Class E airspace established in the form of a corridor, the centerline of which is defined by radio navigational aids.

Alkaline—basic, having a pH greater than 7.

Alluvium—general term for deposits made by streams on river beds, flood plains, and alluvial fans.

Ambient Air—that portion of the encompassing atmosphere, external to buildings, to which the general public has access.

Ambient Air Quality Standards—standards established on a state or Federal level that define the limits for airborne concentrations of designated "criteria" pollutants (nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter, ozone, and lead) to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards).

American National Standards Institute (ANSI)—serves as a consensus standard developed by representatives of industry, scientific communities, physicians, Government Agencies, and the public.

Amplitude—the maximum departure of the value of a sound wave from the average value.

Anadromous—going from salt water to fresh water or up rivers to spawn.

Annual Average Daily Traffic (AADT)—the total volume passing a point or segment of a highway facility in both directions for 1 year divided by the number of days in the year.

Aquifer—the water-bearing portion of subsurface earth material that yields or is capable of yielding useful quantities of water to wells.

Archaeology—a scientific approach to the study of human ecology, cultural history, and cultural process.

Area of Potential Effect—the geographic area within which direct and indirect impacts generated by the Proposed Action and alternatives could reasonably be expected to occur and thus cause a change in historic, architectural, archaeological, or cultural qualities possessed by the property.
Asbestos—a carcinogenic substance formerly used widely as an insulation material by the construction industry; often found in older buildings

Asbestos-containing Material (ACM)—any material containing more than 1 percent asbestos

Association—a group that forms together because of similar environmental requirements

Attainment Area—an air quality control region that has been designated by the U.S. Environmental Protection Agency and the appropriate state air quality agency as having ambient air quality levels as good as or better than the standards set forth by the National Ambient Air Quality Standards, as defined in the Clean Air Act. A single geographic area may have acceptable levels of one criteria air pollutant, but unacceptable levels of another; thus, an area can be in attainment and non-attainment status simultaneously.

Average Daily Traffic (ADT)—the total volume of traffic passing a given point or segment of a roadway in both directions divided by a set number of days

Ballistic Missile—any missile that does not rely upon aerodynamic surfaces to produce lift and consequently follows a ballistic trajectory when thrust is terminated

Bedrock—the solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface

Benthic—associated with the bottom of a body of water

Bifaces—stone tools that have been flaked on both sides

Biological Resources—a collective term for native or naturalized vegetation, wildlife, and the habitats in which they occur

Booster—an auxiliary or initial propulsion system that travels with a missile or aircraft and that may not separate from the parent craft when its impulse has been delivered; may consist of one or more units

Boreal—pertaining to the north

Borough—civil division of the State of Alaska corresponding to a county in most other states

Candidate Species—a species of plant or animal for which there is sufficient information to indicate biological vulnerability and threat, and for which proposing to list as “threatened” or “endangered” is or may be appropriate

Capacity—the maximum rate of flow at which vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions

Carbon Monoxide—a colorless, odorless, poisonous gas produced by incomplete fossil-fuel combustion; it is one of the six pollutants for which there is a national ambient standard (see Criteria Pollutants)

Census Tract—small, relatively permanent statistical subdivisions of a county that are delineated for all metropolitan areas and other densely populated counties
Chlorofluorocarbons (CFCs)—a group of inert, nontoxic, and easily liquefied chemicals (such as Freon) used in refrigeration, air conditioning, packaging, or insulation or as solvents or aerosol propellants

Colluvium—a general term applied to loose deposits, usually at the foot of a slope or cliff and brought there chiefly by gravity; includes talus and cliff debris

Continental United States—the United States and its territorial waters between Mexico and Canada, but excluding overseas states; often abbreviated CONUS

Control Area (CTA)—a controlled airspace extending upwards from a specified limit above the earth

Controlled Airspace—an airspace of defined dimensions within which air traffic control service is provided to Instrument Flight Rules flights and to Visual Flight Rules flights in accordance with the airspace classification

Controlled Environment—areas that may be occupied by personnel who accept potential exposure to radiation as a contingency of employment or duties, by individuals who knowingly enter areas where such levels of radiation are to be expected, and by personnel passing through such areas

Controlled Firing Area (CFA)—airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to non-participating aircraft and to ensure the safety of persons and property on the ground

Council on Environmental Quality (CEQ)—established by the National Environmental Policy Act, the CEQ consists of three members appointed by the President. A CEQ regulation (Title 40 Code of Federal Regulations 1500-1508, as of July 1, 1986) describes the process for implementing the National Environmental Policy Act, including preparation of environmental assessments and environmental impact statements, and the timing and extent of public participation.

Criteria Pollutants—pollutants identified by the U.S. Environmental Protection Agency (required by the Clean Air Act to set air quality standards for common and widespread pollutants); also established under state ambient air quality standards. There are standards in effect for six criteria pollutants: sulfur dioxide, carbon monoxide, particulate matter, nitrogen dioxide, ozone, and lead.

Cultural Resources—prehistoric and/or historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered of importance to a culture, subculture, or community for scientific, traditional, religious, or any other reason

Cumulative Impact—the impact of the environment which results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Decibel (dB)—a unit of measurement on a logarithmic scale which describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference value; the accepted standard unit for the measurement of sound
Degradation—the process by which a system will no longer deliver acceptable performance

Department of Defense Flight Information Publication (DOD FLIP)—a publication produced by the Defense Mapping Agency which is used for flight planning, en route, and terminal operations

Dewater—to remove water, such as in sewage processing

Distance Measuring Equipment (DME)—equipment on-board aircraft that transmits paired pulses at a specific spacing, which are received at a ground station. The station’s transponder then transmits paired pulses back to the aircraft at the same pulse spacing but on a different frequency. The time required for the round trip of this signal exchange is measured in the airborne distance measuring equipment unit and is translated into distance from the aircraft to the ground station.

Drainage Basin—watershed

Drive-to-Work Area—the area within which it would be reasonably expected that personnel would commute to the site of the proposed action. This region may vary in size considerably from place to place, depending on the quality of roads, the level of traffic congestion and the local availability of similar quality jobs.

Easement—a right of privilege (agreement) that a person or organization may have over another’s property; an interest in land owned by another that entitles the holder of the easement to a specific limited use

Effluent—an outflowing branch of a main stream or lake; waste material (such as smoke, liquid industrial refuse, or sewage) discharged into the environment

Electroexplosive Device (EED)—a single unit, device, or subassembly in which electrical energy is used to initiate an enclosed explosive, propellant, or pyrotechnic material

Electromagnetic Interference—electromagnetic radiation that disrupts electronic and electrical systems

Electromagnetic Radiation (EMR)—waves of energy with both electric and magnetic components at right angles to one another

Emission Inventory—a listing, by source, of the amount of air pollutants discharged into the atmosphere of a community

Encroachment—the placement of an unauthorized structure or facility on someone’s property or the unauthorized use of property

Endangered Species—a plant or animal species that is threatened with extinction throughout all or a significant portion of its range

En Route Airway—a low altitude (below 5,486 meters [18,000 feet] mean sea level) airway based on a center line that extends from one navigational aid or intersection to another navigational aid (or through several navigational aids and intersections) specified for that airway
Environmental Justice—an identification of potential disproportionately high and adverse impacts on low-income and/or minority populations that may result from proposed Federal actions (required by Executive Order 12898)

Erosion—the wearing away of a land surface by water, wind, ice, or other geologic agents

Estuary—a water passage where the tide meets a river current; an arm of the sea at the lower end of a river; characterized by brackish water

Explosive Class 1.1—explosives that have a mass explosion hazard (one that affects almost the entire load instantaneously)

Explosive Class 1.3—explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard, or both, but not a mass explosion hazard

Explosive Class 1.4—explosives that present a minor explosion hazard with no projection of fragments of appreciable size or range expected

Explosive Safety Quantity-Distance (ESQD)—the quantity of explosive material and distance separation relationships providing defined types of protection based on levels of risk considered acceptable

Flight Information Region (FIR)—an airspace of defined dimensions within which flight information service and alerting service are provided. Flight information service is provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights, and alerting service is provided to notify appropriate organizations regarding aircraft in need of search and rescue aid and to assist such organizations as required.

Flight Level—a level of constant atmospheric pressure related to a reference datum of 76 centimeters (29.92 inches) of mercury stated in three digits that represent hundreds of feet. For example, flight level 250 represents a barometric altimeter indication of 7,620 meters (25,000 feet); flight level 255 represents an indication of 7,772 meters (25,500 feet).

Flood Hazard Zones—typically lowland areas bordering streams or rivers onto which overflow is most likely to spread at flood stage

Floodplain—the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands; includes, at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year (100-year floodplain)

Fluvial—of or pertaining to rivers; of or produced by the action of a river or stream

Fly-by-Wire—aircraft that rely completely on electrical wires to relay flight commands instead of the usual cables and linkage controls

Friable—easily crumbled or reduced to powder

Fugitive Dust—any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man. Fugitive dust may include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is either removed or redistributed.

Glacial Till—unstratified drift, deposited by a glacier without reworking by meltwater, and consisting of a mixture of clay, silt, sand, gravel, and boulders ranging widely in size and shape
Great Circle Route—the shortest course between two points on the surface of a sphere. Great circle routes, which require constantly changing headings, are most useful beyond the equatorial regions and for distances greater than several hundred miles. Long-distance air traffic uses great circle routes routinely, saving time and fuel. Navigational radio signals also follow great circle paths.

Groundwater—water within the earth that supplies wells and springs; specifically, water in the zone of saturation where all openings in rocks and soil are filled, the upper surface of which forms the water table

Grub—to clear by digging up roots and stumps

Habitat—the area or type of environment in which an species or ecological community normally occurs

Harmonically Related Band—harmonically related receivers and sub-harmonically related transmitters. Harmonic frequencies include those frequencies that are integer multiples of the operating frequencies of the interfering transmitter. Subharmonic frequencies are those frequencies that are simple fractions of the operating frequencies of the interfering transmitter.

Hazardous Material—a substance that can cause, because of its physical or chemical properties, an unreasonable risk to the health and safety of individuals, property, or the environment

Hazardous Waste—a waste, or combination of wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either cause or significantly contribute to an increase in mortality or an increase in serious irreversible illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed

Hertz (Hz)—the standard radio equivalent of frequency in cycles per second of an electromagnetic wave. Kilohertz (kHz) is a frequency of 1,000 cycles per second. Megahertz (MHz) is a frequency of 1 million cycles per second.

High Energy Radiation Area—an area charted on visual aeronautical charts for radar systems that emit energy that could be hazardous to certain aircraft instrument systems. These areas required to be charted by the Federal Aviation Administration shall be shown on sectionals, terminal air charts, and world aeronautical charts with the "sawtooth" symbol. Aircraft flight through the area is not subject to restrictions.

High Power Effects—interference in electronic devices produced by very high power emitters which has not been predictable by the classical analysis processes; i.e., processes that predict antenna-coupled, case-coupled, spurious and intermodulation responses

Historic Properties—under the National Historic Preservation Act, these are properties of national, state, or local significance in American history, architecture, archaeology, engineering, or culture, and worthy of preservation

Hydrocarbons—any of a vast family of compounds containing hydrogen and carbon, including fossil fuels

IFR Military Training Routes (IR)—training routes mutually developed by the Department of Defense and the Federal Aviation Administration to provide for military operational and training
requirements that cannot be met under the terms of FAR 91.117 (Aircraft Speed). Accordingly, the Federal Aviation Administration has issued a waiver to the Department of Defense to permit operation of an aircraft below 3,048 meters (10,000 feet) mean sea level in excess of 463 kilometers per hour (250 knots) indicated airspeed along Department of Defense/Federal Aviation Administration mutually developed and published Instrument Flight Rules routes.

**Impacts (effects)**—an assessment of the meaning of changes in all attributes being studied for a given resource; an aggregation of all the adverse effects, usually measured using a qualitative and nominally subjective technique. In this Environmental Impact Statement, as well as in the Council on Environmental Quality regulations, the word impact is used synonymously with the word effect.

**Impervious Surface**—an external part or layer whose impermeability does not allow entrance or passage of water

**In-band**—all frequencies that are within the operating frequency of the interfering transmitter

**Infrastructure**—the system of public works of a country, state, or region, such as utilities or communication systems; physical support systems and basic installations needed to operate a particular area or facility

**Instrument Flight Rules (IFR)**—rules governing the procedures for conducting instrument flight; also a term used by pilots and controllers to indicate type of flight plan

**Inversion**—an increase of temperature with height through a layer of air; usually associated with stable (but stagnant) air conditions

**Ionizing Radiation**—particles or photons that have sufficient energy to produce direct ionization in their passage through a substance. X-rays, gamma rays, and cosmic rays are forms of ionizing radiation.

**Jet Routes**—a route designed to serve aircraft operating from 5,486 meters (18,000 feet) up to and including flight level 450, referred to as J routes with numbering to identify the designated route

**Lead**—a heavy metal which can accumulate in the body and cause a variety of negative effects; one of the six pollutants for which there is a national ambient air quality standard (see Criteria Pollutants)

**Lead-based Paint**—paint on surfaces with lead in excess of 1.0 milligram per square centimeter as measured by X-ray fluorescence detector, or 0.5 percent lead by weight

**Level of Service**—describes operational conditions within a traffic stream and how they are perceived by motorists and/or passengers; a monitor of highway congestion that takes into account the average annual daily traffic, the specified road segment’s number of lanes, peak hour volume by direction, and the estimated peak hour capacity by a roadway’s functional classification, area type, and signal spacing

**Littoral**—species found in tide pools and near-shore surge channels

**Maritime**—of, relating to, or bordering on the sea

**Material Safety Data Sheet**—presents information, required under the Occupational Safety and Health Act Standards, on a chemical’s physical properties, health effects, and use precautions
Maximum Permissible Exposure Level (MPEL)—as established by the Nuclear Regulatory Commission, exposure standards set at a level where apparent injury from ionizing radiation during a normal lifetime is unlikely

Mesosphere—the third highest layer in our atmosphere, occupying the region 50 to 80 kilometers (31 to 50 miles) above the Earth’s surface, above the troposphere and stratosphere, and below the thermosphere, the coldest layer of the atmosphere

Metamorphic—rock derived from preexisting igneous rock changed by temperature, stress, chemical environment or any combination of these factors

Migratory Birds—avians characterized by their practice of passing, usually periodically, from one region or climate to another

Military Operations Area—an airspace assignment of defined vertical and lateral dimensions established outside Class A areas (formerly Positive Control Areas) to separate certain military activities from Instrument Flight Rules traffic and to identify for Visual Flight Rules traffic where these activities are conducted

Military Training Routes (MTR)—airspace of defined vertical and lateral dimensions established for the conduct of military flight training at airspeeds in excess of 250 knots

Minority—minority populations, as reported by the 2000 Census of Population and Housing, includes Black, American Indian, Eskimo or Aleut, Asian or Pacific Islander, Hispanic, or other

Mitigation—a method or action to reduce or eliminate severity of environmental impacts.

Mobile Sources—any movable source that emits any regulated air pollutant

Mortality—the number of deaths in a given time or place

National Airspace System—the common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components shared jointly with the military.

National Ambient Air Quality Standards (NAAQS)—as set by the U.S. Environmental Protection Agency under Section 109 of the Clean Air Act, nationwide standards for limiting concentrations of certain widespread airborne pollutants to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility and materials (secondary standards). Currently, six pollutants are regulated: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide (see Criteria Pollutants).

National Environmental Policy Act (NEPA)—Public Law 91-190, passed by Congress in 1969. The Act established a national policy designed to encourage consideration of the influences of human activities, such as population growth, high-density urbanization, or industrial development, on the natural environment. The National Environmental Policy Act procedures require that environmental information be made available to the public before decisions are made. Information contained in the National Environmental Policy Act documents must focus on the relevant issues in order to facilitate the decision-making process.

National Register of Historic Places (National Register)—a register of districts, sites, buildings, structures, and objects important in American history, architecture, archaeology, and
culture, maintained by the Secretary of the Interior under authority of Section 2 (b) of the Historic Sites Act of 1935 and Section 101 (a)(1) of the National Historic Preservation Act of 1966, as amended

**Native Americans**—used in a collective sense to refer to individuals, bands, or tribes who trace their ancestry to indigenous populations of North America prior to Euro-American contact

**Native Species**—plants or animals living or growing naturally in a given region and often referred to as indigenous

**Navigable Airspace**—airspace at or above the minimum flight altitudes prescribed in the Federal Aviation Regulations including airspace needed for safe takeoff and landing

**Navigational Aid**—any visual or electronic device, airborne or on the surface, which provides point-to-point guidance information or position data to aircraft in flight

**Nitrogen Dioxide**—gas formed primarily from atmospheric nitrogen and oxygen when combustion takes place at high temperatures

**Nitrogen Oxides**—gases formed primarily by fuel combustion

**Non-attainment Area**—an area that has been designated by the U.S. Environmental Protection Agency or the appropriate state air quality agency as exceeding one or more of the national or state ambient air quality standards

**Non-directional Radio Beacon (NDB)**—an L/MF or UHF radio beacon transmitting non-directional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine the aircraft's bearing to or from the radio beacon and “home” on or track to or from the station

**Non-ionizing Radiation**—electromagnetic radiation at wavelengths whose corresponding photon energy is not high enough to ionize an absorbing molecule. All radio frequency, infrared, visible, and near ultraviolet radiation are non-ionizing.

**Nonpoint Source**—type of pollution originating from a combination of sources

**Notice to Airmen (NOTAM)**—a notice containing information, not known sufficiently in advance to publicize by other means, the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System), the timely knowledge of which is essential to personnel concerned with flight operations

**Out-of-Band**—those frequencies that are not in-band, adjacent-band, or harmonically related band frequencies

**Ozone**—a compound consisting of three oxygen atoms

**Ozone-depleting Substances**—a group of chemicals that are inert under most conditions but within the stratosphere react catalytically to reduce ozone to oxygen

**Paleontology**—the study of life in the past geologic time, based on fossil plants and animals

**Palustrine Emergent**—small, shallow, permanent, or intermittent water bodies dominated by trees, shrubs, persistent emergents, and emergent mosses or lichens
**Particulate Matter**—particles small enough to be airborne, such as dust or smoke (see Criteria Pollutants)

**Peak-Hour Volume (PHV)**—the hourly volume during the maximum volume hour of the day

**Pelagic**—of the ocean waters

**Per Capita**—per unit of population; by or for each person

**Permafrost**—permanently frozen subsoil, for a minimum of 2 years, occurring in perennially frigid areas

**Permeability**—a quality that enables water to penetrate

**Permissible Exposure Limit (PEL)**—that exposure level expressed in electric field, magnetic field, or plane wave power density to which an individual may be exposed and which, under conditions of exposure, will not cause detectable bodily injury in light of present medical knowledge

**Pesticide**—any substance, organic, or inorganic, used to destroy or inhibit the action of plant or animal pests; the term thus includes insecticides, herbicides, fungicides, rodenticides, miticides, fumigants, and repellents. All pesticides are toxic to humans to a greater or lesser degree. Pesticides vary in biodegradability.

**Photochemically Reactive**—substances whose chemical reactions are initiated by sunlight

**Physiographic Province**—a region of which all parts are similar in geologic structure and climate and which has had a unified geomorphic history

**Phytoplankton**—single-celled marine plants that are found for at least part of their lives in the water column (pelagic), although a few species live on the sea floor (benthic)

**Pinniped**—having finlike feet or flippers, such as a seal or walrus

**PM-10**—particulate matter less than or equal to 10 micrometers in diameter

**Point Source**—a distinct and identifiable source, such as a sewer or industrial outfall pipe, from which a pollutant is discharged

**Population Density**—the average number of individuals per unit of space

**Positive Controlled Area**—airspace designated in Federal Aviation Administration Regulation Part 71 within which there is positive control of aircraft; also referred to as Class A airspace

**Power Density**—the amount of power per unit area in a radio frequency field, usually expressed in milliwatts per square centimeter

**Prehistoric**— Literally, "before history," or before the advent of written records. In the old world writing first occurred about 5400 years ago (the Sumerians). Generally, in North America and the Pacific region, the prehistoric era ended when European explorers and mariners made written accounts of what they encountered. This time will vary from place to place.
Prevention of Significant Deterioration—the Prevention of Significant Deterioration program, created by the Clean Air Act, consists of two parts: requirements for best available control technology on major new or modified sources and compliance with an air quality increment system

Prime Farmland—environmentally significant agricultural lands protected from irreversible conversion to other uses by the Farmlands Protection Policy Act

Prohibited Area—airspace designated under FAR Part 73 within which no person may operate an aircraft without the permission of the using agency

Radar—a radio device or system for locating an object by means of radio waves reflected from the object and received, observed, and analyzed by the receiving part of the device in such a way that characteristics (such as distance and direction) of the object may be determined

Region of Influence (ROI)—the geographical region that would be expected to be affected in some way by the Proposed Action and alternatives

Relative Humidity—the ratio of the amount of water vapor actually present in the air to the greatest amount possible at the same temperature

Relief—the difference in elevation between the tops of hills and the bottoms of valleys

Restricted Area—airspace designated under Federal Aviation Administration Regulation Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use, and Instrument Flight Rules/Visual Flight Rules operations in the area may be authorized by the controlling air traffic control facility when it is not being utilized by the using agency. Restricted areas are depicted on en route charts.

Rookery—breeding place or colony of gregarious birds or animals

Runoff—the portion of precipitation on land that ultimately reaches water bodies

Scoping—a process initiated early during preparation of an Environmental Impact Statement to identify the scope of issues to be addressed, including the significant issues related to the Proposed Action. During scoping, input is solicited from affected agencies as well as the interested public.

Seine—a large net with sinkers on one edge and floats on the other, which hangs vertically in the water and is used to enclose fish when its ends are pulled together or are drawn ashore

Sensitive Habitat—habitat that is susceptible to damage from intrusive actions

Sensitive Receptor—an organism or population of organisms sensitive to alterations of some environmental factor (such as air quality or sound waves)

Shrink-Swell Potential—the volume change of a particular soil with changes in moisture content

Slow Routes—slow speed, low altitude training routes used for military air operations at or below 457 meters (1,500 feet) at airspeeds of 463 kilometers per hour (250 knots) or less

Soil Complex—a mapping unit consisting of two or more recognized taxonomic units used in detailed soil studies and classifications
Solid Waste—municipal waste products and construction and demolition materials; includes non-recyclable materials with the exception of yard waste

Specific Absorption Rate—the time rate at which radio frequency energy is absorbed per unit mass of material, usually measured in watts per kilogram (W/kg)

State Historic Preservation Officer (SHPO)—the official within each state, authorized by the state at the request of the Secretary of the Interior, to act as liaison for purposes of implementing the National Historic Preservation Act

Stationary Source—any building, structure, facility, installation, or other fixed source that emits any regulated air pollutant

Stratosphere—the second major layer of the atmosphere that lies above the troposphere in which temperatures rise with increasing altitude

Subsistence—the traditional harvesting of natural resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade

Substrate—the layer of soil beneath the surface soil; the base upon which an organism lives

Sulfur Dioxide—a toxic gas that is produced when fossil fuels, such as coal and oil, are burned

Thermal Distress/Damage—the process by which heat generated in the body causes harm to cell tissue

Thermosphere—the outer layer or region of the atmosphere which is first exposed to the sun's radiation and so is first heated by the sun

Threatened Species—a plant or animal species likely to become endangered in the foreseeable future

Topography—the configuration of a surface including its relief and the position of its natural and man-made features

Traditional Native Resources—prehistoric sites and artifacts, historic areas of occupation and events, historic and contemporary sacred areas, material used to produce implements and sacred objects, hunting and gathering areas, and other botanical, biological, and geographical resources of importance to contemporary American Indian groups

Transient—remaining a short time in a particular area

Troposphere—the lowest layer of the atmosphere, the layer where most of the world's weather takes place

Turbid—the condition of being thick, cloudy, or opaque as if with roiled sediment; muddy

Uncontrolled Environment—areas where personnel would not expect to encounter higher levels of radiation such as living quarters, workplaces, and public access areas

Understory—a foliage layer occurring beneath and shaded by the main canopy of a forest

Unstratified—sediments deposited with an absence of layering

Upland—an area of land of higher elevation
Vista—a distant view through or along an avenue or opening

Visual Flight Rules—rules that govern the procedures for conducting flight under visual conditions. It is also used by pilots and controllers to indicate a type of flight plan.

VFR Military Training Routes (IR)—training routes developed by the Department of Defense to provide for military operational and training requirements that cannot be met under the terms of FAR 91.117 (Aircraft Speed). Accordingly, the Federal Aviation Administration has issued a waiver to the Department of Defense to permit operation of an aircraft below 3,048 meters (10,000 feet) mean sea level in excess of 463 kilometers per hour (250 knots) indicated airspeed along Department of Defense developed and published Instrument Flight Rules routes.

Volatile Organic Compound—one of a group of chemicals that react in the atmosphere with nitrogen oxides in the presence of heat and sunlight

Volcaniclastic—containing volcanic material

Wastewater—water that has been previously utilized; sewage

Water Table—the upper limit of the portion of the ground wholly saturated with water

Wetlands—those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. This classification includes swamps, marshes, bogs, and similar areas.

Yearly Average Day-Night Sound Level—utilized in evaluating long-term environmental impacts from noise; annual mean of the day-night sound level

Zooplankton—single and multi-celled animals that live passively or semi-passively in the water column

Zoning—the division of a municipality (or county) into districts for the purpose of regulating land use, types of buildings, required yards, necessary off-street parking, and other prerequisites to development. Zones are generally shown on a map, and the text of the zoning ordinance specifies requirements for each zoning category.
# 7.0 Public Scoping Process

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
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<tbody>
<tr>
<td>7.0</td>
<td>PUBLIC SCOPING PROCESS</td>
<td>7-1</td>
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<td>7.1</td>
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<td>7.19</td>
<td>Other</td>
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</tr>
</tbody>
</table>
7.0 PUBLIC SCOPING PROCESS

Summary of the Public Scoping Process

The CEQ Regulations implementing the NEPA require an open process for determining the scope of issues related to the Proposed Action and its alternatives. Comments and questions received, as a result of this process, assist the DoD in identifying potential concerns and environmental impacts to the human and natural environment.

The GMD ETR EIS public scoping period began on 28 March 2002, when the Notice of Intent to prepare an EIS was published in the Federal Register. The scoping comment period was originally scheduled to end on 10 May 2002, but was extended to 20 May 2002 in response to public request. Subsequently, inclusion of the SBX in the EIS analysis extended scoping and the comment period even further, through 20 December 2002.

A number of methods were used to inform the public about the GMD ETR Program and of the locations of the scheduled scoping meetings. These included:

- The Notice of Intent announcement in the Federal Register
- Paid advertisements in local and regional newspapers

Public scoping meetings were held at the locations listed in table 7-1. During these public scoping meetings, attendees were invited to ask questions and make comments to the program representatives at each meeting. In addition, written comments were received from the public and regulatory agencies at the scoping meeting, and by letter and e-mail during the extended comment period. Comments received from the public and agencies pertaining to specific resource areas and locations were considered, and more detailed analysis provided in the EIS. Those comments received from the public concerning DoD policy and program issues are outside the scope of what is required to be analyzed in an EIS.

<table>
<thead>
<tr>
<th>Meeting Location</th>
<th>Date</th>
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<tbody>
<tr>
<td>Kodiak, Alaska—Kodiak High School</td>
<td>16 April 2002</td>
</tr>
<tr>
<td>Anchorage, Alaska—Egan Convention Center</td>
<td>18 April 2002</td>
</tr>
<tr>
<td>Lompoc, California— Town Hall Council Chambers</td>
<td>25 April 2002</td>
</tr>
<tr>
<td>Honolulu, Hawaii—Best Western Hotel</td>
<td>18 September 2002</td>
</tr>
<tr>
<td>Seattle, Washington—Hilton Conference Center</td>
<td>17 October 2002</td>
</tr>
<tr>
<td>Oxnard, California—Public Library</td>
<td>22 October 2002</td>
</tr>
<tr>
<td>Port of Valdez— Valdez Civic Center</td>
<td>19 November 2002</td>
</tr>
<tr>
<td>Port Adak—Bob Reeves High School</td>
<td>5 December 2002</td>
</tr>
</tbody>
</table>
Native Village Meetings

A series of village coordination meetings was held on Kodiak Island in June and July 2002 in partial fulfillment of a pledge from the GMD Program Office to reach out to Native residents to explain the Proposed Action at KLC. The team visited the Villages of Akhiok, Ouzinkie, Port Lions, Afognak, Kodiak, and Larsen Bay.

Several generic issues were raised, including the following:

- The environmental consequences of flying rockets from KLC
- The request from the Village of Old Harbor for a fallout shelter
- Job opportunities associated with the Proposed Action
- Most village attendees expressed feelings of patriotism and support for what was being planned

Agency Meetings

An agency meeting was held in the offices of the Alaska Division of Governmental Coordination in Anchorage in April 2002 to provide an overview of the Proposed Action to the represented agencies and to solicit input on the EIS. Agencies represented at this meeting included the USFWS, the Alaska Department of Fish and Game, the U.S. Army Corps of Engineers, the U.S. Coast Guard, and the Alaska Department of Natural Resources. Some of the comments from the agencies are listed below:

- The USFWS recommended that an alternative site to the current proposed launch site at KLC should also be considered, if possible, because this ridge area is a sensitive area and there are public use concerns.
- The agencies requested more detailed information regarding the Proposed Action and alternatives.
- A trip with the agencies to the proposed construction site at Kodiak was suggested and agreed upon for the near future.
- A trip to Kodiak was conducted in May of 2002. The USFWS was the only agency in attendance. After reviewing the proposed KLC sites, the concern over the ridge area noted during the meeting was lessened.

An additional agency meeting was held in the offices of the Alaska Division of Governmental Coordination Offices in Anchorage in November 2002 to provide additional information regarding the potential siting of the SBX at Adak or the Port of Valdez, and to solicit input on the Coordinating Draft EIS. Agencies represented included the Alaska Department of Environmental Conservation, the U.S. Army Corps of Engineers, and the Alaska Department of Natural Resources. Some of the comments from the agencies are listed below:

- Migratory bird site adjacent to Valdez is an Aquatic Resource of National Importance. Air quality is a potential concern.
- Valdez Narrows is closed when a tanker is passing through.
An Alaska Department of Natural Resources permit will be required for all actions within 4.8 kilometers (3 miles) of the shore. This would include barge landing sites and mooring sites. Mooring sites would also require a Section 10 Permit.

Need to add SOPs for debris recovery in case of an accident at KLC. This is the highest probability for perchlorate contamination.

An agency meeting was also held in Honolulu in September 2002 with representatives from the USFWS and the FAA. This meeting centered primarily on the potential siting of the SBX at Pearl Harbor. Some of the comments from the agencies included:

- Questions from the FAA on the proposed operation of the radar and the effects of radiological hazards and interference with air traffic at the Honolulu International Airport.
- Questions from the USFWS mainly concerning the effects of the radar on bird populations.

Results of Public Scoping Meetings

The public scoping meetings used an information/exhibit format with a formal presentation on the GMD Program Overview and the Environmental Analysis Process. A sampling of some of the comments expressed by the public included:

- Concern about the chemicals in the air and the harm that they will do to the environment
- Concern about the pristine fisheries and wilderness, and belief that a thorough investigation of the effects of launch activities should occur in the EIS
- Concern that the EIS could ever fully address all the short- and long-term impacts around KLC
- Concern about the expansion of KLC, since the facility is located in a seismically active area
- Concern about putting valuable resources of Kodiak Island at risk due to toxic substances integral to missile launch operations
- Concern with the hazardous materials that are released in the explosion of a rocket, in flight, on the pad, or in a launch silo. The EIS should address the effects of all potential rocket fuels and payloads
- Concern about the safety of the Proposed Action
- Concern about the health hazards from radars such as the X-band
- Concern that mobile telemetry radars will not be limited to the roads and will be taken into sensitive areas and damage will occur to the land
- Concern that GMD is expensive and will require cuts in funding for human services
- Opposes the U.S. Government’s plan for continuing research and development of the Missile Defense Program
- A desire that additional work be done on measuring the cumulative impacts to the environment
Concern that the Narrow Cape road on Kodiak Island will be closed.

Table 7-2 summarizes the number of comments received from the public at the scoping meetings, and from other sources, for each resource category.

Table 7-2: Number of Comments by Resource Area and Location

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Kodiak, AK</th>
<th>Anchorage, AK</th>
<th>Lompoc, CA</th>
<th>Honolulu, HI</th>
<th>Seattle, WA</th>
<th>Oxnard, CA</th>
<th>Valdez, AK</th>
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<tr>
<td>Cultural Resources</td>
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<td>1</td>
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<td><strong>18</strong></td>
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<td><strong>17</strong></td>
<td><strong>7</strong></td>
<td><strong>307</strong></td>
<td><strong>565</strong></td>
</tr>
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</table>

Note: No comments were received at the Seattle scoping meeting.
Summary of Comments By Category

Code Key:
S = comments received during the public scoping period
T = oral comments (transcripts)
W = written comments or e-mail comments
#### = sequential numbers assigned to each letter, e-mail, oral comment (transcript) in the order in which they were received
# = specific issues identified and numbered sequentially within each comment letter or e-mail.

7.1 AIR QUALITY

☐ Concerned about the chemicals in the air and the harm that it will do to the environment.
S-T-0016-1  S-W-0019-2

☐ What are the impacts on the air after repeated launches at KLC?
S-W-0036-9

☐ What will be the effect of a launch pad failure on the air?
S-W-0036-14

☐ Do rocket exhaust fumes have toxic effects on the local terrestrial, fresh water and marine environment?
S-W-0124-2

7.2 AIRSPACE

☐ Concerned about the environmental impacts that will occur in space and will they be evaluated in the EIS.
S-T-0005-9  S-W-0107-3  S-W-0120-9

7.3 BIOLOGICAL RESOURCES

☐ Concerned about the pristine fisheries and wilderness and believes a thorough investigation of the affects of launch activities should occur in the EIS.
S-T-0003-3  S-W-0100-6
Concerned about the effects of a rocket going into the ocean and how impacts are measured.

S-T-0010-5

Conduct wetland delineations within the footprint of the proposed alternatives.

S-W-0035-2

Identify the direct, indirect, and cumulative impacts of each alternative to fish, wildlife and wetland resources. The scope of this assessment should include impacts related to habitat losses, construction activities, and long-term operation of the facility.

S-W-0035-3

Vandenberg is located in a sensitive marine area.

S-W-0121-1

The missiles use solid propellants for fuel. The burning of solid propellants creates exhaust fumes, which are toxic to plant growth as well as causing acid rain and damage to the ozone layer.

S-W-0121-4

Are studies being done on the plankton bloom since it starts in February and the waters come alive near the shores?

S-W-0124-3

7.4 CULTURAL RESOURCES

Concerned about the cultural resources.

S-T-0003-4

7.5 ENVIRONMENTAL IMPACT STATEMENT PROCESS

Suggested that the EIS address rather than no alternatives, see other alternative other than KLC for interceptor; such as sea-based locations as opposed to land-based.

S-T-0001-4

Does not believe that an EIS for the GMD Extended Test Range could ever fully address all the short and long-term impacts around KLC.

S-W-0002-5 S-W-0095-4
Expressed concern over the need for scoping meetings in two villages, Old Harbor and Akhiok, also Juneau, Fairbanks. Additional meetings should be held in Kodiak and Anchorage, Alaska.

Complete a worst impact commitment, no more incrementalism.

How can you do an EIS when the program is not complete?

Concerned over the scoping meeting format.

Concerned that DoD is exempt from environmental laws.

What will the cumulative environmental impacts be on the total program?

Concerned that DoD has a conflict of interest doing the EIS.

Concerned about the short time for the EIS to be completed, does not allow for enough time to evaluate all areas.

Need to do an EIS on the effects of war.

Feels that comments received from other environmental documents should be added to the EIS.
Need to explain how you will obtain the exemption to the Marine Mammal Protection Act with regards to the endangered Steller’s sea lion, whale species, and depleted harbor seal populations, when fishermen cannot.

S-W-0036-6

Concerned that the scoping meeting in Kodiak did not give the public a chance to verbally comment on the GMD Extended Test Range.

S-W-0060-1 S-W-0100-1

Need to explain the difference between the GMD Validation of Operational Concept and the GMD Extended Test Range and why there was no public notice in the newspapers of a Draft EA.

S-W-0075-1

Request an extension of the comment period to allow for a full 30 days after the scoping meeting. Feel the EIS is being fast tracked and people are not being given a chance to comment.

S-W-0080-1 S-W-0102-1 S-W-0122-1

Would like a public repository in Anchorage for GMD documents.

S-W-0090-1

Notice of Availability and copies of the Draft EIS need to be sent to the State of Hawaii Office of Environmental Quality Control and to the University of Hawaii Environmental Center. This is especially important since no scoping meetings are planned in Hawaii.

S-W-0110-3

Concerned that the scoping meeting for California was held in Lompoc, since this project will have enormous and substantive direct and cumulative adverse effects on the southern California region, including criteria and hazardous air pollutants, disruption of sensitive terrestrial marine ecosystems and further disrupt the social fabric of Santa Barbara County. Very little information was provided about the project, depriving the so-called scoping process.

S-W-0119-1

The EIS needs to include for KLC: Ground Water Protection Plan, Storm Water Pollution Prevention Plan, Emergency Plan for the KLC launch pad, Storm Water Plan, Spill Prevention and Control Plan, Pesticide use, Expeditious Recovery Plan of flight test vehicles and debris containing hazardous materials.

S-W-0120-4
Would like to know if a compliance review has been done, and if so where can it be reviewed.

S-W-0126-2

The EIS needs to assess the Sea-Based Midcourse Defense or intercept tests of any system against targets launched more than 1,200 kilometers from the Pacific Missile Range Facility.

S-W-0127-2

### 7.6 ENVIRONMENTAL JUSTICE

No comments were received for this resource area.

### 7.7 GEOLOGY AND SOILS

Concerned that the expansion of KLC is an intelligent endeavor since the facility is located in a seismically unstable area.

S-W-0002-6  S-W-0004-2  S-T-0002-3  S-T-0003-1
S-W-0020-4  S-W-0095-5  S-W-0100-4

What are the impacts on the soil after repeated launches at KLC?

S-W-0036-8

What will be the effect of a launch pad failure on the soil?

S-W-0036-13

Requested an up-to-date seismic study be done for the Narrow Cape area on Kodiak before any further infrastructure expansion on KLC.

S-W-0080-2  S-W-0122-4  S-W-0124-5

### 7.8 HAZARDOUS MATERIALS AND HAZARDOUS WASTES MANAGEMENT

Concerned about putting valuable resources of Kodiak Island at risk due to toxic substances integral to missile launch operations.

S-W-0002-4

Want the government to pledge to never use nuclear materials in Kodiak.

S-W-0006-2
If nuclear tips are used in the future, will they be studied? They need to be addressed in the EIS.

Concerned that MDA will place nuclear tips on interceptors at Fort Greely and not tell the Pentagon.

Concerned that the potential of experimental fuels, that because of their nature, impacts of these fuels cannot be adequately assessed.

Need to list all types of Hypergolic Missile Fuels, Oxidizers Pesticides and other hazardous toxic materials being proposed for use and storage at the proposed alternatives.

Concerned with the hazardous material that are released in the explosion of a rocket, in flight, on the pad, or in a launch silo. Also feels that the EIS should address this area and cover the effects from all potential rocket fuels and payloads.

What types of fueling systems will be used at KLC to prevent accident spills or leaks of propellants and other hazardous liquids?

The EIS should address responsibilities and clean-up plans for any hazardous materials that may be associated with KLC.

Department of Natural Resources manages state owned tidelands and submerged land, which includes all lands offshore to the 3-mile territorial limit. Department of Natural Resources would like the EIS to address the responsibility for removal of any debris or hazardous materials that may fall onto state tidelands and submerged lands as the result of rocket launches.
Concerned about debris from launches at Vandenberg AFB.
S-T-0025-3

Need to provide information on refueling in Valdez.
S-T-0027-4

**7.9 HEALTH AND SAFETY**

Concerned about the potential disastrous effects and danger.
S-W-0003-1   S-T-0008-3   S-W-011-2   S-T-0015-3
S-W-0050-1   S-W-0058-3   S-W-0065-4   S-W-0125-2

Concerned the population will have to move or will the launch affect their normal lives.
S-T-0003-7

Is the actual launch building secure?
S-W-011-1

Concerned with safety for residents of Akhiok and Old Harbor, need to provide shelters.
S-W-012-1

Concerned about risking health and safety with every toxic rocket launch.
S-T-0015-1   S-W-0095-3

The health hazards from radars such as the X-band should be included in the EIS and the proposed sites for the radars for southern Alaska.
S-W--120-6   S-W-0120-15

Concerned about the 9 November 2001 missile accident in Kodiak and would like more information.
S-W-0076-4

Need to explain the risks and hazardous associated with the Strategic Target System launcher, booster stages and payloads and any other proposed launch vehicles to be launched from KLC.
S-W-0080-4
☐ MDA should eliminate any launch trajectory over 220 degrees SW down the east side of Kodiak Island, because the whole south end of Kodiak Island will be within 70 nm Warning Zone, and any SW launches will jeopardize the safety of Kodiak Island residents from any potential missile accident, fallout or contaminates.

S-W-0080-5  S-W-0120-1  S-W-0122-7

☐ Expressed the opinion that the only environmentally safe and healthy nuclear weapons are non-existent ones.

S-W-0088-1

☐ Concerned about the powerful transmitters that are being used to track the targeted objects. Feels that Airborne laser and other missile systems are unsafe and have caused many health problems. What the effects on migrating birds?

S-W-0106-1  S-W-0120-10

☐ The EIS should include an Impact Risk Analysis for all populated villages which are within the over flight exclusion zone.

S-W-0120-12

☐ Feels that every time a missile is launched, war is simulated, other nations may perceive the Central Coast of California as being at war with them, and highly likely a target for these nations.

S-W-0121-5

☐ Will the SBX be required to meet the same standards as other ships?

S-T-0027-6

☐ Need to address security requirements while in the Port of Valdez.

S-T-0027-8

☐ The EIS needs to contain a detailed analysis of the safety aspects of launches at azimuths other than 280 degrees.

S-W-00127-3

☐ Need to do a better job addressing the reliability of the target and interceptor rockets in the EIS. The analysis should include a discussion of failures in launches.

S-W-0127-4
Need to evaluate possible impacts associated with radar operation while the platform is in port, including those related to public safety and health.

S-W-0128-4

7.10 LAND USE AND AESTHETICS

Concerned that the City of Cordova has been involved in the program and what the purpose of the Atco trailer that has been placed there before and during launches.

S-T-0007-2  S-T-0007-4  S-T-0007-5

Concerned that mobile telemetry radars will not be limited to the roads and will be taken to sensitive areas and damage will occur to the land.

S-W-009-1

An important aspect of the local environment is that Kodiak is an essentially undisturbed and lightly developed area would be harmed by the proposed large-scale development. Need to assess impacts of development (more traffic, noise, detraction from scenery, etc).

S-W-0020-5  S-W-0126-1

How will you protect and compensate the public of the potential loss of their land due to contamination?

S-W-0036-16

Need to list all Kodiak Island regions and communities, which will be potentially impacted by the MDA's proposed short or long-term GMD activities.

S-W-0080-6

No previous chemical analysis has been done on the surrounding land areas in the Narrow Cape vicinity to check for rocket/missile contaminates and pollutants, which may have settled on nearby terrain. Narrow Cape is a populated area for hunting, hiking, and picnics, berry picking and fishing.

S-W-0120-2

Further expanding the GMD program to Alaska will cause further pollution and contamination to the land, air and waters.

S-W-0120-16

Concerned about the rapid erosion of the sand due to the removal of beach sand that has been taken from Bear Paw Ranch.

S-P-0002-1
The EIS should address the long term use of or removal of any facilities constructed at KLC.

7.11 NOISE

- Concerned that the noise will bother wildlife and individuals seeking a wilderness experience.

- Need to study the impact of sound on the gray whales, mother and calves included, all the endangered and non-endangered species in the launch area.

7.12 POLICY

- Does not believe that the putting of nuclear tips on interceptors is a wise given our commitment to the 1967 Outer Space Treaty as well as the Nuclear Non-proliferation Treaty.

- Feel that this current political climate does not justify expanding the military.

- Concerned that Donald Rumsfield exempted the MDA from normal Pentagon weapons oversight.

- Concerned that MDA is exempt from reporting to the Pentagon on time lines and costs and from the testing and oversight office overseeing their test.

- Does MDA complete environmental studies for sites in other countries?
Instead of expanding missile program, the United States should accept the proposal from Canada, China and Russia to negotiate a Space Weapons Ban.

Concerned that the decision-maker, Secretary of Defense is not an environmental expert.

GMD will encourage a new arms race and move it into outer space.

GMD is expensive and it will require cuts in funding for human services for a non-existent threat.
Feels that the United States has no business trying to control and dominate the globe.

Feels we would be wise to befriend North Korea by encouraging their reunification with South Korea and by offering trade agreements. Treating them like an enemy will surely make them behave like an enemy.

Concerned that the U.S. defense budget is larger than all the other countries combined. Need to use this budget for educational and environmental area.

Feels that deployment missile defense would be an offensive military move and provoke the enemy. There is legitimate concern about the proliferation of weapons of mass destruction.

Provide information about launching interceptors from missile silos in Kodiak and how the Intermediate-Range Nuclear Forces Treaty will be violated if this is done.

Concerned that the defense policy should be based on short-term concerns, not long-term considerations that would lead the U.S. to have such systems. Who has the power to launch a war against the United States (China), feels that the United States is trying to consolidate its hold on global power.
Feels that we should build peaceful relationships with people of the globe. Defense of one’s homeland is a legitimate goal, but should evaluate the effectiveness and worth of the cost.

The expense to the U.S. taxpayer is not justifiable for this type of research and development with regard to the level of protection it might give the United States against terrorism.

Are air-launched and sea-launched targets with ranges greater than 500 kilometers prohibited by the Intermediate-Range Nuclear Forces Treaty?

7.13 PROGRAM

Feels that no real threat exists, the military seems to be creating enemies to justify this program.

Oppose the missiles in KLC.

Opposes the U.S. Government’s plan for continuing research and development of the Missile Defense Program.
☐ Show that the program will work, concerned that this is an impractical idea.

S-W-0006-4  S-T-0008-4  S-T-0008-7  S-T-0009-1
S-T-0005-13  S-T-0005-14  S-W-0019-4  S-W-0029-1
S-W-0046-3  S-W-0048-2  S-W-0064-1  S-W-0120-14

☐ Concerned with launching 20 Scud missiles off Poker Flats Research Range at University of Alaska Fairbanks and how it fits into the program.

S-T-0007-3

☐ Concerned about the possibility that an X-Band Radar will be placed at Poker Flats to look at the missiles.

S-T-0007-7

☐ Concerned about the inevitable problems with using Kodiak, such as landscapes, environment and human population and the resources.

S-T-0003-5

☐ Doesn't trust the MDA agency, or the U.S. Army in Alaska.

S-T-0005-5  S-T-0005-7  S-T-0008-1
S-T-0005-12

☐ Would like more information on the type of launch vehicle or kill vehicle that will be used.

S-T-0014-1

☐ Concerned that the X-Band radar will come to Vandenberg AFB.

S-T-0016-3

☐ Concerned that the U.S. Army is spending a lot of money on EISs and other environmental data when Vandenberg has been doing this type of testing for years and with no impacts.

S-T-0018-1

☐ Hopes decision-makers will weigh the pros and cons of this program and find there is not enough evidence that the returns will outweigh the possible losses.

S-W-0002-7  S-W-0095-6

☐ Wants details of possible nuclear tipped missiles.

S-W-0004-1  S-T-0010-7
Would like more information on Fort Greely, since it is not supposed to be part of the Extended Test Range, concerning the building of silos, and other construction is going on.

S-T-0005-8

- Concerned that silos and interceptors should not be put in Alaska just to test the effects of the cold on rocket fuel.

S-T-0005-11

- Suggested not firing from Vandenberg AFB or Kwajalein but from different locations.

S-W-0032-1

- Feels that telecommunication infrastructure, including possible routes for fiber optic links between Kodiak, Shemya, and Fort Greely should be included in the Test Bed EIS.

S-W-0037-1 S-W-0080-14

- Concerned that if the Ballistic Missile Defense System were carried out it would make nuclear war more likely.

S-W-0041-1 S-W-0058-4

- Feels that missile defense is detrimental to the environment.

S-W-0042-3 S-W-0121-8

- Would like a separate on-site EIS for Kodiak, and concerned that Kodiak will be thrown into the GMD EIS at the last minute and that no additional scoping meetings are going to be held in Kodiak.

S-W-0060-4 S-W-0076-1 S-W-0124-1

- Suggested that MDA include all phases of the GMD Extended Test Range (and all proposed locations) in the Extended Test Range EIS for Kodiak and Vandenberg, concerning the fact that all site locations will work in correlation in testing phases of the missile and radar systems in the North Pacific.

S-W-0075-2

- If interceptors are going to be launched from Fort Greely over Alaska, that information needs to be included in an EIS.

S-W-0075-3
☐ Suggested the EIS should include information on the radars at KLC and also at Sheyma.

S-W-0076-2

☐ Would like the following items addressed in detail in the Draft EIS: installation of test Battle Management Command and Control capability with In-Flight Interceptor Communication System Data Terminals, Defense Satellite Communication System, two launch silos, telemetry facility, launch silos chiller facilities, alterations to existing launch control facilities, alterations to existing missile assembly building, booster storage area, missile Hypergolic Fuel and Oxidizer Storage Building, Diesel Transfer Point and mission electrical power, buried power and communication lines.

S-W-0077-1 S-W-0080-10

☐ Encouraged the U.S. Army to continue testing missile defense. It helps create jobs and protects us against the threat of attack from terrorist-harboring nations.

S-W-0092-1

☐ The EIS should discuss any radar facilities and other sensors, communications, and other facilities in Hawaii and that would be used in any GMD tests. X-Band radars need to be discussed.

S-W-0110-1

☐ Since previous environmental analyses of missile defense tests near Hawaii have not analyzed impact of tests of the Navy Theater-Wide system or intercept tests of any system against targets launched more than 1,200 kilometers from the Pacific Missile Range Facility, any such tests that might be part of GMD testing need to be examined in detail.

S-W-0110-2

☐ Need to do a better job notifying people in Hawaii. Need to send notices to the State of Hawaii Office of Environmental Quality Control.

S-T-0019-1 S-W-0127-6

☐ Supports locating the program at Naval Base Ventura.

S-T-0020-1 S-T-0021-1 S-T-0022-1
S-T-0023-1 S-T-0026-1 S-W-0129-1
S-W-0130-1 S-W-0131-1 S-W-0132-1

☐ Concerned about the lack of information to evaluate about the program in Oxnard and would like extension of comment period.

S-T-0024-1 S-T-0025-1
Need to notify local agencies including Channel Beach area.

Will there be a meeting in Adak?

The EIS should discuss relevant sensors, communications, and other facilities in Hawaii as part of the cumulative impacts along with other missile defense testing planned near Hawaii.

Support of the siting of the SBX in Everett, Washington and would like more information.

Would like information on the Notice of Intent sent to the Beacon Foundation.

7.14 SOCIOECONOMICS

Comments expressing need to employ local contractors to assist in preparing the EIS.

Concerned that the program will have adverse effects on tourism.

Would like to know how extensively economic and social impact will be measured and the cumulative impacts.

Would like to have the majority of work at Vandenberg AFB.

Concerned about the social impact of possibility becoming a target for terrorist attack on Alaska because of the project.
The military budget benefits only the military/industrial complex.

Program would have a positive economic benefit to Ventura County.

Need to evaluate possible impacts to recreational commercial boat traffic in the Snohomish River Channel.

Need to evaluate the possible heightened security measures that might impede shipboard commerce.

7.15 SUBSISTENCE

Suggested testing subsistence food at KLC (berries, fish, etc) for contaminants.

Concerned how the launches will affect subsistence and commercial fishing and hunting.

How will you compensate the public for potential loss of land at Narrow Cape and the sea offshore of KLC, major fishing grounds and a tourist location?

7.16 TRANSPORTATION

Concerned that the Narrow Cape road will be closed.

Concerned how the missiles will be transported between Fort Greely and Kodiak.
Will missiles be moved after testing?

Potential environmental and human impact (damage) due to human error in the transportation of propellants and other toxic materials along the road system should be included in the EIS.

Need to cover navigation or transportation into the Port of Valdez in the EIS.

Wanted to know if there would be a helicopter pad on the SBX?

Need to discuss types of escort services required for the SBX in the Port of Valdez.

Need to provide information of the possible impact to ship navigation, berthing and maneuvering in the Port of Everett.

7.17 UTILITIES

No comments were received for this resource area.

7.18 WATER RESOURCES

Concerned about the toxics that go into the water, they are hazardous to fishermen, surfers, anyone who goes into the water.

Concerned about the drinking water standards from test done on the western complex of Vandenberg AFB.

Conduct a thorough evaluation of alternatives pursuant to the Clean Water Guidelines.
What are the impacts on the fresh water and near shore marine environment after repeated launches at KLC.

S-W-0036-10

What will be the effect of a launch pad failure on the water (both fresh and marine)?

S-W-0036-15

Would like to know if pesticides will be used at Kodiak Test Bed Facility and the potential hazards to local waters.

S-W-0077-2

Would like to see the KLC Waste Water Plan and Storm Water Pollution Prevention Plan for the run-off to surrounding waters, grasslands and wildlife in the Narrow Cape area.

S-W-0080-7

The EIS should address the projects needs for and sources of gravel or water resources.

S-W-0126-4

7.19 OTHER

Concerned about the credibility of AADC.

S-T-0001-1

Does not believe the information that Vandenberg AFB supplies to the public.

S-T-0017-1

Requested a copy of all comments and who gave them.

S-W-0007-1

Concerned about the past military not cleaning up, and not providing information on cleanups.

S-T-0002-1  S-T-0002-4  S-T-0008-2  S-T-0008-5

Concerned about the bad weather affecting the launches.

S-T-0003-2
Would like to meet with the contractors to discuss the Alaskan Environment.

Concerned that the subcontractors are part or subsidiaries of defense industry organizations.

Concerned about the plan to place 200 interceptors at Fort Greely and to be effective anti-ballistic missile, it would have to have a multi-megaton nuclear explosive on the tip of the interceptor.

Concerned about the roles of the universities in the EIS Process.

Concerned about the Scud missile program in Alaska.

Concerned about the psychological aspect of the potential threat of becoming more a target because of the program.

Concerned that the recent EA has already issued a Finding of No Significant Impact, without waiting to review the comments.

Feels the current ecological monitoring program is inadequate because it fails to include samples from control sites away from the proposed launch area. Before, after, control, impact method would be the standard protocol.

Concerned that the EA for Ground-Based Midcourse Defense Validation of Operational Concept did not provide program details for Kodiak and Fort Greely. Feels the Notice of Intent for GMD Extended Test Range is the same program. Thought that a meeting was to be held prior to a Notice of Intent for EIS. Want to know if a separate "on-site" EIS for Kodiak will be performed, as was promised in the lawsuit. Feels that any EIS being done which includes part of Alaska as part of a Defense Test Bed should include Kodiak, Shemya Island, and Fort Greely.
Feels that the community was duped by KLC, since they were told that there would not be any military applications and that the whole process of an EIS was scrapped because of one U.S. Senator who had the authority to change protocol. No one from the original meetings attended the scoping meeting. Does not know who or what to believe.

The Draft EIS should include all Department of Energy programs, which will be tested at KLC.

Proximity to Diablo Canyon Nuclear Power Plant and Chevron Oil Refinery creates hazards for military activity at Vandenberg.

Clean up of bases exceeds all the money in the work; clean up of missile launches over the ocean is incalculable.

Concerned that launches from Earth and building in space will negatively impact our environment to the point that the “protection” afforded by this system will be negated by the effect on our biosystem.

Called to verify number.

Need to address if the SBX will be moored or anchored in port.
8.0 DRAFT ENVIRONMENTAL IMPACT STATEMENT COMMENTS AND RESPONSES

Chapter 8.0 of this GMD ETR EIS presents the comments and responses to the Draft EIS made during the public comment period. Section 8.1 provides an overview of the Public Involvement process, 8.1.1—Written Comments, 8.1.2—Email Comments, 8.1.3—Public Hearing Comments, and 8.1.4—Oral Comments.

8.1 GMD ETR DRAFT EIS PUBLIC INVOLVEMENT PROCESS

A Notice of Availability (NOA) for the GMD ETR Draft EIS was published in the Federal Register on Friday, 7 February 2003, by the MDA and the FAA.

Once the NOA for the Draft EIS was published in the Federal Register, notification letters were sent to all persons who requested a copy of the Draft EIS. This letter informed the public that the Draft EIS was available on the MDA web site and that compact disks and hard copies of the document would be mailed out shortly; the letter also informed the public of the dates, locations, and times for the public hearings on the Draft EIS.

Copies of the Draft EIS were also placed at the following public libraries:

- Oxnard Public Library, 251 S. A St., Oxnard, CA 93030
- Kodiak City Library, 319 Lower Mill Bay Rd., Kodiak, AK 99615
- Lompoc Public Library, 501 E North Ave., Lompoc, CA 93436
- Anchorage Municipal Library, 3600 Denali St., Anchorage, AK 99503
- Mountain View Branch Library, 150 S. Bragaw St., Anchorage, AK 99508
- Valdez City Library, 212 Fairbanks, Valdez, AK 99686
- Everett Library, 2702 Hoyt Ave., Everett, WA 98201
- Hawaii State Library, Hawaii Documents Center, 478 South King St., Honolulu, HI 96813
- University of Hawaii at Manoa, Hamilton Library, 2550 The Mall, Honolulu, HI 96822

Based on requests at the public hearings, copies of the Draft EIS were also placed at the following public libraries:

- Hanapepe Public Library, 4490 Kona Rd., Hanapepe, HI 96716
- Kapaa Public Library, 1464 Kuhio Highway, Kapaa, HI 96746
- Koloa Public & School Library, 3451 Poipu Rd., Koloa, HI 96756
- Lihue Public Library, 4344 Hardy St., Lihue, HI 96766
- Princeville Public Library, 4343 Emmalani Drive, Princeville, HI 96722
A number of additional methods were used to inform the public about the GMD ETR Program and of the locations of the scheduled public hearings. These included:

- Detailed information on locations and times for each of the public hearings was published in local and regional newspapers. Table 8.1-1 contains a listing of newspapers and dates when notices were published. Public-service announcements and press releases were provided to radio and television stations.

**Table 8.1-1: Public Hearing Advertisements**

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Public Hearing Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Seattle Times</td>
<td>Everett, WA</td>
<td>10, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Bremerton Sun</td>
<td>Everett, WA</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Everett Herald</td>
<td>Everett, WA</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Lompoc Record</td>
<td>Lompoc, CA</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>The Santa Barbara News</td>
<td>Lompoc and Oxnard, CA</td>
<td>Lompoc: 9, 16, 23 February 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxnard: 12, 16, 23 February 2003</td>
</tr>
<tr>
<td>Ventura County Star</td>
<td>Lompoc and Oxnard, CA</td>
<td>Lompoc: 18, 21, 23, 25 February 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oxnard: 9, 16, 23 February 2003</td>
</tr>
<tr>
<td>Kodiak Daily Mirror</td>
<td>Kodiak, AK</td>
<td>5, 21, 24 February 2003</td>
</tr>
<tr>
<td>Anchorage Daily News</td>
<td>Anchorage, AK</td>
<td>9, 16, 23 February 2003</td>
</tr>
<tr>
<td>Valdez Vanguard</td>
<td>Valdez, AK</td>
<td>19, 26, 27 February 2003</td>
</tr>
<tr>
<td>Valdez Star</td>
<td>Valdez, AK</td>
<td>12, 19, 26 February 2003</td>
</tr>
<tr>
<td>The Honolulu Star-Bulletin</td>
<td>Honolulu, HI</td>
<td>Daily paper: 23, 26 February 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 March 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mid-week paper: 5 March 2003</td>
</tr>
<tr>
<td>The Honolulu Advertiser and</td>
<td>Honolulu, HI</td>
<td>Feb. 16, 21, 23 February 2003</td>
</tr>
<tr>
<td>The Island Weekly</td>
<td></td>
<td>27 February</td>
</tr>
</tbody>
</table>

At the request of MDA and SMDC, personnel from the Fort Richardson Public Affairs Office also provided a copy of the MDA press release to the following Alaska media outlets:

- Print
  - Associated Press, Anchorage
  - Anchorage Daily News
  - Anchorage Press
  - Fairbanks Daily News Miner
  - Kodiak Daily Mirror
  - Juneau Empire
  - The Alaska Journal of Commerce
  - Delta Wind, Delta Junction
  - Valdez Star
Television
- KTUU-Channel 2 (NBC), Anchorage
- KTVG-Channel 11 (CBS), Anchorage
- KIMO-Channel 13 (ABC), Anchorage
- KATN-Channel 2 (ABC), Fairbanks
- KTVF-Channel 11 (NBC), Fairbanks
- KXD, Channel 13 (CBS)/KFXF-Channel 7 (Fox), Fairbanks
- KMXT Kodiak Public Broadcasting

Radio
- APRN-Anchorage
- KNBA-Anchorage
- KENI-AM, Anchorage
- KFQD-AM, Anchorage
- KRAR-AM, Fairbanks

The purpose of the public hearings was to solicit public comments and review on areas relevant to the environmental areas analyzed and considered in the Draft EIS and to identify significant environmental issues that the public and Government agencies feel need further analysis. Transcripts from the hearings and copies of the verbal and written public comments received during the comment period are included in this volume.

Public hearings were held at the locations listed in table 8.1-2. During these public hearings, attendees were invited to ask questions and make comments to the program representatives at each meeting. In addition, written comments were received from the public and regulatory agencies, and by letter and e-mail during the comment period. Comments received from the public and agencies pertaining to specific resource areas and locations were considered, and more detailed analysis was provided in the EIS. Those comments received from the public concerning DoD policy and program issues are outside the scope of analysis in this EIS and are not responded to in the EIS.

Table 8.1-2: Public Hearing Locations

<table>
<thead>
<tr>
<th>City</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxnard, CA</td>
<td>24 February 2003</td>
<td>Oxnard Public Library</td>
</tr>
<tr>
<td>Kodiak, AK</td>
<td>24 February 2003</td>
<td>Kodiak High School</td>
</tr>
<tr>
<td>Lompoc, CA</td>
<td>25 February 2003</td>
<td>Lompoc City Council Chambers</td>
</tr>
<tr>
<td>Anchorage, AK</td>
<td>25 February 2003</td>
<td>Egan Convention Center</td>
</tr>
<tr>
<td>Valdez, AK</td>
<td>26 February 2003</td>
<td>Valdez Convention Center</td>
</tr>
<tr>
<td>Everett, WA</td>
<td>27 February 2003</td>
<td>Everett Holiday Inn</td>
</tr>
<tr>
<td>Honolulu, HI</td>
<td>6 March 2003</td>
<td>Disabled American Veterans Hall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Keehi Lagoon Park</td>
</tr>
</tbody>
</table>
At Public hearings, an Army representative provided a clear and concise GMD program overview, explaining the Proposed Action and Alternatives. Some of the areas discussed included:

- Conceptual ballistic missile defense system and concept
- Proposed GMD ETR sites and components
- Current GMD test range
- Conceptual extension of the GMD test range
- Conceptual SBX Radar
- Potential support bases and conceptual SBX performance regions
- Proposed test activities
- Proposed actions and alternatives
- The No Action Alternative
- Decisions to be made by the MDA

Following the program overview, an environmental representative from SMDC provided an explanation of the GMD Environmental Process, including the proposed schedule and opportunities for further public involvement. Some of the areas discussed included:

- The Draft EIS process
- The Final EIS process
- Environmental areas considered
- Scope of the Draft EIS
- Potential environmental impacts
- Public involvement and comments

Comments made at the public hearings as well as other oral and written comments were reviewed and categorized according to the environmental resource area and specific topic of individual comments and issues that were presented. Each of these identified issues was highlighted and numbered sequentially. For example, if the 10th speaker presented in a transcript from a public hearing document (P-T-010) provided comments on seven separate topics, those comments were numbered P-T-010.1 through P-T-010.7.

Many of the comments received on the Draft EIS were declarative statements not requiring a direct response, but which did need to be noted in the context of overall public review. Some of the comments received were related to program issues such as treaty, system cost, potential threat, and system effectiveness. These general program-related comments are outside the scope of this EIS and required no revision to the EIS and no direct response, except to note the comments for the record (e.g., comment noted).

Some of the comments posed questions about the methodologies, analyses, and conclusions for various environmental resource impacts and mitigations presented in the Draft EIS. For each of these comments, a specific response was prepared—occasionally requiring the
acquisition of new data and the preparation of additional analyses. New information and analysis supporting or changing the conclusions of the Draft EIS were incorporated into the text of the Final EIS.

Sections 8.1.1 through 8.1.4 of the Final EIS presents reproductions of all the original documents that were received during the public comment period for the GMD ETR Draft EIS and provides direct responses to issues included in those documents. The organization of sections 8.1.1 through 8.1.4 provides a separate comment/response section for each of the four types of comment documents:

8.1.1 Written Comment Documents – Draft EIS
   Table 8.1.1-1 Public Comments on the Draft EIS (Written Comments)
   Exhibit 8.1.1-1 Reproductions of Written Documents
   Table 8.1.1-2 Responses to Written Comments

8.1.2 E-Mail Comment Documents
   Table 8.1.2-1 Public Comments on the Draft EIS (Email Comments)
   Exhibit 8.1.2-1 Reproductions of Email Documents
   Table 8.1.2-2 Responses to Email Comments

8.1.3 Public Hearing Documents
   Table 8.1.3-1 Public Comments on the Draft EIS (Public Hearing Comments)
   Exhibit 8.1.3-1 Reproductions of Public Hearing Documents
   Table 8.1.3-2 Responses to Public Hearing Comments

8.1.4 Oral Comment Documents
   Table 8.1.4-1 Public Comments on the Draft EIS (Oral Comments)
   Exhibit 8.1.4-1 Reproductions of Oral Documents
   Table 8.1.4-2 Responses to Oral Comments

The first table in each section provides an index of the names and assigned identification numbers of individuals who submitted comments on the Draft EIS. To follow comments and responses for a specific individual, find their commenter number (e.g., P-W-042, P-E-003, P-T-021) in the appropriate document list; locate their document with sequentially numbered comments; and use the comment numbers to identify corresponding responses in the response table.

All documents and comments that were received during the public review period for the Draft EIS were treated equally regardless of the form or commenter. Each comment was carefully documented, thoroughly read and evaluated, and provided with a response. The National Environmental Policy Act requires the analysis of all reasonable alternatives to the Proposed Action. In accordance with Council on Environmental Quality guidelines, this EIS includes sufficient analysis to inform the public and decisionmakers of potential environmental impacts resulting from the proposed action and alternatives and to assist in the decisionmaking process.
8.1.1 WRITTEN COMMENT DOCUMENTS—DRAFT EIS

Individuals who commented on the Draft EIS in written form are listed in table 8.1.1-1 along with their respective commenter identification number. This number can be used to find the written document that was submitted and to locate the corresponding table on which responses to each comment are provided.

Written Comments

Exhibit 8.1.1-1 presents reproductions of the written comment documents that were received in response to the Draft EIS. Comment documents are identified by commenter ID number, and each statement or question that was categorized as addressing a separate environmental issue is designated with a sequential comment number.

Response to Written Comments

Table 8.1.1-2 presents the responses to comments to the Draft EIS that were received in written form. Responses to specific comments can be found by locating the corresponding commenter ID number and sequential comment number identifiers.
### Table 8.1.1-1: Public Comments on the Draft EIS (Written Comments)

<table>
<thead>
<tr>
<th>Commentor and Affiliation</th>
<th>ID Number</th>
</tr>
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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
2. Air Quality:
- Due to mobility of SHX, Title V Permit or a Prevention of Significant Deterioration Review is required.
- DEIS Pollutant Survey Table data is not current (‘92-’93).
- Diesel generators can burn up to 14,000 gallons per day for transit and maintenance operations but result in no significant emissions.
- No information on diesel consumption for daily dockside operations with one generator operating at all times.

3. Air Space:
- Levels of Electromagnetic Radiation (EMR) and Electromagnetic Interference (EMI) cover a large populated area of Snohomish County. Included in this area are 2 Hospitals, 5 Airports, Commercial and City wide Emergency Response Communication systems that can all be affected by EMR and EMI.
- Potential Interference Distances range from 1.6 miles to 13.8 miles from the center of the SHX.
- Electro Explosive Devices (EED’s) can be initiated within these Potential Interference Distances of 1.6 miles to 13.8 miles. Safe airspace and operating angles of the SHX have not been determined by completion of DDE Form 1494.

4. Biological Resources:
- The only ‘Region of Influence’ is Naval Station Everett itself and does not include the greater surrounding area.
- DEIS does not address a break or leak of 18,000 gallons of diesel into Port Gardner Bay and the possible affect on wildlife and biologic resources.

5. Hazardous Materials and Hazardous Waste:
- No additional significant Hazardous Materials or Wastes are anticipated.
- No Mitigation is required.
- DEIS does not address a break or leak of 18,000 gallons of diesel into Port Gardner Bay and it’s affect on the surrounding area.

6. Health and Safety:
- Safe operating angles, power levels and sector blanking have not been determined by completion of DDE Form 1494.
- EED’s exploding in heavily populated areas does not ensure Health or Safety.
- The results of unsafe air space or airplane malfunction due to EMI around the SHX do not ensure Health and Safety.
- Failure of Community Emergency Response Communications does not ensure Health and Safety.

7. Transportation:
- The area to be required as Security Control around the SHX is not addressed.
- This Security area may have adverse affects on recreational water traffic, water-based tourism and commercial traffic on the water.
- The DEIS does not adequately quantify additional truck trips to the Naval Station and their adverse affects on Everett city streets.

8. Utilities:
- A re-supply vessel, Personnel transport by vessel or helicopter for SHX at mooring site is not addressed in Transportation section, Noise Section, Air Quality Section or Visual and Aesthetic Section.

9. Visual and Aesthetic Impact:
- We challenge the assumption that the ‘Region of Influence’ is Naval Station Everett and the mooring site only. The Visual and Aesthetic impact of the SHX will include the entire shoreline and uplands of Port Gardner Bay, Whidbey Island, and the islands of Marysville, Mukilteo, Lake Stevens, Everett and Snohomish that are west facing and east of the Snohomish River.
- The dimensions of the SHX are not relevant to the dimensions of the USS Lincoln.
- The SHX is 250 feet tall from waterline, the equivalent of a 25 story building. The tallest building currently in Everett is 15 stories. The SHX is 250 feet tall and 220 feet wide. The SHX will overwhelm the Everett waterfront, obscuring panoramic views from all areas.
- The adjacent industrial areas of the Everett waterfront do not obscure panoramic views.
- We challenge the assumption that “Therefore, significant impacts to visual and aesthetic resources are not anticipated due to the proposed action.”
- The SHX is not a typical ‘activity’ at Naval Station Everett.
- We challenge the DEIS assumption that “Because this type of activity consistently occurs at Naval Station Everett, no impacts to visual resources are anticipated.
- The SHX will undermine the economic vision and direction of the City and Port Development Plan.
- The SHX will degrade property values within sight lines of its position.

We respectfully request that our Mayor, City Council Members and Elected Officials provide the Everett community with an opportunity to begin a meaningful public process on the proposed ‘home porting’ of the SHX at Naval Station Everett and in our waterfront.

Respectfully,

Michelle Frantman, Morris Frantman
Snohomish Neighborhood Association

cc. Senators Patty Murray, Maria Cantwell
Congressman Rick Larsen, Norm Dicks, Jay Inslee
Tribal Chairman, Tulalip Tribe, Herm Williams Jr.
Snohomish County Council KirkENDING RESEARCHERS
Mayor Frank Anderson
City Council Member Ron Lisa
City Council Member Mark Olson
City Council Member Arlen Irionco
City Council Member Dale Pope
City Council Member Marian Kell
City Council Member Doug Campbell

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
March 24, 2003

U.S. Army Space
And Missile Defense Command
100 Wynn Drive
Huntsville, AL 35805

ATTN: SMDC-EN-V, Mrs. Julia Hudson Elliott

Dear Mrs. Elliott:

Enclosed please find an additional copy of our comments dated October 31, 2002. We wish to re-submit them into the process by means of this letter. We do not find a response in the DEIS to environmental impacts concerns stated in our testimony at the October 23, 2003, scoping meeting in Concord or in our October 30, 2002 letter. Response to these concerns was also not provided at the scoping session on the DEIS we attended in Concord, California, on February 24, 2003. The “Summary of the Public Scoping Process” provided in the DEIS is inadequate to inform the public what issues were raised in the scoping process or to document response by the preparer to these comments. This deficiency should be corrected by recirculating the DEIS with a comprehensive description of issues raised and of the preparer’s responses.

We wish to supplement our letter of October 30, 2002, with these additional comments:

1. Review of Visual Impact of the proposed action at Naval Base Ventura County is not factually accurate. The DEIS summary (Ex-3) states “because this type of activity consistently occurs at Naval Base Ventura County Port Hueneme, no impacts to visual resources are anticipated.” Nothing remotely like the Sea-Based Test X-Band Radar (SBX) footing platform has ever been seen at this location. The platform reaches the equivalent of more than twenty stories above the water and has a deck area about one and a half times as wide and ten feet short of a football field. This vessel is far too large to enter the Port of Hueneme. The locations where the SBX would be moored for operations or for servicing have not (see our earlier comment) been defined. Clearly, the presence of this enormous structure in the roadway of the Port of Hueneme or elsewhere in the Santa Barbara Channel would have significant visual impacts that require analyses in a sufficient EIS for this proposed action.

2. Air Quality impacts are not factually considered. The DEIS recognizes that Ventura County is a non-attainment area but claims (Ex-21) that the proposed action would result in “No change to the region’s current attainment status.” The DEIS indicates that the X-band platform will be propelled by multiple massive diesel engines. The effects of emissions from these engines at each of the sites to be utilized in waters off Ventura County needs to be subject to a Conformity Analysis to evaluate consistency with the State Implementation Plan for a non attainment area. Such an analysis needs also to consider emissions from vessels serving the platform.

3. Electromagnetic radiation impacts are not adequately defined or analyzed. It is recognized (Ex-33) that “safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units” will be required pursuant to Department of Defense policy. Without first preparing such an analysis and providing it in the DEIS, there is no meaningful public disclosure of potential impacts as required by NEPA. It is implicit in the DEIS (but not clearly stated) that only DoD safety standards for electromagnetic radiation are recognized as applicable. Clear definition on this point is needed to disclose whether the proposed action will be at odds with the policy of the California Coastal Commission that spillover impacts onto civilian land or water areas within the Commission’s jurisdiction must comply not only with DoD but also FCC standards for uncontrolled environment exposure to electromagnetic radiation.

Thank you for your consideration of these additional comments as well as those we provided earlier. Please provide us with a complete copy of all environmental documents issued with regard to this proposed action and also of notice regarding any actions or hearings.

Sincerely,

Lee Quaintance, Secretary
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Comment Sheet
for the
GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Thank you for attending this public hearing. Our purpose in hosting this meeting is to give you an opportunity to comment on issues analyzed in the Draft Environmental Impact Statement. Please use this sheet to comment on any issues that you feel should be clarified. To ensure that your comments are addressed in the Final Environmental Impact Statement, your comments must be postmarked by March 24, 2003.

Date: 4/21/03

I oppose the home posting of the S-X missile radar in Fort Gardner Bay, Everett, WA, for the following reasons:
1) The visual impact on our community is too large and will result in the loss of our visual resource and views, also a loss of economic opportunity in the re-development of Everett.
2) Insufficient information on the visual impact of this radar is in the data, therefore all the visual impacts are inadequately assessed.
3) No accurate information on the effects of the radar on the environment due to the lack of information on the effects on wildlife due to the radar.
4) The radar site was not completed in the proper design, the design and planning for the radar site was not completed.
5) Name: 

City Address:

Street Address:

Zip Code:

Please place form in the drop box or mail to:

S.D.C., 2165, Julia B. Ellis
U.S. Army Space and Missile Defense Command
P.O. Box 1960
Huntsville, AL 35804-1960

6) The S-X missile radar covers a large portion of the city of Everett.
7) The radar site was not completed in the proper design, the design and planning for the site was not completed.
8) Name: Michelle J. Talbot

City Address:

Street Address:

Zip Code:

Please place form in the drop box or mail to:

S.D.C., 2165, Julia B. Ellis
U.S. Army Space and Missile Defense Command
P.O. Box 1960
Huntsville, AL 35804-1960

9) The radar site was not completed in the proper design, the design and planning for the site was not completed.

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
In 1982, the Department of Defense chose Everett as the location for the homeport of a carrier battle group. Naval Station Everett was constructed and today is the most modern Navy base in the nation’s inventory. The City has strongly defended the facility from four rounds of base closure commission reviews. The City has also aggressively advocated for funding from the Department of Defense and the U.S. Military Construction Appropriations Sub-Committee. Today, Naval Station Everett is the assignment of choice for Navy personnel and their families.

Further, it is the City of Everett’s intention to, in conjunction with the U.S. Army Space and Missile Defense Command, to hold a public Listening Forum on April 5 to afford our community members an opportunity to become better informed and to have some of their questions answered.

Upon initial review, the DEIS raises significant questions regarding impacts that, in our opinion, are not adequately addressed. These concerns and comments are set forth in this letter.

**II. The SBX Proposal**

The City understands the SBX component is a sea-based radar system designed to tracking ballistic missile warheads—reentry vehicles—outside of the Earth’s atmosphere. SBX is but one component analyzed in the DEIS. The SBX is a national defense project designed to operate within the navigable waters of the United States as well as international waters.

The remainder of the DEIS addresses the components of a testing protocol intended to address sophisticated integrated tracking of ballistic missiles and their reentry vehicles from the launch, through the various phases of flight, to impact. The “proposed action” for this DEIS is: “...to construct and operate additional launch and test facilities including the Sea Based X-band Radar in the Pacific Region, and to conduct more realistic interception flight tests in support of GMD development.”

**III. The DEIS Procedures**

The DEIS was prepared by the US Army Space and Missile Defense Command located in Huntsville, Ala. As a national defense proposal, the GMD-ETR-SBX proposal is clearly outside of the jurisdiction of the City of Everett. There are no City of Everett permits being requested or required. Nevertheless, the City has significant interests and concerns that require consideration within the scope of this DEIS. By this comment letter, the City of Everett is a party of record under the National Environmental Policy Act process.

The primary purposes of the NEPA—DEIS is to provide the public with the opportunity to comment on a proposed action, and inform the public of potential impacts before a decision is made. The City of Everett believes this DEIS has failed to meet these two primary NEPA objectives.
The scoping process for the DEIS did not involve the City of Everett. We are unaware of any scoping meetings that were held in Everett, though it appears that there was a scoping meeting held in Seattle in October 2002. The City of Everett and the surrounding community still have questions regarding the SBX project. Some of those questions are set forth in this comment letter. It is noteworthy that the DEIS official “Distribution List” (Appendix 11.6, Volume II, DEIS) does not list any City of Everett contacts.

IV. Impacts

Aesthetics - The DEIS indicates that “...no impacts to visual resources are anticipated”. As noted, the SBX is presumed to be a vessel. Like any other ship, it is presumed to be part of the inventory associated with the overall mission of the Department of Defense and the Naval Station Everett. However, the SBX system is larger than the Aircraft Carrier Abraham Lincoln (SBDH) is 250 ft. tall, 390 ft. long & 238 ft. wide - the Lincoln is 206 ft. tall and 1,692 ft. long and 257 ft. wide) and will by any account become a prominent addition to the view of the harbor. While visual impacts and aesthetics are to some degree subjective, clearly, there will be a visual impact associated with the SBX. The visual impacts associated with the SBX are not adequately addressed in the DEIS and additional analysis is required.

Airspace - The operation of the SBX can interfere with some aircraft electronics and communication systems. Impacts to airspace associated with the SBX are to be “mitigated” by adhering to operational requirements, and coordination with the Federal Aviation Administration. However, the operational requirements are not addressed in the DEIS. Therefore, we cannot know what the operational requirements will be until additional tests are performed (Electromagnetic Radiation/Electromagnetic Interference survey and analysis) and the required forms are complete (DD Form 4734). Presumably, this work could result in some operational impacts on aviation and airspace. This could be of interest to the flight operations at Paine Field, and to private and commercial aviation.

Paine Field serves as the primary test facility for the Boeing Co’s Everett commercial aircraft plant. The Boeing/Everett facility is the largest aircraft assembly facility in the world. It is the only assembly facility in the United States for wide-body aircraft (747, 767 & 777). Even modest reductions in flight operations, or risks to the aircraft communication systems resulting from the SBX testing protocol, could have significant impacts on the facility.

Health and Safety - The operations of the SBX system while in the “Primary Support Base” – Everett/Pont Gander Bay (EPR) are not clear from the DEIS. For instance, it is not clear what testing of the radar systems is contemplated, and what the time, frequency and duration of any testing might be. The DEIS assumes that the SBX would not pose any health or safety risk resulting from exposure to radiation associated with its normal operations. However, these “normal operations” are not clearly defined in the DEIS.

More information in a clear and concise format would be helpful. Specifically, we are seeking clear information that describes the operations, frequency, and duration of any testing and the risks, or lack of risk, associated with radiation exposure resulting from the operations of the SBX.

Impacts to communications, electronics, aircraft avionics and the Naval Station Everett – The DEIS clearly acknowledges operation of the SBX could impact “ground-based, airborne, and ship-based systems” (commercial and household electronics, radios, televisions, communication systems, avionics, etc.) However, as noted, the DEIS does not indicate what the testing protocol and operations of the SBX will be while in port, nor does it mention the impacts of the operations of the SBX on any system. The DEIS acknowledges that additional tests, modeling and operational modifications will be necessary to determine the nature and extent of impacts and the appropriate mitigation, modification or response. Without the additional information, the impacts of the SBX cannot be disclosed, much less analyzed. In this regard, the DEIS is clearly inadequate.

Additionally, the SBX is to be located on or immediately adjacent to the Naval Station Everett. Clearly the aircraft carrier ships associated with the battle group, and land-based systems include sensitive electronics, communication systems and aircraft systems that may be susceptible to interference from the electromagnetic and radio frequency transmissions from the SBX. However, there is no mention of this in the DEIS. These potential impacts need to be addressed.

The City is very concerned that impacts to communication systems outlined in the DEIS could result in impacts to the community, residents, and emergency response and communication systems and to Navy operations. The DEIS does not adequately address these potential impacts.

Air quality - The DEIS does not provide a clear indication of the air quality impacts. Since the SBX will burn diesel fuel for at least part of its operation, and since these operational needs are not clearly identified while in the Primary Support Base, it is not clear what the impacts will be. The DEIS correctly notes that the Snohomish County area is a “non-attainment” area under federal clean air standards and that air quality maintenance plans have been adopted and are part of the State Implementation Plan. (Please note that on page 4-23A, Section 4.1.2, the text has a conflicting and incorrect statement that the area is a non-attainment area. The text should be corrected.) Impacts associated with substantial diesel fuel consumption could be significant and in excess of federal and state standards. Emissions from diesel fuel are a substantial source of particulate matter and air toxics in this region. The air quality impacts are not clearly disclosed in the DEIS. The DEIS should provide a quantification of potential emissions, proposed and potential mitigation measures, an indication of whether these emissions would comply with regional air quality standards and conform with the State Implementation Plan. We believe the existing air quality analysis is inadequate in the DEIS and additional information is required.

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Wildlife: The assessment of risks to wildlife mentions a number of species through it specifically does not mention Chinook Salmon and Bull Trout. Both of these species are protected under the Federal Endangered Species Act and should be noted in the DEIS. The DEIS does not appear to identify any impact to fish or birds. It is not clear whether a federal consultation would be required under Sec. 7 of the ESA. The ESA is mentioned in Appendix B, a listing of federal statutes that apply to this proposal. The DEIS needs to address this issue and indicate whether or not a consultation under Sec. 7 of the ESA is required. Potential impacts from fuel spills or other potential contaminants that would impact aquatic resources should also be identified and mitigation measures defined.

Socioeconomic impacts: The DEIS does not address socioeconomic impacts related to the City of Everett. The City of Everett does not know what, if any, impacts or benefits might accrue to the community as a result of the proposed action. The DEIS needs to address these impacts.

Other jurisdictions: It is not clear from the DEIS whether or not the proposal would involve state lands, tidelands, or leases. If so, these should be identified and the appropriate state agencies need to be notified and given an opportunity to comment. These agencies would likely be the Washington State Department of Natural Resources and the Washington State Department of Ecology. For clarification of jurisdictional questions, we recommend you contact the Washington State Attorney General’s office. A copy of our comment letter will be sent to these agencies.

We appreciate your consideration and attention to these concerns. Again, we request that you provide an additional 30-day comment period and hold additional public meetings with appropriate experts to answer questions.

Sincerely,

Mayor Frank Anderson

Arland Hatte, City Council President
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Comment Sheet for the GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Thank you for attending this public hearing. Our purpose in hosting this meeting is to give you an opportunity to comment on issues analyzed in the Draft Environmental Impact Statement. Please use this sheet to comment on any issues that you feel should be clarified. To ensure that your comments are addressed in the Final Environmental Impact Statement, your comments must be postmarked by March 24, 2003.

Date: 3/1/03

There has been no discussion with the community of Seward, Alaska or Fort Wainwright regarding the selection of the site as a site for the SMD. We are the nearest community to the site. This facility would pose a serious threat to our community and our way of life. Like everyone else, we are concerned about the impact on our community and our environment. This facility would pose a serious threat to our community and our way of life.

Commentator: NORMA W. WRIGHT

Please place form in the drop box or mail to:

SMDC-EN-V, Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1300
Huntsville, AL 35807-1300

3/1/03

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
TO: SMED EN-V, Julia Elliott  
U.S. Army Space and Missile Defense Command  
PO Box 1500  
Huntsville, AL 35807

FROM: Michelle Kermode

RE: Conceptual Sea-Based Test X-Band Radar

DATE: 03/01/03

Dear Ms. Elliott,

Thank you for the opportunity to inquire about the proposed “SBX”.

As a matter of fact, I’m extremely concerned about how this will impact my family, neighborhood, and city in general. My questions are as follows:

1. Why wasn’t there a public disclosure meeting held in Everett?

2. Can you provide the scientific data for which you are relying that ensures my three children, ages 2, 3, and 5, will grow up in the center of the EMI spectrum, will not suffer ill-effects?

3. Will EMRA, Air quality, Title V, or other environmental impact reviews be conducted? By whom?

4. What is meant by the phrase “…limitations in areas subject to illumination by radar units to preclude hazard to the public”?

5. Precisely how many residential properties will be impacted by EMRA and other as yet undisclosed hazardous residues? Is there any anticipation as to the effect on homeowners’ property values?

6. How many months per year will it be stationary? Will the generators run while at port? How much noise will they produce? How will they be powered?

7. What exactly are the “small quantities of hazardous waste that could potentially spill or be emitted”? What other substances, by-products, or materials will definitely be emitted or leaked into the environment?

8. What will be the effects on my household radio frequency? (This happens to be a very important part of my household.)

9. I must dispute the statement “no visual impacts are anticipated, because this type of activity consistently occurs at Naval Station Everett”. This behemoth is in a category unto itself. It has not once “consistently” occurred at this port.

10. Exactly how many “especially sensitive” homeowners (I am one) will be overlooking the site? What will be the color scheme? Will it blend in with the beautiful sunsets I now enjoy with my family? Or will the islands I will no longer see?

11. Are there no other proposed sites of a more industrial nature?

As you may have gathered, I am among the many residents who strongly object to the covert nature in which this “proposal” has come to our city. I can only hope that you will seriously consider and address all of the questions/comments you receive from this community before proceeding with this project.

We are a patriotic city. We are taxpayers. But mostly, we too love our great country. However, this doesn’t mean we deserve to have something of this magnitude forced upon our community without any assurances about the negative impact to the welfare of our individual families and our city in its entirety.

Again, thank you for this opportunity to state my concerns. I look forward to your response.

Sincerely,

Michelle Kermode

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
March 6, 2000

U.S. Army Space and Missile Defense Command
ATTN: SMDC-UN-V (Mrs. Julie Hudson-Elliot)
106 Wyman Drive, Huntsville, AL 35805

RE: Ground-Based Midcourse Defense (GMD) Extended Test Range DMES

Dear People:

There are many things unacceptable with GMD. Others will submit testimony on these. I will limit my comments to two issues.

First, "V Band X-band Radar" is dangerous to humans and other living things. It heats tissues. As a result, this type of electromagnetic radiation can and has caused in humans a range of conditions from burns to death. Furthermore, it can interfere with airplane and airport electronics. It should not be placed near our airports, or anywhere in our islands, or anywhere PERIOD. It's too dangerous.

Second, all information I’ve received from independent scientists tells me that the whole "star wars" project is very likely to fail and is tremendously wasteful. It is based to escalate the arms race. We don’t need it. The world doesn’t need it. This project should be abandoned and the billions saved should be used for human needs—such as health insurance for the 39 million Americans who don't have any.

In closing, let me quote from former President General Dwight D. Eisenhower. He spoke these wise words: "Every gun that is made, every warship launched, every rocket fired (bombs dropped), signifies in a final sense a theft from those who are not fed, those who are cold and are not clothed. This world in arms is not spending money alone. It is spending the sweat of its laborers, the genius of its scientists, the hopes of its children."

Sincerely,

Frederick A. Dodge, MD

To: Government and Military Officials
Subject: No Military Expansion in Hawai'i

Militarism and war do not bring true security. Genuine security requires that the environment is able to sustain life, that peoples’ basic needs of food, clothing, shelter, health care and education are met, that fundamental human dignity and cultural identities are honored, and that people and the natural environment are protected from avoidable harm.

To this end, I oppose any military expansion in Hawai'i, including plans for "Army Transformation."

I urge you to clean up, restore and return lands that have been used or damaged by the military. Clean up should include the 123,000 acre former Waiakoa Maneuver area, the 108,000 acre Pohakuloa Training Area and Kawaihae Harbor on Hawai'i Island, the entire island of Kaho'olawe, Makua and Waikane valleys on O'ahu and other areas where the military has left unexploded ordnance or toxins.

Finally, I urge government officials to end Hawai'i's economic dependency on military spending and to develop economic alternatives based on meeting human needs and environmental sustainability.

Sincerely,

Name: Helen TAKEMOTO
Date: ____________

Address:

Telephone number:

Email: ____________________________

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
The text of comment P-W-0018 was the same as that of P-W-0017. This comment was submitted by Sachiko Fujita of Aria, Hawaii.

The text of comment P-W-0019 was the same as that of P-W-0017. This comment was submitted by Peggy Choy of Madison, Wisconsin.
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Horst W. Petzold

In order to solve a problem we must first state it clearly.

One phase of problem solving consists of turning the opposing items around whenever possible and having those forces which were working against us turned into productive forces working for us.

The word impossible is by itself a problem which should not even exist.

Most people of our globe have no willpower to solve problems with intelligence.

Intelligence is not solving any problem.

All Rights reserved.
All Rights reserved.

Horst W. Petzold
2.20.64

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
March 18, 2003

SMDC-EN-V, Ms. Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-1500

Dear Ms. Elliott,

On February 25th the Everett Herald published an article on a proposal by the Missile Defense Agency to possibly bring the SHX to Everett. This was two days before the only public hearing would be held to solicit local opinions, and was the first time that virtually anyone in Everett had ever heard of it.

The Missile Defense Agency is considering six other locations around the Pacific Ocean for deploying the SHX platform. From April to December public information meetings were held in all of those locations, but none was held in Everett. Hundreds of people from those locations commented formally on the plan. There was a meeting held in Seattle, but since Seattle was not being considered as a possible site for the SHX, no one attended.

In January a draft EIS was published and distributed to all interested parties from the first round of meetings. People receiving it had ample time to study it before final hearings were held in February and March at the other potential sites. Since no one in Everett knew anything about this plan, no copies of the EIS were distributed to local government officials, let alone interested citizens, before the only Everett public hearing was held at the Holiday Inn on 128th St. and Interstate 5 on February 27th. Because of the short two-day notice, the meeting location nowhere near the site under consideration in Port Gardner Bay, and the total lack of knowledge of the contents of the draft EIS, only a handful of citizens showed up to comment on it. This is despite the many serious concerns which the draft EIS raises.

Considering the impact this powerful radar system could have on Everett, I don’t believe the hearing process has been anything close to fair and open.

If Everett is the Missile Defense Agency’s preferred location because of the deep harbor and proximity to the USS Lincoln’s pier, then the hearing process, which left Everett residents completely in the dark, has been cynical at best.

March 24th is the final date for public comment on this draft EIS. The period for scoping meetings and comments was extended twice last year. Would you please extend the current deadline by several weeks, and return to Everett for another hearing in a suitable waterfront or downtown location with sufficient early publicity to ensure real citizen participation? This seems only fair to the people of Everett.

Thank you for your consideration.

Sincerely,

Robert C. Jackson

Robert C. Jackson

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
March 24, 2003

Mrs. Yulia Hudson-Elitini
U.S. Army Space and Missile
Defence Command, ATTN: SMDC-EN-V,
106 Wynn Drive, Huntsville, AL 35805

Mrs. Hudson-Elitini,

The Board of Directors of the Kodiak Chamber of Commerce wish to go on record in support of the Ground-Based Midcourse Defense (GMD) Extended Test Range Draft Environmental Impact Statement (DEIS). The DEIS provides analysis of the potential for environmental impacts associated with the proposed action of the establishment of an extended test range capability providing more realistic operational flight testing. The proposed action and alternatives examined in the DEIS includes development of the capability for single and dual launches of interceptor and target missiles at the Kodiak Launch Complex (KLC). Development of these capabilities would entail construction of two interceptor launchers, one additional target launch pad and construction/alteration of launch support facilities at KLC.

The Kodiak Chamber of Commerce has long supported the efforts of the Kodiak Launch Complex to develop itself as a testing site for the launch of flight test rockets. We believe that the Kodiak business community has the ability to serve the needs of the National Missile Defense agency as they carry out their mission of the GMD operational flight testing. The Kodiak business community wishes to ensure that as the test flights and associated activity moves forward that we be given every opportunity to meet the associated support needs of the NMD.

We have a full complement of hotels, bed and breakfast facilities, car rental agencies, trucking, transportation and equipment rental companies as well as local security firms available to provide support to NMD personnel. We believe that Kodiak can fully meet the operational needs of NMD. As such, we would encourage you to keep the Kodiak Chamber of Commerce informed of your operational needs. We can help your staff as they plan their trips and develop their list of required goods and services. There is no need to develop on site housing at the Kodiak Launch Complex until the local inventory is fully utilized.

The Board of Directors of the Kodiak Chamber of Commerce has been a long time supporter of KLC and their efforts to develop a fully operational facility in Norman Cape. We expect that the users of KLC will recognize that support by fully utilizing the local business community to provide for logistical support during their missions.

Dedicated to Kodiak’s Future

We look forward to working with you to provide your organization a successful platform from which to conduct your testing efforts. I genuinely appreciate your careful consideration and thoughtful attention to this detail in your planning efforts.

Yours in economic prosperity,

Deborah M. Milburn
President

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
<table>
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<tr>
<th>COMMENT NUMBER</th>
<th>P-W-0023</th>
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### Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
### Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)

#### CLEAN UP, NOT BUILD UP
**NO MILITARY EXPANSION IN HAWAII**

1. We oppose military expansion in Hawaii, including the build-up and destruction of Hawaiian lands by military forces in Mililani, Pearl Harbor, Honolulu, and Kailua. We renew our demand that military forces in all parts of Hawaii be removed. In light of recent scandals involving military bases and installations off of Hawaii, the military must change its ways, and the military must change its ways.

2. In the military must clean up, restore, and return military-controlled lands, including Koolau, Pearl Harbor, Mililani, Waianae, Koko, Makaha, Honokaa, Waimanalo, and all other areas of military control.

3. End all military dependencies on military spending to maintain bases, clean up the environment, and develop environmentally sustainable, community-based economic alternatives.

4. The military must pay full compensation for its use of and damage to Hawaiian lands.

---

#### NAME | ADDRESS | TELEPHONE | EMAIL
--- | --- | --- | ---
1. John Doe | 123 Main St, Honolulu, HI 96813 | 555-1234 | john.doe@email.com
2. Jane Smith | 456 Oak Ave, Honolulu, HI 96814 | 555-2345 | jane.smith@email.com
3. Mary Johnson | 789 Pine Rd, Honolulu, HI 96815 | 555-3456 | mary.johnson@email.com
4. Robert Brown | 101 Elm St, Honolulu, HI 96816 | 555-4567 | robert.brown@email.com

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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
CLEAN UP NOT BUILD UP

To U.S. Military and public officials:

We, the undersigned, oppose the further build up and desecration of Hawaiian lands by U.S. military forces in Hawaii, including plans for "Army Transformation." This "transformation" means additional troops, equipment, aircraft, training, and military land acquisition on Oahu and Hawaii Island. We believe it is time for the military to clean up, not build up. Clean up should include the 123,000-acre former Waikoloa Maneuver Area, the 108,000-acre Pohakuloa Training Area, and Kawaihae Harbor area on Hawaii Island; the entire island of Kaho'olawe, Makua Valley on Oahu, and other areas where the military has left unexploded ordnance or toxins. The U.S. military presently controls over 22% of Oahu and 5% of all lands in the Hawaiian Islands.

Name (please print & sign)  address  zip  phone/email:
1. Madonna C. Brown  6372 Cheyenne St.  89117  702-888-8888
2. Wanda M. Hensley  4321 Ocean Ave.  92101  619-555-5555
3. Mary Mahan
5. 6.  
7. Ana Perez  789 Main St.  12345  123-456-7890
8. Dona Turner
9. 10.  
11. Ann Ashley  11111 Road  6789ABC  98765-6789
12. Michelle Adams
15. Wanda Brown

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
CLEAN UP NOT BUILD UP

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Name (please print & sign) address zip phone/email
1. [Name]
2. [Address]
3. [Zip]
4. [Phone/email]
5. [Name]
6. [Address]
7. [Zip]
8. [Phone/email]
9. [Name]
10. [Address]
11. [Zip]
12. [Phone/email]
13. [Name]
14. [Address]
15. [Zip]
16. [Phone/email]

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
The proposed Alternative 1 would quadruple existing development at KLC. Proposed developments would include: 2 new launch pads, 2 interceptor sites, an assembly bldg, a movable missile bldg, expansion of the existing KLC building, a missile storage facility, an EDF facility requiring 2 ha (5 acres) of development, expansion of the "Narrows Cape ledge," and construction of a "mancamp" for construction personnel.

The following comments are organized into four general categories: 1) Environmental impacts to marine and aquatic resources; 2) Access to public lands for recreational and subsistence uses; 3) Public safety considerations, and; 4) Consistency with area development plans.

1) Environmental impacts to marine and aquatic resources;

The only statement concerning water resources in the document is on P-4-23, line 25: "... small amounts of deposition from launches would be quickly flushed from stream drainages. No long-term impacts to fish in streams or EPH within the IOM are expected."

I'm inclined they could dismiss this possibility categorically, with no rationale whatsoever. On what information is this statement based? How can they reach a conclusion of "no long term impacts" without any background information? How is it that there is absolutely no reference to 5 years of previous research (AADC, 2002)? What about the data showing increased microaggregate abundance and increased aluminum levels following the 2001 Athena launch? Despite the flawed sampling design of the ENVRI studies (see below), the EIS appears to be totally oblivious to it, despite the fact that it is listed in the bibliography. This appears to be a deliberate omission of relevant information on the part of the ENVRI preparers.

P. 4-98. The EIS states that "recoverable aluminum was detected in very low concentrations ..." and did not exceed levels considered to be toxic to aquatic life." However, aluminum concentrations were only measured before and after each launch. Post-launch values increased at every location sampled, by factors of 2- to 6-fold. Duplicate samples were not taken so no statistical comparisons can be made. Such increases are probably statistically significant, but ENRI did not conduct even a simple t-test on the data.

Similarly, such levels of aluminum are non-toxic at pH above 5. However, discharge of hydrogen chloride could reduce the pH to the point at which aluminium becomes toxic. This might not happen during normal launch events. It could happen during an abnormal event, if a rocket did not leave the launch pad at normal speed, or a catastrophic accident occurred. There

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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)```

P-W-0026

has already been

P. 4-9 The statement that "no discernable effects on water chemistry were found...for five previous launches" is patently false, because water quality was impacted in unusual ways (see below). Elevated aluminum levels, and decreased abundance of midge macrobenthic species were observed in several streams following the Athena launch in 2001. These effects were not found to be significant, because in fact, no tests of significance were performed, or could be with the paucity of data collected.

Background studies:

The expected environmental impacts (for lack thereof) from the GMD ETR development at Narrow Cape are largely dependent on the results of studies done to evaluate the impacts of previous launches by ENRI Environment and Natural Resources Institute, University of Alaska) for the KLC. Therefore, the following review of those documents is necessary as background to this EIS:

The documents examined included: a Baseline Study (ENVRI, Feb. 1998), and subsequent studies conducted around the time of five subsequent launches. A summary report was also published in April 2002. The assessment of water quality in Narrow Cape Streams includes three types of analyses:

1) Basic water chemistry including temperature, dissolved oxygen (DO), pH, and conductivity.
2) Macronutrients sampling (aqueous inorganic) and
3) Sediment bioassay, using phosphates and nitrate bacteria to sediment samples, using a proprietary test ("RotaX").

The use of these tests seems to be supported by several studies, the Department of Environmental Conservation, and the Alaska Stream Condition Index. As an initial step, I assume that the samples were collected and processed properly, that all measurements were correctly identified, and that toxicity tests were conducted accurately. Factors that can be critically reviewed include the sampling design, analysis, interpretation and reporting of results.

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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)```

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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)```

P-W-0026

has already been 1 missile failure out of 5 launches, for a catastrophic rate of 20%. There will be others.

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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)```
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
A considerable amount of work was conducted by the investigators (ENRI). However, the study suffers from poor sampling design, inadequate replication (or none at all), lack of a suitable control site, lack of statistical analysis, or inappropriate statistics. Chemical analyses indicated an increase in aluminum concentrations after the 2001 launch, but it was discounted as an artifact without any statistical justification. The reanalysis attempts were compromised by a change in sampling technique, rendering the baseline studies useless.

Furthermore, the high variability in the 2001 data makes them poor candidates for analysis with the other data sets. Nevertheless, the data suggest a negative impact of the 2001 launch, but again, these results were discounted as "unreliable" without comparison to any control data. The baseline data were primarily sensitive to minor variations in sediment quality, rendering it unsuitable for use in some of the highly sensitive studies.

As a result of these limitations, the ENRI study cannot be used to make any clear statements about the presence or absence of environmental impacts due to rocket launches. It does not demonstrate the best scientific knowledge, or the highest scientific standards, and could not withstand peer review scrutiny. Nor does it represent the quality standards to which the University of Alaska should aspire.

At best, it should be considered as a worthless exercise in futility.

2) Access to public lands for recreational and subsistence uses

Previous public meetings in Kodiak have demonstrated that public access to Narrow Cape and Fossil Beach is a high priority, and the public does not want to be excluded from these sites. Throughout the EIS, references are made to potential closures of the road and restriction of access. These are usually vague, often conflicting, and generally open-ended. All potential restrictions of access should be defined in a single location in the EIS and described with specific terms. A sampling of such references follows:

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
June 16, 2003

U.S. Army Space and Missile Defense Command
ATTN: SMDC-EN-V (Mrs. Julia Hudson-Elliott)
106 Wynn Drive
Huntsville, Alabama 35805
gmdetres@smdc.army.mil

Subject: Comments on the Draft Environmental Impact Statement for the Ground-Based Midcourse Defense Extended Test Range.

Dear Mrs. Hudson-Elliott:

We have reviewed the portions of the Draft Environmental Impact Statement for the Ground-Based Midcourse Defense Extended Test Range (DEIS) that relate to basing the Sea-Based Test X-Band Radar (SBX) in Everett, Washington.

In summary, Everett provides excellent homeport facilities, having very deep water right to the pier, exceptional protection from storms and shoreside access to the facilities and amenities of Everett, Seattle, Tacoma, Bremerton, etc. Although we raise some issues relating to the navigational challenges between Everett and the ocean, these can be mitigated. But Everett is also a very congested area, surrounded by airports, homes, businesses and highways that may require significant restrictions on the operation of the powerful X-band radar of the SBX when in port. The question that must be considered by the project managers is whether operational restrictions on the SBX radar that might be required in Everett's heavily populated environment will ultimately interfere with the testing and calibration necessary to make the tests of the Ground-Based Midcourse Defense a success.

We ask that the following issues be addressed in the Final Environmental Impact Statement, including appropriate alternatives and mitigation.

1. Risk of collision and spills when entering or leaving Puget Sound. Washington State has been working for many years to reduce the risk of vessel groundings, collisions or spills in the Strait of Juan de Fuca and Puget Sound. The State has, at its own cost, stationed a rescue tug at Neah Bay to respond to vessels in distress. The SBX, carrying 800,000 gallons of fuel and with a wind-catching height of 250 feet and a predicted cruising speed of only seven knots, could easily become a danger to itself and other vessels if hit by high winds while fighting surface currents that routinely exceed four knots in Admiralty Inlet. The Final EIS should compare the navigational risks of the approaches to each of the possible SBX basing alternatives. For the Everett alternative, the Final EIS should discuss additional mitigation options including requiring that the SBX have a tug escort all of the way from the mouth of the Strait of Juan de Fuca to Everett, federal support for the state-funded rescue tug and other reasonable forms of mitigation.

2. Risks associated with SBX radiation while in port. The DEIS does a good job of listing the basic radiation risks associated with the SBX. But specific measures to protect people, wildlife and machinery in the air and on the ground are largely put off to the EMR/EMI survey and analysis that will be conducted after the SBX is constructed. While the DEIS contains numerous assurances that a combination of high energy zones on aeronautical charts and ground restrictions around the SBX will, along with operations restrictions on the SBX, prevent any problems, this cannot be demonstrated at this time.

Figure 3.8.2-1 shows just how congested the Everett area is. The Naval Air Station is a few miles due west. Paine Field, which supports an important Boeing Company plant, is five miles south. Interstate 5 runs along the east side and is within the risk circle for ground or air handling of EEDs at 65% power and within the risk circle for the presence or shipping of EEDs at full power. According to the DEIS, the grating lobe covers a large area on the ground and can trigger or damage EEDs within 1.4 miles at full power. Without some detailed alternatives being presented in the EIS, it is hard to see how the safety zones necessary for full power testing of the SBX can actually fit in Everett. Perhaps the Final EIS can have a diagram that shows the area within 15 miles of the moorage and indicating the direction the X-band radar would safely be directed at full power. If flight operations at Paine Field or the Naval Air Station need to be interrupted or commercial and pleasure vessels prohibited from passing the moorage during testing, this needs to be discussed in the Final EIS. The Final EIS should also address the number of small planes that fly from the Seattle area to the San Juan Islands and Canada, passing near Everett. If necessary, the Final EIS could commit to doing a supplemental review of operational restrictions on the radar at Everett once the actual emissions information is available. As noted in the summary, if operations of the X-band radar must be highly restricted while at Everett, it may be impossible to carry out the necessary testing and calibration of the SBX at that site.

3. Visual Impacts. Figure 2.1.4-1 gives a great feeling for the design of the SBX. A second figure comparing the profile of the SBX to the familiar profile of the USS Abraham Lincoln, the Nimitz-class carrier normally moored in Everett, would help reviewers and the public assess the visual impacts of the SBX.
4. Air Emissions
The general discussion of the Everett base points out that the base has excess electrical power capacity available. The air quality benefits of providing shore power to the SBX when at the pier is not adequately considered. Even if the SBX would need its on-board generators to power tests of the radar, shore power could supply the SBX the rest of the time and eliminate the noise and emissions of generators. Of course, this would only be feasible when the SBX is at the pier.

Thank you for the opportunity to comment on the DEIS. Assessing the environmental effects of such a large and complex program is a daunting challenge. Providing a homeport for the SBX may seem a minor issue compared to the construction and operation of missile launch facilities. But we believe that some significant issues have been identified that can be addressed in the Final EIS. We hope our comments can improve the Final EIS and the ultimate decision on this important project.

Sincerely,

John Dohrmann
Policy Director

Island County Board of Commissioners

PHONE: (360) 679-7354 from Camano (360) 629-4522 from S. Whidbey
(360) 321-5111
FAX: (360) 679-7381 P. O. Box 5000, Coupeville, WA 98239-5000

April 15, 2003

United States Army Space Missile Defense Command
Attn: SMDC-EN-V Ms. Julia Elliott
P.O. Box 1500
Huntsville, AL 35807-3801

Ms. Elliott,

Recently, Island County learned of a proposed project for the Missile Defense Agency to site a Sea Based X-Band Radar (SBX) array at Naval Station Everett in the waters of Puget Sound at Everett, Washington. Island County is very interested in learning more about this proposal. We understand that a scoping meeting was noticed in a Seattle newspaper and the meeting held. Unfortunately, Island County was not a recipient of the notice for the scoping meeting and we are not located within the central distribution region for Seattle newspapers so we were unable to view the notice in the newspaper.

Our request is that the comment period deadline of April 15, 2003 be extended so that we may have an opportunity to become more informed on the project details. National security is obviously a very important issue to us, therefore we are not suggesting that we are opposed to the concept, nor are we advocating the project; however, the facility will likely be transported through the waters of Island County and the electromagnetic currents will extend into the county.

We are very anxious to learn more about this project and hope that you will honor our request for an extended comment period deadline.

Sincerely,

Mike Shelton, Island County Commissioner

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
4/1/03

SMDC-EN-V, Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1550
Huntsville, AL 35807-3801

Dear Ms. Elliott,

I write to voice my opposition to the Sea-Based X-Band Radar (SBX) proposed to home port at Naval Station Everett or in Port Gardner Bay, Everett, WA.

I oppose this radar being placed in a large, urban populated area such as Everett and its surrounding communities. The SBX radar should be placed in a site that will not affect any population base.

The 22.5 km (13.8 miles) Radiation Hazard Area and Electromagnetic Interference Area covers a population base estimated at 400,000 people. It interferes with airplane navigation and communication controls. It may interfere with our local hospital and medical equipment and emergency communication systems. Our citizens are not safer within this hazard area.

Current scientific studies have not answered radar levels of this power over a long exposure period. Our children should not be raised within a Radiation Hazard Area regardless of the assurances that radiation levels are within ‘safe’ limitations.

The Draft Environmental Impact Statement (DEIS) does not thoroughly address the negative impacts of the SBX and the security area that will surround it, on the loss of our most valuable resource, our recreational and commercial waterway, Port Gardner Bay. The DEIS does not adequately address the loss of future economic re-development of our public waterfront properties. The SBX eliminates the vision and future economic potentials of our city. Home porting the SBX will forever tie the City of Everett to an industrial, military, and restricted access waterfront.

The impact of this enormous structure on our waterfront will have a huge, negative affect on the visual attraction of the bay as well as destroy the views from surrounding homes and businesses. The loss of desirability and loss of property values are not taken into account in this proposal. The SBX must not become the visual landmark of our town.

I oppose the SBX Radar project being forced upon Everett, Washington and its people.

Place this radar at one of the military sites that does not involve a community.

Sincerely,

Volunteer Group

Concerned Citizens Against the SBX

March 5, 2003

U.S. Army Space and Missile Defense Command
ATTN: SMDC-EN-V (Ms. Julia Elliott)
100 Wynne Drive
Huntsville, AL 35805

Dear Ms. Elliott:

The Port Hueneme City Council enthusiastically endorses the placement of the Sea Based Test X-Band Radar at Naval Base Ventura County (NBVC), San Nicolas Island. Having the X-Band radar at San Nicolas Island geographically makes sense and the Council is confident the community’s support should the Ground Based Midcourse Defense (GBMD) Joint Program Office of the Missile Defense Agency (MDA) make the decision to select NBVC.

Placing the X-Band Radar on the Pacific Sea Test Range with close proximity to NBVC, San Nicolas Island provides a perfect location. The Sea Range will allow the MDA thousands of square miles for uninterrupted, interference-free testing. NBVC will also provide outstanding maintenance logistical support for the system from both Point Mugu and Port Hueneme. instrumentation at Point Mugu will assist the X-Band with its sensors and tracking missions.

At the same time, San Nicolas Island’s remote location off the Ventura County coast eliminates potential encroachment threats and provides a safe venue in which to conduct radar operations. Because of this, the Council is confident that the community, as a whole, would fully support the X-Band Radar System at San Nicolas Island.

The City Council strongly supports the MDA proposal to base the Sea Based Test X-Band Radar at San Nicolas Island.

Sincerely,

Jonathan Sharkey
Mayor

City Council
City Manager
RDP 21

250 North Ln. Ventura, California 93041 • Phone (805) 986-6610
http://www.cityofporthueneme.ca.us

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
March 12, 2003

Ms. Julia Elliott, SMDC-EN-V
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-3801

Dear Ms. Elliott:

On behalf of Prince William Sound Economic Development District, I would like to offer this letter of support for the SBX-Radar site.

Valdez is a port city designated a National Scenic Byway, with astounding natural beauty, surrounded by the highest coastal mountain peaks of any city in Alaska. Valdez has one of the finest school systems in the state, and Prince William Sound Community College. Each year the college sponsors the Last Frontier Theatre Conference attended by leading playwrights from New York and London.

Valdez is the hub city of Prince William Sound offering fishing, kayaking, diving, skiing, hiking, birding, snowmobiling – every sport for the outdoor enthusiast! The region is about 20,000 sq. miles of mountains, glaciers, rivers, beaches and forests.

The other communities in Prince William Sound are easily accessible by the Alaska Marine Highway System. They are Chenega Bay, Cordova, Tatitlek and Whittier.

If our organization can assist your department in any way, please contact us.

Sincerely,

Sue Cassidy
Executive Director

SMDC-EN-V, Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-3801

Dear Ms. Elliott:

Thank you for the opportunity to review and comment on the DEIS for the GMD ETR. Our interest is specifically in the option for basing the SBX radar at Naval Station Everett and its potential for affecting aviation at the Snohomish County Airport/Paine Field which is located 5 miles southwest of the home port.

Paine Field is a large general aviation airport with nearly 550 aircraft based here and over 200,000 annual flight operations. The FAA plans an Airport Traffic Control Tower at Paine Field between the hours of 7am and 9pm. With excellent visual and electronic navigation aids, Paine is a very popular airport for student training with substantial traffic going to/from the uncontrolled airports within the SBX potential interference area at all hours of the day. Paine is home to the Boeing company wide body production plant assembling 747, 767, and 777 aircraft as well as nearly 50 businesses that rely on the continued untethered access to the airport. The continued success of these businesses are the cornerstones of our region’s economy.

In reviewing the DEIS, we are concerned that we cannot accurately gauge the effects of the SBX on aviation operations. We should be made aware of any potential issues or restrictions on use of the SBX or use of surrounding airspace should be disclosed as part of this EIS, not just as a follow-up study after the site is selected.

Sincerely,

Dave Weggner
Airport Director
March 11, 2003

SMDC-EN-V, Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, Alabama 35807-3801

SUBJECT: District Comments on the DEIS for the Ground-Based Midcourse Extended Test Range Missile Defense System

Dear Ms. Elliott,

The Channel Islands Beach Community Services District would like to offer the following comments concerning our agency’s Ground-Based Midcourse Defense Test Range DEIS. Our agency is located in Ventura County, California and therefore our comments are primarily related to project components in Ventura County and San Nicholas Island. Our comments can best be summarized as follows:

1. Volume I, page 2-133, Water: The NAS Point Magu and NBVC Port Hueneme do not receive water from the United Water Conservation District (UWCD), as stated in the DEIS. Both facilities receive their water from the Point Hueneme Water Agency (PHWA). The PHWA was formed in 1994 as a joint powers authority (JPA) by the City of Port Hueneme and the Channel Islands Beach Community Services District (CIBCSD). The PHWA began deliveries of potable water to both Naval Facilities in 1997.

Further, the DEIS states that “the existing system capacity” is 22.0 million liters (5.8 million gallons) per day. The DEIS should be clarified on this point. If “system capacity” is referring to the facility infrastructure being capable of delivering 5.8 million gallons per day, that is one thing. But neither the two base facilities individually or combined have water delivery contracts which assure availability of 5.8 million gallons per day. We believe the total amount of water available to the two facilities is closer to the 1.6 million gallons per day. To our knowledge, no water capacity agreements exist for the receipt of more water than is currently being used.

2. Volume II, page 4-235, Water: The calculation of 37.7% of the NBVC Port Hueneme water capacity (5.8 million gallons per day) is currently being used at the base is incorrect. Please refer to comment # 1 above, as we do not believe that either Port Hueneme or NAS Point Magu (or combined) run a
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
City Of Camarillo
601 Carmen Drive • P.O. Box 288 • Camarillo, CA 93011-2988

March 12, 2003

U.S. Army Space and Missile Defense Command
Attn: SMDC-EN-V (Ms. Julia Elliott)
196 Wyman Drive
Huntsville, AL 35805

Dear Ms. Elliott:

The Camarillo City Council endorses the placement of the Sea Based Test X-Band Radar at Naval Base Ventura County (NBVC) at San Nicolas Island. Having the X-Band Radar at San Nicolas Island logically makes sense since the island is 60 miles offshore and will have virtually no impact on inhabited areas.

Sitting in the Pacific Sea Test Range, close to NBVC, San Nicolas Island provides a perfect location for the X-Band Radar. The Sea Range will allow the MDA thousands of square miles of uninterrupted, interference-free testing. NBVC will also provide outstanding inland logistical support for the system from both Point Mugu and Port Hueneme. Instrumentation at Point Mugu will assist the X-Band with its sensors and tracking missions.

At the same time, San Nicolas Island’s remote location off the Ventura County coast eliminates potential encroachment threats from the community and public sector, and provides a safe venue in which to conduct X-band operations. The City Council unanimously supports the X-Band Radar System at San Nicolas Island.

Sincerely,

Charlotte Craven
Mayor

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
CITY OF SAN BUENAVENTURA

CITY COUNCIL
Ray Doherty, Mayor
Bob Doheny, District Mayor
Neil Andrews, City Manager
James F. Prentice, Council Member
James L. Morgan, Council Member
Carl E. Moore, Council Member
Sue E. Smith, Council Member

March 17, 2000
U.S. Army Space and Missile Defense Command
ATTN: SMDC/ENG-V (Mrs. Julia Hudson-Elliot)
106 Wyne Drive
Huntsville, Alabama 35805

Re: Ground-Based Midcourse Defense Test Range Draft Environmental Impact Statement (DEIS)

Dear Mrs. Hudson-Elliot:

The City of Ventura appreciates the opportunity to provide comments on the subject DEIS. As a neighboring jurisdiction to one of the proposed military installations that would support the Sea-based Test X-Band Radar, specifically Port Hueneme/Point Magu, the City of Ventura has expressed concerns regarding socioeconomics, housing, and employment related to the project alternatives. These concerns have been addressed in the DEIS, and the City of Ventura fully supports siting of the Sea-based Test X-Band Radar at the Naval Base Ventura County of San Nicolas Island, and location of the logistical support for the system at Point Magu and Port Hueneme.

Again, thank you for the opportunity to participate in the review process, and best of success as this program advances.

Sincerely,

Paul Caldenwood
Senior Planner

cc: Susan J. Daluddung, Community Development Director

501 Poli Street • P.O. Box 99 • Ventura, California • 93002-0099 • (805) 654-7800 • FAX (805) 652-0865

Printed on recycled paper - to help protect our environment

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Dear Sirs,

I'm fourteen years old, and have lived my whole life in Everett. Some signs of Everett: Everett, a city as pretty as its name, and Everett city with a view. If this SBR Radar is placed in our bay, we would certainly no longer have a view of anything pretty.

The proposed missile would pollute and ruin our city. It would use three generators while in port, and one continually. This machine would consume 14,000 gallons of fuel a day. Our city record the All-American City Award last year symbolizing a new era for the city and its citizens, and now you want to take that away from us. Turning Everett into a rusty, cramped city!

The SBR radar emits Electromagnetic Radiation (EMP) that could damage our citizens and facilities. In a city near Cape Cod, a similar machine can best be installed. The citizens of this city suffer the highest rate of soft tissue cancer in the country. We don't want that in our city. National Security is at stake, that is why this radar has been proposed. Don't sacrifice the security of our health in the process. Install this radar near people until next winter.

Thank you for your time,
Adel Noorami
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)

Morgan Aero Products

Wednesday, April 02, 2003

SMDC-EN-V
Julia Elliott
US ARMY Space & Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-3601

RE: SBX deployment on Everett’s Port Gardner Bay

This is to support the proposed deployment of the SBX radar platform on Port Gardner Bay. I believe it is entirely compatible with Naval Station Everett and with our current national defense requirements.

The only opposition I have noted to date is the same group of people who opposed Naval Station Everett which has proved to be a fine addition to the City of Everett as I believe the SBX platform will be.

I am a 50 year resident of Everett and 79 year resident of Snohomish County and a long time business owner in Everett. I recently made a million dollar commitment to a new manufacturing facility here that will not benefit financially in any way from the SBX platform. I am also a WWII veteran of the United States Army Air Corps.

As probably one of the more silent of the silent majority who will be unable to attend the meetings scheduled for April 05 in Everett I must support this platform by writing this letter. It is good for the country and for our city and should not be deterred by our very vocal NIMBY minority.

With best regards,

MORGAN AERO PRODUCTS

Virgil Morgan
President

James E. Deno

April 7, 2003

SMDC-EN-V, Ms. Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 500
Huntsville, AL 35807-3801

Dear Sir or Madam,

I write to you to comment on the proposed placement of the SBX missile system component in Everett, Washington. I live in an area that will be adversely affected by both the appearance and the potential radiation from the radar equipment if used in the Puget Sound.

I realize that sacrifice of some things is necessary in this dangerous age, but I believe that the placement of this system in the Everett Harbor is not the best location. As I am sure others have advised you, this system will impact public and private aviation, will impact two public hospitals located adjacent and within the effective radio frequency radiation area.

Located within the Puget Sound is the Bremerton Shipyard which is equipped to store and house substantial naval vessels and equipment. Additionally, other facilities located within the Puget Sound are closer to the Pacific Ocean and pose less of a hazard to the general population of the Puget Sound area. The ultimate failure of this system and harm to the general environment is clearly predictable due to lack of investigation of air quality, biological resources, impact of the radiation and impartation of visual and quality of life resources of this community. Please find and locate this system in a better and more suitable site.

Due to the size, the unknown but predictable harm from electronic emissions, the unknown hazards to residents of houses within the area, patients in the hospitals, and the users of the Port Susan waterways, the decision to maintain this system in Everett, Washington poses significant and ongoing hazards that are neither necessary nor in the best interests of the United States Military. Please listen to the citizens of this City. We are good neighbors with the Navy, but request that the Navy respect and be a good citizen to its ‘Home Port’.

Sincerely,

James E. Deno
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Port of Everett

April 10, 2003

U.S. Army Space and Missile Defense Command
ATTN: SMDC-ENV (Ms. Julia Hudson-Elliot)
106 Wynn Drive
Huntsville, AL 35805

RE: Proposed Ground-based Midcourse Defense (GMD)
    Extended Test Range (ETR)
    Draft Environmental Impact Statement (DEIS)

Dear Ms. Elliot:

Thank you for the opportunity to comment on the DEIS associated with the above-referenced proposal. The main focus of our comments is the potential spill of the Sea Based X-Band Radar (SBRX) Primary Support Base component at Naval Station Everett. The Naval Station is adjacent to Port of Everett facilities in Port Gardner Bay and the Snohomish River Channel. It is the Port’s understanding that the comment deadline for the Naval Station Everett alternative has been extended to April 15, 2003; therefore, we trust that this letter will be considered timely.

Previously, the Port of Everett submitted both written and verbal comments on this proposal. The Port’s October 30, 2002 letter and the verbal comments made by Executive Director, John Mohe, at the February 27, 2003 Public Hearing at the Everett Holiday Inn are part of the public record.

The Port does not question the purpose and need for the proposed action; however, in our opinion, further detailed analysis is needed on at least two issues related to the Naval Station Everett alternative for the SBRX component:

- **Impacts to ship navigation, berthing, and maneuvering in the Port’s deep-water terminal area.** This was one of the issue areas raised in the Port’s Letter of October 30, 2002. The DEIS states in Section 3.8.6.2 that “other than the CVN and Destroyer Squadron 9 that are homeported at Naval Station Everett, the only other large ship calling is a tanker at the pier directly east of the carrier berth, providing visual contact at all times.” This substantially underestimates the shipping activity that the Port of Everett experiences.

- **Impacts associated with radar operations while the platform is in port, including those related to public health and safety.** This was another area of concern expressed in the Port’s October 30, 2002 letter.

Sincerely,

EVEPORT COMMISSION

[Signature]

Philip B. Busman, President
4-2-03

DEAR MS. ELLIOTT:

My home overlooks Port Gardner Bay. That proposed 56x would not be a problem.

It is about twice shorter than the current superstructure and 50 feet lower than a drilling rig that was moved here for 18 months with no problems.

The Port of Everett has existing mooring facilities at Marine 50, terminal 4, that would be perfect.

Jack Olson
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-W-0052</td>
<td>The text of comment P-W-0052 was the same as that of P-W-0029. This comment was submitted by Carol Wolton of Kirkland, Washington.</td>
</tr>
<tr>
<td>P-W-0053</td>
<td>The text of comment P-W-0053 was the same as that of P-W-0029. This comment was submitted by Sara Elliott of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0054</td>
<td>The text of comment P-W-0054 was the same as that of P-W-0029. This comment was submitted by Katie Elliott of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0055</td>
<td>The text of comment P-W-0055 was the same as that of P-W-0029. This comment was submitted by Julia Elliott of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0056</td>
<td>The text of comment P-W-0056 was the same as that of P-W-0029. This comment was submitted by Robert and Marion Nokleby of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0057</td>
<td>The text of comment P-W-0057 was the same as that of P-W-0029. This comment was submitted by Paul LaVigne of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0058</td>
<td>The text of comment P-W-0058 was the same as that of P-W-0029. This comment was submitted by Dorothy Boroughs of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0059</td>
<td>The text of comment P-W-0059 was the same as that of P-W-0029. This comment was submitted by Dan and Marsha O'Brien of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0060</td>
<td>The text of comment P-W-0060 was the same as that of P-W-0029. This comment was submitted by Marion Skalley of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0061</td>
<td>The text of comment P-W-0061 was the same as that of P-W-0029. This comment was submitted by Thomas Skalley of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0062</td>
<td>The text of comment P-W-0062 was the same as that of P-W-0029. This comment was submitted by Elinora Jane Cater of Seattle, Washington.</td>
</tr>
<tr>
<td>P-W-0063</td>
<td>The text of comment P-W-0063 was the same as that of P-W-0029. This comment was submitted by Mary Ellen Egge of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0064</td>
<td>The text of comment P-W-0064 was the same as that of P-W-0029. This comment was submitted by Steve Nagel of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0065</td>
<td>The text of comment P-W-0065 was the same as that of P-W-0029. This comment was submitted by Victoria Adlum of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0066</td>
<td>The text of comment P-W-0066 was the same as that of P-W-0029. This comment was submitted by Laura Elliott of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0067</td>
<td>The text of comment P-W-0067 was the same as that of P-W-0029. This comment was submitted by Madeleine Sosin of Seattle, Washington.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
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<tr>
<td>P-W-0068</td>
<td>The text of comment P-W-0068 was the same as that of P-W-0029. This comment was submitted by Stephen Somogy of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0069</td>
<td>The text of comment P-W-0069 was the same as that of P-W-0029. This comment was submitted by Michele Somogy of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0070</td>
<td>The text of comment P-W-0070 was the same as that of P-W-0029. This comment was submitted by Leslie Minor of LaJolla, California.</td>
</tr>
<tr>
<td>P-W-0071</td>
<td>The text of comment P-W-0071 was the same as that of P-W-0029. This comment was submitted by Rosemarie Brown - Sisters of the Holy Names of Jesus and Mary, of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0072</td>
<td>The text of comment P-W-0072 was the same as that of P-W-0029. This comment was submitted by Linda Sinter of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0073</td>
<td>The text of comment P-W-0073 was the same as that of P-W-0029. This comment was submitted by John and Kim Larson of Marysville, Washington.</td>
</tr>
<tr>
<td>P-W-0074</td>
<td>The text of comment P-W-0074 was the same as that of P-W-0029. This comment was submitted by Mary Lee Griswold of Freeland, Washington.</td>
</tr>
<tr>
<td>P-W-0075</td>
<td>The text of comment P-W-0075 was the same as that of P-W-0029. This comment was submitted by Marion Elert of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0076</td>
<td>The text of comment P-W-0076 was the same as that of P-W-0029. This comment was submitted by Marjorie D. Ross of Mukilteo, Washington.</td>
</tr>
<tr>
<td>P-W-0077</td>
<td>The text of comment P-W-0077 was the same as that of P-W-0029. This comment was submitted by Kathleen Haban of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0078</td>
<td>The text of comment P-W-0078 was the same as that of P-W-0029. This comment was submitted by Leslie and Deane Minor of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0079</td>
<td>The text of comment P-W-0079 was the same as that of P-W-0029. This comment was submitted by Marianna C. Skalley of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0080</td>
<td>The text of comment P-W-0080 was the same as that of P-W-0029. This comment was submitted by Thomas and Denise Murphy of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0081</td>
<td>The text of comment P-W-0081 was the same as that of P-W-0029. This comment was submitted by Elsie M. Anderson of Lynnwood, Washington.</td>
</tr>
<tr>
<td>P-W-0082</td>
<td>The text of comment P-W-0082 was the same as that of P-W-0029. This comment was submitted by Unreadable of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0083</td>
<td>The text of comment P-W-0083 was the same as that of P-W-0029. This comment was submitted by Richard and Inez Lawrence of Marysville, Washington.</td>
</tr>
<tr>
<td>COMMENT NUMBER</td>
<td>COMMENT</td>
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<tr>
<td>P-W-0084</td>
<td>The text of comment P-W-0084 was the same as that of P-W-0029. This comment was submitted by Elizabeth B. Bentler of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0085</td>
<td>The text of comment P-W-0085 was the same as that of P-W-0029. This comment was submitted by Patricia A. Larson of Sisters of the Holy Names of Jesus and Mary Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0086</td>
<td>The text of comment P-W-0086 was the same as that of P-W-0029. This comment was submitted by Karen Pauley of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0087</td>
<td>The text of comment P-W-0087 was the same as that of P-W-0029. This comment was submitted by Gene O'Neil of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0088</td>
<td>The text of comment P-W-0088 was the same as that of P-W-0029. This comment was submitted by Dawn O'Neil of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0089</td>
<td>The text of comment P-W-0089 was the same as that of P-W-0029. This comment was submitted by Randy Bonsen of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0090</td>
<td>The text of comment P-W-0090 was the same as that of P-W-0029. This comment was submitted by J.C. and Mary Ellen O'Donnell of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0091</td>
<td>The text of comment P-W-0091 was the same as that of P-W-0029. This comment was submitted by Katherine Lynch of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0092</td>
<td>The text of comment P-W-0092 was the same as that of P-W-0029. This comment was submitted by Jeff and Caroline Mason of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0093</td>
<td>The text of comment P-W-0093 was the same as that of P-W-0029. This comment was submitted by Diane and Jerry Solie of Marysville, Washington.</td>
</tr>
<tr>
<td>P-W-0094</td>
<td>The text of comment P-W-0094 was the same as that of P-W-0029. This comment was submitted by Won Chong Kim of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0095</td>
<td>The text of comment P-W-0095 was the same as that of P-W-0029. This comment was submitted by Bernadine Casey of Spokane, Washington.</td>
</tr>
<tr>
<td>P-W-0096</td>
<td>The text of comment P-W-0096 was the same as that of P-W-0029. This comment was submitted by John D. Lindstrom of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0097</td>
<td>The text of comment P-W-0097 was the same as that of P-W-0029. This comment was submitted by Deanne Lindstrom of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0098</td>
<td>The text of comment P-W-0098 was the same as that of P-W-0029. This comment was submitted by Shirley and C.H. Sievers of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0099</td>
<td>The text of comment P-W-0099 was the same as that of P-W-0029. This comment was submitted by Bill Mulliken of Everett, Washington.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
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</tr>
</thead>
<tbody>
<tr>
<td>P-W-0100</td>
<td>The text of comment P-W-0100 was the same as that of P-W-0029. This comment was submitted by Betty L. Startup of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0101</td>
<td>The text of comment P-W-0101 was the same as that of P-W-0029. This comment was submitted by Rich and Andrea Semon of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0102</td>
<td>The text of comment P-W-0102 was the same as that of P-W-0029. This comment was submitted by Lisa Gebert of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0103</td>
<td>The text of comment P-W-0103 was the same as that of P-W-0029. This comment was submitted by Jean C. Hokanson of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0104</td>
<td>The text of comment P-W-0104 was the same as that of P-W-0029. This comment was submitted by Aaron and Michelle Lamoureux of Marysville, Washington.</td>
</tr>
<tr>
<td>P-W-0105</td>
<td>The text of comment P-W-0105 was the same as that of P-W-0029. This comment was submitted by Barb Lemoureux of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0106</td>
<td>The text of comment P-W-0106 was the same as that of P-W-0029. This comment was submitted by William T. Belshaw of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0107</td>
<td>The text of comment P-W-0107 was the same as that of P-W-0029. This comment was submitted by Mary S. Belshaw of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0108</td>
<td>The text of comment P-W-0108 was the same as that of P-W-0029. This comment was submitted by Amy J. Straddell of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0109</td>
<td>The text of comment P-W-0109 was the same as that of P-W-0029. This comment was submitted by M. L. Geck of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0110</td>
<td>The text of comment P-W-0110 was the same as that of P-W-0029. This comment was submitted by Peter Bennett of Langley, Washington.</td>
</tr>
<tr>
<td>P-W-0111</td>
<td>The text of comment P-W-0111 was the same as that of P-W-0029. This comment was submitted by Jeffrey and Leslie Strickland of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0112</td>
<td>The text of comment P-W-0112 was the same as that of P-W-0029. This comment was submitted by Sandy Koznek of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0113</td>
<td>The text of comment P-W-0113 was the same as that of P-W-0029. This comment was submitted by Judi A. Little of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0114</td>
<td>The text of comment P-W-0114 was the same as that of P-W-0029. This comment was submitted by Katherine A. Benusa of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0115</td>
<td>The text of comment P-W-0115 was the same as that of P-W-0029. This comment was submitted by Jeannie Sheldon of Everett, Washington.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
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</tr>
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<tbody>
<tr>
<td>P-W-0116</td>
<td>The text of comment P-W-0116 was the same as that of P-W-0029. This comment was submitted by Bryan Cook of Seattle, Washington.</td>
</tr>
<tr>
<td>P-W-0117</td>
<td>The text of comment P-W-0117 was the same as that of P-W-0029. This comment was submitted by Annemarie Montera of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0118</td>
<td>The text of comment P-W-0118 was the same as that of P-W-0029. This comment was submitted by Jack McGinty of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0119</td>
<td>The text of comment P-W-0119 was the same as that of P-W-0029. This comment was submitted by Anne Van Clue.</td>
</tr>
<tr>
<td>P-W-0120</td>
<td>The text of comment P-W-0120 was the same as that of P-W-0029. This comment was submitted by Nanette Leaman of Oak Harbor, Washington.</td>
</tr>
<tr>
<td>P-W-0121</td>
<td>The text of comment P-W-0121 was the same as that of P-W-0029. This comment was submitted by Elizabeth J. Morrow of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0122</td>
<td>The text of comment P-W-0122 was the same as that of P-W-0029. This comment was submitted by Edward M. Morrow of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0123</td>
<td>The text of comment P-W-0123 was the same as that of P-W-0029. This comment was submitted by Ed Severinghaus of Langley, Washington.</td>
</tr>
<tr>
<td>P-W-0124</td>
<td>The text of comment P-W-0124 was the same as that of P-W-0029. This comment was submitted by Nicole J. Thompson of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0125</td>
<td>The text of comment P-W-0125 was the same as that of P-W-0029. This comment was submitted by Carol Rodlond of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0126</td>
<td>The text of comment P-W-0126 was the same as that of P-W-0029. This comment was submitted by Kaila Cogdill of Everett, Washington.</td>
</tr>
<tr>
<td>P-W-0127</td>
<td>The text of comment P-W-0127 was the same as that of P-W-0029. This comment was submitted by Marsha Cogdill of Everett, Washington.</td>
</tr>
</tbody>
</table>

**Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)**
Dear Mr. Elliott,

I am writing to record my strong and unconditional opposition to the proposed SBX radar platforms being considered for Fort Gardner Bay and Everett, Washington.

By its size and its potential for risk to humans and wildlife from electromagnetic transmissions, a facility of this kind is totally inappropriate for a highly populated area. And given the questionable effectiveness of the missile defense strategy ("star wars") it is very likely to be a tremendous misuse of public funds when so many urgent educational, environmental, and healthcare issues are seriously under-funded.

In addition to recording my personal objection to this proposal, I wish to note that the scoping process for the EIS was flawed by the lack of public notice. Therefore, the process should be restarted, beginning with proper notice to all affected communities. The EIS should then be rewritten to include public comments received from this new process.

Thank you for your consideration.

Respectfully,

Walt Blackford

P-W-0128

April 12, 2013

Walt Blackford

P-W-0129

April 13, 2013

Walt Blackford

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807

Dear Sirs,

I am deeply concerned about the SIBX radar project proposed for homeport in Everett, Washington. I believe that the effectiveness of the SIBX is questionable at best, that it presents health risks to nearby residents, that it is no longer an appropriate or necessary means to accomplish national security, and that it is a misuse of tax dollars. I also object to the lack of public access to this issue.

I will speak my concerns through my representative, Rick Larson. Please listen.

Sincerely,

Suzanne Schlicker

April 8, 2003

SMDC-EN-Y, Ms. Julia Elliott
US Army Space Missile Defense Command
PO Box 500
Huntsville, AL 35807-5001

RE: SIBX Homeporting in Everett

Dear Ms. Elliott:

I am opposed to homeporting the SIBX in Port Gardner Bay. Everett is not a good option for the following reasons:

1. The impact or public access to the Everett waterfront by land or by water.
2. The dangers of high levels of electro-magnetic energy on the populace of the city.
3. The negative impacts of the above 2 issues on Everett's ability to attract other waterfront tenants.
4. There are better options with less population.

Sincerely,

Kim Ratliff

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
April 11, 2003

My wife and I are residents of Everett, Washington and wish to note our objection to the proposed 3DX radar system that is under consideration for our area.

John K. 

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Dear Ms. Elliott,

I am writing to you to oppose the possible housing of the Sea-Based X-Band Radar (SBX) at the Naval Station Everett in Everett, WA. Because there is no scientific information that can show that the radar facility will not create a health risk for the entire area, the weak and minimal way to handle this unknown is to consider the situation that may prove to be an unwelcome risk to the population of Everett.

The draft Environmental Impact Statement does not address the negative impacts of the SBX and the security area that will surround it. I believe that SBX will hurt the economic potential of our city as a tourist destination, affecting both property and businesses in the area.

I oppose the SBX Radar project and fear the initial lack of communication to the Everett community is a warning of things to come. If your organization cannot communicate clearly in this stage of the project, I don’t believe that I could expect the communications to the public to improve if there is a time when the project possibly poses a risk to the surrounding areas.

Sincerely,

Janis Tullis

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Comment Sheet
for the
GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Thank you for attending this public hearing. Our purpose in having this meeting is to give you an opportunity to comment on issues analyzed in the Draft Environmental Impact Statement. Please use this sheet to comment on any issues that you feel should be clarified. To ensure that your comments are addressed in the final Environmental Impact Statement, your comments must be postmarked by April 15, 2003.

Date: April 15, 2003

1. I attended the public meeting on April 20, 2003, in Everett, and was very impressed at the concern shown for the safety of the community. It is clear that there is a need for a radar in the area, but I believe the proposed radar system plan is a viable alternative. It is important that the safety of the community is considered.

2. The project is a waste of tax payers' money. There should be better options for improving the safety and security of the area.

3. The proposal for the radar system is not feasible. The community should be involved in the decision making process.

Comment:

Name:

Street Address:

City, State, Zip Code:

Please place form in the drop box or mail to:

SMDC-EV, Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-1500

April 15, 2003

SMDC-ENV Ms. Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-1500

RE: Proposed Everett location of SBEX radar

Dear Mr. Elliot:

I support the department of defense proposal to locate the Sea-Based X-Band radar in Everett. Washington for a number of reasons.

I feel that Everett is NOT a good choice for this radar. Everett is a clean, quiet residential community that overlooks Port Gardner Bay. This beautiful bay is the source of vitals and recreational opportunities. We have worked hard to clear up our shoreline and protect its natural beauty and well as increase its economic utility. Everett has the second largest economy on the west coast with a wealth of recreational opportunities. We are proud to become one of the most livable cities in America and we have been working to increase tourism here.

The Navy is a clean and welcome presence in our bay. It is a home to an Aarpriotic fleet. But this radar is unsightly. Its presence would seriously damage our home values, environmental health, and economy.

Another reason I am opposed to this location is my concern for health issues. The possible health impacts caused by receiving long-term, low level EM radiation have not been fully studied. I understand the risks of exposure to this radiation is almost 44 miles radius. That is a lot of people that would be affected.

I am also concerned that this is a diesel powered facility. I have asthma and diesel is the primary trigger. A facility of this size powered by diesel would be a blow to my health. I do not accept these health risks.

Please consider more suitable sites that are not as populated or as rich in natural beauty as our beautiful port.

Respectfully yours,

[Signature]
April 15, 2003
SMDC-EN, Ms. Julia Elliott
US Army Space Missile Defense Command
PO Box 1900
Huntsville, AL 35807–1900

Dear Ms. Elliott,

I write to oppose the SBX being located in Everett, WA. It would interfere with aviation controls, our medical response system, hospital safety, and our desirability of our community. It would also have a huge impact on property values, businesses, and on our waterfront. I have resided in Everett on various occasions and love the beauty of Puget Sound.

Thank you for hearing my concerns.

Sincerely,

Anne Bosco

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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
April 15, 2003

US Army Space and Missile Defense Cmd.
P.O. Box 1500
Huntsville, AL 35807-5001

TO WHOM IT MAY CONCERN:

I write to register my opposition to the plan to test or base the Sea-based X-band radar (SBX) system in Everett, Washington.

This port is in the heart of Everett's downtown and residential core. The dangers of radiation to the population are unknown, but probable, the interference to hospitals and other diagnostic equipment located less than a mile from the base site is likely, and the aesthetic impact on the city's waterfront development plans is significant.

Please reconsider this baseline proposal and look elsewhere. Surely the Defense Department can find a location which would not be in the heart of a small city where the residential, health care, and business centers are the primary targets of any unforeseen ill-effects of this testing.

Sincerely,

Karen J. Wilke
Resident, Everett, Washington
To: SMDC-EN-V
Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL 35807-5801

From: Anna Petersons

Re: SBX Radar Project

I am writing to object to your proposed placement of the SBX Radar Platform at Port Gardner Bay near Everett, Washington, for the following reasons:

-- I am concerned about the platform’s interference with many electronic devices. I have heard that similar platforms have disrupted non-critical things like garage door openers, but I am concerned that this platform could disrupt more vital things like pacemakers or emergency responders’ communication systems.

-- I don’t want our community’s beautiful landscape marred by an unsightly, large platform.

-- I fear that the Radar Platform may have unexpected effects on living systems. For instance, I would like to know if anyone has studied the effects of this type of radiation on the navigation systems of migratory birds and mammals.

Thank you for considering my objections.

Anna Petersons

April 14, 2003

SMDC-EN-V Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL 35807-5801

RE: SBX in Everett

Dear Ms. Elliott,

Since 1960 I have been involved with the arsenic and lead contamination clean-up in North Everett. The clean-up is the result of practices by a smaller that was in operation briefly at the turn of the last century. At the time, they were employing commonly accepted methods of production. The clean-up costs are rapidly approaching $30 million and may ultimately be more.

Now, I am concerned that the SBX radar which is being proposed for Everett may have very serious long term consequences that people in future years will have to deal with. I worry that people may suffer irreparable damage from the radiation.

I strongly oppose the placement of this questionable device in such a highly populated area.

Sincerely,

Anna Robson

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
April 14, 2003
SMDC-EN-V, Ms Julia Elliott
US Army Space and Missile Defense Command
YP Box 1500
Huntsville, AL 35807-3801

3E: SBX in Everett

Dear Ms. Elliott,

I am writing to document my opposition to the Sea-Based Test X-Band Radar (SBX) proposed to home port at Naval Station Everett or in Port Gardner Bay, Everett, WA.

As a four year cancer survivor, I am incensed that the Department of Defense would consider a highly populated urban area such as Everett as a location for this project. The DEIS does not address the effects of radar of this power over a long period of time, nor use it. These studies do not exist— they have not been made.

According to the EPA's most current data, Snohomish County ranks among the district's worst 10% of all counties in the U.S. in terms of the number of people living in areas where cancer risk from hazardous air pollutants exceed 1 in 10,000. More than 968,972 people in Snohomish County face a cancer risk more than 100 times the goal set by the Clean Air Act. You are proposing to put an as-yet-untested device in a community that already has unacceptable levels of cancer.

To place the SBX in a populated area is a cure that would be worse than the ailment it was intended to treat. Place this radar at a site that a community does not call home.

Sincerely,

Valerie Noel

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Comment Sheet for the GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Thank you for attending this public hearing. Our purpose in holding this meeting is to give you an opportunity to comment on issues analyzed in the Draft Environmental Impact Statement. Please use this sheet to comment on any issues that you feel should be clarified. To ensure that your comments are addressed in the Final Environmental Impact Statement, your comments must be postmarked by March 26, 2003.

Date: April 11, 2003

1. I have attended a public meeting in Everett (Fred's Arena) to learn more about the test range operations at SBX.

2. SBX appears to have severe problems with almost all of the performance criteria being exceeded (including emissions) and the test range operations in the SBX area are so severe that it is a major concern for participation and a reason to participate in the ET Range testing. The ET Range testing is a major problem, according to ATC.

3. SBX is a major concern because it is located near the ski resort, which has not been properly designed, and it appears to be a major hazard to the general public. The test range operations are so severe that it is a major concern for participation and a reason to participate in the ET Range testing. The ET Range testing is a major problem, according to ATC.

Comments:

Name: C. L. DURBAN
Street Address: 2201 Labor Dr., Everett, WA 98201
City, State: Everett, WA
Zip Code: 98201

Please place in the drop box or mail to: SMDC-EN-V, Julia Elliott

U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-3801
14 April 2003

SMDC-EN-V, Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL 35807-5011

Subject: Sea-Based Test X-Band Radar based in Everett, Washington

Dear Ms. Elliott:

I live very close to Naval Station Everett, Washington State. I am opposed to the proposed deployment of the Sea-Based Test X-Band Radar (SBX) so near my home and that of the other 306,000 to 500,000 people within a 13.8 mile radius.

Many questions remain to be answered regarding this device:

1. Why does it need to be located near an urban center?
2. How will it affect the wildlife of Puget Sound? Will it further degrade our endangered populations of Puget Sound Chinook Salmon, Marbled Murrelet, Humpback Whales, Stellar Seals, Leatherback Sea Turtles, Bald Eagles, Bull Trout, and Coho Salmon?
3. How seaworthy is it? Will it break loose or break up when exposed to a tidal wave, for instance, spilling those 810,000 gallons of diesel fuel on our shorelines and in our fragile estuaries? How about when it is being towed through the Strait of Juan De Fuca and off the Pacific beaches of Washington? Winter weather off our coast is notoriously rough. Will this unsightly structure be seaworthy?
4. How will it impact human health over an extended period?
5. How will the radio frequency radiation affect hospital equipment and pacemakers?
6. What other hazardous wastes are produced by the operation of this device and how will they be disposed of?
7. How do you propose to deal with noise pollution?
8. Will the presence of this device trigger further security measures in the Port, hampering trade and employment?
9. How well tested is this technology?
A complete Environmental Impact Statement should address these questions and many more.

More basic questions should also be addressed before making such a proposal:
10. Do we need the SBX, or is it a redundant system?
11. If we did not need it before we were the dominant military force in the world, why do we need it now?
12. Could the resources be used for more pressing needs?
13. How about better medical care for military personnel?
14. How about better medical care for all Americans?

I object to being one of the organisms being tested by this project. Obviously there are thousands of children, aged, and other at-risk populations in a city of this size. We will all be exposed to the electromagnetic field and radiation hazards of this device.

Finally, this project will further degrade our quality of life by obstructing our view of Port Gardner Bay. Our city and county have made significant environmental and infrastructure improvements in the last 25 years, and we would like to continue this trend. This may seem to be a minor issue for those who live elsewhere, but the citizens of Everett and Snohomish County object to being the victims of socio-economic discrimination.

Sincerely,

Christine Lavra

cc: US Congressman Rick Larsen
State Representative John McCoy
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
To: SMDC-EN-W
Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL 35807-3801

From: Molly Pettersson

Re: SBX Radar Project

I am writing to object to your proposed placement of the SBX Radar Platform at Port Gardner Bay near Everett, Washington, for the following reasons:

I am greatly concerned about the platform's interference with many electronic devices. I have heard that similar radar installations have disrupted non-critical things like garage door openers, but I am concerned that this installation could disrupt more vital things like heart pacemakers and emergency responders' communication systems.

I don't want our community's beautiful landscape marred by an unsightly, large installation or the waters of the Puget Sound Basin adversely affected by this project.

I fear that the Radar Platform may have unexpected effects on living systems. For instance, I would like to know if anyone has studied the effects of this type of radiation on the navigation systems of migratory birds and mammals. Puget Sound is on the migrational route of several types of whales. I value the biodiversity of our region.

I fear that the radar installation may have unexpected effects on humans living in the area also. This area is densely populated so the potential effects of increased exposure to radar will be multiplied by the density of that human population. While it may be inconvenient for you to locate in a more remote area, the potential damage to human populations too, warrants serious consideration.

Thank you for considering my objections.

Molly Pettersson

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COUNCIL OF NEIGHBORHOODS

April 10, 2003

Mayor Frank Anderson
City of Everett
2030 Wetmore Avenue
Everett, WA 98201

Dear Mayor Anderson,

At the March meeting of the Council of Neighborhoods we heard from a number of neighbors who expressed concerns over the SBX Radar platform proposed for location on the Everett waterfront. A lengthy discussion ensued covering such issues as health and safety, visual and aesthetic impacts as well as the significant lack of public and City involvement in the project. It was for many of the neighborhood representatives, the first opportunity to understand what the SBX was about. All of us were appalled that a proposal of this magnitude and one having so many negative impacts on the community was being promoted with so little public information.

After our discussion we voted unanimously to strongly oppose locating the SBX in Everett until such time as the many concerns and questions are answered to the satisfaction of the Administration, the City Council and the Citizens of our Community. We also voiced unanimous support for your efforts as well as City Council efforts to foster an environment where the public opinion is welcome and where the government decision-makers listen and respond appropriately.

Sincerely,

Bill Bellhorn, Chair
Everett Council of Neighborhoods

Cc: Julia Elliott, U.S Army SMDC
Senator Patty Murray
Congressman Rick Larsen

City of Everett • 3002 Wetmore • Everett, WA 98201
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)

Robin Alhama

April 11, 2003

Dear Mr. Elliot,

I am writing to voice my opposition to the Sea-Based Test X-Band Radar (SBX) that the Army is proposing to home port at Naval Station Everett in Port Gardner Bay, Everett, WA.

I oppose this radar being placed in any large, urban populated area such as Everett and its surrounding communities. The SBX, if built, should be placed in a site that will not affect any population base.

I live on the Tulalip Indian Reservation in Marysville, WA, on Puget Sound and within the 22.3km (13.8 mi) Radiation Hazard Area and Electromagnetic Interference Area. Our community was not notified of the proposal to site the SBX in Everett until Feb 25, 2003 when one article appeared in the Everett Herald newspaper. When I contacted officials of Marysville and Tulalip they had never heard about the project. Why were citizens and elected officials left out of this public process?

According to the Draft EIS (DEIS) and information gathered from the military personnel at the public meeting held in Everett on April 5, 2003, I have determined that the SBX would pose through our fragile ecosystem approximately 12 times/year on its way to and from its testing sites out in the Pacific Ocean. This untested radar platform would carry more than 800,000 gallons of diesel through an area rich in marine life, including feeding gray whales, seals, abundant salmon, eagles, herring and equally as scarce sea lions. The DEIS listed all the wrong species for this area. Who did the "research" for the DEIS? It does not thoroughly address the negative impacts of the SBX on our most valuable resource, our recreational and commercial waterway. Who will take responsibility for protecting our wonderful environment?

Despite the assurance from military personnel (Commander Deen) at the April 5 meeting that the radar would always be operating at an angle of 15 degrees and higher, we know that there is a certain amount of EMR scatter which must radiate within the 22.3km Radiation Hazard Area. Current scientific studies have not analyzed radars of this power, or the effects of long EMR scatter over a long exposure period on Human Health and Safety. Current JBER guidelines are based on outdated science. We do not want our children to be raised within a Radiation Hazard Area regardless of the assurances that radiation levels are within "safe" limitations.

The SBX would interfere with airplane navigation and communication controls, and the current temporary flight restrictions would most likely become permanent. We know that Boeing is one of the contractors for this project but it does affect Paine Field and other local airfields. Adequate testing has not been done to determine the potential interference with our local hospital medical equipment and emergency response communication systems. Why is much of the research and data in the DEIS (vol. 2) at least 10 years old?

In Volume 2 of the DEIS there is repeated mention of mitigating impacts or measures from the SBX. It also states that it is not stationary at Naval Station Everett so it is not necessary to complete a Significant Design Review or a Tier V permit (9.1.2.2). I would consider 7-8 months in port quite permanent. What about the loss of future economic vision and redevelopment of our public waterfront? Everett is no longer a mill/industrial city and is working hard to change its desirability for residential and business growth. The appearance of the SBX (for as long as 20 years according to Commander Deen) would prevent Everett and the surrounding areas from becoming anything other than an industrial, military and restricted access waterfront and airspace.

In fact, both the Everett City Council and Port of Everett Commission have voiced their opposition to the SBX.

Home porting of the SBX at Naval Station Everett would have a huge negative impact on our community; certainly destroying the visual attraction of the bay and economic re-development and potentially destroying the health of humans and marine life.

Commander Deen mentioned in the meeting that the SBX should be home ported where it is welcomed by the community. My community has spoken loud and clearly as evidenced at that same meeting. We do not want the SBX here!

Sincerely,

Robin P. Alhama
Brenda Lynn Kerr
April 15, 2003

SMDC-EN-V, Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1560
Huntsville, AL 35807-1560

Dear Ms. Elliott,

I would like to begin by thanking you for your prompt response to my request for a copy of the Draft Environmental Impact Statement for the Ground-Based Midcourse Defense (GBMD) Test Range. After reviewing the DEIS, I would like to voice my opposition to using Naval Station Everett and/or Port Gardner as the Primary Support Base (PSB) for Sea-Based Test X-Band Radar (SBX).

As my property overlooks Port Gardner, I am not thrilled about my view being occupied by the SBX and the resulting decrease in my property value. But I would be willing to sacrifice my property value for the defense of the nation if that was the only negative impact that the SBX would pose. But after reviewing the DEIS, it is my conclusion that the SBX poses many threats to the health and welfare of the Everett community and surrounding area along with dangers to our natural resources.

The Radiation Hazard Area and Electromagnetic Interference Area covers a large population base. As stated in the DEIS, the SBX will interfere with airplane navigation. At the community meeting held in Everett, the Department of Defense representative stated that the SBX would not significantly impact the air traffic in the Everett/Puget Sound Area. I find this very difficult to comprehend. There are 5 airports within the Range of Influence (ROI) of the SBX if the Naval Station Everett becomes a PSB. I think that the SBX would have a large, negative impact on air traffic and the safety of aircraft passengers. It is my understanding that the SBX would not be sited at Naval Station Everett prior to the Abraham Line being in place. Where would the SBX be sited before these periods? If it would be moored in the immediate area, it would definitely have an even larger negative impact on airplane navigation and travel in the Puget Sound Area.

The SBX's Radiation Hazard Area and Electromagnetic Interference Area would also impact communication controls. This impact is much more than a matter of convenient communication. Since there would be at least 2 hospitals in the SBX's Range of Influence (ROI), the ESM from the SBX could interfere with the lifesaving efforts that occur at these hospitals. The DEIS does not adequately address the SBX's impact on the Emergency Response System in its ROI nor its impact on medical equipment and/or medical devices such as pacemakers or defibrillators. Due to the SBX's negative impact on communication controls, emergency response system, and medical devices, I am opposed to using Naval Station Everett as the SBX's PSB.

I also oppose the use of Naval Station Everett as the SBX's PSB because of the risk of the SBX's Electromagnetic Radiation (EMR) on the health of citizen's who come within SBX's ROI. Currently there are no controlled studies on the effects of chronic exposure to low dose EMR EMR "scatter" from X-Band Radar on human populations. Until the effects of low dose EMR EMR "scatter" on human populations are thoroughly studied, the SBX should not be located in a populated area. Our children should not be raised within a Radiation Hazard Area.

The Draft Environmental Impact Statement (DEIS) also does not thoroughly address the potential risks to our most valuable natural resources, our recreational and commercial waterway, Port Gardner Bay. The potential radiation hazard to our wildlife has not been adequately studied. In addition, in my understanding the portions of the SBX's fuel storage system is only single hulled. The DEIS does not adequately address the real danger to Port Gardner Bay resulting from an oil spill.

Although the DEIS does not reflect the cumulative negative economic impact of the SBX on the Everett community, I am much more concerned about the cost to the health of the citizens, wildlife, and natural resources within the SBX's ROI of Naval Station Everett because it's PSB. Due to the aforementioned reasons, I would like to request that a more suitable PSB be found for the SBX where it would not impact the lives of so many people.

Thank you for your attention to my request.

Sincerely,

Brenda Lynn Kerr
Concerned Citizens Against the SBX

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
April 14, 2003

SMDC-EN-V, Ms. Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-3801

Dear Ms. Elliott,

On February 27, 2003, I commented at the first SBX hearing held in Everett, and then obtained a copy of the draft EIS. I subsequently made remarks about the draft EIS during the Listening forums that were held on April 5th. I would like to expand my comments at this time.

I do appreciate your returning to Everett for the second time, and extending the comment period until April 15th. However, I think you would have to agree that people in Everett were not given the same amount of time as those in other potential SBX locations to become familiar with the issues, to obtain the draft EIS, and to make comments about it.

As stated on p. ex-8 of the draft EIS, the scoping period began in March, 28, 2002, and the comment period was at least twice extended to December 20, 2002 as the SBX was added to the project. Before that time scoping meetings were held in locations other than Everett, some as early as April, 2002. I now understand that you made a good faith attempt to include us in those meetings by holding the Seattle meeting on October 17, 2002, when you still had other Puget Sound locations in mind. Unfortunately that failed when the Seattle location did not attract any notice in Everett.

During the time period when citizens of other potentially affected communities were able to discuss the pros and cons of the SBX, and, after January, read the draft EIS, and prepare for their February and March public hearings, people in Everett still knew nothing about the project. I understand that you took out an ad in the Everett Herald, and published notice in the Federal Register. Most people do not read that kind of ad, or

the Federal Register, so it was not until February 25, 2003, when the Everett Herald published a story about the upcoming hearing on February 27th, that virtually any of us in Everett knew about this project. Since then people in Everett have had a much shorter time period to learn what was in the few copies of the draft EIS which subsequently entered the community before April 5th.

Because this process has left citizens in the Everett area with less time to understand and comment on the proposed SBX project than citizens in other potentially affected communities, I believe that it does not meet the criteria required by CEQ regulations for an open process under NEPA.

I'm concerned about the objectivity of the draft EIS and the rigor of the science being used to justify some of its conclusions. For example, in Chapter 4, p. 244, there is a discussion of EEDs (electro-explosive devices) like fire extinguishers, air bags in cars, and ejection seats on military aircraft. XBR emissions could have two possible effects on these devices. They could be made not to work, or they could be inadvertently initiated. On that page there is also a chart showing the required separation distances of these devices from the SBX. If the SBX were tied up to the USS Lincoln's dock, it appears that cars with airbags may come within that distance.

The draft EIS seeks to assure drivers by saying that "there is no predicted potential for inadvertent initiation of vehicle airbags because the metallic body/frame of the vehicle provides sufficient shielding." This fails to take into account cars which have bodies which aren't made of metal. These include fiberglass bodies on some models of Corvette, Taurus, Monte Carlo, and Grand Prix. Saturns are made from sheet molded composites. Chrysler is researching cars made from the same plastic used to make pop bottles.

Please be extremely thorough and rigorous as you complete your scientific examination of the safety of this system. I understand some of the pressure you are under to get the SBX tested and operational in a short period of time. But please do not let speed and deadlines interfere with valid, reliable, scientific examination of all aspects of this complex project.

There seems to be a lot of qualifications in the draft EIS. For instance in Chapter 4, p. 239, in the discussion of the effects of FMR/EMI on airspace surrounding the SBX, it says, "The actual SBX operating area at the pier or
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)

In Everett we are striving hard right now to develop a positive image and create a livable city. If you had driven by here on the freeway 20 or 30 years ago, let alone visited the city, you would have smelled us. It didn’t smell good. We were defined by that negative image, just like Seattle is defined by the positive images of the Space Needle or the Public Market.

That image of Everett is pretty much gone now. We realize that we are surrounded by water, and our waterfront is a great opportunity to define our city in a positive way. We have a great marina and another on the drawing board. We have lots of people working in various ways to transform our waterfront. We want it opened up for people to enjoy. I am afraid of what bringing the SBX to Everett will mean for our image and our plans.

When the Navy came to Everett they were careful to design handsome brick buildings that would not detract from the view. The originally SBX, on the other hand, would become the focal point of that view.

We are trying to promote the idea of waterfront condominiums and restaurants with gorgeous water and mountain views. I spoke with a man in late March who is hoping to buy one of those condominiums. He told me that if the SBX came to Everett, he would leave. This would be a giant step backwards for Everett.

For us this is not a simple question of whether or not this project will drive down land values. It’s a question of whether or not people will want to live in Everett or drive people out. The siting of the SBX in Port Gardner Bay would be entirely unfair to those who already live and work here, and are hoping for a renewal of spirit in Everett.

In Appendix B, p. 14, of the draft EIS there is a description of visual and aesthetic resources. “The significance of visual effects is very subjective and depends upon the degree of alteration, the scenic quality of the area disturbed, and the sensitivity of the viewers. The EIS defines sensitive viewers as ‘those who utilize the outdoor environment or value a scenic viewpoint to enhance their daily activity and are typically residents or recreation users.’ That includes just about everyone.

This section concludes by saying, “Visual impacts would also occur if proposed development is inconsistent with existing goals and policies of jurisdictions in which the project is located.” The existing goals of the city...
of Everett include, among other things, the enhancement of the aesthetic value of our waterfront. The SBX is extremely inconsistent with this goal.

On p. 34 of the Executive Summary, the EIS concludes that "... no impacts to visual resources are anticipated." Please go out Mukilteo Blvd. to Harbor View Park. Look back at the waterfront and imagine the SBX floating in front of you before you decide that no impacts to visual resources are anticipated. On the way back, go down in the mouth of Pigeon Creek #1 where the city plans a small waterfront park. Tell me if the SBX in front of you didn't just get a whole lot bigger.

Then walk down to the overlook at the end of Warren St, and look at the view of Mt. Baker, the Olympic Mountains, Port Gardner Bay, Whidbey, Hat, and Camano Islands. Try to ignore the SBX. Finally stop at Grand Av. Park, and see if that sweeping view wouldn't be impacted by the SBX for even the most jaded viewer. As you look off that cliff, decide for yourself the scenic quality of the area being disturbed.

We are now in the process of responding to this proposal. The other half of the democratic equation is for you to truly listen to what we have to say. I realize that you probably have the authority to park the SBX pretty much wherever you choose. But besides your military role, you are also members of this civil society. I hope that you have not already made up your mind to locate the SBX in Everett.

There are other communities without large populations, like Port Adak, Alaska, which would like to see the SBX located there. On April 10th, 2003, I spoke with Sandra Moller, President and CFO of the Alaska Enterprise Corporation in Port Adak. She said that she would be delighted to see the SBX come to Port Adak. She talked about the benefits of their deep water, ice-free port. She felt that their location, much closer to the mid-Pacific than Everett, was a particularly strong advantage.

The SBX doesn't belong in a city. Please weigh our concerns carefully when you make your final recommendations. I would appreciate being sent a copy of the final EIS when it becomes available. Thank you.

Sincerely,

Robert C. Jackson

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
We, the undersigned, oppose the Department of Defense proposal to use Naval Station Everett or Fort Gardner Bay, Everett WA, as Primary Support Base for the Sea-Based Test X-Band Radar. We oppose this location for SBX Testing or as a Permanent Primary Support Base.

<table>
<thead>
<tr>
<th>Printed Name</th>
<th>Signature</th>
<th>Address</th>
<th>City/State</th>
<th>Zip</th>
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<td>Joe Smith</td>
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<td>Jane Doe</td>
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<td>Bill Jackson</td>
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<td>etc.</td>
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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
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<td>P-W-0154</td>
<td>The text of comment P-W-0155 was the same as that of P-W-0154. This comment was submitted by R. L. Holmer of Everett, Washington.</td>
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<td>The text of comment P-W-0156 was the same as that of P-W-0154. This comment was submitted by Jane L. Cauley of Everett, Washington.</td>
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<td>The text of comment P-W-0157 was the same as that of P-W-0154. This comment was submitted by Lyan Lichtenberg of Everett, Washington.</td>
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<td>The text of comment P-W-0158 was the same as that of P-W-0154. This comment was submitted by Todd Combs of Everett, Washington.</td>
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<td>4</td>
<td>The text of comment P-W-0159 was the same as that of P-W-0154. This comment was submitted by Garret Tomsin of Everett, Washington.</td>
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<td>P-W-0160</td>
<td>The text of comment P-W-0160 was the same as that of P-W-0154. This comment was submitted by Jan Olsen of Everett, Washington.</td>
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<td>P-W-0161</td>
<td>The text of comment P-W-0161 was the same as that of P-W-0154. This comment was submitted by Peach Tomsin of Arlington, Washington.</td>
</tr>
<tr>
<td>P-W-0162</td>
<td>The text of comment P-W-0162 was the same as that of P-W-0154. This comment was submitted by Jeff Rowe of Marysville, Washington.</td>
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| COMMENT NUMBER | The text of comment P-W-0163 was the same as that of P-W-0154.
This comment was submitted by Roshael Tomsin of Arlington, Washington. |
|---------------|-------------------------------------------------------------------|
| P-W-0163      | The text of comment P-W-0164 was the same as that of P-W-0154.
This comment was submitted by Gary A. Vandal Bushemi of Everett, Washington. |
| P-W-0164      | The text of comment P-W-0165 was the same as that of P-W-0154.
This comment was submitted by Leann Rowe of Arlington, Washington. |
| P-W-0165      | The text of comment P-W-0166 was the same as that of P-W-0154.
This comment was submitted by Russell Silva of Everett, Washington. |
| P-W-0166      | The text of comment P-W-0167 was the same as that of P-W-0154.
This comment was submitted by Bryon Henault of Everett, Washington. |
| P-W-0167      | The text of comment P-W-0168 was the same as that of P-W-0154.
This comment was submitted by Jane Best of Everett, Washington. |
| P-W-0168      | The text of comment P-W-0169 was the same as that of P-W-0154.
This comment was submitted by Ryan J. May of Seattle, Washington. |
| P-W-0169      | The text of comment P-W-0170 was the same as that of P-W-0154.
This comment was submitted by M. Cogdill of Everett, Washington. |
| P-W-0170      | The text of comment P-W-0171 was the same as that of P-W-0154.
This comment was submitted by Stephen Clough of Everett, Washington. |
| P-W-0171      | The text of comment P-W-0172 was the same as that of P-W-0154.
This comment was submitted by Ed and Vera Carlston of Everett, Washington. |
| P-W-0172      | The text of comment P-W-0173 was the same as that of P-W-0154.
This comment was submitted by Marsha Cogdill of Everett, Washington. |
| P-W-0173      | The text of comment P-W-0174 was the same as that of P-W-0154.
This comment was submitted by Linda Rethke of Kirkland, Washington. |
| P-W-0174      | The text of comment P-W-0175 was the same as that of P-W-0154.
This comment was submitted by Marianne Roberts of Everett, Washington. |
| P-W-0175      | The text of comment P-W-0176 was the same as that of P-W-0154.
This comment was submitted by John L. Wetzstein of Everett, Washington. |
| P-W-0176      | The text of comment P-W-0177 was the same as that of P-W-0154.
This comment was submitted by D. G. Carlson of Everett, Washington. |
| P-W-0177      | The text of comment P-W-0178 was the same as that of P-W-0154.
This comment was submitted by Holly Fellows of Everett, Washington. |
<p>| P-W-0178      |</p>
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<td>P-W-0182</td>
<td>The text of comment P-W-0182 was the same as that of P-W-0154. This comment was submitted by Earl and Doris Beech of Everett, Washington.</td>
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<td>The text of comment P-W-0185 was the same as that of P-W-0154. This comment was submitted by Tom and Vida Delany of Everett, Washington.</td>
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<td>P-W-0186</td>
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<td>P-W-0188</td>
<td>The text of comment P-W-0188 was the same as that of P-W-0154. This comment was submitted by B. Bruno of Everett, Washington.</td>
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<td>P-W-0189</td>
<td>The text of comment P-W-0189 was the same as that of P-W-0154. This comment was submitted by Tom and Margaret Hoban of Everett, Washington.</td>
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<td>The text of comment P-W-0191 was the same as that of P-W-0154. This comment was submitted by Reg Scodeller of Everett, Washington.</td>
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<td>The text of comment P-W-0194 was the same as that of P-W-0154. This comment was submitted by Victoria Kehoe of Snohomish, Washington.</td>
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<td>The text of comment P-W-0195 was the same as that of P-W-0154. This comment was submitted by Rochelle Ritchie of Everett, Washington.</td>
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<td>P-W-0196</td>
<td>The text of comment P-W-0196 was the same as that of P-W-0154. This comment was submitted by Dolores M. Hancock of Everett, Washington.</td>
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<td>The text of comment P-W-0197 was the same as that of P-W-0154. This comment was submitted by Felita Hernandez of Everett, Washington.</td>
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<td>P-W-0198</td>
<td>The text of comment P-W-0198 was the same as that of P-W-0154. This comment was submitted by Lisa Mechals of Lynnwood, Washington.</td>
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<td>P-W-0199</td>
<td>The text of comment P-W-0199 was the same as that of P-W-0154. This comment was submitted by Marie McLain of Mukileto, Washington.</td>
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<td>P-W-0200</td>
<td>The text of comment P-W-0200 was the same as that of P-W-0154. This comment was submitted by Larry Bashoy of Arlington, Washington.</td>
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<td>P-W-0201</td>
<td>The text of comment P-W-0201 was the same as that of P-W-0154. This comment was submitted by Judy Matheson of Everett, Washington.</td>
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Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
SUMMARY STATEMENT: CITIZENS' POINTS AGAINST THE SBX

Introduction:
The "SBX" or (Sea-Based Test X-Band Radar) is an experimental antiballistic missile radar system on a sea-going platform. The entire entity is the size of a football field and 25 stories tall. US Army Space Command hopes the SBX will successfully track incoming intercontinental missiles. The Department of Defense has proposed placing the system at the Naval Station in Everett, Washington for nine months of each year. The SBX has an expected life cycle of approximately twenty years, with the selected home port likely to be a permanent base for the continuing SBX program. The radar unit would be operational 5 to 6 days per week for testing. It would be within 1.5 kilometers of schools, many businesses, hospitals and residential areas. Citizens of Snohomish, King, and Island Counties have concerns about the SBX, and believe it should be placed in a remote area. The three points of concern are:

- Public Health
- Economic Impact
- Due Process

PUBLIC HEALTH:
- The SBX generates extremely high frequency non-ionizing radiation, at the highest end of the band range. Consistent safety standards have not been set for human exposure to non-ionizing radiation. In depth reviews of the scientific and medical literature show that scientists are concerned about a two-fold increase in childhood leukemia in children exposed to a LOWER BAND FREQUENCY than the SBX. Breast cancer, amyotrophic lateral sclerosis and other diseases may also be caused by such exposure over time. There are no scientific studies which prove the safety of this high frequency radiation and studies do exist which indicate exposure may be damaging to human health.
- Research used to validate the SBX as safe and harmless dates back to 1962, with a revision in 1993. The Institute of Electronic and Electrical Engineers (IEEE) is one of the lead scientific bodies originally charged with helping to formulate these standards. However, the IEEE recently published a paper urging that the standards be changed to more conservative health and safety measures.
- No studies have been done on the SBX and long term human exposure to this type of high frequency radiation.

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Documents from the Defense Department indicate the SBX will create a disturbance strong enough to interfere with television and radio signals at ground level for approximately three miles. The actual range of disruption is yet to be determined by the FCC. The SBX imposes fire safety and navigational systems in airplanes, and could spontaneously ignite electro-explosive devices such as those which detonate air bags in automobiles.

- Concerns have been raised about sensitive medical equipment, cardiac monitors, pacers, and computer technology, which may be disrupted within this three-mile range.
- The Department of Defense has no plans and has designated no agencies to monitor the radiation scatter from the SBX and its effects on local citizens.
- If placed in Washington, the SBX would be in the center of an urban area with a population of approximately 400,000 people. Citizens feel the SBX should be placed far from urban or residential areas, for the above health-related reasons.

**ECONOMIC IMPACT:**

- Everett's waterfront is its greatest economic resource and the key to future growth for the city. In recent years, Everett and her citizens have been working hard to draw talents and businesses to the area due to the physical location and the beauty of Port Gardner Bay. The SBX spans approximately 310 feet from its floating pontoons to its dome-top. If compared to nearby geographical landmarks, the SBX would span an elevation close to that of Rucker Hill. The visual aesthetic of Port Gardner Bay and the businesses around it would be impacted, with economic repercussions for the community. For example, the SBX would be seen from many windows of the new Providence Pavilion Hospital, a multi-million dollar project designed to bring first class obstetrical services to Everett, beautifully situated to maximize the view.
- The visual impact will result in a drop in property values and the tax base this represents.
- The SBX holds 816,000 gallons of fuel in multiple tanks. It will be running generators three hours a day while in port. It is expected to emit polluting substances into the air and water. Port Gardner Bay contains many species of fish, bird-life, and marine life in a delicate ecosystem created by the sound and the river estuary, and efforts are being made to protect them. Local pleasure and commercial fishing and marine craft will be affected, as well as the businesses associated with these activities.
- Plans to commercially develop the port with condominiums, shopping, and restaurants will be threatened. Fewer new businesses will choose Everett. The tax base these businesses represent will be lost to the community.

- Business owners and their employees concerned about the above stated health risks will move their commercial entities from Everett and surrounding locations.
- Individuals and families concerned about public health will leave the area, taking professional skills and community investment with them.
- According to DoD spokesmen, it is less costly if the array can be plugged into a readily available urban electrical and sewer grid, saving fuel costs. However, financial loss to the community would be significant and permanent, for a minimum of a twenty-year span of time. We do not feel the cost savings warrants the potential damage to human health and the economy.
- The SBX employs only 54 personnel; thus any local positive economic impact from the SBX would be far outweighed by the financial loss to the community for the above reasons.
- No economic loss or negative impact study has been conducted to date.

**DUE PROCESS:**

- The initial scoping process to develop the Draft Environmental Impact Statement (DEIS) for the SBX in Everett was by law required to involve the community. It did not.
- The five other sites being considered were afforded meetings within their own communities. But the scoping meeting for the Everett site was in Seattle, Washington, in King County on October 7th, 2002. Everett citizens were not aware that this meeting had taken place and no Everett citizens, City, or County officials were in attendance.
- The first meeting held in Everett was on February 27th, 2003. The deadline for citizens' comments was less than one month later, on March 24th. No copies of the Draft Environmental Impact Statement were made available to the public at that meeting.
- Local citizens were informed of the above meeting by an article in The Everett Herald. This article gave little coverage on the SBX and gave only two days prior notice of the meeting.
- The initial DEIS assumes no visual, aesthetic or safety concerns for the SBX if placed in Everett, such an assumption would not allow citizens to properly mitigate the statements therein.
- There are many concerns about the impact of the SBX on Everett, Snohomish, Island and King counties. Citizens believe economic, health and safety concerns cannot be ignored.
- There has been inadequate time for these issues to be presented by citizens to their Congressman and Senators given the restrictions of the federal timelines and lack of due process. The SBX cannot come to Everett, Washington without adequate voice from all constituencies affected.

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**Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)**
Prepared by:
Concerned Citizens Against the SBX (CCA-SBX)
PO. Box 12278
Everett, WA. 98206

To register opposition to the SBX please contact:
PHONE: US Army Space Missile Defense Command  1-800-823-8823
EMAIL: gdsdtrds@usarmy.mil
WRITE: S/ADC-EN-V, Ms. Julia Elliott
US Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL. 35807-3801

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
SBX Electromagnetic Radiation Beam:
Proximity to Human Population in Everett

SBX Size Comparison
At Drawings Use the Same Scales to Allow for Comparison

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Human exposure to EMR has increased in the 20th century because of newer technologies such as cell towers, power lines and mobile phones. Epidemiologic studies raise concern for a two-fold increase in the risk of childhood leukemia caused by electromagnetic radiation exposure. Amyotrophic lateral sclerosis is related to occupational exposure. Breast cancer, suicide, depression, reproductive disorders, increased spontaneous abortion, and cardiovascular disease remain unresolved concerns. Animal studies indicate behavioral disruption, immunosuppression and reproductive disorders. However, rigorous case-controlled studies on humans do not exist. This is because it is difficult to quantify EMR in the environment, and measure exposure to it over a relevant time period.

The current safety standards for human exposure to EMR, including the SBX, are based on studies performed during World War II and reviewed in 1992 by IEEE/ANSI. The standards were based on assumptions about the behavior of EMR in human tissue, primarily that it produces heat and can raise human body temperatures. Moreover, studies in the last twenty years are pointing to many types of changes in tissues and animals exposed to EMR. An opinion paper published by the IEEE in July of 2002 states “current exposure standards for electromagnetic radiation do not adequately address current realities...we must revise our safety standards and set conservative new ones using all of the available results and information—not just data that fits previously held assumptions.”

The average power line generates EMR at about 60Hz, and the SBX generates at 8-12 GHz, a billion times higher frequency. The SBX is in the highest frequency spectrum of all man-made non-ionizing radiation. Guidelines limiting EMR exposure for public health purposes outlined by the International Commission on Non-Ionizing Radiation Protection in 1998 indicate that higher frequency radiation is more harmful to health than lower frequencies, and multiple exposures at different frequencies are additive. (i.e. a cell phone, electric line and SBX radiation, for example).

In addition, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) states that the resonant absorption frequency of

EMR varies depending on many factors, including body habitus, position in relation to the beam, intensity, polarization and frequency. Children and those with shorter stature have a resonant absorption frequency or specific absorption rate (SAR) approximately 42% greater than adults. A review of the available literature published in 2001 by an international group of scientists under the auspices of the World Health Organization has shown a two-fold increase in childhood leukemia at certain SAR’s of EMR. Many European countries do not allow the levels of EMR exposure that are currently considered “safe” in the United States. A very recent study indicates damage to DNA caused by low-grade radiation (i.e. lower exposure) may be harder for the body to recognize and repair than that caused by high-grade. This study looked at ionizing radiation, but its outcome was concerning. Scientists had assumed the body repairs DNA damage at the same rate regardless of the dose of radiation. This may not be true. Low-grade exposure may be as harmful as higher intensity radiation experienced for a short period of time. Assumptions made by the scientific community about radiation may not be true and further study is required.

Finally, the DEIS and proposal from the Department of Defense do not include any measures to monitor the health of local citizens after placement of the SBX. The only historical prototype for the SBX is a radar one-third the size (PAVE PAWS) which has been on Cape Cod for over twenty years. The National Research Council was asked in 2002 to look at the adverse health affects of this radar. However, their review was sorely limited by inadequate measurements of the PAVE PAWS waveform and “inadequate data about the distribution of population exposures in the Cape Cod region.” Citizens of the area have raised concerns about an increase in soft tissue tumors caused by PAVE PAWS for two decades, but there is still no agency actually monitoring these effects. With regards to the SBX I would like answers to each of the following questions:

- Do you have measurements of the electromagnetic scatter (or the E and H fields) at 300 – 500 feet, 2, 25, 5, 1, 2 and 3 miles

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
which would come from the radar beam and side lobes; the frequency, polarization and intensity of such scatter at these distances, in the test mode and with the unit fully operational?

- Have the Specific Absorption Rates in humans been measured for the electromagnetic field generated by the SBX at 300 – 500 feet, 2, 2.5, 5, 1, 1.5, 2 and 3 miles from the beam? Both horizontally from the radar unit, including side lobes, and vertically (DOWN from the beam)? Do you have measurements for the average adult, infants and children? If so, what are they?

- Have you measured, for example, the EMR and SAR’s which those living at a given point in North Everett, downtown Everett or the View Ridge areas might be exposed to? What are those measurements? I.e. an average three-year-old standing at Grand Ave park would be exposed to how much EMR at what SAR for the twenty minutes the unit is operating?

- Recent guidelines for limiting exposure to time-varying EMR are published by the ICNIRP in 1998. The ETS literature, published in 1993 and not updated, refers to older standards (ANSI 1982, IEEE revision 1991). These are the standards being used to defend the SBX. Has any attempt been made to review these standards based on current international scientific analysis?

- Are there case-controlled or epidemiologic studies on chronic exposure in humans to the electromagnetic field generated by X-Band radar such as the SBX would generate over a twenty year period and if so please reference them?

- Everett citizens would experience intermittent, pulsed type exposure to the SBX radar both because of the sweep of the beam and because the radar would be turned off and on while in port. Intermittent exposure might be harmful because the body would not have time to repair damaged DNA prior to repeat exposure. Have you tested this? Have you studied the effect of intermittent EMR exposure on human tissues? Cumulative intermittent exposure (i.e. repeat exposures over a long period of time)?

- Have you tested cumulative effects of prenatal and post-natal exposure to the electromagnetic field such as neonates, newborns, and infants living in the local area would be exposed to?

- Have you determined additive sources of EMR, specifically, that which comes from the USS Lincoln and other ships when in port, and local power lines?

- The SBX literature does not quantify the human SAR (Specific Absorption Rate) of its electromagnetic radiation field. Why not?

- Have you determined the effect on sensitive medical devices such as MRI scanners, telemetry monitors, cardiac pacers etc. within the field of scatter?

- Have you created an independent agency designated only to measure the EMR exposure of humans living near the SBX? If so, what is the agency? What measurement will it use? How will it be funded? Do you have plans to monitor the incidence of soft tissue tumors, leukemia and reproductive disorders in citizens living within a thirteen-mile radius of the SBX? How will you do this? And if adverse health effects were to be documented, what contingencies are in place to remove the SBX at a future date?

- Have you studied the device in proximity to air bags in automobiles with fiberglass, plastic or other non-metal bodies?

- Why would you consider placing such a high frequency radar system with so many unknown risks in a densely populated area?

The SBX is new technology. Standards for human exposure to EMR are inconsistent internationally, and human exposure to extremely high frequency radiation such as the SBX is not thoroughly understood. Infants, children and adults should not be exposed unnecessarily to low, moderate or high levels of EMR on a chronic basis without first conducting rigorous scientific protocols to determine the effects of such exposure. The SBX should not be placed in any densely or moderately populated area.

Elizabeth Marshall, M.D.
Dartmouth Medical School 1987

The Everett Clinic
3901 Hoyt Ave
Everett, WA 98201

Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)

- The Sea-Based Test X-Band Radar (SBX) is part of the Ground-Based Missile Defense System governed by the Missile Defense Agency, US Government.
- The SBX is responsible for tracking, communication, and all mid-course sensor functions for national missile defense.
- It is the element that tracks Ballistic Missile flight in Mid-course Phase, (approx. 20 minutes), while missiles are in the upper atmosphere.

Note: This has been estimated to be the same size as Husky Stadium and 25 stories tall from the water line. The tallest building currently in Everett is 12 stories tall.
- The X-band Radar (XBR) would have either a 65% populated array (approx. 39,000 elements) or a fully populated array (approx. 66,000 elements) to support the planned testing.
- The SBX is proposed to home port at Naval Station Everett, docked at the pier when the USS Lincoln is at sea, or moored nearby in Port Gardner Bay.
- The SBX will be towed to the mid-Pacific 5 times a year for realistic interceptor flight testing.
- The SBX is powered by six 3.3 MW diesel driven generators. While in Port only three generators will be used with one operating continually for daily functions. This represents a total of 8.270 hours of generator operation at the Primary Support Base (PSB). Usage is based 24 hours per day for 9 months per year.
- The SBX carries $818,000 gallons of diesel fuel at full capacity. For transit and maintenance operations its consumption is 14,500 gallons per day.
- The ZMI creates a radio frequency radiation area, aircraft navigation interference area, electronic communication interference area, and electro explosive device interference areas.
- Safe operating areas and angles are not established at this time.
- Within the Potential Interference areas are 5 airports, 2 low altitude air routes, 2 hospitals, City Emergency Response Communication Systems and commercial communications systems (partial list).
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)

NOAA Comments on Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) Draft Environmental Impact Statement (DEIS)

General Comments
The draft Environmental Impact Statement (DEIS) includes alternatives that would launch up to 5 targets annually from the existing Kodiak Launch Complex (KLC), and would construct new facilities near KLC such as launch pads, silos, and range sites. Several agencies and stakeholders raised concerns about the KLC and the environmental impacts of the facility and launches. For instance, efforts to monitor certain environmental and physical conditions are ongoing near Narrow Cape, as well as operational conditions agreed to by the vendor, AADC.

Specific Comments
The DEIS references Best Management Practices (BMPs) and Standard Operating Procedures (SOPs) but does not include a description of these. It recommended that ETR activities be classified under the designation of “Wildlife Viewing.” The DEIS should include an expanded description of wildlife viewing within the KLC area.

Comments on Proposed Activities
The proposed activities may affect the listed Stellar sea lions, Hawaiian monk seals, and other species. Therefore, the DEIS should include a detailed description of the activities and their potential impacts on marine and bird populations in the vicinity of the KLC. Monitoring needs to be addressed as well.

Please refer any questions regarding the DEIS to the NOAA Fisheries and Wildlife Service for species listed under their jurisdiction. Additional comments are provided regarding potential impacts on habitat and marine resources in the vicinity of the KLC. Monitoring needs are addressed as well.

Sincerely,

James P. Burgess, III
NEPA Coordinator
Exhibit 8.1.1-1: Reproductions of Written Documents (Continued)
<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tr>
<td>Bob Brodie</td>
<td>P-W-0001-1</td>
<td>Safety and Health</td>
<td>2.1.1</td>
<td>See P-E-0020-13</td>
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<tr>
<td></td>
<td>P-W-0001-2</td>
<td>Socioeconomics</td>
<td>4.8</td>
<td>See P-T-0014-2</td>
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<tr>
<td>Jean Murphy</td>
<td>P-W-0002-1</td>
<td>EIS Process</td>
<td>See P-E-0208-1</td>
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<tr>
<td></td>
<td>P-W-0002-2</td>
<td>Policy</td>
<td>See P-E-0032-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-W-0002-3</td>
<td>Program</td>
<td>A siting study was conducted to identify candidate locations for a PSB. Only those locations that met the exclusionary criteria and application of initial evaluative criteria were carried forward for analysis in the GMD ETR EIS. The preliminary rank-order list of sites had Naval Station Everett, Washington, as the most desirable. See section 2.4.4 of the EIS for additional information.</td>
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<td>Walter Selden - Port Gardner</td>
<td>P-W-0003-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<td>Neighborhood Association</td>
<td>P-W-0003-2</td>
<td>EIS Process</td>
<td>See P-E-0242-1</td>
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<td>P-W-0003-3</td>
<td>EIS Process</td>
<td>See P-E-0242-1</td>
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<td>P-W-0003-4</td>
<td>EIS Process</td>
<td>See P-E-0208-1</td>
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<td>P-W-0003-5</td>
<td>EIS Process</td>
<td>See P-E-0208-1</td>
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<td>P-W-0003-6</td>
<td>EIS Process</td>
<td>See P-E-0208-1</td>
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<td></td>
<td>P-W-0003-7</td>
<td>EIS Process</td>
<td>3.7</td>
<td>By the nature of the marine mission and use of existing homeport facilities, the SBX support and operational activities would not result in any adverse effects to cultural resources or noise levels. A socioeconomic analysis has been added to the Naval Station Everett portion of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-W-0003-8</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0275-4</td>
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<td>P-W-0003-9</td>
<td>Air Quality</td>
<td>3.8.1.2</td>
<td>Please see section 3.8.1.2. for information.</td>
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<td>P-W-0003-10</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0208-3</td>
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<td>P-W-0003-11</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0208-3</td>
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<td>Walter Selden - Port Gardner Neighborhood Association</td>
<td>P-W-0003-12</td>
<td>Airspace Use</td>
<td>4.8.2 2.1.4.2</td>
<td>See P-E-0008-4</td>
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<td>P-W-0003-13</td>
<td>Safety and Health</td>
<td>2.1.4.2 Appendix G</td>
<td>See P-E-0208-4</td>
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<td>P-W-0003-14</td>
<td>Safety and Health</td>
<td>2.1.4 2.1.8 4.3.5.2.5 4.6.5.2 4.8.5.2</td>
<td>See P-E-0005-1</td>
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<td></td>
<td>P-W-0003-15</td>
<td>Airspace Use</td>
<td>4.6.2 4.8.2 2.1.4.2</td>
<td>See P-E-0033-17</td>
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<td></td>
<td>P-W-0003-16</td>
<td>Biological Resources</td>
<td>3.8.3</td>
<td>The ROI for impacts to biological resources that may potentially be affected by the use of Naval Station Everett for the SBX will be modified as suggested.</td>
</tr>
<tr>
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<tr>
<td></td>
<td>P-W-0003-17</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>Text will be expanded to include minimizing the potential for impacts to wildlife from diesel fuel spills.</td>
</tr>
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<tr>
<td></td>
<td>P-W-0003-18</td>
<td>Hazardous Materials</td>
<td>4.8.5</td>
<td>See P-E-0318-6</td>
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<tr>
<td></td>
<td>P-W-0003-19</td>
<td>Safety and Health</td>
<td>2.1.7 4.8.5</td>
<td>See section 4.8.5. A DD Form 1494 would be completed prior to SBX operations and would assist in defining the operating area and defining safe operating angles, power levels, etc. Mitigation methods would include safe distance separations and software controls, such as those currently in place on the XBR used at Kwajalein Island in the RMI. Under proposed operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. RF Radiation Hazard Safety Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. Section 2.1.7; Two separate, redundant computer systems would monitor all emission energy levels at locations around the radar to assure safe exposure levels would be maintained. The odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than a second should this occur.</td>
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<td>P-W-0003-20</td>
<td>Safety and Health</td>
<td>2.1.4.2 Appendix G</td>
<td>See P-E-0008-3</td>
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</table>
As indicated in section 2.1.4.2, the SBX can exceed the 300 V/m average power threshold at 12 km. The average power threshold is based upon reducing the time of exposure of aircraft avionics to high intensity radiated field environments in order to preclude shortening the life of the aircraft avionics. The concern is not interference, but a reduction in life of the aircraft avionics. Additional information on the potential effects of EMR on communications-electronics, including aircraft avionics, is provided as appendix G of the EIS. Mitigation measures such as the redundant software that would help minimize potential interference to aircraft systems are discussed in section 2.1.4 as well as in appendix G.

Such issues are not addressed at Port Everett as the scenario involves the actual use of Pier Alpha or Pier Bravo (section 4.8.7.2), precluding the need for such measures.

The ROI for Visual and Aesthetics (section 3.8.9) was determined in the EIS to include all areas that may be affected by the proposed action.

Table 8.1.1-2: Responses to Written Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
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<tr>
<td>Walter Selden - Port Gardner Neighborhood Association</td>
<td>P-W-0003-21</td>
<td>Safety and Health</td>
<td>2.1.4 Appendix G</td>
<td>As indicated in section 2.1.4.2, the SBX can exceed the 300 V/m average power threshold at 12 km. The average power threshold is based upon reducing the time of exposure of aircraft avionics to high intensity radiated field environments in order to preclude shortening the life of the aircraft avionics. The concern is not interference, but a reduction in life of the aircraft avionics. Additional information on the potential effects of EMR on communications-electronics, including aircraft avionics, is provided as appendix G of the EIS. Mitigation measures such as the redundant software that would help minimize potential interference to aircraft systems are discussed in section 2.1.4 as well as in appendix G.</td>
</tr>
<tr>
<td>P-W-0003-22</td>
<td>Safety and Health</td>
<td>2.1.4.2 Appendix G</td>
<td>See P-E-0208-4</td>
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<td>P-W-0003-23</td>
<td>Transportation</td>
<td>4.8.7.2</td>
<td>See P-E-0303-2</td>
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<td>P-W-0003-24</td>
<td>Transportation</td>
<td>4.8.7.2</td>
<td>See P-E-0303-2</td>
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<td>P-W-0003-25</td>
<td>Transportation</td>
<td>4.8.6.2</td>
<td>See P-E-0318-5</td>
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<td>P-W-0003-26</td>
<td>Utilities</td>
<td>4.8.6.2</td>
<td>See P-E-0318-5</td>
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</tr>
<tr>
<td>P-W-0003-27</td>
<td>Visual Aesthetics</td>
<td>3.8.9</td>
<td>The ROI for Visual and Aesthetics (section 3.8.9) was determined in the EIS to include all areas that may be affected by the proposed action.</td>
<td></td>
</tr>
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<td>P-W-0003-28</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0008-1</td>
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<td>4.8.9</td>
<td>See P-E-0011-1</td>
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<td>4.8.6</td>
<td>See P-E-0026-4</td>
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<td>See P-E-0006-2</td>
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<td>EIS Process</td>
<td>3.6</td>
<td>See P-E-0250-2</td>
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<td>Mohala Aiu - AFSC Hawai'i Area</td>
<td>P-W-0004-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<td>P-W-0004-2</td>
<td>Program</td>
<td>See P-E-0018-5</td>
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<td>P-W-0004-3</td>
<td>EIS Process</td>
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<td>P-W-0004-4</td>
<td>EIS Process</td>
<td>See P-T-0057-3</td>
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<td>P-W-0004-5</td>
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<td>4.3.5</td>
<td>See P-W-0004-11</td>
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<td>Mohala Aiu - AFSC Hawai'i Area</td>
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<td>Policy</td>
<td>4.11.1.3</td>
<td>See P-E-0032-3</td>
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<tr>
<td>P-W-0004-7</td>
<td>Airspace Use</td>
<td>4.11.1.3</td>
<td>As discussed in section 4.11.1.3, delays from launches and intercept debris would be handled in a manner similar to severe weather. Aircraft would be scheduled to approach a launch corridor just after a launch, or to have passed through a launch corridor prior to the launch. Since commercial aircraft are the most likely to be flying in the BOA, the additional time would likely be less than 10 minutes.</td>
<td></td>
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<tr>
<td>P-W-0004-8</td>
<td>Safety and Health</td>
<td>4.4.4, 4.1.7, 4.5.5, 4.3.5</td>
<td>See P-E-0004-4</td>
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<tr>
<td>P-W-0004-9</td>
<td>Airspace Use</td>
<td>4.11.1.3</td>
<td>As discussed in section 4.11.1.3, the airspace in the broad ocean area outside territorial limits lies in international airspace and, consequently, is not part of the National Airspace System. Because the area is in international airspace, the procedures of ICAO, outlined in ICAO Document 444, Rules of the Air and Air Traffic Services, are followed. ICAO Document 444 is the equivalent air traffic control manual to FAA Handbook 7110.65, Air Traffic Control. The FAA acts as the U.S. agent for aeronautical information to the ICAO, and air traffic in the overwater ROI is managed by the Honolulu, Oakland, and Anchorage ARTCCs.</td>
<td></td>
</tr>
<tr>
<td>P-W-0004-10</td>
<td>Program</td>
<td></td>
<td>See P-E-0018-5</td>
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<tr>
<td>P-W-0004-11</td>
<td>Safety and Health</td>
<td>4.3.5</td>
<td>Instrumentation is used for range safety by tracking incoming reentry vehicles and terminating missile flights in order to prevent an impact on inhabited islands. The Kwajalein Range Safety System links the RTS radar system to a range safety center on Kwajalein. A missile and payload can be tracked during the entire flight by the range safety center. Missiles launched from RTS are equipped with flight termination systems that allow destruction of the missile if the flight deviates significantly from planned criteria or otherwise poses a threat to the public. For example, a flight would be terminated if the missile path intersects the Marshall Islands protection circle, an artificial boundary around inhabited atolls and islands.</td>
<td></td>
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<tr>
<td>P-W-0004-12</td>
<td>Safety and Health</td>
<td>4.3.5</td>
<td>See P-W-0004-11</td>
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<td>P-W-0004-13</td>
<td>Program</td>
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<td>See P-T-0017-1</td>
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<td>P-W-0004-14</td>
<td>Hazardous Materials</td>
<td>NA</td>
<td>Thank you for your comment.</td>
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<tr>
<td>P-W-0004-15</td>
<td>Biological Resources</td>
<td>4.11.2</td>
<td>Comment noted. The Proposed Action is not expected to result in significant impacts to marine biological resources.</td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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<tr>
<td>Mohala Aiu - AFSC Hawai‘i Area</td>
<td>P-W-0004-16</td>
<td>Biological Resources</td>
<td>4.11.2</td>
<td>The potential for auditory and debris impacts to marine species is discussed on pages 4-285 through 4-287.</td>
</tr>
<tr>
<td>P-W-0004-17</td>
<td>Safety and Health</td>
<td>4.11</td>
<td></td>
<td>See sections 4.1.3.2.1 and 4.1.14.2.1. Any residual aluminum oxide and burnt hydrocarbon coating the inside of the motor casings would not present any toxicity concerns. Were hazardous materials to leach out of the intercept debris, the great volume of water in the ocean would dilute the contaminant to acceptable levels. The solid fuel’s aluminum oxide is insoluble; in addition, as the fuel slowly dissolves, its outer layers become spongy, further retarding dissolution. Thus no toxic levels of ammonia, chlorine, or aluminum would be expected. As shown in table 4.1.14-2, it would take approximately 270 days for 90 percent of the perchlorate to leach out of solid propellant that land in the ocean (at 29 °C [84 °F]). The perchlorate would be expected to be diluted as it mixes with the surrounding water.</td>
</tr>
<tr>
<td>P-W-0004-18</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
<td></td>
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<tr>
<td>P-W-0004-19</td>
<td>Transportation</td>
<td>As noted in section 4.4.4.1, clearance of commercial/recreational shipping areas for safety reasons is a typical procedure during PMRF launches (announced via NOTMARs) and, as such, is understood by transients utilizing such areas in and around the Facility. In addition, these events are discrete and of short duration, posing no long-term effects on area water transportation.</td>
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<tr>
<td>P-W-0004-20</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td></td>
<td>See P-E-0011-1</td>
</tr>
<tr>
<td>P-W-0004-21</td>
<td>Hazardous Materials</td>
<td>The National Response Center (NRC) is the federal point of contact for reporting all oil and chemical spills. Refer to the attached to tables for a statistical summary of spill reports and responses from 1979 to 2002.</td>
<td></td>
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<tr>
<td>P-W-0004-22</td>
<td>Biological Resources</td>
<td>4.6.3</td>
<td></td>
<td>The potential for impacts to marine species from the floating platform is discussed on pages 4-214 and 4-215.</td>
</tr>
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## Table 8.1.1-2: Responses to Written Comments (Continued)

<table>
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<tr>
<td>Mohala Aiu - AFSC Hawai‘i Area</td>
<td>P-W-0004-23</td>
<td>Transportation</td>
<td>Section</td>
<td>The basic assumption regarding the SBX operation while in port, or at a nearby mooring location, is that the 20 minutes of daily calibration and tracking would be coordinated in both time and space so as to reduce any potential EMR interference to a negligible level. The potential radiation hazard for EEDs on the ground would exist only 10 meters (32.8 feet) in front of the radar on the main deck of the SBX. Therefore EEDs on the ground, including those associated with airbags in vehicles, would not be affected. Garage door openers as well would not be affected because they are well below the operating frequency of the SBX. The beam from the SBX would not remain stationary during operation for any period of time; thus the odds of interference from high power effects with any electronic equipment on the ground would be slight, 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment (section 4.8.2.2) and would last for less than a second, should this occur. The SBX would be constrained so that the existing ground-, air-, and sea-based electronics are not impacted.</td>
</tr>
<tr>
<td></td>
<td>P-W-0004-24</td>
<td>Biological Resources</td>
<td>4.4.2</td>
<td>The TPS-X radar will be sited on a previously disturbed site. Temporary artificial berms and ground cover would be removed after fueling. No new vegetation will be introduced.</td>
</tr>
<tr>
<td></td>
<td>P-W-0004-25</td>
<td>Cultural Resources</td>
<td>4.4</td>
<td>As discussed in the introduction in section 4.4, based on the prior analyses done and the effects of past target and missile launch activities, the potential impacts related to proposed GMD ETR activities are expected to be minimal; therefore, the proposed action would result in minimal changes to the land or to the Hawaiian culture.</td>
</tr>
<tr>
<td></td>
<td>P-W-0004-26</td>
<td>EIS Process</td>
<td>See P-E-0250-2</td>
<td></td>
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<tr>
<td></td>
<td>P-W-0004-27</td>
<td>Environmental Justice</td>
<td>NA</td>
<td>Native Hawaiian sovereignty is a political issue that would be best addressed outside an environmental document.</td>
</tr>
<tr>
<td></td>
<td>P-W-0004-28</td>
<td>Policy</td>
<td>Strategic Target System launches from PMRF would be included in existing missile flight activities.</td>
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<td></td>
<td>P-W-0004-29</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
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<td></td>
<td>P-W-0004-30</td>
<td>EIS Process</td>
<td>Authors of the Draft EIS have been working environmental projects at PMRF since 1989.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-W-0004-31</td>
<td>Cultural Resources</td>
<td>4.6</td>
<td>Comment noted.</td>
</tr>
</tbody>
</table>
As stated in section 4.4, there is no ground disturbance planned for PMRF; therefore, there would be no impacts to cultural resources at PMRF. All operations would be carried out in accordance with Cultural Resource management guidelines, as presented in previous environmental documents for PMRF listed in appendix B.

The decision will be made by the Director of MDA after reviewing comments gathered from the public.

Additional text has been added to section 4.7 to state that the SBX would only be moored at San Nicolas Island and would not be visible from Port Hueneme.

As discussed in section 4.7.1.2, the SBX would be moored off of San Nicolas Island. While San Nicolas is within Ventura County, a non-attainment county for federal and state 1-hour ozone standards, San Nicolas is considered to be in attainment or unclassified; therefore, a Conformity Analysis would not be required.

That Copper Valley derives power from Solomon Gulch is addressed in section 3.10.7.2. Text has been altered to indicate that Solomon Gulch is no longer state owned, based on information derived from Copper Valley Electric Association.

As per section 3.10.7.2, "the Valdez Landfill, a Class 2 landfill operated by the City of Valdez on Glacier Haul Road, utilizes a bale fill system. At the Port of Valdez docks, the City provides dumpsters to handle solid waste removal (Kinney, 2002)." Thus, once removed from the Port of Valdez and processed at the baler facility, the solid waste is removed to the landfill, or solid waste disposal area, that you mention.
Table 8.1.1-2: Responses to Written Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
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<th>Response Text</th>
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<td>Michelle Trautman</td>
<td>P-W-0009-2</td>
<td>Safety and Health</td>
<td>2.1.4.2</td>
<td>Section 2.1.4.2 discusses SBX emission patterns.</td>
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<td>P-W-0009-3</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0208-3</td>
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<td>P-W-0009-4</td>
<td>Safety and Health</td>
<td>2.1.7</td>
<td>See P-W-0003-19</td>
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<td>Safety and Health</td>
<td>2.1.4</td>
<td>See P-E-0005-1</td>
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<td>2.1.8</td>
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<td>4.3.5.2.5</td>
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<td>4.6.5.2</td>
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<td>4.8.5.2</td>
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<td>P-W-0009-6</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<td></td>
<td>P-W-0009-7</td>
<td>EIS Process</td>
<td></td>
<td>See P-E-0242-1</td>
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<td></td>
<td>P-W-0009-8</td>
<td>EIS Process</td>
<td></td>
<td>Hard copies and CDs were available at the registration table.</td>
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<td></td>
<td>P-W-0009-9</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>David Mascarenas</td>
<td>P-W-0010-1</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>See P-E-0005-1</td>
</tr>
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<td></td>
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<td>2.1.8</td>
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<td>4.8.5.2</td>
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<td>Program</td>
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<td>See P-E-0018-5</td>
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<td>Airspace Use</td>
<td>4.8.2</td>
<td>See P-E-0008-4</td>
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<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0209-2</td>
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<td>See P-E-0005-1</td>
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<td>4.8</td>
<td>See P-E-0208-2</td>
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<td>Biological Resources</td>
<td>4.8.3</td>
<td>See P-E-0209-4</td>
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<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0006-2</td>
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Table 8.1.1-2: Responses to Written Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tr>
<td>David Mascarenas</td>
<td>P-W-0010-9</td>
<td>EIS Process</td>
<td></td>
<td>See P-E-0242-1</td>
</tr>
<tr>
<td>Frank Anderson - City of Everett</td>
<td>P-W-0011-1</td>
<td>EIS Process</td>
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<td>Comment noted.</td>
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<td></td>
<td>P-W-0011-2</td>
<td>EIS Process</td>
<td></td>
<td>No decision will be made until the NEPA process is complete. The comment period was extended until 15 April and additional meetings were held 5 April.</td>
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<td></td>
<td>P-W-0011-3</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0008-1</td>
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<td>P-W-0011-4</td>
<td>Airspace Use</td>
<td>4.6.2, 4.8.2</td>
<td>See P-E-0033-17</td>
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<td></td>
<td>P-W-0011-5</td>
<td>Program</td>
<td></td>
<td>The operation of the SBX while in the PSB would include system testing, calibration, and tracking of satellites. Radar emissions would occur in 15- to 20-minute periods totaling approximately 1 hour per day.</td>
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<td>P-W-0011-6</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0208-3</td>
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<td></td>
<td>P-W-0011-8</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>The potential for impacts to Chinook salmon and bull trout will be added to the Final EIS.</td>
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<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
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<td>P-W-0011-10</td>
<td>Policy</td>
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<td>See</td>
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<td></td>
<td>P-W-0011-11</td>
<td>Land Use</td>
<td>3.8</td>
<td>As discussed in section 3.8, potential impacts to state lands, tidelands, or leases are not anticipated. If Naval Station Everett is selected as the PSB, the Proposed Action and the potential for impacts to state lands, tidelands, or leases would be reviewed at that time.</td>
</tr>
<tr>
<td>Todd Apo - Ko Olina Community Association</td>
<td>P-W-0012-1</td>
<td>Visual Aesthetics</td>
<td>4.6.7</td>
<td>Section 4.6.7 states that visual resources may be slightly affected by the proposed SBX off-shore at Barbers Point. The SBX would be moored at an adequate distance away from the shore and would not obstruct panoramic views.</td>
</tr>
<tr>
<td></td>
<td>P-W-0012-2</td>
<td>Socioeconomics</td>
<td>4.6</td>
<td>Socioeconomic impacts were determined to be minimal regarding the SBX at Pearl Harbor. As stated in section 4.6.7, the SBX facilities at Pearl Harbor would be visually synonymous with historic and present military activities that occur there. The SBX would have a very minor impact on views from Barbers Point.</td>
</tr>
<tr>
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<td>P-W-0012-3</td>
<td>Airspace Use</td>
<td>4.6.2</td>
<td>See P-E-0319-17</td>
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<td>Deborah Wright</td>
<td>P-W-0013-1</td>
<td>EIS Process</td>
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<td>See P-E-0242-1</td>
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<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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<td>Terri Pauls</td>
<td>P-W-0014-1</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
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<td>Program</td>
<td>See P-E-0006-1</td>
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<td></td>
<td>P-W-0014-3</td>
<td>Program</td>
<td>The missiles proposed for testing will not be nuclear-tipped.</td>
<td></td>
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<td>P-W-0014-4</td>
<td>Transportation</td>
<td>2.3.1.16</td>
<td>See P-E-0020-14</td>
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<td>Program</td>
<td>See P-E-0018-5</td>
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<td>Michelle Kermoade</td>
<td>P-W-0015-1</td>
<td>EIS Process</td>
<td>See P-E-0242-1</td>
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<td>P-W-0015-2</td>
<td>Safety and Health</td>
<td>See P-E-0208-5</td>
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<td>P-W-0015-3</td>
<td>EIS Process</td>
<td>Multidisciplinary team of experts.</td>
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<td>See P-E-0248-7</td>
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<td>P-W-0015-5</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0006-2</td>
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<tr>
<td></td>
<td>P-W-0015-6</td>
<td>EIS Process</td>
<td>4.8</td>
<td>Based upon five tests per year, the SBX would be at the PSB for 7 months. In the case of Naval Station Everett, it is anticipated that the SBX would be docked and use existing power sources for daily ship functions. Two generators would be used for powering of the 65 percent or fully populated radar for 3 hours per day. The noise levels produced by the SBX are not anticipated to be loud enough to disturb those on land. It is anticipated that JP-8 fuel would be used to fuel the generators.</td>
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<td>P-W-0015-7</td>
<td>Hazardous Materials</td>
<td>4.7.4, 4.8.4</td>
<td>See P-E-0208-6</td>
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<td>P-W-0015-8</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0011-1</td>
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<td>P-W-0015-10</td>
<td>Program</td>
<td>Please see section 2.4.4. of the EIS for more detailed information pertaining to the SBX PSB selection process.</td>
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<tr>
<td>Frederick Dodge</td>
<td>P-W-0016-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, 4.8.5.2</td>
<td>See P-E-0005-1</td>
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<td>Airspace Use</td>
<td>4.6.2</td>
<td>See P-E-0319-17</td>
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<td>P-W-0016-3</td>
<td>Program</td>
<td>See P-E-0018-5</td>
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<td>Helen Takeuchi</td>
<td>P-W-0017-1</td>
<td>Policy</td>
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<td>This is beyond the scope of the EIS.</td>
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<td>Sachiko Fujita</td>
<td>P-W-0018-1</td>
<td>P-W-0017</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0017.</td>
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<td>Peggy Choy</td>
<td>P-W-0019-1</td>
<td>P-W-0017</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0017.</td>
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<td>Horst Petzold</td>
<td>P-W-0020-1</td>
<td>Program</td>
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<td>See P-E-0018-5</td>
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<td>Robert Jackson</td>
<td>P-W-0021-1</td>
<td>EIS Process</td>
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<td>See P-E-0208-1</td>
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<td>Peggy Choy</td>
<td>P-W-0021-2</td>
<td>EIS Process</td>
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<td>See P-W-0011-1</td>
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<td>Deborah Milam -</td>
<td>P-W-0022-1</td>
<td>Socioeconomics</td>
<td>4.8</td>
<td>See P-T-0014-2</td>
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<td>Kodiak Chamber of Commerce</td>
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<td>See P-E-0006-1</td>
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<td>Kristina Kuch - American</td>
<td>P-W-0023-1</td>
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<td>See P-E-0032-3</td>
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<td>Dominic Clemente -</td>
<td>P-W-0024-1</td>
<td>Policy</td>
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<td>See P-E-0032-3</td>
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<td>American Friends Service</td>
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<td>Committee Hawai’i</td>
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<td>Madeleine Hiraga-Huccio -</td>
<td>P-W-0025-1</td>
<td>Policy</td>
<td></td>
<td>See P-E-0032-3</td>
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<td>Malu Aina</td>
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<td>Bradley G Stevens</td>
<td>P-W-0026-1</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>Additional information concerning water resources and further reference to the AADC research is provided on pages 4-105 and 4-106.</td>
</tr>
<tr>
<td>P-W-0026-2</td>
<td>Biological Resources</td>
<td>4.1.14</td>
<td></td>
<td>As also stated on page 4-105 in the Draft EIS, aluminum oxide is only a hazard to aquatic life in acidic environments when it dissociates into as free aluminum cation. Aluminum oxide should not dissolve in water with pH levels between 5 and 9.5. As summarized in the Summary Findings of KLC Environmental Studies 1998-2001, there have been no discernable effects on water chemistry to date, including from the Strategic Target System mishap.</td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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<tr>
<td>Bradley G Stevens</td>
<td>P-W-0026-3</td>
<td>Water Resources</td>
<td>4.1.14</td>
<td>As stated in chapter 2, up to five launches from each selected launch site would occur per year as part of the Proposed Action. According to the FAA EA, no significant impacts to water quality were anticipated as a result of launching nine missiles per year. The missile launches required as part of the Proposed Action would not exceed the number previously analyzed. As stated on page 4-105 in the Draft EIS, aluminum oxide is only a hazard to aquatic life in acidic environments when it dissociates into a free aluminum cation. Aluminum oxide should not dissolve in water with pH levels between 5 and 9.5. We agree with the Summary Findings of KLC Environmental Studies 1998-2001. As stated on page 4-103, the existing water quality monitoring required by KLC’s 401 Water Quality Assurance Permit from the Alaska Department of Environmental Conservation, and the implementation of related components of the KLC Natural Resources Management Plan would continue.</td>
</tr>
<tr>
<td>P-W-0026-4</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td></td>
<td>Comment noted. The studies were conducted within the parameters of the KLC Environmental Monitoring Plan (approved by NMFS, USFWS, and FAA), which included detailed work plans, sampling protocols, objectives, and criteria for monitoring tasks such as environmental quality monitoring.</td>
</tr>
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<td>P-W-0026-5</td>
<td>Land Use</td>
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<td>See P-T-0007-4</td>
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<td>P-W-0026-6</td>
<td>Cultural Resources</td>
<td>4.1.15</td>
<td></td>
<td>Comment 1: The information being referenced had been removed from the document before the Draft version was released.</td>
</tr>
<tr>
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<td></td>
<td>Comment 2: The 9 days per year pertain to what was established by the KLC EA. The GMD ETR EIS is planning for only 5 days per year. The argument is to ensure that the program stays within the limits of what was established by the KLC EA.</td>
</tr>
<tr>
<td></td>
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<td>Comment 3: Thank you for your comment. The Visual and Aesthetics section (4.1.13) has been modified.</td>
</tr>
<tr>
<td>P-W-0026-7</td>
<td>Program</td>
<td></td>
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<td>See P-E-0006-1</td>
</tr>
<tr>
<td>P-W-0026-8</td>
<td>Land Use</td>
<td>Appendix E</td>
<td></td>
<td>Based on discussions with several state and federal agencies, appendix E, Determination of Consistency with Coastal Management Plans, was removed from the document prior to publication of the GMD ETR Draft EIS. Consultation is ongoing with the appropriate agencies regarding Coastal Consistency requirements.</td>
</tr>
</tbody>
</table>
It is assumed that 50 of the 150 support personnel would be housed at the existing mancamp near KLC. The remaining 100 would be housed at other accommodations on Kodiak. As stated in section 4.1.10, the use of existing accommodations would be coordinated and utilized to the maximum extent while trying to minimize potential long-term negative impacts due to displacing repeat tourists. There is the possibility of an additional mancamp being constructed and the existing mancamp being expanded which would accommodate an additional 75 to 100 personnel. As stated in section 4.1.11 the average daily traffic would only be minimally increased on key roads.

Based on input from the Alaskan Department of Natural Resource the Proposed Action at KLC would be compatible with the existing ILMA. Furthermore, section 4.1.8.2.1 on page 4-69 states that all Launch Hazard Areas would be established and maintained by AADC in accord with the ILMA for the property.

The SBX platform would be constructed (enclosed double bottom) and operated in accordance with the military, state, federal and international maritime (SOLAS) and (MARPOL 73/78) standard construction and operating requirements for safety and pollution prevention. Like other marine vessels entering Puget Sound and the Strait of Juan de Fuca, the SBX would undergo inspection by the 13th Coast Guard District MSO Puget Sound, Prevention Department. The vessel would be inspected for seaworthiness, safety and pollution prevention concerns, and compliance with local, State ,and Federal regulations, including the standards of care and protocol contained in the Puget Sound Harbor Safety Plan. Regular U.S. Coast Guard inspections would occur and fueling operations would be monitored and controlled. Any potential breech or leak would be handled in accordance with existing Naval and Coast Guard procedures. Vessel navigation/escort requirements would be in compliance with local, U.S. Coast Guard District 13 MSO, State and Federal provisions, and performance obligations and would be determined prior to arrival at the Strait of Juan de Fuca and reviewed at the time of initial U.S. Coast Guard inspection.
<table>
<thead>
<tr>
<th>Name</th>
<th>Section</th>
<th>Resource</th>
<th>Comment #</th>
<th>Resource #</th>
<th>Comment Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Dohrmann - State of Washington Office of the Governor</td>
<td>4.8.1.2</td>
<td>EIS</td>
<td>P-W-0027-5</td>
<td>Air Quality</td>
<td>The text and analysis has been modified in section 4.8.1.2. It is anticipated that the SBX would be able to dock at Naval Station Everett and would utilize shore utilities.</td>
</tr>
<tr>
<td>Mike Shelton - Island County Board of Commissioners</td>
<td>4.8.1.2</td>
<td>EIS Process</td>
<td>P-W-0028-1</td>
<td>Program</td>
<td>The comment period was extended from March to 15 April.</td>
</tr>
<tr>
<td>Dolores Geary</td>
<td>4.8.1.2</td>
<td>Airspace Use</td>
<td>P-W-0029-1</td>
<td>Program</td>
<td>As stated in section 4.8.2, the SBX would not exceed the FAA 3000 V/m peak power threshold. The SBX could exceed the FAA 300 V/m average power threshold by 1.8 kilometers (1.1 miles) (65% population radial) or 19 kilometers (12 miles) (90% population radial). The average power threshold is based upon the level of exposure of aircraft avionics electronics. Therefore, the comment is not correct but is in the existing EIS. While in port, or at a nearby mooring location, the 20 minutes of daily calibration and tracking would be coordinated in both time and space so as to reduce any potential EMR interference to a negligible level. Based on the spectrum certification and frequency allocation process, the high energy radiation operating area for the SBX would be modified to fit existing airport and airspace requirements. The FAA would provide notice regarding the SBX operating area to local airports and aircraft through a NOTAM.</td>
</tr>
</tbody>
</table>

Table 8.1.2: Responses to Written Comments (Continued)
<table>
<thead>
<tr>
<th>Name</th>
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<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tbody>
<tr>
<td>Dolores Geary</td>
<td>P-W-0029-4</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the redevelopment plan, it states that while it is possible that those that visit and reside in this area may be affected by the SBX, the effects would be minimal in regards to this plan.</td>
</tr>
<tr>
<td>P-W-0029-5</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the ability of Everett to maintain and increase tourism, commercial, and residential value it states that given the possible visual impacts of the SBX, along with the misconception that the SBX would have adverse health impacts to the public, the proposed project could potentially lead to adverse impacts. However, the impacts would be minimal due to the fact that the SBX would be an additional structure on an existing military base immediately surrounded by industrial land uses, thereby reducing the impact to these resources.</td>
<td></td>
</tr>
</tbody>
</table>

| Jonathan Sharkey - City of Port Hueneme | P-W-0030-1 | Program | See P-E-0006-1 |
| Sue Cogswell - Prince William Sound Economic Development District | P-W-0031-1 | Program | See P-E-0006-1 |
| Dave Waggoner - Paine Field | P-W-0032-1 | Airspace Use | 4.6.2 4.8.2 2.1.4.2 | See P-E-0033-17 |
| Gary Stormo - Everett Parks and Recreation Board of Commission | P-W-0033-1 | Program | See P-E-0006-1 |
Table 8.1.1-2: Responses to Written Comments (Continued)

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<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Higgins - Channel Islands Beach Community</td>
<td>P-W-0034-1</td>
<td>Utilities</td>
<td></td>
<td>Information from the Navy (see section 3.7.6.2) indicates that the source of potable water for NBVC Port Hueneme and Point Mugu is groundwater from the United Water Conservation District, conveyed through the Oxnard-Hueneme Pipeline to the City of Port Hueneme's Brackish Water Desalination Plant. This is under the auspices of the Port Hueneme Water Agency. Per the City of Port Hueneme, &quot;...The City of Port Hueneme's primary source of water is from the Port Hueneme Water Agency (PHWA)...The United Water Conservation District delivers the source water for these processes from El Rio water wells to the PHWA Brackish Water Reclamation Demonstration Facility (Treatment Plant)...&quot; To meet demands, the treated water is then blended with State Water Project water delivered by Calleguas Municipal Water District. The existing system has a capacity of 22.0 million liters (5.8 million gallons) per day, and an average demand of 6.1 million liters (5.3 million gallons) per day. &quot;Existing System Capacity&quot; refers to the facility infrastructure being capable of delivering 5.8 million gallons per day. Information was previously provided as to the &quot;base-only&quot; use of 1.6 mgd and was added after the draft EIS was delivered, as was the other updated information.</td>
</tr>
<tr>
<td>P-W-0034-2</td>
<td>Utilities</td>
<td></td>
<td></td>
<td>Thank you for your comment. This refers of course to the City's capacity and has been restated to avoid further confusion (section 4.7.6.1).</td>
</tr>
<tr>
<td>Neal Andrews - San Buenaventura City Council</td>
<td>P-W-0035-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
<td>Kathy Long - Board of Supervisors, County of</td>
<td>P-W-0036-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
<td>Ventura</td>
<td></td>
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</tr>
<tr>
<td>Charlotte Craven - City of Camarillo</td>
<td>P-W-0037-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
<td>Keith Martin - City of Adak</td>
<td>P-W-0038-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
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<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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<tr>
<td>Paul Calderwood - City of San Buenaventura</td>
<td>P-W-0039-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<tr>
<td>Louise Stanton-Masten - Everett Area Chamber of Commerce</td>
<td>P-W-0040-1</td>
<td>EIS Process</td>
<td>See P-W-0011-1</td>
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<td></td>
<td>P-W-0040-2</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0011-1</td>
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<td></td>
<td>P-W-0040-3</td>
<td>Airspace Use</td>
<td>4.8.2 2.1.4.2</td>
<td>See P-E-0008-4</td>
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<td></td>
<td>P-W-0040-4</td>
<td>Safety and Health</td>
<td>2.1.4 2.1.8 4.3.5.2.5 4.6.5.2 4.8.5.2</td>
<td>See P-E-0005-1</td>
</tr>
<tr>
<td></td>
<td>P-W-0040-5</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>When at home port, the SBX vessel would be moored at the pier. No adverse effects to water quality, fish, shellfish, or other wildlife are anticipated. The potential for impacts to the Chinook salmon and bull trout will be added to the Final EIS.</td>
</tr>
<tr>
<td></td>
<td>P-W-0040-6</td>
<td>Transportation</td>
<td></td>
<td>See P-E-0012-1</td>
</tr>
<tr>
<td>Robert Drucker</td>
<td>P-W-0041-1</td>
<td>Program</td>
<td>See P-E-0018-5</td>
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<tr>
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<td>P-W-0041-2</td>
<td>EIS Process</td>
<td></td>
<td>Reference analysis sections in the Final EIS.</td>
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<td>P-W-0041-3</td>
<td>EIS Process</td>
<td>See P-E-0208-1</td>
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<td>P-W-0041-4</td>
<td>Program</td>
<td>See P-E-0018-5</td>
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<tr>
<td>Jean Lanigan</td>
<td>P-W-0042-1</td>
<td>EIS Process</td>
<td>See P-E-0242-1</td>
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<tr>
<td></td>
<td>P-W-0042-2</td>
<td>EIS Process</td>
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<td>Multi-disciplinary team of experts coordinated with State and Federal agencies.</td>
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<td>Annie Lyman</td>
<td>P-W-0043-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<td>P-W-0043-2</td>
<td>EIS Process</td>
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<td>Seattle scoping meeting held, comment period extended for Everett, and additional meetings held in Everett.</td>
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<td>P-W-0043-3</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0026-4</td>
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<tr>
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<td>EIS Section</td>
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<tr>
<td>Lydia Marshall</td>
<td>P-W-0044-1</td>
<td>EIS Process</td>
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<td>See P-W-0043-2</td>
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<td>P-W-0044-2</td>
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<td>See P-E-0006-1</td>
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<td>P-W-0044-3</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
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<tr>
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<td>P-W-0044-4</td>
<td>Safety and Health</td>
<td>4.8.5</td>
<td>See P-E-0348-1</td>
</tr>
<tr>
<td>Alice Minor</td>
<td>P-W-0045-1</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>The PAVE PAWS radar at Cape Cod, Massachusetts, is a completely different kind of radar from the proposed SBX and operates at a different frequency. As indicated in section 2.1.4 the proposed SBX would operate like the GBR-P at Kwajalein Island in the RMI and will employ similar redundant software controls to reduce potential RF interference and ensure public safety.</td>
</tr>
<tr>
<td></td>
<td>P-W-0045-2</td>
<td>Airspace Use</td>
<td>4.8.2</td>
<td>See P-E-0008-4</td>
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<tr>
<td>Virgil Morgan - Morgan Aero Products</td>
<td>P-W-0046-1</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<tr>
<td>James Deno</td>
<td>P-W-0047-1</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<tr>
<td>Niles Fowler - Navy League of the United States</td>
<td>P-W-0048-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
<td>Peter Lorentzen - Chugiak-Eagle River Chamber of Commerce</td>
<td>P-W-0049-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Philip Bannan - Everett Port Commission</td>
<td>P-W-0050-1</td>
<td>Transportation</td>
<td></td>
<td>See</td>
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<tr>
<td></td>
<td>P-W-0050-2</td>
<td>Safety and Health</td>
<td>2.1.4.2</td>
<td>See P-O-0057-1</td>
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<td>Jack Olson</td>
<td>P-W-0051-1</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<tr>
<td>Carol Wolton</td>
<td>P-W-0052-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Sara Elliott</td>
<td>P-W-0053-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<td>Katie Elliott</td>
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<td>P-W-0029</td>
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<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Julia Elliott</td>
<td>P-W-0055-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Robert and Marion Nokleby</td>
<td>P-W-0056-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Paul LaVigne</td>
<td>P-W-0057-1</td>
<td>P-W-0029</td>
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<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Dorothy Boroughs</td>
<td>P-W-0058-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Dan and Marsha O'Brien</td>
<td>P-W-0059-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Marion Skalley</td>
<td>P-W-0060-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Thomas Skalley</td>
<td>P-W-0061-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
</tr>
<tr>
<td>Elinora Jane Cater</td>
<td>P-W-0062-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Mary Ellen Egge</td>
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<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Steve Nagel</td>
<td>P-W-0064-1</td>
<td>P-W-0029</td>
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<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Victoria Adlum</td>
<td>P-W-0065-1</td>
<td>P-W-0029</td>
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<td>See responses to issues identified for comment number P-W-0029.</td>
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<td>Laura Elliott</td>
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<td>P-W-0029</td>
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<tr>
<td>Madeleine Sosin</td>
<td>P-W-0067-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
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<tr>
<td>Stephen Somogy</td>
<td>P-W-0068-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Michele Somogy</td>
<td>P-W-0069-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Leslie Minor</td>
<td>P-W-0070-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Rosemarie Brown - Sisters of</td>
<td>P-W-0071-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>the Holy Names of Jesus and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mary</td>
<td></td>
<td></td>
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<tr>
<td>Linda Sinter</td>
<td>P-W-0072-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>John and Kim Larson</td>
<td>P-W-0073-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Mary Lee Griswold</td>
<td>P-W-0074-1</td>
<td>P-W-0029</td>
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<td>Marion Elert</td>
<td>P-W-0075-1</td>
<td>P-W-0029</td>
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Table 8.1.1-2: Responses to Written Comments (Continued)
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<tr>
<td>Marjorie D. Ross</td>
<td>P-W-0076-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
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<td>Kathleen Haban</td>
<td>P-W-0077-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Leslie and Deane Minor</td>
<td>P-W-0078-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<td>Marianna C. Skalley</td>
<td>P-W-0079-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<td>Thomas and Denise Murphy</td>
<td>P-W-0080-1</td>
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<td>Elsie M. Anderson</td>
<td>P-W-0081-1</td>
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<td>P-W-0029</td>
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<td>Richard and Inez Lawrence</td>
<td>P-W-0083-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<td>Elizabeth B. Bentler</td>
<td>P-W-0084-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<tr>
<td>Patricia A. Larson</td>
<td>P-W-0085-1</td>
<td>P-W-0029</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-W-0029.</td>
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<td>[Sisters of the Holy Names of Jesus and Mary]</td>
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<td>Karen Stolworthy</td>
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<td>A socioeconomic section has been added to the document. The proposed project would be visible from some of the surrounding neighborhoods, and there would be a potential for a visual impact. However, the area is arguably visually synonymous with the present industrial and military uses. The assumption that the SBX would result in a reduction in property values is conjecture and does not present any quantifiable statistics or other information that can be readily or credibly analyzed. In addition, real estate values in an area are more directly related to the levels of income and employment that occur in the area. Socioeconomic studies prepared by the Air Force and the military's experience during several rounds of base closures have shown that housing values and military programs are generally positively related. Particularly in a port area where the mooring of ships and other Navy activities are a normal incidence of the military presence, a reduction of property values from the visual effect of large vessels in the harbor, or a perceived risk, does not seem likely. The SBX would occupy a small part of the panoramic view of Possession Sound when viewed from the waterfront. The addition of personnel and resupply of the SBX would provide a small, positive impact to the local economy.</td>
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<td>Suzanne Schlike</td>
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<td>Mitigation options could be as listed in the section 4.8.1.2; however, there are no current plans to implement them.</td>
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<td>SBX emission pattern and power levels are discussed in section 2.1.4. The separation distance and calculated power density is discussed in section 4.8.5. For the fully populated radar at a distance of 150 meters (492 feet) and for the 65 percent populated radar at a distance of 85 meters (297 feet) the power density was calculated to be 2.5mW/cm². Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time and two separate, redundant radio frequency radiation hazard safety software controls, similar to controls effectively used on the large XBR at Kwajalein Island in the RMI, would monitor all emission energy levels at locations around the radar and would not allow a full power beam to come in contact with any personnel, on the SBX platform or on land. Results of the EMR/EMI survey will be provided pending survey completion. A DD Form 1494 would be completed prior to SBX operations and would assist in defining the operating area and defining safe operating angles, power levels, etc.</td>
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<td>No exceedences of the NAAQS or state AAQS would be anticipated. See section 4.8 for additional information on Air Quality and Safety and Health issues pertaining to the SBX.</td>
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<td>Appendix G</td>
<td>As indicated in appendix G, EMR is classified as ionizing and non-ionizing. Numerous studies have been conducted regarding the health effects of low dose ionizing radiation, such as that produced by X-rays, and of non-ionizing radiation, such as that generated by radars, microwave ovens, cellular phones, etc. These studies (321 that are referenced in the latest version of IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, 16 April 1999), have resulted in the development of various operating guidelines/controls and exposure standards such as the IEEE MPELs used in the EIS analytical process.</td>
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<td>Comment noted. However, the radar beam would be in motion, making it extremely unlikely that a bird would be in the intense area of the beam and would remain there for any considerable length of time. The power density is also not expected to exceed levels that could impact birds. No significant impacts to biological resources are anticipated. The Proposed Action is not expected to result in changes to the biodiversity of the region.</td>
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<td>2.1.4</td>
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<td>Valerie Steel</td>
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<tr>
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<td>P-W-0145-2</td>
<td>Safety and Health</td>
<td>Appendix G</td>
<td>As indicated in appendix G, a large body of evidence was used in determining the current IEEE standards. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards and therefore additional studies are not warranted or planned at this time.</td>
</tr>
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<td>4.8</td>
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<td>P-W-0146-1</td>
<td>EIS Process</td>
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<td>See P-O-0087-3</td>
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<td></td>
<td>Please see section 2.1.4.1 of the EIS for addition information pertaining to the Sea-Based Platform of the SBX.</td>
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<td>P-W-0146-4</td>
<td>Safety and Health</td>
<td>Appendix G</td>
<td>New information on the potential effects of electromagnetic radiation on human health from the proposed SBX has been added as appendix G of the EIS.</td>
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<td><strong>2.1.4</strong> 2.1.8 4.3.5.2.5 4.6.5.2 4.8.5.2</td>
<td>See P-E-0340-1</td>
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<td>P-W-0146-6</td>
<td>Hazardous Materials</td>
<td><strong>Potentially hazardous materials associated with GMD ETR/SBX maintenance activities could include solvents, oils/lubricants, and paints/primers. The quantities of these materials ordered and used would be kept to the minimum for the work required. Therefore, most would be consumed during use and minimal quantities of potentially hazardous wastes would be generated. Potentially hazardous wastes would be collected for disposal in accordance with applicable state and federal regulations/requirements. Only a licensed hazardous waste carrier would transport the waste to an RCRA permitted hazardous waste treatment or disposal facility.</strong></td>
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<td>P-W-0146-7</td>
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<td>See P-E-0209-2</td>
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<td>P-W-0146-9</td>
<td>Program</td>
<td><strong>A prototype XBR (GBR-P) has been in operation at RTS since 1998.</strong></td>
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<td>P-W-0146-10</td>
<td>Policy</td>
<td>See P-E-0032-3</td>
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<td>Peggy Toepel - Everett Shorelines Coalition (Co-chair)</td>
<td>P-W-0147-1</td>
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<td>4.8.3</td>
<td>See P-E-0209-4</td>
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<td>P-W-0147-2</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td><strong>Comment noted. The radar beam would be in motion, making it extremely unlikely that a bird would be in the intense area of the beam and would remain there for any considerable length of time. The power density is also not expected to exceed levels that could impact birds. The radar main beam would be directed 10 degrees above horizontal for calibration and maintenance testing while at the PSB, which would not result in impacts to resident humans. The side lobes that reach the ground would be far removed from the main beam and would not contain sufficient energy to present any type of RF emission hazard.</strong></td>
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<td>See P-E-0011-1</td>
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<td>See P-W-0142-3</td>
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Table 8.1.1-2: Responses to Written Comments (Continued)

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<td>Bill Belshaw</td>
<td>P-W-0149-1</td>
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<td>See P-E-0006-1</td>
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<td>Robin Ahmann</td>
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<td>P-W-0150-5</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
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<td>Brenda Lynn Kerr</td>
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Table 8.1.1-2: Responses to Written Comments (Continued)

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<tr>
<td>Brenda Lynn Kerr</td>
<td>P-W-0151-5</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>Analysis in the EIS is based on effects of other similar radar systems. As stated on page 4-130, a full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of this survey. The Proposed Action will comply with all applicable federal and state laws and regulations. As stated on page 4-242, the SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts to biological resources are anticipated.</td>
</tr>
<tr>
<td>Robert Jackson</td>
<td>P-W-0152-1</td>
<td>EIS Process</td>
<td>See P-E-0208-1</td>
<td>According to analysis by the Joint Spectrum Center, air bags would have to be within 10 meters (32.8 feet) of the radar to be affected, or on the deck of the SBX. Additional information pertaining to this issue will be included in the Final EIS in appendix G.</td>
</tr>
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<td>P-W-0152-2</td>
<td>EIS Process</td>
<td>4.8.2</td>
<td>See P-E-0008-4</td>
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<td>2.1.4, 2.1.4.2</td>
<td>See P-E-0008-4</td>
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<td></td>
<td>P-W-0152-4</td>
<td>Safety and Health</td>
<td>2.1.4, 4.3.5.2.5, Appendix G</td>
<td>The EIS EMR analysis is based on IEEE C95.1-1999 human exposure standards (refer to section 2.1.4, section 4.3.5.2.5, and appendix G), and IEEE C95.3-1999 measurement practices standards (5 mW/square centimeters - MPEL models). Appendix G also discusses the potential affects of human exposure to EMR.</td>
</tr>
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<td>P-W-0152-5</td>
<td>EIS Process</td>
<td>At the time of the Draft EIS, responses from participating agencies were still being received.</td>
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<td>See P-E-0026-4</td>
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<td>Karen L. Dworkin</td>
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<td>Program</td>
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<td>Kathie Hoban</td>
<td>P-W-0154-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, 4.8.5.2</td>
<td>Sections 2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2 of the EIS indicate the SBX operating and mooring areas and general operational effects. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards. New information on the potential effects of electromagnetic radiation on human health from the proposed SBX has been added as appendix G of the EIS.</td>
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**Table 8.1.1-2: Responses to Written Comments (Continued)**

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<tr>
<td>Kathie Hoban</td>
<td>P-W-0154-2</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>Based on the additional analysis in section 4.8.9 in the EIS, the proposed project would be visible from some of the surrounding neighborhoods, and there would be a potential for a visual impact. However, the area is arguably visually similar to the present industrial and military uses and aside from the viewer being very near the SBX, it would not obscure panoramic views.</td>
</tr>
<tr>
<td>P-W-0154-3</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td></td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the redevelopment plan, it states that while it is possible that those that visit and reside in this area may be affected by the SBX, the effects would be minimal in regards to this plan.</td>
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<tr>
<td>P-W-0154-4</td>
<td>Safety and Health</td>
<td>2.1.4.2 Appendix G</td>
<td></td>
<td>Section 2.1.4.2 and appendix G of the EIS discusses potential interference with communications and electronics equipment. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. Thus, the odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). If interference occurs, the short-term effects would not damage any electronic equipment. These odds are based on conservative calculations that assume the SBX would operate in full power mode for 20 minutes each day at maximum duty cycle. New information on the potential effects of EMR on human health and communications-electronics has been added as appendix G of the EIS.</td>
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<td>R.L. Holmer</td>
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<td>Todd Combs</td>
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<td>Jan Olsen</td>
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<td>Peach Tomsin</td>
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<td>Jeff Rowe</td>
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<td>Roshaiel Tomsin</td>
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<td>Gary A Vandalfsfeni</td>
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<td>Leann Rowe</td>
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<td>Russell Silva</td>
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<td>Bryon Henault</td>
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<td>Jane Best</td>
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<td>Ryan J. May</td>
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<td>M Cogdill</td>
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<td>Stephen Clough</td>
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<td>Ed and Vera Carlston</td>
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<td>Marsha Cogdill</td>
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<td>Earl and Doris Beech</td>
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<td>Jonathan Witte</td>
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<td>Mark Underwood</td>
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<td>Tom and Vida Delany</td>
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<td>Won Chong Kim</td>
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<td>Bill Mullikin</td>
<td>P-W-0187-1</td>
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<td>B. Bruno</td>
<td>P-W-0188-1</td>
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<td>Tom and Margaret Hoban</td>
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<td>Angela Hill</td>
<td>P-W-0190-1</td>
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<td>Reg Scodeller</td>
<td>P-W-0191-1</td>
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<td>Betty Scodeller</td>
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<td>Constance Bennet</td>
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<td>Victoria Kehoe</td>
<td>P-W-0194-1</td>
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<td>Rochelle Ritchie</td>
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<td>Dolores M. Hancock</td>
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<td>Marie McLain</td>
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<td>Larry Bashoy</td>
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<td>Judy Matheson</td>
<td>P-W-0201-1</td>
<td>P-W-0154</td>
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<td>Maureen McCrea - State of Alaska, Office of the Governor</td>
<td>P-W-0202-1</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>The text has been revised in accordance with the information provided by the Alaska Department of Fish and Game.</td>
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<td>P-W-0202-2</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>As discussed on page 4-68, restricted access to the beach landing areas and road closures to the immediate area during unloading would occur. However, short-term closures would not significantly impact such aspects of land use.</td>
</tr>
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<td>P-W-0202-3</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>The five MDA launches are included in the total nine launches per year currently authorized at KLC. The exact dates and length of closures concerning the Proposed Action have not been established at this time. In addition, any restrictions of public access is further discussed in section 4.1.8.2.1 on page 4-69.</td>
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<td>P-W-0202-4</td>
<td>Cultural Resources</td>
<td>3.1.4</td>
<td>Paleontological section has been modified within section 3.1.4.</td>
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<td>P-W-0202-5</td>
<td>Air Quality</td>
<td>3.1.1.1</td>
<td>Text revised in section 3.1.1.1.</td>
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<td>Maureen McCrea - State of Alaska, Office of the Governor</td>
<td>P-W-0202-6</td>
<td>Airspace Use</td>
<td>3.1.2</td>
<td>Text in section 3.1.2.2 has been corrected.</td>
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<td>P-W-0202-7</td>
<td>EIS Process</td>
<td>See P-E-0250-2</td>
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<td>Dennis J. McLerran - Puget Sound Clean Air Agency</td>
<td>P-W-0203-1</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>Text revised in section 4.8.1.2 to state dust suppression measures.</td>
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<td>P-W-0203-2</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>It is assumed that the SBX would be considerably less than 1.39 tons per year of total HAPs and less than 0.47 tons/year for the maximum individual HAP (benzene). These levels were determined for the stationary XBR previously proposed for Eareckson Air Station with seven generators running 8,760 hours per year per generator (24 hours a day, 7 days a week), a total of 61,320 hours per year.</td>
</tr>
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<td>P-W-0203-3</td>
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<td>4.8.1.2</td>
<td>Screen modeling was not performed for the anticipated emissions from the SBX as it is a mobile source.</td>
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<td>Elizabeth Marshall - The Everett Clinic</td>
<td>P-W-0204-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, 4.8.5.2</td>
<td>See P-E-0340-1</td>
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<td>4.8.5</td>
<td>See P-E-0208-5</td>
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<td>2.1.4.2 Appendix G</td>
<td>See P-O-0057-1</td>
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<td>Elizabeth Marshall - The Everett Clinic</td>
<td>P-W-0204-6</td>
<td>Safety and Health</td>
<td></td>
<td>The SBX has not been built so measurements are not available.</td>
</tr>
<tr>
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<td>P-W-0204-7</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>Based upon documented IEEE, ANSI, and DoD RADHAZ to personnel standards, the SBX will not adversely effect personnel. Drawing comparisons between potential personnel exposure and interference to communications-electronics equipment is like comparing apples to oranges. A single pulse could degrade communications-electronic equipment, but for personnel to be effected, they would need to be radiated continuously for over 6 minutes. Also, as indicated in section 2.1.4, the port is not deep enough for the SBX to be submerged.</td>
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<td>Elizabeth Marshall - The Everett Clinic</td>
<td>P-W-0204-23</td>
<td>Safety and Health</td>
<td>4.3.5.2.5 Appendix G</td>
<td>ICNIRP EMF guidelines do not address equipment/product design and performance standards or provide guidance concerning the use of safety factors, computational methods or measuring techniques to reduce exposure and therefore have been criticized by experts in a variety of fields as lacking direct application to any equipment currently in existence. In a 31 March 1999 statement, ICNIRP recognized that physics and engineering expertise from organizations such as the IEEE is required to measure and “translate biologically justified restrictions on human exposure into practical exposure limitations”. As indicated in Section 4.3.5.2.5 and appendix G IEEE standards afford public protection and have safety factors built in.</td>
</tr>
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<td>P-W-0204-24</td>
<td>Safety and Health</td>
<td>4.3.5.2.5 Appendix G</td>
<td>See P-W-0204-23</td>
<td>P-W-0204-24 Safety and Health 4.3.5.2.5 Appendix G See P-W-0204-23</td>
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<td>See P-E-0340-1</td>
<td>P-W-0204-25 Safety and Health 2.1.4 See P-E-0340-1</td>
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<td>P-W-0204-26</td>
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<td>See P-W-0045-1</td>
<td>P-W-0204-26 Safety and Health 2.1.4 See P-W-0045-1</td>
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<td>P-W-0204-27</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>The SBX has not been built, so measurements are not available.</td>
<td>P-W-0204-27 Safety and Health 2.1.4 The SBX has not been built so measurements are not available. Additional modeling may be completed that would predict power densities over a certain time period and allow one to compute the specific absorption rates (SARs) for persons of varying heights.</td>
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<td>P-W-0204-28</td>
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<td>See P-W-0204-28</td>
<td>P-W-0204-28 Safety and Health 2.1.4 See P-W-0204-28</td>
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ICNIRP EMF guidelines do not address equipment/product design and performance standards or provide guidance concerning the use of safety factors, computational methods or measuring techniques to reduce exposure and therefore have been criticized by experts in a variety of fields as lacking direct application to any equipment currently in existence. In a 31 March 1999 statement, ICNIRP recognized that physics and engineering expertise from organizations such as the IEEE is required to measure and “translate biologically justified restrictions on human exposure into practical exposure limitations”. As with other standards, including ICNIRP guidelines, the current standard is followed until there is an official change. As indicated in section 4.3.5.2.5 and appendix G, the EIS EMR analysis is based on 1999 IEEE human exposure and measurement practices standards, C95.1-1999, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, 16 April 1999 and IEEE C95.3-1999, respectively. The equivalent ANSI designations are ANSI C95.1-1999 and ANSI C95.3-1999.

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<td>Elizabeth Marshall - The Everett Clinic</td>
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<td>4.3.5.2.5</td>
<td>ICNIRP EMF guidelines do not address equipment/product design and performance standards or provide guidance concerning the use of safety factors, computational methods or measuring techniques to reduce exposure and therefore have been criticized by experts in a variety of fields as lacking direct application to any equipment currently in existence. In a 31 March 1999 statement, ICNIRP recognized that physics and engineering expertise from organizations such as the IEEE is required to measure and “translate biologically justified restrictions on human exposure into practical exposure limitations”. As with other standards, including ICNIRP guidelines, the current standard is followed until there is an official change. As indicated in section 4.3.5.2.5 and appendix G, the EIS EMR analysis is based on 1999 IEEE human exposure and measurement practices standards, C95.1-1999, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, 16 April 1999 and IEEE C95.3-1999, respectively. The equivalent ANSI designations are ANSI C95.1-1999 and ANSI C95.3-1999.</td>
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P-W-0204-31 | Safety and Health | 4.11.3.4 | See section 4.11.3.4. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards, and therefore additional studies are not warranted or planned at this time. As with other standards, the current standard is followed until there is an official change. |

P-W-0204-32 | Safety and Health | 4.11.3.4 | See P-W-0204-31 |

P-W-0204-33 | Safety and Health | 4.11.3.4 | See P-W-0204-31 |

P-W-0204-34 | Safety and Health | 4.3.5.2.5 | See section 4.3.5.2.5 and appendix G. Additional modeling is underway to determine potential interference distances related to high power effects. Also ground-based, airborne, and ship-based systems will be evaluated for in-band, adjacent band, and harmonic band interference during detailed EMR/EMI survey that is underway. Level 2 surveys are planned to be completed in Summer 2003. A DD Form 1494 would be completed prior to SBX operations and would assist in defining the operating area and defining sea operation angles, power levels, etc. |

P-W-0204-35 | Safety and Health | 2.1.4 | The SBX is not yet built, so there are no measurements. |

P-W-0204-36 | Safety and Health | 2.1.4.2 | See P-O-0057-1 |
### Table 8.1.1-2: Responses to Written Comments (Continued)

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<td>Elizabeth Marshall - The Everett Clinic</td>
<td>P-W-0204-37</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>To date, no independent agency has not been designated for such a task. Two separate, redundant radio frequency radiation hazard safety software controls, similar to controls effectively used on the large XMR at Kwajalein Island in the RMI, would monitor all emission energy levels at locations around the radar and would not allow a full power beam to come in contact with any personnel, on the SBX platform or on land.</td>
</tr>
<tr>
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<td>P-W-0204-38</td>
<td>Safety and Health</td>
<td>Appendix G</td>
<td>As indicated in appendix G, the main beam and side lobes of the SBX could illuminate EEDs on the ground in the presence/shipping phase. However, the potential radiation hazard would exist only 10 meters (33 feet), in front of the radar, which would be limited to the deck of the SBX. Therefore, EEDs on the ground, including those associated with airbags in vehicles, would not be affected.</td>
</tr>
<tr>
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<td>P-W-0204-39</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>As indicated in section 2.4.4, alternative locations in each geographic area were considered. Based on the compatibility criteria discussed in sections 2.1.4 and 2.3.1.8, Naval Station Everett is a preferred potential PSB location.</td>
</tr>
<tr>
<td>James P. Burgess, III - National Oceanic and Atmospheric Administration</td>
<td>P-W-0205-1</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>To date, no indications of significant disturbance to the sea lions from activities on KLC have been identified. Safety crews and other personnel are briefed on harassment guidelines established by the National Marine Fisheries Service to minimize harassment. The GMD ETR program would adhere to the terms and conditions of KLC's pending harassment/take permit from the National Marine Fisheries Service. Cumulative impacts are discussed at the end of each resource.</td>
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<td>Water Resources</td>
<td>4.1.14</td>
<td>See P-W-0026-3</td>
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<td>P-W-0205-3</td>
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<td>Program</td>
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<td>See P-E-0020-5</td>
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<td>P-W-0205-5</td>
<td>Land Use</td>
<td>3.1.8.2</td>
<td>Section 3.1.8.2 acknowledges that recreation, which includes wildlife and scenic viewing, was included as a component of the more broad resource area of land use.</td>
</tr>
<tr>
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<td>P-W-0205-6</td>
<td>Program</td>
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<td>More realistic testing using trajectories and distances that closely resemble those required of an operational element is needed to ensure the GMD element being developed has the capability to defend the United States against limited missile attacks. The details on the potential barge facilities on Kodiak are the most recent and up to date information available at this time.</td>
</tr>
<tr>
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<td>P-W-0205-7</td>
<td>Program</td>
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<td>Figure 4.1.7-2 depicts a representative Exclusion and Warning area. Figure 4.1.7-3 depicts a realistic Flight Safety Corridor for potential launches out of KLC. See section 4.1.7.2.1 of the EIS for additional information.</td>
</tr>
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<td>James P. Burgess, III - National Oceanic</td>
<td>P-W-0205-8</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>An appendix has been added to the document providing a brief discussion of potential listed species (terrestrial and marine) that may be found in the areas affected by the Proposed Action. Consultation with applicable agencies has been initiated.</td>
</tr>
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<td>Biological Resources</td>
<td>4.1.3</td>
<td>As stated in section 4.1.3.5, no significant impacts to biological resources of KLC are expected from nine annual launches. It is not likely that the Proposed Action of five total launches per year, in conjunction with current planned or anticipated launches, would exceed this level of activity. Multiple failures at the same point in flight would be required to cumulatively impact biological resources. AADC has applied to the National Marine Fisheries Service for a take authorization.</td>
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<td>P-W-0205-10</td>
<td>Biological Resources</td>
<td>4.3.3</td>
<td>The SBX is designed to track an incoming target missile. Its narrow beam is always moving and looking up in order track a moving object in space. In order for tissue damage to occur, the radar’s main beam would have to rest on an animal (or human) for several minutes. Since the main beam will not come into contact with the water’s surface or remain stationary, the main beam will not come in contact with any animal at the water’s surface for any significant period of time. The only potential hazard to personnel or animals from the radar beam would be from the grating lobes that result from steering the beam. The grating lobes would be suppressed using the radar’s software for the safety of personnel on the deck of the SBX platform. Power density levels from the grating lobes at the water’s surface would be below the IEEE threshold for human exposure and at a low enough level to pose little or no chance for harm to an animal remaining at the water’s surface for extended periods of time. Results from modeling of power density levels from the SBX, in a scenario where it is tracking multiple targets, show that the power density levels are below IEEE safety levels for human exposure in an uncontrolled environment (IEEE C95.1, IEEE Standard for Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3 kHz to 300 GHz, 16 April 1999). An uncontrolled environment includes locations where there is exposure of individuals who have no knowledge or control of their exposure. Based on these results, marine species would be exposed to power density levels that are below the standard for human exposure.</td>
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<td>Page 4-148 discusses air quality impacts. The potential for impacts to biological resources from the TPS-X Radar, including protected species, is discussed on pages 4-153 through 4-155.</td>
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<td>The distance will be changed to 45.7 meters (150 feet). As described in sections 2.1.3.1.1 and 2.1.3.5, the construction would involve less than 0.4 hectare (1 acre) for the IDT and less than 0.1 hectare (0.25 acre) for the COMSATCOM.</td>
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<td>The appendix is intended to be a list and description of laws and regulations which are taken into consideration during the EIS process.</td>
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8.1.2 E-MAIL COMMENT DOCUMENTS—DRAFT EIS

Individuals who commented on the Draft EIS in e-mail form are listed in table 8.1.2-1 along with their respective commenter ID number. This number can be used to find the e-mail document that was submitted and to locate the corresponding table on which responses to each comment are provided.

E-Mail Comments

Exhibit 8.1.2-1 presents reproductions of the e-mail comment documents that were received in response to the Draft EIS. Comment documents are identified by commenter ID number, and each statement or question that was categorized as addressing a separate environmental issue is designated with a sequential comment number.

Response to E-Mail Comments

Table 8.1.2-2 presents the responses to substantive comments to the Draft EIS that were received in e-mail form. Responses to specific comments can be found by locating the corresponding commenter ID number and sequential comment number identifiers.
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From: S Canja
Sent: Saturday, March 22, 2003 3:39 PM
To: gmdetreis@smdc.army.mil
Subject: Opposition to GMD ETR

I am writing to express my deepest concern over the proposed inclusion of Midway Atoll, NWHI in the Ground Based Midcourse Defense Extended Test Range. Please continue to protect Midways unique biological resources by preserving the atoll as a wildlife refuge.

I worked at Midway Atoll from October 1997 to September 2000 as a field biologist studying the endangered Hawaiian monk seals. Since the establishment of a Wildlife Refuge with the USFWS in 1996, the birth rate of Midway monk seal population has grown substantially and continues to be delicately stable.

The beaches, reefs, and surrounding waters of Midway not only support the monk seals, but also the threatened Green Sea Turtles, Hawaiian Spinner Dolphins and a vast array of rare lagoon, reef, and pelagic fishes. Midway provides important and critical habitat for fifteen species of seabirds totally more than 2 million birds, including albatross, petrels, terns, noddis, tropicbirds, shearwaters, and frigatebirds. Midway has the largest colony of Laysan Albatross in the world, the second largest Black footed Albatross colony and has several endangered Short tailed Albatross. In addition Midway is an important stopover for migrant shorebirds.

My concern is this:

The proposed activities increase the potential for an oil spill and/or hazardous waste contamination. Midway has already still experiencing the repercussions of these acts. Because of the sensitivity of an isolated atoll, I strongly oppose risking the balance of the ecosystem any further.

Light pollution created from proposed security lights is a serious threat to nocturnal birds like the Bonin Petrel. USFWS has been working on mitigating the existing lights on the island for this reason. Bonin petrels are easily disoriented with lights and often collide into them and/or associated buildings. Because of their fragile body structure, these incidents are often lethal. Similarly, proposed antennas, power lines, fences, and satellites can pose a major hazard to seabirds, particularly albatross. Seabirds are not keyed into having obstructions to deal with and are unexpectedly caught off guard with these types of structures. Unfortunately, these mistakes could cost them their lives.

And finally, while facility locations may be inshore, away from beaches where seals haul out, the increased levels of noise pollution created during construction and the addition of regular human presence will impact nesting and resting seabirds. Undoubtedly some seabird nest sites will be displaced by the onset of a new building(s) and a large fenced in area surrounding such building(s). In addition the increased use of motor vehicles during the albatross nesting season could be hazardous to chicks who begin to wander away from their nest.

Midway Atoll was created as a National Wildlife Refuge for good reason. Many rare and endangered species have come to know and count on Midway as being a safe home. It is in the wildlife’s best interest that I oppose the use of Midway Atoll as a Ground Based Midcourse Defense Extended Test Range. Thank you for your time.

Sincerely, Suzanne Canja
From: KDONEHOWER  
Sent: Friday, March 21, 2003 10:15 PM  
To: gmdetreis@smdc.army.mil  
Subject: GMD ETR EIS

Please do not include Midway Atoll in GMD ETR. Over the past few years Midway's unique biological resources have been nurtured and preserved as a National Wildlife Refuge. Part of that care has included removal of lighting and physical structures which impede the growth, habitat, and nesting of many restricted bird populations. The proposed GMD ETR plans would reverse those moves and destroy the refurbished breeding grounds of those birds, as well as several groups of marine mammals. Much hard work, planning, and money has been spent to promote the reintroduction and re colonization of this atoll by endangered species. Please do not destroy the work that has been done there. Consider using offshore monitoring for the GMD ETR. Or perhaps, a previously established military operative base could be used, without the expense of setting up and staffing a new facility or the destruction of the breeding areas of endangered animals.

Thank you.
Kathleen Donehower
Gig Harbor WA

From: Joanna Donehower  
Sent: Sunday, March 23, 2003 12:47 PM  
To: gmdetreis@smdc.army.mil  
Subject: No to Midway Atoll Missile Defense Testing

I am writing to express my concern over the proposed inclusion of Midway Atoll, NWHI in the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR). Please continue to protect Midway’s unique biological resources by preserving the atoll as a wildlife refuge.

Joanna Donehower
From: Michael Jones
Sent: Friday, March 21, 2003 6:08 PM
To: gmdetreis@smdc.army.mil
Subject: additional comments on the GMD ETR draft EIS

21 March 2003

via E mail to: gmdetreis@smdc.army.mil
U.S. Army Space and Missile Defense Command
ATTENTION: SMDC EN V (Mrs. Julia Hudson Elliott)
106 Wynn Drive
Huntsville, AL 35805

Additional Comments on the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR) Draft Environmental Impact Statement (EIS)

These comments supplement those that I submitted on 3 March 2003. Please confirm that you have received these comments and those I submitted previously.

1) number of launches at PMRF and KLC The draft EIS does not make clear whether Strategic Target System launches from PMRF and KLC would be part of or in addition to those for the North Pacific Targets Program. I was told at the 6 March meeting in Honolulu that any Strategic Target System launches from these sites for GMD tests would not add to the totals envisioned in the North Pacific Targets Program EA. The final EIS should include tables giving the proposed annual number of launches at PMRF and at KLC for GMD tests and other programs during the expected duration of GMD testing.

2) inconsistent weights The numbers given in the 3rd line on page 218 are inconsistent. A weight of 20,000 tons corresponds to 18,144 metric tons, not 20,320 metric tons.

3) launch hazard area for 360 degree azimuth at PMRF I addressed this issue in my scoping comments for this EIS and in the comments I submitted on 3 March. I also noted in one of my comments on the North Pacific Targets Program EA that no previous environmental documents have provided details of the launch hazard area for a launch azimuth of 360 degrees. I consider the response to this comment inadequate for any meaningful assessment of the hazard area. I was told at the 6 March meeting in Honolulu that the launch hazard area could be modified (for example by reducing the maximum reaction time before the range safety officer is required to terminate an off course missile) so that the north half of Polihale State Park is excluded. The final EIS should discuss this, explicitly state what modifications are necessary for a launch with a 360 degree azimuth, and show a diagram analogous to that in Fig. 4.1.1.7.2 in the 1998 PMRF Enhanced Capability EIS for a 360 degree launch azimuth.

Michael Jones
Dept. of Physics & Astronomy
Univ. of Hawaii
Honolulu, Hawaii

Below is one of my comments on the Environmental Assessment (EA) for the North Pacific Targets Program dated 3 April 2001. This comment addresses a launch azimuth of 360 degrees for a Strategic Target System booster from the Kauai Test Facility (KTF) at PMRF.

9) The discussion of proposed launches from KTF in section 2.1.2.3 on page 222 asserts that “appropriate launch safety criteria can be applied to preclude the need for new land use requirements.” The only basis given for this assertion is "discussion with the PMRF Range Safety office." More details need to be provided to assess this assertion. This is particularly important for an initial launch azimuth near 360 degrees. One can see from figure 2.10 that a trajectory at an azimuth of 360 degrees comes within 3 kilometers of the northern part of Polihale State Park. Therefore, a warning area of the same size as shown in figure 2.7 (i.e. 4 kilometers on either side of the flight trajectory) would contain all of the park.
However, only the southern part of the park is within the current ground hazard area and is thus subject to the restrictive easement for launches from PMRF. If the warning area were to extend 37
kilometers on either side of the 360 degree trajectory, one can see in figure 1 3 that it would contain Kokee State Park and the towns of Hanalei and Princeville.

The response to this comment, dated 1 Oct. 2001, is the following:

"The warning area expands out as if from the center of a cone after the flight has left the Kauai coast thus the extended safety zone is over water. No portion of the warning area covers any new area of Polihale State Park. The PMRF Range Safety Office confirmed this during northwest and north launch discussions as part of the PMRF Enhanced Capability EIS. Since the warning area does not cover the northern part of Polihale State Park, it will also not cover Kokee State Park or the North Shore."

From: Dagirlz48  
Sent: Sunday, March 23, 2003 2:26 PM  
To: gmdetreis@smdc.army.mil  
Subject: SBX port

Gentlemen,
I am writing to add my voice to the other Everett, Washington, residents who have asked that the SBX not be ported here. My primary concern is the proximity of two hospitals within the 13.8 mile Potential Disturbance Area.

These hospitals provide care for the residents of two large counties. One is the trauma center and handles more patients than the trauma center in King County where Seattle is located. The other Providence hospital campus provides special care for neonates and pediatric intensive care.

The SBX should be located where major medical facilities such as these will be well out of the range of the PDA.

Thank you for your consideration,
Miriam Bennett, R.N.
From: Ginger  
Sent: Sunday, March 23, 2003 1:50 PM  
To: gmdetreis@smdc.army.mil  
Subject: Proposed Everett location of SBX radar

Julia Elliott  
U.S. Army  
Missile Defense Command  

RE: Proposed Everett location of SBX radar

Dear Ms. Elliott:

I am very concerned about the proposed Everett location of the Sea Based X Band radar. I feel that Everett is not a good choice for this radar. Everett is a clean, quiet residential community that overlooks Port Gardner bay. This beautiful bay is the source of vistas and recreational opportunities. We have worked hard to clean up our shoreline and protect it's natural beauty and well as increase it's economic vitality. Years ago, our shoreline was heavily industrialized and Everett was not considered a desirable place to live.

We now have the second largest Marina on the west coast with a wealth of recreational opportunities. We are poised to become one of the most livable cities in America and we have been working to increase tourism here.

The Navy is a clean and welcome presence in our bay. It gives our town an 'Annapolis' feel. But this radar is unsightly. It's presence would seriously damage our home values, environmental health, and economy.

Please consider more suitable sites that are not as populated or as rich in natural beauty as our beautiful port.

Ginger Decker  
Everett, WA

From: Marie Anne Hudson  
Sent: Monday, March 24, 2003 12:25 AM  
To: gmdetreis@smdc.army.mil  
Subject: Midway Atoll National Wildlife Refuge

To whom it may concern,

I am writing to express my concern over the proposed inclusion of Midway Atoll, NWHI in the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR). Midway Atoll should be conserved in its current state as a wildlife refuge for many reasons:

1. Fifteen species of seabirds (more than 2 million birds, including albatross, tropicbirds, boobies, shearwaters, petrels, frigatebirds, terns, noddies) nest on the atoll each year.
2. Midway is home to the largest colony of Laysan Albatross (Phoebastria immutabilis) in the world and the second largest Black footed Albatross (P. nigripes) colony. An endangered Short tailed Albatross (P. albatrus) recovery effort is also underway.
3. It is an important stopover for migrant shorebirds (curlews, plovers, turnstones).
4. The beaches, reef, and surrounding waters support endangered Hawaiian Monk Seals (Monachus schauinslandi), threatened Green Sea Turtles (Chelonia mydas), Hawaiian Spinner Dolphins (Stenella longirostris) and a vast array of rare lagoon, reef, and pelagic fishes.

This is but a short list please continue to protect Midway's unique biological resources by preserving the atoll as a wildlife refuge.

Thank you,

Marie Anne Hudson  
M.Sc. Candidate  
McGill University  
Quebec, Canada
From: Matt DeBenedetti  
Sent: Sunday, March 16, 2003 4:14 PM  
To: 'gmdetreis@smdc.army.mil'  
Subject: Opposed to SBX in Everett

Some more information

Original Message
From: Matt DeBenedetti  
Sent: Sunday, March 16, 2003 2:12 PM  
To: 'pwhitely  
Subject: SBX in Everett

Peyton,

I just read your article about the proposed SBX at Naval Station Everett, and I also read the Environmental Impact Statement. Have you read the EIS? The claims they make in that document are worthy of an article unto itself. Here are some of the highlights, which I shared with family and friends...

Hey guys,

I've learned some new things today... We all know what EPA stands for, but here are some new ones that go along with EPA (and DoD). Do you know what EMR is? How about EED? IEEE, anyone? Well the EIS that I read this morning talks about all of these things, and more! Read on...

EIS = Environmental Impact Statement
EMR = Electromagnetic Radiation
EED = Electroexplosive Device
IEEE = Institute of Electrical and Electronics Engineers

Nice, huh? There goes the neighborhood...

I am reading the Environmental Impact Statement... not much to worry about other than intense radiation discharge, navigational equipment interference, prolonged periods of significant noise generation, etc... oh wait, there is also the aesthetic impact (can you say resale value) oh, wait... the EIS says that we already have a carrier in port, and it's about as tall, so there really won't be any aesthetic impact (other than the fact that the carrier is half submerged by design!).

What's to worry about RF radiation, anyway? The EIS actually argues that because the IEEE and the EPA averages radiation level exposure per 6 minute increment, increased exposure (10x) for shorter durations is acceptable.

Yeah, so what if there is considerable published concern over the likelihood of EED (Electroexplosive devices) interference causing ejection seats in aircraft to discharge, airbags in cars to deploy, military aircraft weapons to launch and fire extinguishers to activate? It's all part of something called Main Beam Illumination, and because this radar device is designed to go in 360 degrees, everything is affected by it. Neat, huh?

The EIS also identifies that AM/FM radio, Harmonic Band Radio frequencies and aerial and nautical navigation equipment will be affected, as well (although no LONG TERM affect is anticipated) the ocean creatures like whales, dolphins, etc, who use sonar to navigate and communicate. Oh wait, I just read that television signals will also be adversely affected, and high power transmission lines will further distribute the effects beyond the immediate vicinity.

The real bonus to this is that I'll be able to look directly at the platform from my living room window. Wow, my very own converted oil platform X band Radar facility in Port Gardner Bay.

Sincerely,

Matt DeBenedetti
LEGATO SYSTEMS, INC.
Pacific NW Area Sales Manager, Xtender Solutions
OR, WA, ID, MT, WY, ND, SD, AK and Western Canada (BC, AB, SK, YT)
From: Kirsten Potter  
Sent: Saturday, March 15, 2003 11:35 AM  
To: gmdetreis@smdc.army.mil  
Subject: Midway Atoll usage

Please send me the info on use of the Midway Atoll Refuge in the DEIS. I want to study it further.

My addresses are below. Thanks!

I also wish to file the below comments in case I do not receive the DEIS information in time to allow study and more in depth comments by the cut off dates [since I am in travel status soon.]

I briefly served as fill in, acting Refuge Manager, US Fish and Wildlife Service, on Midway Atoll in 2001. I can say, from first hand observations, that it is a very unique place both biologically and historically. I also worked with the E.A. that established the Guam NWR and served as fill in Refuge Manager four times from 1993-1998.

Regarding the possible military uses on the Midway Atoll NWR, I urge that no construction or other actions be undertaken that would damage habitat in the refuge.

My specific biological comments:

a) Measures must be taken extremely vigorously to prevent alien species, like rats, brown tree snakes, mongoose or house cats, etc., into the Atoll. Every aircraft and ship cargo, crew and passengers must be very thoroughly instructed, inspected and screened to prevent transfer of life forms.

Unhappily, I know for a fact, having worked on Guam, that military commanders pushed by military deadlines are not always concerned with introducing exotic species into new habitats! They often don't listen to their staff biologists. Day to day compliance with environmental protection protocols and policies must be clearly required and routinely inspected for of all commands by order of the top military officer him or herself.

b) Measures must be taken to extremely vigorously check soil, food items and all other plant materials so that alien plants species ['weeds'] are not further introduced into Midway Atoll. Things as seemingly simple as dirt in the soil of vibram tread boots can bring in seeds or organisms that could further damage this very important habitat. Again, military commanders often ignorant of these avenues must be made very sensitive to these potentially very adverse impacts.

c) As a U.S. Coast Guard officer in the 1970's I worked oil spill control. I also received training in oil spill cleanup with the US Fish and Wildlife Service. Monk seals, green sea turtles and many, many marine organisms could and would be very greatly damaged by an oil or other fuel spill. Spills on land, especially in the Atoll's porous sand, could be equally damaging and maybe even harder to clean up. [How do you dig up all the contaminated soil and remove it when it is the island?]

Thorough training must be implemented to enforce spill prevention procedures. The routine erection of spill control barriers around every fuel storage point must be required. And, first responder spill cleanup procedures must be well instructed. Also, spill clean up materials must be stockpiled on the Atoll.

d) Night lighting on hangers, at the oil facility and street lights was causing excessive Petrel losses [collisions as they are drawn to lights just like moths] during my time. The final EIS must stipulate that lighting not in immediate use will be turned off, always. Lighting needed for longer periods must be provided with cones or shields to direct the light downward or only toward the needed location. No general night lighting, please!

e) I have seen Laysan Albatross routinely collide with old style power lines in broad daylight. The final EIS should state that except when absolutely impossible communication and electric cables are to be laid out on the ground surface. With the wide spread of Petrel burrows in the soft sand, these lines should be laid parallel to roads and not cross county.
g) When possible, exotic vegetation like Ironwood Trees should be removed. The EIS should require that in no case should non-native vegetation be further planted or propagated on the Atoll, except in food garden container areas. No more Ironwoods, no grasses to reinstate the golf course and no uncontrolled personal tree, shrub or vegetable plantings should be allowed. The risk of exotic insects and exotic plant irruptions is too great.

h) During my time, waste disposal was being very poorly handled. Existing sewage lines were breaking down, an open pit garbage dump was in use and recyclables, like batteries, were stacking up. The final EIS must stipulate repair of sewage systems including no dumping of sewage within the Atoll or within a proper [1/2 mile?] distance offshore from the Atoll. No open or closed pit garbage dumping should be allowed. All garbage must be transported off island. Maximum recycling must be employed.

i) During my time, diesel generators produced electricity. The EIS should require the maximum possible employment of solar and wind powered generators for electricity. This also would reduce the need for power lines since the power could be produced near the use site.

j) Use of battery powered vehicles of all types should be maximized in the final EIS. All people regardless of age or rank should be required, except where medically or otherwise impossible, to travel the two larger islands on bicycles. It would help people’s physical fitness. Also, this would greatly increase the compatibility of motor vehicles with the great concentration of bird life nesting on the Atoll.

Thank you for this chance to comment. We have to have a strong military but Midway Atoll has very significant biological resources that really must be protected to the very best of our abilities.

I sure fell in love with the place!

Dave Potter
Klamath Falls, OR
From: DBeames  
Sent: Wednesday, February 26, 2003 1:13 AM  
To: gmdetreis@smdc.army.mil  
Subject: SBX in Everett

Im sure Im one of many on the hillside overlooking Port Gardner Bay who feel we have sacrificed our share to the defense effort by loosing much of our view to the Navy port at Everett and her greyness, the USS Lincoln. The months when she is away making some water viewable seems a fair trade off. Please dont tell us now that we will have to look at some thing three times as high and not near so sleek. My vote is no for a SBX in Everett. In case no one has noticed, most of Puget sound is deep enough for your needs.. Indian Island sounds like a great place.

Sincerely
Dave Beames
Everett, WA

From: Craig726  
Sent: Tuesday, March 18, 2003 9:30 AM  
To: gmdetreis@smdc.army.mil  
Subject: SBX Mooring, Naval Station Everett

SMDC EN V  
Ms. Julia Elliott  
U.S. Army Space and Missile Defense Command  
P.O. Box 1500, Huntsville, AL 35807 3801

Re: Naval Station Everett, SBX mooring

The SBX environmental impact statement GMD ETR Draft EIS under estimates the impact of selecting Naval Station Everett as an SBX mooring site in the "Ocean Traffic" section 3.8.6.2.

The security lighting installed on Pier Bravo has created a hazard to navigation that does impact commercial and recreational vessels. None the navigation markers are visible when approaching from the Bay. This situation will be far worse when the USS Lincoln is in port requiring the SBX platform to be anchored.

The report also notes limited commercial freighter operation at the Port of Everett. That is historically correct as the development of Naval Station Everett has interrupted commercial operations. The Port continues to establish new business and the number of scheduled freighters stops is increasing.. This will create harbor navigation problems far greater than implied by the reports "occasional log carrier" reference.

Naval Station Everett is not the best site for SBX mooring.

Craig Bender  
recreational boater  
moored Port of Everett marina
From: Cynthia Dale  
Sent: Monday, March 17, 2003 3:07 PM  
To: gmdetreis@smdc.army.mil  
Subject: SBX Test X Band Radar

Ms. Julia Elliott,

I'm writing you today to voice my disapproval of the SBX Radar project proposed for Everett, Washington. Your Sea Based Test X Band Radar will have a profound negative impact on our town and the surrounding community.

Everett is home to the second largest Estuary in the State of Wa., the second largest pleasure boat Marina on the West Coast of America, a haven for Marine Wildlife such as Seals, Whales, Crab, Salmon, Eagles and Seagulls, all of which surround our water front Jetty and nearby Island. Everett also has a thriving water front tourist business. We are a home to the second largest multi campus hospital in the state of Wa., and to 5 nearby private and publicly owned Airports. We currently have approximately 20,000 children attending Public and Private Schools in Everett, all of which will be effected in a seriously negative way if this SBX Radar project is located in Everett. The housing market will plummet, individuals will not be able to sell their homes, and small business will vacate down town Everett; This project will devastate Everett's economy.

The Department of Defense has no business locating this Sea Based Missile Defense Program in Everett. I plan to fight this project all the way out of Everett.

Cynthia Dale  
Everett, WA.

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From: Cdonehower@aol.com  
Sent: Friday, March 21, 2003 12:28 PM  
To: gmdetreis@smdc.army.mil  
Subject: Public comment DEIS, Midway Atoll

March 21, 2003  
To whom it may concern:

I am writing to express my concern over the proposed inclusion of Midway Atoll in the Ground Based Missile Defense (GMD) Extended Test Range (ETR). I urge you to continue to preserve Midway in its current state as a National Wildlife Refuge. As a research intern for the U.S. Fish & Wildlife Service, I had the pleasure of spending three summers on Midway (1999 2001). I worked directly with 12 species of seabirds and gained invaluable skills and knowledge for my current graduate work in ornithology and a future career in conservation biology.

While Midway's role in the GBD ETR will be as a support site, and most environmental impacts will arise from proposed facilities and infrastructure construction, I have outlined some of my specific concerns regarding the DEIS below:
1. Midway's endemic flora and fauna, like many island ecosystems, suffer from decades of competition with aggressive invasive species. As mentioned in the DEIS, over 200 plant species have been introduced to Midway since the arrival of residents in 1902. However, little discussion is provided as to how military personnel will minimize the potential for the spread of existing (and introduction of new) invasive species. What precautions will be taken and how will construction areas be restored following disturbance? Will native plants be planted, or will alien species be allowed to colonize these locations?
2. Light pollution (from security lights) is a serious threat to nocturnal birds like the Bonin Petrel (Pterodroma hypoleuca); petrels can become disoriented, colliding with buildings, etc. with lethal force. Not only should USFWS approved lights be used but efforts should be made to minimize lighting altogether. Similarly, fences, power lines, antennas, satellites, and other infrastructure may impede flight patterns and pose a hazard to seabirds, particularly albatross.
### 3. Increased use of motor vehicles for construction and transportation purposes may not only degrade air quality but may increase 1) casualties of naïve albatross chicks wandering the roadways and 2) general disturbance to nesting seabirds.

4. While construction activities and facilities’ locations may be confined to inshore areas away from hauling out locations of seals and turtles, the increased levels of human disturbance will undoubtedly impact other wildlife via noise pollution (e.g., from generator operation) and regular human presence.

5. The proposed activities increase the potential for an oil spill and/or hazardous waste activities. The atoll’s remote location could make clean up difficult and costly.

**Why we should preserve Midway in its current state as a wildlife refuge:**

1. Fifteen species of seabirds (more than 2 million birds, including albatross, tropicbirds, boobies, shearwaters, petrels, frigatebirds, terns, nodies) nest on the atoll each year.

2. Midway is home to the largest colony of Laysan Albatross (Phoebastria immutabilis) in the world and the second largest Black footed Albatross (P. nigripes) colony. An endangered Short-tailed Albatross (P. albatrus) recovery effort is also underway.

3. It is an important stopover for migrant shorebirds (curlews, plovers, turnstones).

4. The beaches, reef, and surrounding waters support endangered Hawaiian Monk Seals (Monachus schauinslandi), threatened Green Sea Turtles (Chelonia mydas), Hawaiian Spinner Dolphins (Stenella longirostris) and a vast array of rare lagoon, reef, and pelagic fishes.

Thank you for accepting public comment.

Sincerely,
Christina E. Donehower
Graduate Student
McGill University, Dept. Natural Resource Sciences
Ste Anne de Bellevue, QC
CANADA

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**From: Farhana Mia**

**Sent: Friday, March 21, 2003 12:00 PM**

**To: gmdetris@smdc.army.mil**

**Subject: Ground Based Midcourse Defense**

Good afternoon,

I am writing to express my concern over the proposed inclusion of Midway Atoll, NWHI in the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR). Please continue to protect Midway’s unique biological resources by preserving the atoll as a wildlife refuge.

Thank you,

Farhana Mia
From: Jessica Forrest  
Sent: Friday, March 21, 2003 12:15 PM  
To: gmdetreis@smdc.army.mil  
Subject: proposed testing on Midway Atoll

I was disappointed to learn that Midway Atoll (Northwestern Hawaiian Islands) is to be included in the Ground Based Midcourse Defense Extended Test Range. I do not believe that this is an appropriate use for a National Wildlife Refuge. It was my understanding that Wildlife Refuges have been created to provide wildlife with relatively undisturbed habitat; this goal is clearly incompatible with military testing. At a more general level, I believe the world would be much better off if more resources were devoted to conservation and less to defense but I suppose that comment needs to be directed elsewhere.

Thank you for your attention.

Jessica Forrest

From: F. Anthony Kurtz  
Sent: Wednesday, February 26, 2003 7:05 PM  
To: gmdetreis@smdc.army.mil  
Subject: Ground Based Midcourse Defense Extended Test Range Environmental Impact Statement

To whom it may concern:

I am a citizen of the community known as Channel Islands Beach, CA, which is adjacent to Naval Base Ventura County Port Hueneme. I have owned property in this community for nearly 20 years and have lived full time in the community for the last 9 years in retirement. I naturally have concern for those events and activities, which affect the quality of life in the community and therefore have studied the Draft Environmental Impact Statement with much interest.

I must admit my analysis of the Statement is that of a layman, as I have no special scientific expertise. But, from my review of the document it would appear that a most careful attempt was made by experts to compile and assess the anticipated impacts of such an important and complex project to all areas to be affected.

As a citizen I still have some significant degree of trust that my elected representatives and in turn the career employees of the government who carry out there legislated programs are for the most part concerned in the best interest of the country and its citizens. I pray that they in turn fulfill that trust by having done as represented, a careful analysis as set forth in the above named document to identify potential risks and hazards to the environment. My layman's assessment tells me that they have done such a careful analysis.

It would also seem that it would be an intelligent decision to locate such a facility in this community because of the synergistic benefits relating to existing facilities and the geography of the proposed site. These factors seem to spell particular benefits to taxpayers particularly because it seem to be the least cost option. Furthermore, from my
understanding of the proposal, the Sea Based X Band Radar platform would either be moored at San Nicholas Island or at sea for use in various test programs. While the platform might from time to time be towed within the proximity of Port Hueneme and made visible to the surrounding coastal community it would be only for maintenance and/or repairs and such events would be of limited duration. There is no intent to have the Sea Based X Band Radar platform permanently moored within view of the surrounding coastal community when not being used in the Pacific for tests simulating incoming missile attacks.

Therefore, assuming that all of my conclusions set forth above are true, I am in support of this proposed project in general and in specifics as to its impacts upon the community surrounding the Naval Base Ventura County Port Hueneme and the adjacent San Nicholas Island facility.

In closing I wish to thank all those responsible for conducting the information hearings in the Ventura County, CA area for there respectful and helpful presentation of the EIS.

Sincerely,

F. Anthony Kurtz
Channel Islands Beach, CA

From: Jim Anderson
Sent: Wednesday, March 05, 2003 12:48 PM
To: gmdetreis@smdc.army.mil
Subject: X band dome in Everett

This is in regard to the Public Hearing in Everett on February 27, 2003.

Why should we have a billion dollar boondoggle cluttering up an already cluttered harbor? This huge white dome will only detract from the existing environment. If it were something that would genuinely keep us safe I would still have doubts about locating it here.

But it will do nothing to keep us safe. This whole missile defense idea has been proven ineffective in the few tests they have done (the results of which have been so spun that the meaning of the term "success" has been redefined to be synonymous with "failure"). And even if they could shoot down a missile with a missile it would only work if the missile were unaccompanied by decoys or chaff (which any country that can make warhead shaped mylar balloons, even North Korea, is capable of producing). Even without decoys any more than a single missile firing would not be effectively stopped. This means that countries like Russia, China or even India could easily defeat it by firing a whole bunch of missiles.

This enormous billion dollar white dome you want to stick in the bay, the X band radar, has such a short wavelength that it will warn us about raindrops, hailstones, small birds, and any other such common objects commonly occurring in the skies above us and only be able to pick up an object (but not whether it is a warhead or a similarly shaped decoy) in space if such interference is not present. Please don't waste any more of our money on defense industry welfare programs.

(Reference: "Shield of Dreams" by Tim Folger Discover magazine Nov. 2001)

Jim Anderson
resident of Snohomish County WA
From: kirsten potter
Sent: Wednesday, March 19, 2003 6:22 PM
To: gmdetreis@smdc.army.mil
Subject: Additional Midway DEIS comments

Sir,

Thank you for rushing the two volume Draft DEIS which includes military use of Midway Atoll. I read through it but don’t claim to be an expert on it, of course!

I offer these comments as additions to my earlier e-mail.

I am writing as a retired US Fish and Wildlife Service Refuge Manager who served briefly [a few weeks] in 2001 as temporary, fill in Refuge Manager on Midway as well as serving four tours as fill in Refuge Manager for the Guam National Wildlife Refuge from 1993-1998. I retired with 35 years federal service and 22 years as a Refuge Manager project leader.

a) The No Action Alternative includes the statement that Midway Atoll will continue as a National Wildlife Refuge. This statement is not made under Alternatives 1, 2, and 3.

This should be clarified. Alternatives 1, 2 and 3 should state that Midway would continue to serve as a National Wildlife Refuge. Or, if this is not true, the reasons why it will not continue as a National Wildlife Refuge must be discussed thoroughly since that action would have significant impacts in many areas.

b) The numbers of people and the duration of their stay during both construction phase and operational phase were not presented, as far as I could find. I see this as a serious omission.

Impacts from increasing the number of people living on the Atoll, both short and long term, could be significant. They may be as great or greater than the project’s operational impacts on the environment.

c) No biological mitigation measures are proposed in this document. I think this is a significant error. Monitoring, coordinating, educating and all other phases of managing the project’s on Atoll environmental impacts especially human associated impacts as above will involve significant work loads. Please include in the final EIS that funding will be provided to hire and place a qualified biological observer on Midway Atoll reporting directly to the Refuge Manager. This extra person would be required to insure that coordination, training, orientation and supervisory attention is well and continually conducted toward minimizing adverse environmental impacts.

Thank You.

Dave Potter

The project’s full impacts on many areas of Midway’s environment will vary greatly depending upon numbers and duration of people brought to the Atoll. A thorough discussion needs to be included of the impacts from these added humans, their living arrangements, allowable off duty activities and how their impacts on wildlife and the environment will be monitored, quantified and qualified. Also, how will wildlife protection rules be enforced, seven days per week and 24 hours per day? I know from experience, this will not be an easy task. This needs to be discussed in the final EIS.
March 23, 2003

U.S. Army Space and Missile Defense Command
ATTENTION:  SMDC-EN-V, Mrs. Julia Hudson-Elliott
106 Wynn Drive
Huntsville, AL 35805

By E-mail to:  gmdetreis@smdc.army.mil

Enclosed are my comments on the Ground-Based Midcourse Defense Extended Test Range (ETR) Draft Environmental Impact Statement (DEIS).

1) The Kodiak Launch Complex (KLC) is the only proposed launch site which will launch a total of 11 different vehicles (launch vehicles, targets and interceptor). The FEIS needs to include the targets and interceptors which will be in violation of the INF Treaty. The STARS is still subject to the INF Treaty (1992 STARS Final EIS, Volume 1, page 3-66), but in spite of that fact the MDA supported a launch of the STARS missile from Kodiak on November 9, 2001, which 'exploded' 6 miles off Kodiak's coastline. MDA has ignored the INF Treaty issue in previous Environmental Assessments and this issue needs to be addressed before, not after GMD expansion.

2) Comments in this DEIS are very contradictory and confusing. Page es- 4, Section ES 1.4, Proposed Action, states there will be a total of approximately 10 launches per year for the entire GMD ETR. Then, Page 2-1 (DOPPA) states approximately 15 launches per year. Clarification is also needed as to how many vehicles are actually being proposed for each launch. For example, if 5 launches are being proposed from the KLC in one year, each one of those 5 launches might include 2 targets, 2 interceptors or one of each. In reality, that would total 1-10 vehicles per year from the KLC, not including other launch sites. It is difficult to believe that 10 launch vehicles a year would not have a cumulative effect on Kodiak's air quality, commercial fisheries and natural resources.

3) The Transportable System Radar Electromagnetic Radiation hazard zones, Page es-29, Table ES-4, refers to the Alaska Aerospace Development Corporation's (AADC) 'safety procedures relative to radar operations.' The FEIS should include the radar's EMR hazards range, and the hazardous waste which will be generated by its use, since this radar was not included in the 1996 KLC EA nor the Army or Air Force's EAs.

Also, what authority does the AADC have outside of Alaska in relationship to the PMRF (Table ES-4) If the Alaska Aerospace Development Corporation is a State of Alaska entity. Please explain in FEIS.

4) Page 2-3, Section 2.1.1. Ground-Based Interceptor Systems. In reference to liquid propellants, it states:

"These liquid propellants would consist of a form of monomethyl hydrazine and nitrogen tetroxide, respectively. The liquid fuel and liquid oxidizer tanks would arrive at the site fully fueled." There is no discussion of how these highly volatile, toxic materials will be transported to the KLC.

Transportation on Kodiak's main public road system is unacceptable. The potential of an accident happening is too great a risk. Paving the dirt road to the Narrow Cape/KLC site (which is going to continue this summer) is not going to lessen the hazards of an accident happening. In fact, the road will become even more hazardous during the fall and winter because the paved roads around the city of Kodiak become 'very slick' with freezing temperatures. As the SMDC and MDA is already aware, the road to Narrow Cape consists of many S- turns and steep hills, and the defense agencies may need reminding--- the majority of the road is adjacent to cliff edges.

Page 4-54 states: "The primary hazard related to the transportation of missile components would be the
potential for an accident involving the transport vehicle and a resulting explosion/fire of solid fuel motors and/or small explosive actuation devices (used in missile control and FTS)."

5) Page 2-4, Section 2.1.1.1. states there are presently no plans to store liquid propellants on-site for the Ground-Based Interceptor other than the preloaded fuel and oxidizer tanks that would be installed on the EKV. However, this statement is contradictory in regards to the KLC, which will have a 'Hypergolic Fuel Storage Facility' for the storage of liquid fuel (Page 2-51, Table 2.3.1-1). The KLC is already 'plumbed' for liquid fuels, according to information released by the AADC over a year ago. For the past two years the Kodiak public has been outright lied to by the Alaska Aerospace Development Corporation, the Army SMDC and the MDA, when these agencies denied liquid fueled vehicles would be launched from the KLC. The liquid missile fuels must pose a great 'explosive' hazard, considering the agencies have gone through a great deal of deception to keep the public from knowing the fuel would be used, or tested.

Liquid fuel at the KLC will prevent public access to Narrow Cape/Fossil Beach, since there is no way the public can get to Fossil Beach without driving within the radius of the ESQD, and the probability is very good that the public will be denied access to Narrow Cape area by security guards when liquid fuel is stored at the KLC site.

Regarding 'Ground-Based Interceptor Security'-- "It is estimated that security related activities would occur for approximately 5 weeks for each campaign." (Page 2-5, Section 2.1.1.3). Also, Page 2-63 states: "The Beach could also be closed if a GBI missile is at the site during times of heightened security."

The FEIS should include the ESDQ for proposed ETR Targets and 'Interceptors', along with the 'Warning Zone' in nautical miles.

6) Page 2-7, Figure 2.1.2-1. The only proposed launch vehicle listed for the PMRF is the STARS. Please explain why no other missiles are being proposed for launch from that location for the ETR. Also, the KLC is the only site being considered for launching the AIT and OQLV vehicles (both which have previously been launched from the KLC). If the reason is 'safety risk' related in regards to launching from other locations, then the KLC should also be eliminated from consideration for further launches.

7) Page 2-8, paragraph 4- Ground Launched Target, states: "Land launches of target missiles would be accomplished from a fixed launch pad or silos." Launching targets from silos at the KLC would be in violation of the INF Treaty MOU, since silos are not 'above ground'. Likewise, interceptor launches from the KLC would violate the INF Treaty (long-range).

8) Page 2-9 states: "All potential ranges would be able to accommodate air delivery of a target missile with the existing support facilities and infrastructure. Therefore, no construction or additional major equipment would be required." This statement is untrue in regards to the Kodiak Launch Complex. Page 2-50, Proposed Facilities, says new GBI silos or launch pad would be required at KLC. The Narrow Cape/KLC site has no 'FAA approved' licensed runway for air delivery of missiles, boosters, etc. There is no documentation in the DEIS which gives reference to the fact that a runway will be constructed at Narrow Cape to off-load boosters and hazardous materials. If this idea is being proposed, please state in the FEIS. Hazardous fuels (hydrazines, nitrogen tetroxides e.g) had to be shipped to the PMRF only by aircraft or cargo vessel--
Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)

14. NOT BY LAND (1992 STARS DEIS, page 2-31). However, the MDA proposes to transport the same hazardous fuels in addition to the more hazardous 'Hypergolic Missile Fuels' and 'Oxidizers' on Kodiak Island's main public road system to the KLC site. If this situation was a public safety issue for the PMRF, it is also unacceptable to transport fuel-filled missile boosters and volatile missile related materials on Kodiak's main public highway.

The FEIS should include discussion of how target missiles and interceptors would be delivered from Ft. Greeley to the KLC (public transportation hazard on the ONLY highway to Anchorage, e.g.) Since Ft. Greeley is considered the Deployment location, it should be included in the FEIS as such.

Transporting missiles /interceptors to Kodiak from Ft. Greeley, will make Ft. Greeley a 'major player' in the GMD ETR and it should be included in the FEIS. Also, if Kodiak is going to be considered a 'Deployment' location, that information should also be included. According to a August 5, 2002 'Wall Street Journal' article, the Sea-Based X-Band Radar "will be linked to at least 10 ground-based interceptors in Alaska." 6-10 missile interceptor silos in Alaska are presently being built at Ft. Greeley. The Wall Street Journal article also stated the SBX-Band Radar will be used to "guide test interceptors located on Kodiak Island." It is evident that Ft. Greeley is a major component in the GMD ETR, even though it was not discussed in the DEIS. Ft. Greeley's participation in the GMD ETR program needs to be included in the FEIS; Otherwise, the MDA is attempting to deceive the public once again.

The FEIS should include the type of Ground-Based Interceptors being proposed for the GMD ETR. According to a BMDO news release on March 07, 2003, the Missile Defense Agency has put out a contractor's bid for the 'Kinetic Energy Interceptor (KEI) program. Will this particular interceptor be tested at the KLC and other launch locations (sea/air based) as part of the GMD ETR? If so, include it in the FEIS.

9) Page 2-42, Figure 2.1.8-2- The map shows Targets or Interceptors launched in a SW launch trajectory down the east side of Kodiak Island will pose a potential hazard from falling missile debris, which could land anywhere within the 70 nm 'Warning Zone' (populated land areas e.g.), for the STARS missile. No calculations are given in the DEIS for the other proposed SW launch trajectories of target/interceptor missiles from the KLC, which shows the velocity and 'Warning Zone' for each proposed missile launch. Page C-9, Debris Impact Areas- states: "Debris consists of missile fragments that may land upon structures or populated areas. Fragments may include burning propellants which could explode or burn thus posing additional hazards (explosion or fire)."

As I have stated in previous written comments, all proposed SW launch trajectories down the east side of Kodiak Island should be ENTIRELY ELIMINATED from consideration in the FEIS, because of populated villages. Some Kodiak Island villagers may be supportive of the MDA's proposed activity (as one MDA comment states in the DEIS), however, that does not mean that native village people are in support of potentially hazardous missile debris falling on their property. The recent 'Space Shuttle' tragedy is a perfect example of how far debris can scatter in the air from an accident. The MDA is ignoring public safety issues by refusing to eliminate this particular launch trajectory. WHY?? Are 'minorities' more expendable? The MDA can not assume a launch accident will not happen. The November 9, 2001 KLC STARS missile is another example. What if that same missile had exploded in 'mid-air' during a SW launch trajectory, and debris fell over/near Old Harbor?
10) Page 4-35, Cumulative Impacts states: “there will be no cumulative impacts anticipated at the KLC from launches proposed for the GMD ETR program, since combined activities would be performed at different times and locations.” There is no basis for this statement, considering that there has not been any ‘dual launches’ from the KLC. Page 4-169 states: “In the event of dual GBI launches, the exhaust products are conservatively estimated to be twice the level of a single launch.” Common sense dictates that exhaust from dual launches up to 5 times a year at the KLC would potentially pollute the land and fishing waters in the Narrow Cape area, especially in the vicinity of the popular Pasagshak River State Park if the wind blows in that direction during a launch.

11) Page 4-55 (last sentence) states: “The same ESQD would be established and enforced while the missile components are at the KLC.” Considering the fact that 5 launches per year from the KLC is being proposed, and the fact that there will be 1-10 vehicles /missiles launched per year, depending on whether the launches are ‘dual’ in nature, it seems reasonable to assume that the Narrow Cape/Fossil Beach area is going to be closed to the public for a good portion of the year, especially since the GBI (booster stages and EKV) would be assembled at the KLC (and other test sites), as stated on Page 2-3 (Ground-Based Interceptor Systems). If this is the case, the FEIS needs to clarify and state the fact if the public will lose access for most of the months of each year.

The Narrow Cape/Fossil Beach area is State of Alaska ‘public’ property-----NOT ‘Federal’ property. As such, the public has the right to access the area and beaches without federal restrictions. The MDA is taking over one of the most highly public- use areas on Kodiak’s road system, especially in the summer when people use the Narrow Cape area and beaches for camping, hiking and fishing. A city-wide population of approximately 14,000 people (not including village people), are confined to 50 miles of road system, which ends either at Narrow Cape or Chiniak. Imagine….. one main road—50 miles long, for 14,000 people! Even then, because of rocky cliffs, forest growth etc., much of the land on the main road system is not accessible to the public. Two thirds (2/3) of Kodiak Island is already Federally owned (Wildlife Refuge). The remaining land on the road system is either Borough, Coast Guard or privately owned property, so public recreational property is very limited to Kodiak residents. So limited in fact, that it is becoming a problem in more ways than one.

The majority of people in Kodiak do not own boats in order to escape to nearby islands for recreational purposes, so they are dependent on the recreational areas on the main road system, which have been available to them for the last 50 years. Narrow Cape is one of those areas, and now—because of future KLC security issues, the Defense Department is going to deprive the public from enjoying State of Alaska entitlement.

NOTE: Constitution of Alaska. Article. VIII, Section 1. Statement of Policy. “The natural resources of Alaska “belong” to Alaska and to Alaskans in a way that, in the federal system, Alaska’s society and economy in general do not.” Article VIII, Section 2. General Authority. “The legislature shall provide for the utilization, development, and conservation of all natural resources belonging to the State, including land and waters, for the maximum benefit of its people.”

The development of a missile launch site at Narrow Cape is not ‘beneficial’ to the public when ‘federal’ security actions will be enforced on ‘public’ roads and property. The public will lose access to the land and beaches at Narrow Cape when Interceptors, liquid fuels, and boosters are on the KLC site, and when the ‘TPS -X’ radar is being tested.
10) Page 4-35, Cumulative Impacts states: “there will be no cumulative impacts anticipated at the KLC from launches proposed for the GMD ETR program, since combined activities would be performed at different times and locations.” There is no basis for this statement, considering that there has not been any ‘dual launches’ from the KLC. Page 4-169 states: “In the event of dual GBI launches, the exhaust products are conservatively estimated to be twice the level of a single launch.” Common sense dictates that exhaust from dual launches up to 5 times a year at the KLC would potentially pollute the land and fishing waters in the Narrow Cape area, especially in the vicinity of the popular Pasagshak River State Park if the wind blows in that direction during a launch.

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The Narrow Cape/ Fossil Beach area is State of Alaska ‘public’ property——NOT ‘Federal’ property. As such, the public has the right to access the area and beaches without federal restrictions. The MDA is taking over one of the most highly public-use areas on Kodiak’s road system, especially in the summer when people use the Narrow Cape area and beaches for camping, hiking and fishing. A city-wide population of approximately 14,000 people (not including village people), are confined to 50 miles of road system, The MDA’s actions are ‘deplorable’, especially when there are other GMD ETR options (sea and air launches and continued launches from ‘Federal’ launch locations), rather than taking over public property. The MDA does not absolutely have to have a missile launch site in Kodiak, it ‘prefers’ the location in order to test some of its newly developed weapon and fuel systems along with ‘classified’ research, which poses too great of a risk to test in large populated areas.

12) The DEIS does not list the KLC contamination control procedures, nor the management of hazardous material use, storage and disposal of liquid waste. The DEIS refers to an ‘off-site’ location for some of the hazardous KLC waste, but the off-site location is not named. Will some hazardous waste be taken to a Soil Remediation Facility on Kodiak Island? If so, what facility and what type of waste (liquid, soil, e.g)? Will hazardous waste go to the Kodiak Borough landfill outside city limits? If so, what kind of waste? The landfill is already near capacity.

13) How will the location of the Transportable System -X Radar (TPS-X) at Narrow Cape/KLC affect public access of the area? Page 2-61. TPS-X Radar, states the TPS-X radar is a wide band, phased array radar system, and “EMR hazard exclusion areas would be established around the TPS-X radar antenna.” If the radar system emits an electromagnetic radiation "due to potential sidelobe exposure", within 1,312 feet, how will the public access Fossil Beach and stay out of the radar’s hazardous zone? Page 2-61. Launch Complex Security states: “ It is assumed that testing would be on a campaign basis and the security for these tests would be on a similar basis. It is estimated that the security activities would occur for approximately 5 weeks for each campaign.” Now, it sounds as though the public is going to be further restricted to Narrow Cape by the radar’s testing phases. More clarification is needed in the FEIS.
14) A wide band, phased array, sidelobe radar system already exists on the Kodiak road system (Chiniak), and is located only a few miles across from the Kodiak Launch Complex. It emits an 'electromagnetic wave beam'. Another similar radar system is in King Salmon, Alaska on federal property (old Air Force Base). The transmission of these radar systems would pose an immense hazard to a missile's electronics during a launch, possibly by causing a missile's electronics to heat up and potentially causing the missile to 'explode'. How could the MDA ignore such a 'powerful' radar system (1.9 MW transmission) which is very close to the Kodiak Launch Complex, and fail to include it in the DEIS when other GMD ETR radars and sensors are listed? Is it possible that this radar system will be used to test the Air Force's 'Directed Energy' defense program? The radar's purpose needs to be included in the FEIS, along with the radar's public health hazards. The FEIS needs to include more detailed information on how all of the radar systems will correlate with one another and the EMR hazards if all of them are transmitting at once. If all of these radar systems will be correlated at the same time as part of the GMD ETR program, then include information in the FEIS. The Chiniak electromagnetic wave radar has the capability alone to emit EMR far into the atmosphere AND the ionosphere, and its EMR range would be very beneficial in monitoring or possibly 'intercepting' any 'reentry' vehicles.

Assuming all radar systems will be turned on at the same time as part of the GMD ETR (the' KLC TPS-X Radar', the Chiniak and King Salmon electromagnetic wave radars, AND the 'Sea-Based X-Band radar'-- a tremendous amount of EMR will be focused in the airspace at once. It would be an environmental hazard to aircraft and birds which were not able to escape the high level of electromagnetic transmission.

It is now beginning to make sense why the Department of Defense is asking for an 'exemption' from the 'Migratory Bird Act.' If bird populations begin to decrease because of all the EMR transmission as part of DOD testing (Sea-Based Test X-Band Radar e.g.) then the department would not be held accountable for its actions. If the radar systems did not pose a hazard, the DEIS would not have made references to birds.

15) Regarding the Sea-Based Test-X Band (I note the wording 'test'). How can the MDA know what all of the potential hazards will be from the radar during its various test mode locations along its route to the Pacific Ocean and to Alaska? The radar system is going to pose great hazards to commercial airlines and small aircraft along its 7 months route. During the radar's 'testing' calculations, how will the MDA 'calculate' how many species and numbers of birds will be killed or 'fried' when they fly through the X-Band transmission? Include that information in the FEIS.

The DEIS EIS does not name the 'remote' areas the SBX will operate. Include these locations in the FEIS.

Since the MDA already knows the SBX is going to be tested, why was the 'DD Form 1494' not filed with the Military Communications Electronic Board ahead of time and the results included in this DEIS? The public would then know what EMR risks will be involved in the radar's transmission. Please include the DD 1494 Form and the Military Communications Electronic Board's comments and recommendations in the FEIS. Once the FEIS is distributed and the SBX is in operation, the public will not know what comments were made by the Military Communications Electronic Board concerning the radar's operation.
16) Page 4-55 states: "The same ESQD would be established and enforced while the missile components are at the KLC." If a minimum of 5 single/dual launches per year (potentially 9 or more in the future) will take place from the Kodiak Launch Complex (KLC) and launch personnel will be at the KLC site for up to 2 1/2 months before and 2 weeks after launches, it is reasonable to assume the public is going to lose access to Narrow Cape/Fossil Beach for the majority of each year, including having to evacuate the 'extremely popular' Pasagshak River fishing area in the summertime (ESQD) if barges are off-loaded at Barge Landing #3.

The FEIS needs to include descriptive diagrams which show the ESQD for 'Interceptor' launches, along with the 'Warning Zone' for potential interceptor debris should an accident occur.

17) Page 4-137 states: "Targets launched from KLC, Vandenberg AFB, air and/or ocean platforms, if not destroyed by intercept, would impact in the BOA or possibly on uninhabited islands within the precalculated debris hazard/impact zone." Page 4-138 (Figure 4.3.5-1) shows launch protection circles for launches from Reagan Test Center, but no other locations. The Alaska coast has many uninhabited islands, but many of the islands are haulout areas for Stellar Sea Lions. A few of the locations are: 'Dangerous Cape' (haulout), 'Cape Barnavous' (a 'major, official, designated haulout'), 'Two-Headed Island' (major haulout), 'Cape Kaguljak', 'Sitkinak Island' (a 'major rookery and haulout' on the east side of Kodiak island). Why were these locations not included in the DEIS? Stellar Sea Lions are an endangered species as the MDA is well aware. Include all Stellar Sea Lion haulouts and rookeries in the FEIS which would be potential impact areas for missile debris and/or booster drop zones.

18) Page 3-14. Affected Environment. The MDA has been given expert opinions regarding the Geological and Soil Status at Narrow Cape/KLC. The expert opinions alone should justify why a missile site should not be located on Kodiak Island. Page 3-15, "The Narrow Cape fault also poses a surface rupture potential at KLC. The U.S. Geological Survey concluded that the fault was active." Page 3-18 states there is a landslide approximately 1,400 feet long near the Pasagshak Point Road, and "the landslide feature itself may actually extend to within the project site boundaries." The same page then states "no detailed fault studies have been performed for the entire KLC site". WHY not?

Page D-1. Appendix D— Engineering Field Analysis of Seismic Design Building Standards for Existing Facilities at Kodiak Launch Complex states: "the shaking hazard at Kodiak is significantly greater than was previously recognized and exceeds standards such as the Uniform Building Code that have traditionally been used as a basis for design and construction in the Kodiak area."

Seismic hazard analysis of Narrow Cape has been ongoing for the last couple of years and the study should be almost completed, but the DEIS fails to include any of the analysis completed to date. Page D-1 states this analysis is currently not available for use in the Draft EIS, but the information will be evaluated and taken into consideration upon the completion of the study. The MDA should already have enough evidence on hand to concur that the land at Narrow Cape should be excluded as a launch site. A seismic hazard analysis should have been done in 1995 before the AADC started construction of the KLC.

Page D-2. The MDA’s "valid assumption" that the present KLC facilities comply with the 1994 edition of the 'Uniform Building Code' is not good enough to continue further construction at Narrow Cape/KLC. How can the
From: Matt DeBenedetti  
Sent: Sunday, March 16, 2003 2:04 PM  
To: 'gmdetreis@smdc.army.mil'  
Subject: Everett, WA SBX  

Ms. Elliott,  

I am writing this letter to express my opposition and concern regarding the SBX proposal in Everett, WA. Not only does this equipment pose a serious health hazard to the residents of the community, but also it detracts from the natural beauty of Port Gardner Bay in the Puget Sound. I would like to receive details regarding this proposal.

The info about the Sea Based Radar is as follows:

It is called the SBX and looks like an oil rig topped by a huge sphere that will sit 250 feet above the water and measures 390 feet in length. None of the links they provided for more information work—how convenient! But there is a name and email address for someone to contact with the program is:

SMDC EN V, Julia Elliott  
U.S. Army Space and Missile Defense Command  
P.O. Box 1500  
Huntsville, AL 35807  
gmdetreis@smdc.army.mil <mailto:gmdetreis@smdc.army.mil>

All comments have to be submitted by March 24th to the person listed above.

Sincerely,

Matt DeBenedetti  
LEGATO SYSTEMS, INC.  
Pacific NW Area Sales Manager, Xtender Solutions  
OR, WA, ID, MT, WY, ND, SD, AK and Western Canada (BC, AB, SK, YT)

Carolyn Heitman  
Kodiak, Alaska

MDA 'verify' the design of the KLC structures when it was not able to obtain a copy of the calculations to verify the design? This is unbelievable! The Code may now require less load capacity than it did when the KLC buildings were designed—however, the earthquake magnitude rating has also changed since the KLC was constructed.

An earthquake rating of 7.0 magnitude in 1995, would now be a 10.0 magnitude. The FEIS needs to include the present earthquake magnitude measurements in reference to the KLC/Narrow Cape location.

19) The STARS missile is still subject to the 'INF Treaty' and should be eliminated from further launches from the KLC. The Final EIS will not be released until August 2003, which ironically is the same month the White Sands Missile Range with MDA support, is already proposing to launch another strategic long-range target from Kodiak, Alaska (Army Magazine-December 2002). There should be no further long-range target or future interceptor launches from Kodiak, nor expansion of the GMD program until treaty issues are confronted and dealt with.

20) The DEIS did not include public hearing, public comments transcripts, etc. (Section 8.0) Why were these excluded? The FEIS should include ALL public comments in full by each individual and agencies (written and oral), and the comments should not be 'summarized' as they are in this Draft EIS. Comments by individuals and state and federal agencies have always been included in full in previous Final EIS's. Please do not take 'short cuts' by summarizing, as it is not beneficial or respectful to the public when people have taken their time to make oral and written comments (especially written comments).
From: Isabel Julian  
Sent: Friday, March 21, 2003 9:47 AM  
To: gmdetreis@smdc.army.mil  
Subject: Midway Atoll

To whom it may concern,

I am writing to you in regards of the plans to use Midway Atoll as a missile testing facility. I am wildlife biology student from McGill University in Montreal, Quebec, Canada and there are several concerns that I would like to bring up concerning this project.

1. Midway’s endemic flora and fauna, like many island ecosystems, has suffered from decades of competition with aggressive invasive species. As mentioned in your EIS, over 200 plant species have been introduced to Midway since the arrival of residents in 1902. However, little discussion is provided as to how military personnel will minimize the potential for the spread of existing (and introduction of new) invasive species. What precautions will be taken and how will construction areas be restored following disturbance? Will native plants be planted, or will alien species be allowed to colonize these locations?

2. Light pollution (from security lights) is a serious threat to the nocturnal birds like the Bonin Petrel (Pterodroma hypoleuca); petrels can become disoriented, colliding with buildings, etc. with lethal force. Not only should USFWS approved lights be used but efforts should be made to minimize lighting altogether. Similarly, fences, power lines, antennas, satellites, and other infrastructure may impede flight patterns and pose a hazard to seabirds, particularly albatross.

3. Increased use of motor vehicles for construction and transportation

4. While construction activities and facilities’ locations may be confined to inshore areas away from hauling out locations of seals and turtles, the increased levels of human disturbance will undoubtedly impact other wildlife via noise pollution (e.g. from generator operation) and regular human presence.

5. The proposed activities increase the potential for an oil spill and/or hazardous waste contamination. The remote location of the atoll could make clean up very difficult and costly.

The Atoll is a unique environment and should be left as undisturbed as possible. There is potential for much damage that would be irreversible and devastating. Please reconsider your plan of using this unique biological area as a testing site, and continue to preserve it as a natural refuge.

Thank you

Isabel Julian
Montreal, Quebec, Canada
From: rmgibson
Sent: Thursday, February 27, 2003 11:23 PM
To: gmdetreis@smdc.army.mil
Subject: VAFB Range Expansion

As a 24 year Air Force veteran, I take exception to the nonfactual statements of Ms Baker (as reported in the Lompoc Record, Lompoc, CA dated February 26, 2003). Obviously she is not aware of the fact that had it not been for the missile/nuclear stand off with the USSR during the cold war she would be either speaking Russian or learning how to today. She is of the opinion that if we had dumped all our missiles, warheads, munitions and sent the Navy to the ocean bottom, all would have been peace and light with the Russians.

I stood the ramparts during the Korean, Cuban crisis and the cold war and when I hear the uninformed, simplistic mewings of people like Ms Baker, I can only say that they should have walked in my shoes for those 24 years. Mr. Ruhge hit the nail on the head when he stated that there is no factual evidence of any harm to either people or the environment during the years of missile testing at Vandenberg AFB. The current missile launch schedule is only a small fraction of what it was 20 years ago.

With the known ability of North Korea to hit the west coast with a missile, it would seem logical to have all the protection that we can have. With any degree of accuracy, San Luis Obispo would be well within the circular area of probability for a missile armed with a nuclear warhead aimed at Vandenberg.

If you are looking for inputs, I am solidly in favor of this program.

Richard Gibson
Lompoc, CA

From: Graeme Marsh
Sent: Monday, March 24, 2003 6:24 PM
To: gmdetreis@smdc.army.mil
Subject: Protest & Complaint about inadequate information and debate process

To Whom It May Concern,
The US Military,
re: Proposed new US Military activities on Kauai

March 24th, 2003

To Whom It May Concern,

The US Military,

Dear Sir(s) / Madam(s),

It has come to my attention as a tax paying resident of Kauai, a county in the State of Hawaii, that the US military proposes to increase its operations on Kauai, with an emphasis towards the proposed "Star Wars" initiatives.

There has been no public hearings here on Kauai to allow the general public, especially Kauai residents, to be made fully aware of:

1: The precise nature of such proposed increases in US military activities, and operations on our island home.

2: Disclosure and public debate related to necessary Environmental Impact study results of the proposed increased levels of military operations here on island.

3: The impact on access to, and use of traditional Hawaiian sites and locations that are critical to the ongoing practice of the ancient rites and ceremonies by the Hawaiian Peoples.

Richard Gibson
Lompoc, CA
To this end I demand that there be public hearings held here on this island, that full disclosure of all environmental impact studies be made, and that all rights of the indigenous Hawaiian population be upheld, and preserved.

If no such environmental impact studies have been made, then I further demand that such detailed studies be undertaken, and the results made available to the public, and that a full debate of such issues take place before the US Military proceeds any further.

Regards,
Graeme Marsh.

Graeme Marsh
Kapaa HI

---

From: Sallyskims
Sent: Monday, March 24, 2003 12:38 PM
To: gmdetreis@smdc.army.mil
Subject: klc draft eis

below is a list of questions regarding the draft EIS for the Kodiak launch proposals

1. EIS states information from the faa on the weather facts that KLC has a wind direction average of "NW". FAA gets this info from the Kodiak airport which is set between two mountain ranges. Kodiak airport wind is from a funnel between the two ranges, concluding that variations of winds from WNW to ENE feeds this valley in the direction of NW or SE. In the EIS, it is also stated that KLC has a "Marine" environment different from the "Inland" climate. Maybe the weather facts and information should have been taken from the off shore data buoys that depict a more accurate wind and weather averages. National Data Buoy Center(NDBC) shows not the average but duration of wind directions. Most winds blow NE or SE/SW. Both of these winds pose a hazard to Old Harbor and Kodiak City if there were an in flight catastrophic failure with great amount of fallout.

2. With the great proposed expansions of the KLC, you need to have a second look at the current fire fighting equipment and personnel. Currently they have a flat bed truck with a water tank on it as their "fire engine". The "specially trained" fire fighters are actually off duty city and Federal fire fighters that have little training in responding to rocket mishaps. Do you think that the current fire fighting equipment is adequate for even a small fire? Please address the true needs of a fire department.
3. (4.1.3.2.1) page 4 26 states information on debris of solid fuel's aluminum oxide and the solubility of the fuel. The EIS used the U. S. Air Force (Lang, et al, 2000) study on the measurement of prechlorate in dilution. This study was done at water temps at 84 degrees F. I do not think that the study accurately represents the waters of the KLC. At F 84, the prechlorate was diluted to a "safe" level in 270 days. How long would it take to dilute in water temps of the KLC surrounding waters? If the there were an in flight abortion and the fuels, solid or liquid, were to land in Pasagshak bay, using the information given, 270 days of dilution could disturb or kill the salmon runs of four sub species for a year cycle. Using an accurate dilution chart of the prechlorate in water temps associated in the KLC areas, how long would it take and how would the salmon and other wildlife be effected or altered if exposed to these fuels?

4. The EIS addressed the KLC's Environment Monitoring Plan which requires five pre launch and five post launch aerial surveys for endangered species. The fact is that there has been 0 aerial surveys due to weather. What is the point of having the survey and for it to be required if the environment has yet to cooperate.

Please review these questions. I would like to have a copy of the EIS when complete.

David Skimin
Kodiak, Ak

From: Bruce MacCracken
Sent: Monday, March 24, 2003 4:18 PM
To: gmdetreis@smdc.army.mil
Subject: SBX in Pert Gardner Bay, Everett, WA

Dear Ms. Julie Elliott,

We are citizens of Everett, WA, and would like to voice our strong opposition to the placement of the SBX in our harbor.

There are many issues that concern us in regard to this project and it is difficult for us to speak to these issues intelligently since there has been a dearth of information on the subject. A letter to you, Ms. Elliott, from Walter Seldon of the Port Gardner Neighborhood Association parallels our concerns.

However, there is one issue we would like to address: the visual and aesthetic impact. This will have a profound negative impact on Everett's economic development, revitalization of the downtown core and pending development of the waterfront. There has been a tremendous amount of work on the part of citizens and our local government to bring about positive changes in our city. Progress has been slow but steady and our reputation is gradually improving. With the downturn in the economy we are already facing hurdles that hinder our forward progress. Do not provide us with another hurdle which could well be the straw that breaks the camel's back.

Our home does not have a view of the harbor but we do have our eyes on Everett's future and, with that in mind, we strongly oppose siting the SBX in the heart of our crown jewel: our beautiful harbor.

Sincerely,

Amy Winterscheidt and Bruce MacCracken
From: Fmmccord
Sent: Friday, February 28, 2003 12:33 AM
To: gmdetrieis@smdc.army.wil
Subject: MDA’s GMD at Naval Station Everett

We appreciated the presentations made at the Everett Holiday Inn today.

I have to admit that some of the technical aspects of this proposal are over our heads. However there is a majority of our community that support this proposal for the following reason:

The country understands the impact and changes resulting for September 11.

We are fighting a war with terrorists who are dedicated to our destruction by any and all available means.

Seattle was reported to be one of the top ten terrorist targets in the country.

North Korea has missiles that can reach the West coast.

North Korea is now able to make one atomic bomb a month.

Unfortunately these conditions will probably get worst not better in the future.

The Seattle area is very liberal and has its share of antiwar groups who always show up in meetings such as yours to voice their concerns. The silent majority rarely comes out but I know from past experience that there is great support for defending the country.

There is a large population of retired military living in this area who are very supportive if we need them.

I am confident that the Everett community will support the GMD proposal as strongly as we support Naval Station Everett and our military forces.

Frank McCord
Chairman of Cascade Bank and the Navy Relations Committee
From: David Bird  
Sent: Friday, March 21, 2003 7:43 AM  
To: gmdetreis@smdc.army.mil  
Subject: midway atoll

While I have personally not had the pleasure of visiting Midway, a number of fellow scientists and friends of mine, including one of my current graduate students, have spoken very highly of this place as a refuge for wildlife.

Is there no place on earth that humans can leave alone, or at least minimize our impact so that birds and other wildlife can thrive? Even when we set up wildlife refuges such as the one in Alaska, there are those who cannot seem keep their fingers off them if there is money involved. While I do understand the need for developing weaponry for fighting the scourge of terrorism, can the U.S. government not find an alternative place, one with less value for wildlife and the scientists who study it, to Midway Atoll? Please reconsider your decision to test bombs in this area.

David M. Bird, Ph.D.  
Professor and Director  
Avian Science and Conservation Centre  
McGill University  
Quebec

From: JosÈe Rousseau  
Sent: Friday, March 21, 2003 3:40 PM  
To: gmdetreis@smdc.army.mil  
Subject: Protection of Midway Atoll

TO:  
U.S. Army Space and Missile Defense Command  
ATTN: SMDC EN V (Mrs. Julia Hudson Elliot)  
106 Wynn Drive  
Huntsville, AL 35805  
U.S.A.

I am writing to express my concern over the proposed inclusion of Midway Atoll, NWHI in the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR).

Please continue to protect Midway's unique biological resources by preserving the atoll as a wildlife refuge.

Why we should preserve Midway in its current state as a wildlife refuge:

1. Fifteen species of seabirds (more than 2 million birds, including albatross, tropicbirds, boobies, shearwaters, petrels, frigatebirds, terns, noddies) nest on the atoll each year.
2. Midway is home to the largest colony of Laysan Albatross (Phoebastria immutabilis) in the world and the second largest Black footed Albatross (P. nigripes) colony. An endangered Short tailed Albatross (P. albatrus) recovery effort is also underway.
3. It is an important stopover for migrant shorebirds (curlews, plovers, turnstones).
4. The beaches, reef, and surrounding waters support endangered Hawaiian Monk Seals (Monachus schauinslandi), threatened Green Sea Turtles (Chelonia mydas), Hawaiian Spinner Dolphins (Stenella longirostris) and a vast array of rare lagoon, reef, and pelagic fishes.

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
The inclusion of Midway Atoll, NWHI in the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR) will have several negative impacts on its fragile equilibrium. Just the fact that the island is home of several endangered species should be enough to remove Midway Atoll as a test range location.

Thank you,

Josee Rousseau
Dept. Natural Resource Sciences
McGill University
Ste Anne de Bellevue, Quebec
Canada

| COMMENT NUMBER | From: lari.belisle
|               | Sent: Thursday, February 27, 2003 2:23 PM
|               | To: gmdetreis@smdc.army.mil
|               | Subject: EIS  GMD Extended Test Range

I have just completed a cursory review of the draft EIS for the Ground Based Midcourse Defense Extended Test Range. I would like to comment on the aspect of commercial air traffic as it is impacted by launches from the Kodiak Launch Complex.

I have been directly involved with KLC since its beginning. Through close coordination and refinement of procedural issues as they relate to the integration of missiles from a commercial launch facility into the National Airspace System, we have been able to reduce the impact to commercial aviation but never eliminate it. In paragraph 4.1.2.2, reference is made to the En Route Airways and Jet Routes and is summarized to imply that there is no disruption to air traffic. This is not true. Figure 3.1.2.1 only shows that portion of the airway structures north of KLC. The airway structure that exist south of the KLC is not addressed and is significantly impacted.

Everyday, commercial aircraft travel between North America and the Far East. In the Anchorage ARTCC Flight Information Region alone, this number can be between 60 and 80 a day. Additionally, within Oakland ARTCC’s Flight Information Region, this number can reach as high as 150 per day.

To restrict your scoping to the impact to commercial aviation to those airways north of KLC does not portray an accurate picture of the impacts to commercial aviation. Working in concert with representative of Alaska Aerospace Development Cooperation and the airline industry, we have managed to reduce the impacts to commercial aviation. However, each launch can cost the airline industry hundreds of thousands of dollars in operating expenses. This is due to aircraft having to fly around safety areas on alternate routes and in many cases, a disruption to their schedules to accommodate the restricted flight areas.
There is a typographical error in paragraph 3.1.8.2 Recreation. Pasagshak State Recreation Area is located the northwest of KLC in lieu of northeast.

If I can be of any further assistance, please do not hesitate to contact me.

Lari Belisle
Airspace and Procedures Specialist
Anchorage ARTCC

From: Ivona Xiezopolski
Sent: Thursday, February 27, 2003 12:43 PM
To: gmdetreis@smdc.army.mil
Subject: Testimony against missile expansion tests

Ms. Julia Hudson Elliott,

STOP THE EXPANSION OF "STAR WARS" MISSILE TESTS!

The U.S. Missile Defense Agency proposes a massive expansion of its missile defense tests- Ground based Midcourse Defense (GMD) Extended Test Range (ETR) in the North Pacific to include:
- additional missile launches between Nohili, Kwajelein, Kodiak, and Vandenberg;
- High frequency X Band Radar platforms in the sea off of Kalaeloa (Barber's Point) and on Midway.

In addition, the Navy is conducting sea based missile defense tests, and the

Army is expanding its Theater High Altitude Area Defense missile launches.

Missile defense:
A+ violates the Anti Ballistic Missile Treaty;
B+ will create greater global insecurity and escalate the nuclear arms race;
C+ desecrates Hawaiian sacred places;
D+ poses a threat of accidents, electromagnetic radiation, and damage to endangered species and cultural sites

Ivona Xiezopolski
Kaneohe, HI

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Judy Evered  
Sent: Tuesday, February 25, 2003 9:47 AM  
To: gmdetreis@smdc.army.mil  
Subject: Missile Defense G.B.M.D.S.

To Julia Elliott  
U.S. Army Space and Missile Defence Command.

Dear Ms Julia Elliott,

I am opposed to the establishment of the various Ground based Midcourse Defence Extended Test Range for the following reasons:

1. The past tests have been largely unsuccessful. Three out of eight trials is not sufficient to continue in this line of research.

2. Ocean life is not being properly protected.

3. Budget projections, performance objectives and development deadlines must have public, academic and specialists oversight.

4. This oversight must be an open process, with all diverse/intelligent, rational considerations must be consulted for our future.

5. War on the U.S. is too immanent to depend on this research. We need our resources here and now, not planned with huge debts which would bankrupt our economy further. Examples are cargo containers not all inspected in Long Beach and Los Angeles harbors.

6. Dollars are better spent in proper, proven protection ie. on the Coast Guard and local radar over our vulnerable site eg, VAF Base,

I crossed the Pacific by freighter in December 2001. We observed very few ships, but one the crew pointed out was illegally fishing.

Sincerely, Judith B. EVERED
From: Michael Jones  
Sent: Monday, March 03, 2003 12:26 PM  
To: gmdetreis@smdc.army.mil  
Subject: comments on the GMD ETR draft EIS 

3 March 2003

via E mail to: gmdetreis@smdc.army.mil
U.S. Army Space and Missile Defense Command
ATTENTION: SMDC EN V (Mrs. Julia Hudson Elliott)
Huntsville, AL 35805

Comments on the Ground Based Midcourse Defense (GMD) Extended Test Range (ETR) Draft Environmental Impact Statement (EIS)

The comments below are based on my review of the draft EIS document dated January 2003. The most serious deficiencies in the draft are inadequate information on hazard areas for GBIs and target missiles (comments 6-9), inadequate analysis of cumulative impacts of all missile tests (comments 14-17, 22), no details about locations of tests of the SBX radar in the Gulf of Mexico and in transit to the Pacific Ocean (comment 18), incomplete safety analyses of SBX operation near Honolulu International Airport (comments 18-19), no mention of treaty restrictions on air launched and sea launched targets (comments 12-13), and inadequate analysis of hazards to aircraft from debris from collisions between targets and interceptors (comment 27). In addition, there are several errors (comments 20, 23-25) and inconsistencies (comments 2, 26, 29) to be resolved. Furthermore, improvement is needed in distribution of the EIS (comment 1) and providing access to comments made during the scoping process (comment 31).

Detailed comments follow.

1) distribution of the draft EIS  The distribution list in section 11.0 indicates that the document was sent to 11 federal and state agencies in Hawaii plus the Hawaii Office of Environmental Quality Control and the Univ. of Hawaii Environmental Center. This is an improvement from last fall, when notices about the scoping meeting in Honolulu were not sent to either of the latter two organizations. It is also useful that the document is available via the Internet. However, the distribution list does not include any agencies on Kauai, any Hawaii state libraries, or any of Hawaii's members of Congress. The notice in the 7 Feb. Federal Register does indicate that the document was sent to the Hawaii State Library and the Univ. of Hawaii Library. Because the GMD ETR program could include additional launches from the Pacific Missile Range Facility (PMRF) on Kauai and use of the TPS X radar at PMRF, the document should be sent to state libraries on Kauai and to PMRF. Similarly, there should be much wider distribution of the draft EIS in the Republic of the Marshall Islands (RMI); the distribution list includes only two RMI officials. Finally, only one person in Florida is on the list even though the Sea Based X Band Radar (SBX) will be tested in the Gulf of Mexico.

2) annual number of launches  Page es 4 contains a statement there would be "a total of approximately 10 launches per year for the entire GMD ETR." Nearly identical statements on pages 1-5 and 2-1 claim a total of 15 launches per year. The latter number seems to be based upon 5 launches per year from three sites Kodiak Launch Complex (KLC), Vandenberg AFB, and the Reagan Test Site (RTS) in Kwajalein. However, this number seems to exclude target launches from PMRF, air launched, and sea launched targets. This should be clarified in the final EIS.

3) radar safety at PMRF  The Health and Safety section of Table ES 5 on page es 29 mentions adherence to Alaska Aerospace Development Corporation safety procedures. Why do these apply outside of Alaska?

4) related environmental documents  The list of related documents and Internet link to them in Appendix A are useful. The 2002 THAAD Pacific Test Flights Environmental Assessment should be added to Table A 1. Also, page A 1 twice refers the current document as the ... Extended Test Range EIS.
5) propellant in GBI  Page 2 3 gives an assumed GBI propellant mass of 20,500 kg but the total masses for the two GBI configurations in Table 4.1.1 9 are 19,767 kg and 12,572 kg respectively. Is there a third configuration with propellant mass of 20,500 kg?

6) ESQDs for GBIs  It is stated on page 2 4 that explosive safety quantity distances (ESQDs) would be established around GBIs but no quantitative information is given. Fig. 4.1.7 1 on page 4 56 shows ESQD circles of radii 399 meters and 239 meters at the Kodiak Airport. It is stated on page 4 55 that an inhabited building ESQD with radius of 434 meters would be established assuming the GBI contains 20,410 kg of division 1.1 explosive. If the propellant were division 1.3 explosive, it is claimed that the inhabited building ESQD radius would be 74.7 meters. The only diagrams showing these ESQD areas at KLC seem to be Figs. 2.3.1 2 and 2.3.1 3 on pages 2 54 and 2 55. The final EIS should clarify what ESQDs will be applied for GBIs.

7) ESQDs for target missiles  It is stated on page 2 8 that ESQDs would be established around target missiles but no quantitative information is provided. This information is especially important for Minuteman II, MX, and Trident I target missiles because these missiles have much more propellant than that assumed for the GBI. The final EIS should clarify what ESQDs will be applied for each target missile.

8) LHAs for GBIs and target missiles  No information about launch hazard areas (LHAs) for GBIs is given in section 2.1.1. Section 2.1.2.2 on page 2 8 indicates only that LHAs would be established for target missiles. The final EIS should include quantitative information and diagrams indicating the size of the LHAs at various launch azimuths at each launch site. The diagram of "representative exclusion and warning areas" (Fig. 4.1.7 2 on page 4 59) for KLC is nearly identical to Fig. 2 7 in the North Pacific Targets Program EA, which was intended for a Strategic Target System launch at an azimuth of 135 degrees. It is unclear whether the LHA and exclusion and warning areas in this diagram are intended to apply for GBIs or any other target missiles.

9) LHA for Strategic Target System launches at PMRF  The discussion in section 4.4.4 contains no quantitative information or diagrams showing the LHA for Strategic Target System launches at PMRF. It is stated on page 4 159 that launches from PMRF to RTS have used an initial launch azimuth of 280 degrees. It is also asserted that the North Pacific Targets Program EA analyzed launches with initial azimuths between 310 and 360 degrees. My interpretation of previous environmental analyses (1992 STARS EIS, 1998 PMRF Enhanced Capability EIS, and 2001 North Pacific Targets Program EA) is that there has been no detailed analysis of the safety aspects of Strategic Target System launches at azimuths other than 280 degrees. The 1998 PMRF EIS examined other launch azimuths only for smaller rockets. The North Pacific Targets Program EA envisioned Strategic Target System launches with azimuths between 310 and 360 degrees but did not have diagrams showing the LHA and did not contain a detailed safety analysis of such launches. This is especially important because a launch with an azimuth of 360 degrees and the same LHA used for a launch at 280 degrees appears to bring all of Polihale State Park within the hazard area. I raised this issue both in my written scoping comments and at the 18 Sept. 2002 meeting. The final EIS should contain a diagram similar to that in Fig. 4.1.1.7 2 in the 1998 PMRF EIS for a launch azimuth of 360 degrees.

10) missile reliabilities  There is no discussion of missile reliabilities in the draft EIS. This is understandable for the GBI because it is still under development. However, the final EIS should discuss reliabilities of the target missiles. An analysis of Minuteman test launches found a rate of severe failures of 15%. The Strategic Target System has had one failure (9 Nov. 2001 launch at KLC) in five launches.

11) past launch failures  The discussion of launch safety in Appendix C is useful. Three guidance and control failures which led to a decision to destroy the missile are noted on pages C 6 to C 7. It would be helpful to examine some specific examples and compare debris dispersal with the LHAs. Relevant examples are the 15 June 1993 Minuteman failure at Vandenberg AFB and the 9 Nov. 2001 Strategic Target System failure at KLC. It should also be noted that notices to mariners are not always sufficient to insure ships avoid hazard areas. In Dec. 1988, a commercial ship near Kauai was hit by a missile launched from an
aircraft and one of the ship's crew was killed.

12) treaty restrictions on air launched targets The discussion of air launched targets on pages 2 9 to 2 10 does not mention treaty restrictions. I noted in my written scoping comments and at the scoping meeting that the INF Treaty seems to prohibit air launched or sea launched missile targets if the target range is between 500 and 5,500 kilometers. Statements noting this restriction were made in the Jan. 1994 Theater Missile Defense Extended Test Range EIS. The 2002 LRALT EA does not discuss treaty restrictions. A reply to my comment on the LRALT EA asserted that the INF Treaty did not apply to such launches but no compliance review was cited to justify this interpretation. The final EIS should address treaty restrictions and provide references to any relevant compliance reviews.

13) treaty restrictions on sea launched targets The discussion on pages 2 10 to 2 11 does not mention treaty restrictions even though previous environmental analyses (1994 Theater Missile Defense Extended Test Range EIS and the 1998 TMD Extended Test Range Draft Supplemental EIS) discuss restrictions from the START and INF Treaties. The 1998 TMD ETR DSEIS states that the START Treaty prohibits launches from sea based platforms and that launches from ships are restricted to ranges less than 600 kilometers. The 1994 TMD ETR EIS notes that the INF Treaty restricts launches from mobile and fixed sea launch platforms to ranges less than 500 kilometers. The final EIS should address what treaty restrictions apply to launches from sea platforms.

14) cumulative impacts of all missile defense tests near Hawaii I noted in my written scoping comments that no previous environmental analyses of missile defense tests near Hawaii have analyzed impacts of tests of the Navy Sea Based Midcourse Defense (formerly the Theater Wide system) or intercept tests of any system against targets launched more than 1,200 kilometers from the Pacific Missile Range Facility. The final EIS needs to assess the impacts of such tests (including THAAD tests) as cumulative impacts along with GMD tests.

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
18) SBX safety analyses  On pages 4 212 and 4 220 are statements that an "EMR/EMI survey and analysis would be conducted" and that potential interference with ground, air, and ship based electronics will be evaluated "during the detailed EMR/EMI survey that is underway." How can one evaluate the impacts of the SBX operations near Oahu until this survey and analysis are completed? Similarly, it is stated on page 4 275 that the location of SBX testing in the Gulf of Mexico "has not been determined" and a "full EMR/EMI survey and analysis would be conducted." Nearly identical statements are made about SBX testing between the Gulf of Mexico and the Pacific Ocean on page 4 276. The final EIS should cite the results of the EMR/EMI surveys and specify testing areas.

19) SBX hazards to aircraft near Oahu  It is noted on page 4 212 that unrestricted operation of the SBX moored off Barbers Point "would have the potential to adversely affect air operations." Coordination with agencies and airspace users and use of the EMR/EMI survey results to define SBX operating times and areas are intended to "minimize adverse effects." It is questionable whether these procedures are adequate to reduce EMR hazards to aircraft using Honolulu International Airport and Kalaeloa Airport. It is noted on page 4 213 (and shown in Fig. 3.6.2 1) that several low altitude airways cross the area of potential SBX interference. These seem to be compelling reasons to avoid operating the SBX near a major airport. As the EIS understates on pages 4 211 to 4 212, "A location outside the approach/departure area for Honolulu International Airport would probably reduce the potential restrictions on SBX operations and simplify the coordination process."

20) error in last line of Table 4.6.2 1  The distances in the Fully Populated columns should be 150 meters and 483 feet respectively.

21) rank order of SBX support bases  The preliminary rank order is given on page 2 89 but no details are given about the criteria used to determine the ranking. The final EIS should discuss these criteria and indicate how the decision about the support base will be made.

22) cumulative impacts of the TPS X radar at PMRF  Section 4.4.4.3 on page 4 161 does not address potential cumulative impacts of the TPS X radar and the THAAD X band radar. There is no analysis of simultaneous operation of both radars or of effects of the TPS X radar on THAAD interceptors, whose potential launch site is about 400 meters from the potential TPS X site on the PMRF main base.

23) incorrect reference  The reference to the North Pacific Targets Program EA on the 4th line of page 3 2 should indicate 2001b, not 2000.

24) 1999 MOA for ground disturbing activities at PMRF  On page 3 68, it is implied that the 1999 Memorandum of Agreement among the Navy, PMRF, and the Hawaii State Historic Preservation Officer is shown in the 1998 PMRF EIS. In fact, this EIS, dated December 1998, contains only a draft MOA dated November 1998. The final EIS should contain the final MOA or a reference to it.

25) missile of the ROI?  The next to last line on page 3 117 states that airway V4 "crosses through the missile of the ROI." Fig. 3.6.2 1 on page 3 118 shows V4 passing through the middle of the SBX interference area.

26) inconsistent tables  The propellant masses for the Orion 50SXLG and BV/BV+ GBI configurations given in Table 4.1.1 9 total 19,767 kg and 12,572 kg respectively; the corresponding total masses of the exhaust products in Table 4.1.1 10 are 22,670 kg and 23,830 kg respectively. The final EIS should correct these numbers or explain the inconsistency.

27) hazards of debris from intercepts  It is acknowledged on page 4 277 that debris from collision of a GBI from Vandenberg AFB and a target from KLC "may have moderate impacts to airspace." Fig. 4.11.1 1 shows that the area in which the probability of such debris causing a fatality for a 737 aircraft exceeds one in a million has a diameter of 22 kilometers. Comparing the diagram of high altitude jet routes in Fig. 3.11.1 6 with the intercept scenario in Fig. 2.1.8 3 seems to...
Exhibit 8.1.2-1: Reproductions of Email Documents

indicate that both target and interceptor debris would cross several jet routes between Hawaii and the West Coast. The interceptor debris for the scenario in Fig. 2.1.8 4 also appears to cross some jet routes. The final EIS should show the jet routes on the intercept scenario diagrams. The measures proposed to avoid debris hazards to aircraft are coordination with the FAA, NOTAMs, and surveillance of the affected airspace. In order to judge whether these measures are adequate, it would be useful to know how often aircraft have flown into warning areas during previous missile tests.

28) sea launched target sites. No specific sea launched target sites are discussed on pages 4.279 and 4.280, but it is stated that the sea launch platform would be positioned to avoid jet routes. The only scenario illustrated for a sea launched target is in Fig. 2.1.8 6. The final EIS should include jet routes near the Aleutian Islands on this figure so one can judge how close they are to the trajectory of the sea launched target. Similar figures for any other scenarios involving sea launched targets that are being considered should be included in the final EIS.

29) cumulative launches over the Pacific. In section 4.11.3.4 on page 4.289, it is stated that the proposed action would result in five launches per year. This seems inconsistent with the quoted number of 15 per year on pages 1.5 and 2.1.

30) discreet events? The 3rd line on page 4.290 describes each flight test and SBX test as a "discreet short term event." The people involved with the tests may be discreet but the tests themselves are discrete.

31) scoping comments. Sections 8.0 and 9.0 seem to be intended to contain public comments and responses and consultation comments and responses but they contain only the phrase "to be provided in the final EIS" in the draft. Perhaps these sections are intended for comments on the draft. Section 7.0 contains only summaries of comments submitted during the scoping process. It summarizes meetings with federal and state agencies but does not provide any detailed comments from these agencies. Previous draft EIS documents (for example, the draft PMRF Enhanced Capability EIS) have provided detailed agency comments as well as public comments during the scoping process. Such detailed comments can be useful and important. For example, it would be useful to know what questions the FAA representatives in Honolulu asked about operation of the SBX radar near Honolulu International Airport. The only indication on page 7.3 is that the FAA questions concerned "operation of the radar and the effects of radiological hazards and interference with air traffic." (Presumably the FAA actually asked about EMR hazards, not hazards from ionizing radiation.) Without access to such detailed comments, it is very difficult for the general public to assess possible impacts.

32) fact sheets and schedules. The "Fact Sheets" available at the Sept. 2002 meeting are not available on the Missile Defense Agency web site http://www.acq.osd.mil/bmdo/bmdolink/html/factsheet.html It would be helpful to set up a web site at which meeting schedules and other EIS related documents are available.

Michael Jones
Dept. of Physics & Astronomy
Univ. of Hawaii
Honolulu, Hawaii
From: Ben Brisbois  
To: gmdetreis@smdc.army.mil  
Subject: ATTN: SMDC EN V (Mrs. Julia Hudson Elliot)  
Date: Tue, 25 Mar 2003 21:22:18 0000

Dear Mrs. Hudson Elliot,

It has recently been brought to my attention that the U.S. armed forces intends to include Midway Atoll in the Ground Based Midcourse Defense Extended Test Range. I would like to express my concern over this action, as Midway’s unique biological resources make it a valuable but vulnerable wildlife refuge. Please continue to protect Midway’s diverse ecosystems.

Sincerely,
Ben Brisbois

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From: Mike Milligan  
To: gmdetreis@smdc.army.mil  
Subject: DEIS  
Date: Tue, 25 Mar 2003 20:07:59 0000

Mike Milligan  
Kodiak, Alaska

I have three main concerns with the DEIS:

1) There is not enough concrete statements guaranteeing the exclusive use of solid fuel, (as opposed to liquid fuel) rocket motors in both the testing and deployment phase.

2) There is no description of test target rockets after existing inventories of existing assets (ie minuteman) are exhausted. There should also be a commitment by GMD to use the testing matrix as a method of disposing of existing weaponry as new treaties (such as START) mandate weapon delivery system removal.

3) There must be concrete statements at the beginning and throughout the document that this proposal is about hit to kill technology and that any pursuit of other technologies (such as used by Israel in the ARROW system) will require a new DEIS.

Sincerely, Mike Milligan  
Kodiak, Alaska
From: moonmagick@wildmail.com
To: gmdetreis@smdc.army.mil
Subject: DEIS comments to Midcourse Missile System
Date: Tue, 25 Mar 2003 18:21:52 0000

U.S. Army Space & Missile Defense Command
Attn: SMDC EN V, Mrs. Julia Hudson Elliott
106 Wynn Drive
Huntsville, AL 35805

Sent via email to: gmdetreis@smdc.army.mil

Comments to the "GROUND BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE (ETR) DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)".

Any further building in Fort Greeley or elsewhere should be immediately halted for three reasons. First, the EIS process is not complete. Moving forward on this project without such in place belies the NEPA process, which is the only tool the public has for oversight. Second, the project is on a fast track without even knowing if it will work. The Pentagon, in their yearly report on weapons, released last month, stated the NMD has failed to demonstrate the capabilities for which it is being built. It has failed in every test except those in which a decoy was in place. These do not reflect realistic circumstances. Third, around $73 billion has been spent thus far on a program that has not proven itself to work. In a time when the economy is failing, unemployment has skyrocketed, education, health care, and other basic needs services go unfounded, this country simply cannot afford this program.

The Missile Defense program ought to be scrapped, for the following reasons.
° First, it is in violation of an international treaty that was in effect until the current Administration. We see the effects backing out of this treaty already with the reactions by North Korea. (Recall they were one of the “axis of evil” this Administration so diplomatically named, and one of the reasons cited for going forward with NMD.)
° The program destabilizes the Pacific Rim region politically. This program puts this country in more jeopardy, not less. The build up of arms only signifies to other countries they must do the same, in order for their country to “be safe”. That is why international treaties are negotiated in the first place; the arms race is a dead end, security wise.
° It will be environmentally devastating. Already, Alaska lives with the legacy of some 700 contaminated military sites. Our communities are dying of cancer and other illnesses as a result. I have read through the records of all military Superfund sites in Alaska, seeing first hand how the military has failed to clean up their toxic pollution even within the guise of such. They can’t even keep their records straight; on Adak they simply “lost” thousands of pounds of chemical warfare agent. And another example, when the Army was being held accountable for their pollution at Eagle River Flats (which has killed hundreds of waterfowl) through a citizen suit, they simply went to the Alaska State Legislature seeking exemption from current state regulations. When the Army cited “nation security” as the reason, the Legislature, wanting to show their sense of patriotism, immediately complied. Given the Department of Defense’s dismal environmental record and their continuing push for immunity from environmental law, we have no reason to believe contamination from NMD would be treated any differently.

Alaskans want answers, not rhetoric. This system should not be exempted from current law, which mandates it must prove itself to work before being employed. Comments from public hearings were not part of the DEIS, and should be in order for the public to better understand the concerns of affected communities. Unanswered broad view questions remain, such as, what are the potential impacts to Kodak fisheries? What are the impacts to communities surrounding Fort Greeley? Should the system be pursued without the knowledge it will work? Does the American public want the system? There are many specifics, as well. For these, I defer to the careful interpretation of Carolyn Heitman from Kodiak Island. I support her comments.

Sincerely,

Karen L. Button
Anchorage, AK
<p>| COMMENT NUMBER | The text of comment P-E-0037 was the same as that of P-E-0319. This comment was submitted by Nola Conn of Anahola, Hawaii. |
| P-E-0037    |
| P-E-0038    | The text of comment P-E-0038 was the same as that of P-E-0319. This comment was submitted by Graeme Marsh of Kapa’a, Hawaii. |
| P-E-0039    | The text of comment P-E-0039 was the same as that of P-E-0319. This comment was submitted by Ronald Russell of Kapa’a, Hawaii. |
| P-E-0040    | The text of comment P-E-0040 was the same as that of P-E-0319. This comment was submitted by Miguel Checa of DeKalb, Illinois. |
| P-E-0041    | The text of comment P-E-0041 was the same as that of P-E-0319. This comment was submitted by Paul Miller of Kapa’a, Hawaii. |
| P-E-0042    | The text of comment P-E-0042 was the same as that of P-E-0319. This comment was submitted by Robin Connors of Aptos, California. |
| P-E-0043    | The text of comment P-E-0043 was the same as that of P-E-0319. This comment was submitted by Marie Le Boeuf of Kihei, Hawaii. |
| P-E-0044    | The text of comment P-E-0044 was the same as that of P-E-0319. This comment was submitted by Pete Doktor of Honolulu, Hawaii. |
| P-E-0045    | The text of comment P-E-0045 was the same as that of P-E-0319. This comment was submitted by Hattie Berg of Kilauea, Hawaii. |
| P-E-0046    | The text of comment P-E-0046 was the same as that of P-E-0319. This comment was submitted by Kawika Alfiche of Hilo, Hawaii. |
| P-E-0047    | The text of comment P-E-0047 was the same as that of P-E-0319. This comment was submitted by Ednette Chandler of Las Vegas, Nevada. |
| P-E-0048    | The text of comment P-E-0048 was the same as that of P-E-0319. This comment was submitted by Gary Bart of Beverly Hills, California. |
| P-E-0049    | The text of comment P-E-0049 was the same as that of P-E-0319. This comment was submitted by Marti Paskal of Hanalei, Hawaii. |
| P-E-0050    | The text of comment P-E-0050 was the same as that of P-E-0319. This comment was submitted by Deborah Burnham of Kapa’a, Hawaii. |
| P-E-0051    | The text of comment P-E-0051 was the same as that of P-E-0319. This comment was submitted by Myra Lewin of Kula, Hawaii. |
| P-E-0052    | The text of comment P-E-0052 was the same as that of P-E-0319. This comment was submitted by Richard Burge of Kilauea, Hawaii. |</p>
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
<th>COMMENT TEXT</th>
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</thead>
<tbody>
<tr>
<td>P-E-0053</td>
<td>The text of comment P-E-0053 was the same as that of P-E-0319. This comment was submitted by Kima Douglas of Princeville, Hawaii.</td>
</tr>
<tr>
<td>P-E-0054</td>
<td>The text of comment P-E-0054 was the same as that of P-E-0319. This comment was submitted by Dolores Blalock of Chico, California.</td>
</tr>
<tr>
<td>P-E-0055</td>
<td>The text of comment P-E-0055 was the same as that of P-E-0319. This comment was submitted by Scot Ryder of Silver Spring, Maryland.</td>
</tr>
<tr>
<td>P-E-0056</td>
<td>The text of comment P-E-0056 was the same as that of P-E-0319. This comment was submitted by Kathy-Lyn Blalock of DeKalb, Illinois.</td>
</tr>
<tr>
<td>P-E-0057</td>
<td>The text of comment P-E-0057 was the same as that of P-E-0319. This comment was submitted by Diana Richardson of Kapa'a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0058</td>
<td>The text of comment P-E-0058 was the same as that of P-E-0319. This comment was submitted by Lauryn Galindo of Hanalei, Hawaii.</td>
</tr>
<tr>
<td>P-E-0059</td>
<td>The text of comment P-E-0059 was the same as that of P-E-0319. This comment was submitted by John Kesich of Millerton, Pennsylvania.</td>
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<tr>
<td>P-E-0060</td>
<td>The text of comment P-E-0060 was the same as that of P-E-0319. This comment was submitted by Carole Madsen of Kilauea, Hawaii.</td>
</tr>
<tr>
<td>P-E-0061</td>
<td>The text of comment P-E-0061 was the same as that of P-E-0319. This comment was submitted by Shawn Dicken of Beaverton, Michigan.</td>
</tr>
<tr>
<td>P-E-0062</td>
<td>The text of comment P-E-0062 was the same as that of P-E-0319. This comment was submitted by John Grant of Seattle, Washington.</td>
</tr>
<tr>
<td>P-E-0063</td>
<td>The text of comment P-E-0063 was the same as that of P-E-0319. This comment was submitted by Michael Douglas of Princeville, Hawaii.</td>
</tr>
<tr>
<td>P-E-0064</td>
<td>The text of comment P-E-0064 was the same as that of P-E-0319. This comment was submitted by Nancy Miller of Kapa'a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0065</td>
<td>The text of comment P-E-0065 was the same as that of P-E-0319. This comment was submitted by Cindy Brookway of Miami, Florida.</td>
</tr>
<tr>
<td>P-E-0066</td>
<td>The text of comment P-E-0066 was the same as that of P-E-0319. This comment was submitted by James Danoff-Burg of New York, New York.</td>
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<tr>
<td>P-E-0067</td>
<td>The text of comment P-E-0067 was the same as that of P-E-0319. This comment was submitted by Douglas Cornett of Marquette, Michigan.</td>
</tr>
<tr>
<td>P-E-0068</td>
<td>The text of comment P-E-0068 was the same as that of P-E-0319. This comment was submitted by Makaala Kaumoana of Kilauea, Hawaii.</td>
</tr>
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</table>

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
The text of comment P-E-0069 was the same as that of P-E-0319. This comment was submitted by Yvette Crosby of Kilauea, Hawaii.

The text of comment P-E-0070 was the same as that of P-E-0319. This comment was submitted by Kevin Correll of Wernersville, Pennsylvania.

The text of comment P-E-0071 was the same as that of P-E-0319. This comment was submitted by Maire Susan Sanford of Kapa’ā, Hawaii.

The text of comment P-E-0072 was the same as that of P-E-0319. This comment was submitted by Kami Altar of La Crescenta, California.

The text of comment P-E-0073 was the same as that of P-E-0319. This comment was submitted by Eli Harris of Carrboro, North Carolina.

The text of comment P-E-0074 was the same as that of P-E-0319. This comment was submitted by Charles Hansen of Greensboro, North Carolina.

The text of comment P-E-0075 was the same as that of P-E-0319. This comment was submitted by Nahe Kahokualohi of Hilo, Hawaii.

The text of comment P-E-0076 was the same as that of P-E-0319. This comment was submitted by Nancy Crom of Albany, New York.

The text of comment P-E-0077 was the same as that of P-E-0319. This comment was submitted by Lori Juiff of Lebanon, Oregon.

The text of comment P-E-0078 was the same as that of P-E-0319. This comment was submitted by Pulelehuakeanuenuenue Oshiyama of Honolulu, Hawaii.

The text of comment P-E-0079 was the same as that of P-E-0319. This comment was submitted by Tammy Robinson of Asheboro, North Carolina.

The text of comment P-E-0080 was the same as that of P-E-0319. This comment was submitted by Kekama Galioto of Honolulu, Hawaii.

The text of comment P-E-0081 was the same as that of P-E-0319. This comment was submitted by Dane Nance of Asheboro, North Carolina.

The text of comment P-E-0082 was the same as that of P-E-0319. This comment was submitted by Bryan Kuwada of Ewa Beach, Hawaii.

The text of comment P-E-0083 was the same as that of P-E-0319. This comment was submitted by Rosemary Alles of Kamuela, Hawaii.

The text of comment P-E-0084 was the same as that of P-E-0319. This comment was submitted by Jessica Manthey of Indio, California.
The text of comment P-E-0085 was the same as that of P-E-0319. This comment was submitted by Christine Page of Lahaina, Hawaii.

The text of comment P-E-0086 was the same as that of P-E-0319. This comment was submitted by Shaun Smakal of Byron, Michigan.

The text of comment P-E-0087 was the same as that of P-E-0319. This comment was submitted by Kalyan Meola of Pahoa, Hawaii.

The text of comment P-E-0088 was the same as that of P-E-0319. This comment was submitted by Fredy Morse of Phoa, Hawaii.

The text of comment P-E-0089 was the same as that of P-E-0319. This comment was submitted by Amy Ono of Honolulu, Hawaii.

The text of comment P-E-0090 was the same as that of P-E-0319. This comment was submitted by Mike Stephens of St. Joe, Alaska.

The text of comment P-E-0091 was the same as that of P-E-0319. This comment was submitted by Gary Mafredi of Los Angeles, California.

The text of comment P-E-0092 was the same as that of P-E-0319. This comment was submitted by David M. K. Tane Inciong III of Pearl City, Hawaii.

The text of comment P-E-0093 was the same as that of P-E-0319. This comment was submitted by Amanda Rang of Stanford, California.

The text of comment P-E-0094 was the same as that of P-E-0319. This comment was submitted by Karen Mavec of Kapa’a, Hawaii.

The text of comment P-E-0095 was the same as that of P-E-0319. This comment was submitted by Joy Chambers of Milford, Massachusetts.

The text of comment P-E-0096 was the same as that of P-E-0319. This comment was submitted by Peter Zadis of Jamaica, New York.

The text of comment P-E-0097 was the same as that of P-E-0319. This comment was submitted by Peter Sandoval of Brooklyn, New York.

The text of comment P-E-0098 was the same as that of P-E-0319. This comment was submitted by Robert Culbertson of Hanamau, Hawaii.

The text of comment P-E-0099 was the same as that of P-E-0319. This comment was submitted by Paul Williams of Atlantic City, New Jersey.

The text of comment P-E-0100 was the same as that of P-E-0319. This comment was submitted by Kathy Harter of Honolulu, Hawaii.

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
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</tr>
</thead>
<tbody>
<tr>
<td>P-E-0101</td>
<td>The text of comment P-E-0101 was the same as that of P-E-0319. This comment was submitted by Mary Lu Kelley of Kalaheo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0102</td>
<td>The text of comment P-E-0102 was the same as that of P-E-0319. This comment was submitted by Christina Borra of St. Augustine, Florida.</td>
</tr>
<tr>
<td>P-E-0103</td>
<td>The text of comment P-E-0103 was the same as that of P-E-0319. This comment was submitted by Cathleen Hayes of Kilauea, Hawaii.</td>
</tr>
<tr>
<td>P-E-0104</td>
<td>The text of comment P-E-0104 was the same as that of P-E-0319. This comment was submitted by Marion Kelly of Honolulu, Hawaii.</td>
</tr>
<tr>
<td>P-E-0105</td>
<td>The text of comment P-E-0105 was the same as that of P-E-0319. This comment was submitted by L. M. Bubala of Central Point, Oregon.</td>
</tr>
<tr>
<td>P-E-0106</td>
<td>The text of comment P-E-0106 was the same as that of P-E-0319. This comment was submitted by Eleawani Felix of Kilauea, Hawaii.</td>
</tr>
<tr>
<td>P-E-0107</td>
<td>The text of comment P-E-0107 was the same as that of P-E-0319. This comment was submitted by James Nordlund of Stockton, Kansas.</td>
</tr>
<tr>
<td>P-E-0108</td>
<td>The text of comment P-E-0108 was the same as that of P-E-0319. This comment was submitted by Jeff Frontz of Columbus, Ohio.</td>
</tr>
<tr>
<td>P-E-0110</td>
<td>The text of comment P-E-0109 was the same as that of P-E-0319. This comment was submitted by Terry Bunch of San Diego, California.</td>
</tr>
<tr>
<td>P-E-0111</td>
<td>The text of comment P-E-0110 was the same as that of P-E-0319. This comment was submitted by Deborah Davis of Kilauea, Hawaii.</td>
</tr>
<tr>
<td>P-E-0112</td>
<td>The text of comment P-E-0111 was the same as that of P-E-0319. This comment was submitted by Charone O'Neil-Naeole of Hilo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0113</td>
<td>The text of comment P-E-0112 was the same as that of P-E-0319. This comment was submitted by KatRama Brooks of Kapa'a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0114</td>
<td>The text of comment P-E-0113 was the same as that of P-E-0319. This comment was submitted by D. J. Colbert of Kilauea, Hawaii.</td>
</tr>
<tr>
<td>P-E-0115</td>
<td>The text of comment P-E-0114 was the same as that of P-E-0319. This comment was submitted by Jeffery Courson of Lawai, Hawaii.</td>
</tr>
<tr>
<td>P-E-0116</td>
<td>The text of comment P-E-0115 was the same as that of P-E-0319. This comment was submitted by Nathan Boddie of LaGrange, Georgia.</td>
</tr>
<tr>
<td>P-E-0117</td>
<td>The text of comment P-E-0116 was the same as that of P-E-0319. This comment was submitted by Virginia Gibson of Key Largo, Florida.</td>
</tr>
<tr>
<td>COMMENT NUMBER</td>
<td>The text of comment P-E-0117 was the same as that of P-E-0319. This comment was submitted by Aggelige Spanos of Kailua-Kona, Hawaii.</td>
</tr>
<tr>
<td>---------------</td>
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</tr>
<tr>
<td>P-E-0118</td>
<td>The text of comment P-E-0118 was the same as that of P-E-0319. This comment was submitted by Ravi Grover of Chicago, Illinois.</td>
</tr>
<tr>
<td>P-E-0119</td>
<td>The text of comment P-E-0119 was the same as that of P-E-0319. This comment was submitted by Forest Shomer of Port Townsend, Washington.</td>
</tr>
<tr>
<td>P-E-0120</td>
<td>The text of comment P-E-0120 was the same as that of P-E-0319. This comment was submitted by Timothy Johnson of Marina, California.</td>
</tr>
<tr>
<td>P-E-0121</td>
<td>The text of comment P-E-0121 was the same as that of P-E-0319. This comment was submitted by Donna Melead of Kapa‘a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0122</td>
<td>The text of comment P-E-0122 was the same as that of P-E-0319. This comment was submitted by Ana Young of El Paso, Texas.</td>
</tr>
<tr>
<td>P-E-0123</td>
<td>The text of comment P-E-0123 was the same as that of P-E-0319. This comment was submitted by D. Bowman of Athens, Georgia.</td>
</tr>
<tr>
<td>P-E-0124</td>
<td>The text of comment P-E-0124 was the same as that of P-E-0319. This comment was submitted by Dr. Rudolf Vracko of Kailua-Kona, Hawaii.</td>
</tr>
<tr>
<td>P-E-0125</td>
<td>The text of comment P-E-0125 was the same as that of P-E-0319. This comment was submitted by Jessica Ma of Princeton, New Jersey.</td>
</tr>
<tr>
<td>P-E-0126</td>
<td>The text of comment P-E-0126 was the same as that of P-E-0319. This comment was submitted by Joseph Rodrigues of Honolulu, Hawaii.</td>
</tr>
<tr>
<td>P-E-0127</td>
<td>The text of comment P-E-0127 was the same as that of P-E-0319. This comment was submitted by Karrina Mount of Hilo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0128</td>
<td>The text of comment P-E-0128 was the same as that of P-E-0319. This comment was submitted by Christopher Kubiak of Honolulu, Hawaii.</td>
</tr>
<tr>
<td>P-E-0129</td>
<td>The text of comment P-E-0129 was the same as that of P-E-0319. This comment was submitted by Faye Kurk of Princeville, Hawaii.</td>
</tr>
<tr>
<td>P-E-0130</td>
<td>The text of comment P-E-0130 was the same as that of P-E-0319. This comment was submitted by Toni Ehrlich-Feldman of El Cerrito, California.</td>
</tr>
<tr>
<td>P-E-0131</td>
<td>The text of comment P-E-0131 was the same as that of P-E-0319. This comment was submitted by Stephen Thompson of Kalaheo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0132</td>
<td>The text of comment P-E-0132 was the same as that of P-E-0319. This comment was submitted by Jeremiah Spence of Austin, Texas.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
The text of comment P-E-0133 was the same as that of P-E-0319. This comment was submitted by Frank Marsh of Kapa’a, Hawaii.

The text of comment P-E-0134 was the same as that of P-E-0319. This comment was submitted by Reagan Hooton of Kapa’a, Hawaii.

The text of comment P-E-0135 was the same as that of P-E-0319. This comment was submitted by Pat Porter of Yardley, Pennsylvania.

The text of comment P-E-0136 was the same as that of P-E-0319. This comment was submitted by Jane Yamashita of Los Gatos, California.

The text of comment P-E-0137 was the same as that of P-E-0319. This comment was submitted by Monica Kaiwi of Kaneohe, Hawaii.

The text of comment P-E-0138 was the same as that of P-E-0319. This comment was submitted by Matthew McGuire of Cheshire, Connecticut.

The text of comment P-E-0139 was the same as that of P-E-0319. This comment was submitted by Sanford Higginbotham of Princeville, Hawaii.

The text of comment P-E-0140 was the same as that of P-E-0319. This comment was submitted by Dick Miller of Hanalei, Hawaii.

The text of comment P-E-0141 was the same as that of P-E-0319. This comment was submitted by Nikki Gentry of Shreveport, Louisiana.

The text of comment P-E-0142 was the same as that of P-E-0319. This comment was submitted by Carlos Altieri of San Juan, Puerto Rico.

The text of comment P-E-0143 was the same as that of P-E-0319. This comment was submitted by Tina Horowitz of Philadelphia, Pennsylvania.

The text of comment P-E-0144 was the same as that of P-E-0319. This comment was submitted by Annalia Russell of Kapa’a, Hawaii.

The text of comment P-E-0145 was the same as that of P-E-0319. This comment was submitted by Gain Andrea Morresi of Fairfield, Connecticut.

The text of comment P-E-0146 was the same as that of P-E-0319. This comment was submitted by Miguel Godinez of Hanalei, Hawaii.

The text of comment P-E-0147 was the same as that of P-E-0319. This comment was submitted by Perry McCorkle of Washington, D.C.

The text of comment P-E-0148 was the same as that of P-E-0319. This comment was submitted by Kay Snow-Davis of Kapa’a, Hawaii.

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
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<tbody>
<tr>
<td>P-E-0149</td>
<td>The text of comment P-E-0149 was the same as that of P-E-0319. This comment was submitted by Niyati Brown of Pa<code>a</code>uilo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0150</td>
<td>The text of comment P-E-0150 was the same as that of P-E-0319. This comment was submitted by Shannon Rudolph of Holualoa, Hawaii.</td>
</tr>
<tr>
<td>P-E-0151</td>
<td>The text of comment P-E-0151 was the same as that of P-E-0319. This comment was submitted by Lisa Carter of Honolulu, Hawaii.</td>
</tr>
<tr>
<td>P-E-0152</td>
<td>The text of comment P-E-0152 was the same as that of P-E-0319. This comment was submitted by James Albertini of Kurtistown, Hawaii.</td>
</tr>
<tr>
<td>P-E-0153</td>
<td>The text of comment P-E-0153 was the same as that of P-E-0319. This comment was submitted by Raphael Mazor of Berkeley, California.</td>
</tr>
<tr>
<td>P-E-0154</td>
<td>The text of comment P-E-0154 was the same as that of P-E-0319. This comment was submitted by Adam Mick of Kailua, Hawaii.</td>
</tr>
<tr>
<td>P-E-0155</td>
<td>The text of comment P-E-0155 was the same as that of P-E-0319. This comment was submitted by Larry Ford of Captain Cook, Hawaii.</td>
</tr>
<tr>
<td>P-E-0156</td>
<td>The text of comment P-E-0156 was the same as that of P-E-0319. This comment was submitted by Jenifer Prince of Princeville, Hawaii.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
<th>COMMENT</th>
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<tbody>
<tr>
<td>P-E-0157</td>
<td>The text of comment P-E-0157 was the same as that of P-E-0319. This comment was submitted by B. McClintock of Honolulu, Hawaii.</td>
</tr>
<tr>
<td>P-E-0158</td>
<td>The text of comment P-E-0158 was the same as that of P-E-0319. This comment was submitted by Philip Mohorich of Lakewood, Ohio.</td>
</tr>
<tr>
<td>P-E-0159</td>
<td>The text of comment P-E-0159 was the same as that of P-E-0319. This comment was submitted by Mary Krane Derr of Chicago, Illinois.</td>
</tr>
<tr>
<td>P-E-0160</td>
<td>The text of comment P-E-0160 was the same as that of P-E-0319. This comment was submitted by Paul Waller of Woodland Hills, California.</td>
</tr>
<tr>
<td>P-E-0161</td>
<td>The text of comment P-E-0161 was the same as that of P-E-0319. This comment was submitted by Connie Boitano of Seattle, Washington.</td>
</tr>
<tr>
<td>P-E-0162</td>
<td>The text of comment P-E-0162 was the same as that of P-E-0319. This comment was submitted by Carroll Dana of Kalaheo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0163</td>
<td>The text of comment P-E-0163 was the same as that of P-E-0319. This comment was submitted by Jean Flint of Kaneohe, Hawaii.</td>
</tr>
<tr>
<td>P-E-0164</td>
<td>The text of comment P-E-0164 was the same as that of P-E-0319. This comment was submitted by Jerome Carpenter of Asheville, North Carolina.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
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<thead>
<tr>
<th>Comment Number</th>
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<tbody>
<tr>
<td>P-E-0165</td>
<td>The text of comment P-E-0165 was the same as that of P-E-0319. This comment was submitted by Philip Simon of San Rafael, California.</td>
</tr>
<tr>
<td>P-E-0166</td>
<td>The text of comment P-E-0166 was the same as that of P-E-0319. This comment was submitted by Cheryl Rosefeld of Columbia, Missouri.</td>
</tr>
<tr>
<td>P-E-0167</td>
<td>The text of comment P-E-0167 was the same as that of P-E-0319. This comment was submitted by Emma Kaye of Mantua, New Jersey.</td>
</tr>
<tr>
<td>P-E-0168</td>
<td>The text of comment P-E-0168 was the same as that of P-E-0319. This comment was submitted by Robert Blakiston of Sewell, New Jersey.</td>
</tr>
<tr>
<td>P-E-0169</td>
<td>The text of comment P-E-0169 was the same as that of P-E-0319. This comment was submitted by Forrest Hurst of Westfield, Indiana.</td>
</tr>
<tr>
<td>P-E-0170</td>
<td>The text of comment P-E-0170 was the same as that of P-E-0319. This comment was submitted by Tod Heintz of Minneapolis, Minnesota.</td>
</tr>
<tr>
<td>P-E-0171</td>
<td>The text of comment P-E-0171 was the same as that of P-E-0319. This comment was submitted by Alison Hartle of Honolulu, Hawaii.</td>
</tr>
<tr>
<td>P-E-0172</td>
<td>The text of comment P-E-0172 was the same as that of P-E-0319. This comment was submitted by Walter Pomroy of Anahola, Hawaii.</td>
</tr>
<tr>
<td>P-E-0173</td>
<td>The text of comment P-E-0173 was the same as that of P-E-0319. This comment was submitted by Robert Lebendiger of Kapa'a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0174</td>
<td>The text of comment P-E-0174 was the same as that of P-E-0319. This comment was submitted by Ricky Wright of St. Simons Island, Georgia.</td>
</tr>
<tr>
<td>P-E-0175</td>
<td>The text of comment P-E-0175 was the same as that of P-E-0319. This comment was submitted by Judy Dalton of Lihue, Hawaii.</td>
</tr>
<tr>
<td>P-E-0176</td>
<td>The text of comment P-E-0176 was the same as that of P-E-0319. This comment was submitted by David Dinner of Kilauea, Hawaii.</td>
</tr>
<tr>
<td>P-E-0177</td>
<td>The text of comment P-E-0177 was the same as that of P-E-0319. This comment was submitted by Tom Jackson of Denver, Colorado.</td>
</tr>
<tr>
<td>P-E-0178</td>
<td>The text of comment P-E-0178 was the same as that of P-E-0319. This comment was submitted by Robert Kelly of Calgary, Canada.</td>
</tr>
<tr>
<td>P-E-0179</td>
<td>The text of comment P-E-0179 was the same as that of P-E-0319. This comment was submitted by Scott Jarvis of Hanalei, Hawaii.</td>
</tr>
<tr>
<td>P-E-0180</td>
<td>The text of comment P-E-0180 was the same as that of P-E-0319. This comment was submitted by Dwayne Tarletz of Pahoa, Hawaii.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
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<tbody>
<tr>
<td>P-E-0181</td>
<td>The text of comment P-E-0181 was the same as that of P-E-0319. This comment was submitted by Karin Hazelhoff of Kamuela, Hawaii.</td>
</tr>
<tr>
<td>P-E-0182</td>
<td>The text of comment P-E-0182 was the same as that of P-E-0319. This comment was submitted by Daniel Lovejoy of Kealakekua, Hawaii.</td>
</tr>
<tr>
<td>P-E-0183</td>
<td>The text of comment P-E-0183 was the same as that of P-E-0319. This comment was submitted by Scott McKenzie of Asheville, North Carolina.</td>
</tr>
<tr>
<td>P-E-0184</td>
<td>The text of comment P-E-0184 was the same as that of P-E-0319. This comment was submitted by Gary Brady of Kapa’a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0185</td>
<td>The text of comment P-E-0185 was the same as that of P-E-0319. This comment was submitted by Noelani Puniwai of Vancouver, Washington.</td>
</tr>
<tr>
<td>P-E-0186</td>
<td>The text of comment P-E-0186 was the same as that of P-E-0319. This comment was submitted by Katie Johnson of Reston, Virginia.</td>
</tr>
<tr>
<td>P-E-0187</td>
<td>The text of comment P-E-0187 was the same as that of P-E-0319. This comment was submitted by Bob Tripp of Kekaha, Hawaii.</td>
</tr>
<tr>
<td>P-E-0188</td>
<td>The text of comment P-E-0188 was the same as that of P-E-0319. This comment was submitted by Maya Moiseyev of Palo Alto, California.</td>
</tr>
<tr>
<td>P-E-0189</td>
<td>The text of comment P-E-0189 was the same as that of P-E-0319. This comment was submitted by Maliu Neilson of Waimanalo, Hawaii.</td>
</tr>
<tr>
<td>P-E-0190</td>
<td>The text of comment P-E-0190 was the same as that of P-E-0319. This comment was submitted by Michele Chavez-Pardini of Kamuela, Hawaii.</td>
</tr>
<tr>
<td>P-E-0191</td>
<td>The text of comment P-E-0191 was the same as that of P-E-0319. This comment was submitted by Donovan Watts of Berkeley, California.</td>
</tr>
<tr>
<td>P-E-0192</td>
<td>The text of comment P-E-0192 was the same as that of P-E-0319. This comment was submitted by Eliza Linser of Kapa’a, Hawaii.</td>
</tr>
<tr>
<td>P-E-0193</td>
<td>The text of comment P-E-0193 was the same as that of P-E-0319. This comment was submitted by Catherine Rawson of Colorado Springs, Colorado.</td>
</tr>
<tr>
<td>P-E-0194</td>
<td>The text of comment P-E-0194 was the same as that of P-E-0319. This comment was submitted by Berton Harrah of Columbus, Ohio.</td>
</tr>
<tr>
<td>P-E-0195</td>
<td>The text of comment P-E-0195 was the same as that of P-E-0319. This comment was submitted by Bill Lewis of Hawaii National Park, Hawaii.</td>
</tr>
<tr>
<td>P-E-0196</td>
<td>The text of comment P-E-0196 was the same as that of P-E-0319. This comment was submitted by Kiope Raymond of Kula, Hawaii.</td>
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</tbody>
</table>

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
<table>
<thead>
<tr>
<th>Comment Number</th>
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<tr>
<td>P-E-0197</td>
<td>The text of comment P-E-0197 was the same as that of P-E-0319. This comment was submitted by Suki Ewers of Los Angeles, California.</td>
</tr>
<tr>
<td>P-E-0198</td>
<td>The text of comment P-E-0198 was the same as that of P-E-0319. This comment was submitted by William Golove of Berkeley, California.</td>
</tr>
<tr>
<td>P-E-0199</td>
<td>The text of comment P-E-0199 was the same as that of P-E-0319. This comment was submitted by Gregg Schulze of San Francisco, California.</td>
</tr>
<tr>
<td>P-E-0200</td>
<td>The text of comment P-E-0200 was the same as that of P-E-0319. This comment was submitted by Dr. Lee Altenberg of Kihei, Hawaii.</td>
</tr>
<tr>
<td>P-E-0201</td>
<td>The text of comment P-E-0201 was the same as that of P-E-0319. This comment was submitted by Mark Reif of Winchester, Virginia.</td>
</tr>
<tr>
<td>P-E-0202</td>
<td>The text of comment P-E-0202 was the same as that of P-E-0319. This comment was submitted by Richard Powers of Kailua-Kona, Hawaii.</td>
</tr>
<tr>
<td>P-E-0203</td>
<td>The text of comment P-E-0203 was the same as that of P-E-0319. This comment was submitted by Rhoda Libre of Kaumakani, Hawaii.</td>
</tr>
<tr>
<td>P-E-0204</td>
<td>The text of comment P-E-0204 was the same as that of P-E-0319. This comment was submitted by Raphael Kaliko of Honolulu, Hawaii.</td>
</tr>
</tbody>
</table>

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: BonnieMinor
Sent: Tuesday, April 01, 2003 10:19 AM
To: gmdetreis@smdc.army.mil
Subject: Everett, Washington

Dear Ms. Julia Elliott,

We live in Everett, Washington and we are deeply opposed to having a SBX X Band Radar platform in our bay. This thing needs to be located AWAY from people, not near the 100,000 plus citizens of Snohomish and Island counties.

The environmental concerns of diesel spills and radar emissions would still exist away from a population zone, but health concerns, such as cancer, and economic concerns, such as the devaluation of our home and the economic development of Everett, would not come into play if this thing were set away from a populated area.

Thank you for listening to the concerned citizens of Everett.
Leslie Minor
Everett, Washington

From: “RICHARD D.EBERHARTER”
To: gmdetreis@smdc.army.mil
Subject: SBX at NS Everett Public comments
Date: Sat, 5 Apr 2003 06:01:09 0000

I am a dedicated Everett resident homeowner etc... I support in full the deployment and stationing of the SBX module in Port Gardener Bay. My guess is the opposition will come from a minority of very localized residents who feel the SBX will upset their view of the bay. One more large floating military object in our bay won’t screw up anyone’s view. The USS ABRAHHAM LINCOLN and her attachments don’t seem to be bothering them so I say Yeah! thumbs up for the SBX. Remember, this is a military town now and I believe in the stated mission of the SBX. Sincerely, RICK D. EBERHARTER EVERETT WA.
From: Jane Seymour  
To: gmdetreis@smdc.army.mil  
Subject: SBX BAD IDEA  
Date: Sat, 5 Apr 2003 17:18:44 0000

The SBX is a very bad, stupid idea, beginning with tremendous health risks that far outweigh any possible benefit. I don't want it and everyone I know objects to the SBX on many, many grounds, too numerous to mention.

Jane Seymour

To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Sun, 6 Apr 2003 03:07:48 0000

Deborah M. Wright  
Everett, WA  
SMDC EN V, Ms. Julia Elliott  
US Army Space Missile Defense Command  
PO Box 1500  
Huntsville, AL 35807 3801

April 5, 2003

Dear Ms. Elliott,

I am writing to express my concern and objection for the site selection of the Sea Based Test X Band Radar (SBX). It is my understanding that Everett Washington has been selected as the site most favored among all the others. We are a very heavy populated area and the site located in inland waters is a bay, surrounded by residence, hospitals, airports, and the Snohomish County Emergency System all of which will be impacted environmentally, visually and there are serious safety considerations. Also, the time for citizens to respond is so short that many questions are unanswered.

The first I heard of this project was the second week in February. When were our County and City officials told about the SBX? We were told by the Department of Defense that in February that there had been a meeting in Seattle in October. The meeting was not even in our county. Who was told about this meeting? I understand that no one from Everett was there which indicates to me that no one was told. If there was a note in the paper it was not significant enough a project of this magnitude. In the meeting in February there was an opportunity to express our views but no dialog and not enough time for the average citizen to get information to investigate the project in order to ask questions. I got the impression from City officials that there was
not much anyone could do about the decisions that were made by Defense Department.

Now that I have had a little time to study some of the material, I have more concerns.

1. Environment: How noisy is the SBX? I understand that it runs 24 hours per day 7 days per week and burns 14,500 gallons of diesel fuel each day. How does the diesel fuel impact our air quality? How does the Electromagnetic Interference Area affect operations like our hospitals, airports and our Emergency Communication Systems using similar systems on the same frequencies? How does the activity around the SBX like the use of helicopters for ferrying personnel impact the environment?

2. Safety: Health and safety concerns include the powerful radar equipment placed in a highly populated area. What studies have been done to demonstrate no harm can come to the people, animals and plant life in this area? What is the increase in hazardous materials and the impact on our community? What fail safe controls are planned to ensure our health and safety?

3. Fair Notification: The citizens of this community have not been fairly notified. We have not had time to digest the information to even ask pertinent questions. On April 5, 2003 at the Listening Forum held in Everett at the Snohomish County PUD, I made a Public Information Request for all notification documents relating to the SBX; both received and sent from July 2002 to present. While I am not apposed to the Navy in Everett, they have been good neighbors and contributing citizens. This project has been rushed. Information has not been easily available. It was way below our "radar screen". It is potentially very dangerous to our community as well as impacting the economics of our area by posing a huge unsightly floating piece of equipment that is visually distasteful, has potential health and safety hazards and impacts our environment. The SBX belongs in an area where populations are not affected. There are such sites listed.

Also, please send me a copy of the Draft Environmental Statement.

Sincerely,

Deborah M. Wright

Thank you,

Deborah M. Wright, MA, CEAP, PHR
Mediations and Workplace Solutions
From: Annie Lyman
To: gmdetreis@smdc.army.mil
Subject: SBX radar Everett
Date: Sun, 6 Apr 2003 16:58:18  0000

SMDC EN V Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL.  35807 3801

Dear Ms. Elliott,

This letter is written in opposition to home porting the SBX missile defense system in Port Gardner Bay, Everett, Washington. After reading through the Draft EIS, I have come to the conclusion that there are too many red flags in locating such a project in a densely populated area such as Everett alongside neighboring communities of Marysville, Mukilteo, Edmonds and Whidbey Island.

The red flags that I see would impact economic development of non governmental businesses on the waterfront and impede regular waterway traffic of commercial and recreational natures not only when the SBX is home ported but also as it makes its way to and from the Pacific Ocean test grounds several times a year. My understanding of the written EIS is that the presence of the SBX's electromagnetic field would also impact air space around it. We have the Boeing Company air strip and Paine Field airport within 5 miles of the port. I see no written mitigation about dealing with this potential problem.

However, economics aside, the areas of biggest concerns for me are those of potential environmental and safety hazards in the whole of Puget Sound. This project would create water -- air-- noise pollution.

The public has a responsibility to be watchdogs and protect our environment as best as we can. To allow the placement of this project in our already fragile ecological system of Puget Sound from Port Gardner Bay out to the Straits of Juan De Fuca would be a travesty. Again I see no written mitigation on how to deal with potential damage while in port and during transport.

I think a proper homeland defense is essential for the safety of America and its citizens. I am in favor of locating this project out in the Pacific Ocean closer to its test grounds and away from populated areas. Just the economic factor of using less fuel/ travel time between home port and testing range area ( a difference of 15 18 hours) is considerable. Is it true that the SBX will be making this trip as many as 6 times a year? The savings to taxpayers would be beneficial in having a mid Pacific home base (Marshal Island) over the distant Puget Sound Everett Region.

Thank you for reading my concerns and consider them as valid. I would like to ask it to become part of the updated EIS record.

Sincerely,

Margaret Ann Lyman
Everett WA
From: Victoria Walker  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Sun, 6 Apr 2003 19:19:16   

To Whom It May Concern:

I am against the SBX being in Port Gardner Bay in Everett WA. I have invested money into my property and “paid” for a view. The view I have since enjoyed has been of the Lincoln, and other Navy vessels. I realize that billions of dollars of wasted defense money can’t compete with the paltry investment of my home, but it is the largest one us common folk can afford to make. So please, take your SBX somewhere where we don’t have to look at it, our environment doesn’t have to compete with it, and I don’t have to worry about what health issues will arise five, ten or twenty years from now. As always, the exact effects of this type of equipment isn’t “known” and frankly I don’t want to find out that I can’t sue the government for literally killing me.

Everett is an old mill town that is struggling for identity. I do not support the Navy being part of it. Go to Bremerton, where the damage has already been done and let Everett’s waterfront blossom into something that is aesthetic and welcoming. I realize these ideas of esthetics are foreign to the government but just imagine the White House with a view of the SBX as it’s main focus when you look out the windows. I guess you get my point.

Victoria Walker

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: lin
To: gmdetreis@smdc.army.mil
Subject: SBX
Date: Mon, 7 Apr 2003 00:24:40  0000

We are residents of Everett, WA, and want to voice our disapproval of anchoring the SBX off the Naval Station here.

We have several concerns, one of which is Everett's economic development efforts. There have been huge revitalization to our downtown core with the construction of waterfront view condos. Needless to say, that housing market will suffer when the view is the SBX for 9 months of the year.

Another HUGE concern is that not enough is known about the long term effects of electro magnetic radiation exposure.

We strongly oppose your consideration of Everett and encourage you to base it in a less populated area. Thank you for taking our concerns seriously.

Sincerely
Linda & Dennis Finlayson
Everett, WA
e-mail: linfin

From: Crispin Wilhelm
To: gmdetreis@smdc.army.mil
Subject: Huge mistake
Date: Fri, 4 Apr 2003 18:36:18  0000

To whom it may concern. I am a physician in Everett, WA. I cannot come to the public hearing this Saturday, but I and my family are strongly opposed to this project coming to Everett. The Navy has done a good job of partnering with civilian concerns. All of that goodwill would be severely eroded. Don't make a huge mistake. Listen to our concerns.

Sincerely yours, Crispin Wilhelm, M.D.
<table>
<thead>
<tr>
<th>From: res06o3w</th>
<th>To: <a href="mailto:gmdetreis@smdc.army.mil">gmdetreis@smdc.army.mil</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject: comment on Everett homeport base for SBX</td>
<td>Date: Mon, 7 Apr 2003 01:10:37 0000</td>
</tr>
</tbody>
</table>

To Whom it may concern:

Thank you for providing an email address for allowing citizen comments on the SBX radar homeport issue for Everett, Washington. Like a lot of my friends and neighbors, I don’t have time to go to some of the local meetings that have been held. But, I was surprised to learn that some people did go to voice a negative opinion. I would like to voice a strong FAVORABLE opinion for my wife, children, retired parents, and all the neighbors and co-workers I have talked to about this. In fact I have yet to talk to someone who opposes it. I have a boat in the marina next to the Everett Navy Base and I can visualize the radar there with no problems. The security and support is already here. I’m an electrical engineer and am familiar with your technology. I’m aware of and have seen pictures of Cobra Dane, Cobra Ball, Cobra Jane, and other military installations around the world that do similar functions. I strongly support this effort and would welcome the decision to make Everett the SBX homeport.

Thank you,
charles.glaisyer

<table>
<thead>
<tr>
<th>From: Nancy Robert</th>
<th>To: <a href="mailto:gmdetreis@smdc.army.mil">gmdetreis@smdc.army.mil</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject: No to SBX in Everett</td>
<td>Date: Sat, 5 Apr 2003 17:47:40 0000</td>
</tr>
</tbody>
</table>

I am voicing my opposition for plans to have Everett as the home port for the huge SBX structure. My concern is the impact it will have to those of us who live within range of the structure. Its size is overwhelming for the harbor. I don’t think there is enough information to indicate that EMR transmission is innocuous to living beings.

Everett is more than a Navy base. Please do not place things that have the potential for harm in our community.

Sincerely,
Nancy Robert
Langley, Wa.

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Larry R Walsh
To: gmdebreis@smdc.army.mil
Subject: SBX at Everett WA
Date: Mon, 7 Apr 2003 16:19:29 0000

Hi

Just wanted to weigh in with my opinion concerning positioning an SBX at the Everett Washington waterfront.

Welcome! The simulated photo of it in Everett looks pretty cool. Looks a lot better than the paper mills, etc in the same area. Kind of dresses the place up.

But, if I were you, I'd consider the Pearl Harbor option perhaps a better place to be stationed.

Good Luck!

Larry Walsh

From: OVPEG
To: gmdebreis@smdc.army.mil
Subject: re: sbx/Port Gardiner Bay
Date: Mon, 14 Apr 2003 16:57:28 0000

To whom it may concern:

I am writing to let you know I am against your proposal. I think it should be located in non populated areas.

Thank you,
Peggy Katica
Mill Creek, WA
From: Chris Runo  
To: gmdetreis@smdc.army.mil  
Subject: SBX Everett, WA  
Date: Mon, 14 Apr 2003 20:06:12  0000

We have a home directly south of the Everett Port. We love watching the naval ships arrive and depart. However, about every third time the Lincoln comes in, we cannot open our garage door with the remote control in the car. After much calling and convincing the powers that be, they shut off some equipment and life returns to normal. We do not want the SBX located in Everett. It would lower our property values and obstruct our view. That is not our main concern. Our main concern is radiation that it might emit. Since there are five other locations, we ask that you consider one of those that is not in a heavy populated area, such as Everett. Sincerely, Chris and Doretta Runo, Everett, WA. E mail cdrun53

Thank you for your time.

From: Peggy Kurtz  
Sent: Monday, April 14, 2003 3:06 PM  
To: gmdetreis@smdc.army.mil  
Subject: SBX in Everett

The possibility of having the SBX in the port of Everett is very worrisome to me. First, I am particularly concerned about possible effects of radiation scatter. No matter how safe you say it is, there have been instances of this type of scatter affecting people's health, and I do not want to take that risk. Second, I have been living in north Everett for 20 years, and have seen the waterfront change from an industrial eyesore to a pleasant place for people to spend time. Even the navy complex is at least pleasant to look at. Having an SBX in our port would ruin what we citizens have spent 20 years trying to improve. Everett is not a large city with tall buildings. Your platform would be more than twice as tall as any building currently in our city. Third, we already experience electrical difficulties from equipment at the hospital, and do not welcome any more from defense systems. Finally, the economic impact on our city and property values would be negative. My family has saved money for many years to be able to afford a house looking at the bay, and do not want that savings to be in vain.

KEEP SBX OUT OF EVERETT!!!  
Peggy B. Kurtz

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Wendy Zieve  
Sent: Monday, April 14, 2003 2:47 PM  
To: gmdetreis@smdc.army.mil  
Subject: No to the SBX Plans in Washington

To: Julia Elliott  
Huntsville, Alabama  
US Army Space Missile Defense Command

I am extremely upset to learn about the SBX plans for Everett. I understand that the City of Everett has passed a resolution that the SBX does not belong in a densely populated area. I understand that it has a X band radar capable of sizzling anything within 13.8 miles which is proposed to putter around the Sound while “testing” the capacity of its sizzling system. You have failed to give proper notice to the “affected communities” and must schedule a series of very public Scoping meetings. Then you’re going to have to go back and re write the EIS to reflect what they hear at the Scoping meetings.

I sometimes work in the radius and often visit friends there. Although I don’t live there, I find this so totally abusive of our rights as citizens.

Wendy Zieve  
Shoreline, Washington

---

From: Peggy Toepel  
To: gmdetreis@smdc.army.mil  
Subject: DEIS Comment, SBX S Band Radar Platform Siting  
Date: Mon, 14 Apr 2003 19:28:28 0000

TO: US Army Space Missile Defense Command  
FROM: Everett Shorelines Coalition

SUBJECT: Comment, DEIS for SBX S Band Radar Platform Siting at Naval Station Everett

The City of Everett, the Port of Everett, and citizens (including our members), plus local, regional and state environmental organizations and Washington State Departments of Ecology, Community Trade and Economic Development, and Fish & Wildlife have invested over 5 years of study and effort in planning for management of appropriate and sustainable use of Everett vicinity shorelines and their function, as intended under the US Coastal Zone Management Act. Intermittent SBX Platform moorage in Everett does not qualify as a reasonable and appropriate use of Everett’s waterfront. The DEIS conclusions of no significant adverse impacts are unfounded; they appear to be based upon incomplete information, over optimistic assumptions, and inadequate analysis of the factors addressed. The Everett Shoreline Coalition requests removal of Everett from consideration as an eligible site.

One of the key considerations in careful and detailed local planning has been the concern that all of the possible human activities at our shoreline create impacts that are compounded and cumulative. If a proposed action is evaluated in isolation, such as the SBX platform siting proposal, it allows far more adverse consequences than would be predictable for a) that use alone and b) that immediate vicinity. The DEIS for proposed moorage and maintenance of the SBX platform at Naval Station Everett is negligent, in confining its brief attention to the immediate vicinity of the Naval Station. Literally, a river runs through it, and daily tides send the harbor waters far upstream into the sensitive Snohomish River estuary.
The DEIS statements, pages 4-238–4-246

* fail to address effects of SBX platform transport, refueling, cleaning and other maintenance upon 9 separate stocks of Snohomish watershed salmonids that migrate through these waters at different times throughout each year, with regional consequences;

* fail to include substantive evaluation of prospective test transmission impacts upon well documented large concentrations of migratory birds using the tidelands near the Naval Station; (This conspicuous omission undermines confidence in the ASMD Command’s broad assumptions regarding potential impacts upon resident humans, and electro sensitive equipment and facilities, as well as wildlife.)

* the statements that acknowledge potential susceptibility of other military systems to disturbance, within the range of SBX transmission, disregard potential susceptibility of civilian systems, relying upon:

* unproven design features for interference suppression, still to be defined and developed

* “coordination” of SBX operational timing with numerous external agencies and other civilian entities

* area avoidance designation, depending upon other entities to recognize and remain outside of invisible boundaries of a mapped High Energy Radiation Area!

Each of these assumptions remains highly questionable.

Superficial DEIS consideration of standard environmental factors is clearly inadequate for evaluation of siting impacts upon an increasingly dense urban population with a broad array of transportation, communication, and Health & Safety services dependent upon functions vulnerable to interference from not yet studied SBX transmission.

Thank you for considering our comments.

Everett Shorelines Coalition
Everett, WA
Peggy Toepel, Co Chair
Everett, WA
From: Pmpalmer  
To: gmdetreis@smdc.army.mil  
Subject: Everett SBX Comments  
Date: Mon, 14 Apr 2003 19:22:47  0000

To whom It may concern,  
I want to register my opposition to the homeporting of the SBX radar in Everett, WA at Naval Everett. It is the most densely populated of the considered sites and the socioeconomic impacts should have been considered, as well as the effects of the biological impacts and electromagnetic impacts have not been answered adequately. Thank You,  
Mike Palmer  
Everett, WA

From: Bruce Wasell  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Mon, 14 Apr 2003 18:36:25  0000  
Importance: high

I would like to comment on the proposed SBX.  
I am in favor of the SBX, because we must realize that to survive in this highly technical, electronic age, we must use scientific sophisticated equipment to stay a notch ahead of our potential enemies.  

A great example is the war in Iraq. After all, we are within range of North Korea's missile capability. That should cause enough concern that we would want to be as prepared as possible. Any technical problems with this kind of equipment can be solved.  

By the way, I live on South Whidbey Island and I don’t think our view of Everett will be harmed by the SBX. Thank you for this opportunity!  
Bruce Wasell

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
| P-E-0224 | From: Brian Dale <briandale@dmdd.com>  
To: Gmdetreis@smdc.army.mil  
Subject: SBX X Band Radar siting  
Date: Mon, 14 Apr 2003 18:31:40 0000  
This letter opposes siting of the SBX X Band Radar at the Naval Station Everett in Everett, Washington. Please include this letter in the public comment record on the SBX system.  
The DEIS incorrectly concludes that no adverse impacts are anticipated for air quality, noise, hazardous materials, visual and aesthetic resources. In fact, all of these adverse impacts will occur with this proposed siting in Everett and the alternative sites are better suited for this installation. The Naval Station Everett is located on Port Gardner Bay, an urban harbor surrounded by a city of 100,000 residents. The SBX platform will operate diesel generators causing air and noise pollution to the nearby homes and businesses. The SBX platform is a visual nuisance that will deteriorate the quality of views and aesthetics enjoyed by the residential neighborhoods that surround the harbor. The existing piers at Naval Station Everett with naval vessels are consistent with the historic use of the harbor, but the SBX platform dwarfs these in size and visual impact. A major commercial and general aviation airport, Paine Field, operated by Snohomish County, lies within the electromagnetic interference and radiation area of the SBX and siting the SBX here would interfere with the operation of this airport. The proposed location for the SBX is at the mouth of the Snohomish River at Port Gardner Bay, a commercial and recreational marine channel. Locating the SBX at Everett would interfere with existing commercial and recreational marine traffic, requiring an exclusion security zone significantly larger than the current Naval Station Everett security zone. Alternate sites for the SBX identified in the DEIS do not have these significant impacts because they are not urban areas. The military mission of the SBX can be accomplished without these significant adverse impacts by siting the facility in one of the other proposed sites.  
Brian Dale  
Everett, WA |

| P-E-0225 | From: Ann Peterson  
To: gmmdetreis@smdc.army.mil  
Subject: Department Of Defense Proposal to locate the SMX in Everett Washi  
Date: Mon, 14 Apr 2003 17:12:19 0000  
I oppose the proposal to locate the SMX in Everett Washington for a number of reasons. These are: The possible negative impacts to Human Health and Safety caused by receiving Long Term, Low Level EM Radiation have not been fully studied. The DoD indicates that Radiation "Scatter" will be an issue despite its attempts to target the array "So as to not Irradiate" people. The DoD has not fully assessed the chances of interference to Airborne Navigation & Commercial Systems, Sensitive Electronics and Hospitals (we have two large county hospitals very close to our waterfront) and clinic based Medical diagnostic equipment. Especially unknown is what effects will be caused by running tests of the energy beam at FULL POWER five to six times a week while stationed in this populated urban port. I am very concerned about these possible negative impacts for my family and our community. Please place the SBX in an area that isn't so populated.  
Sincerely,  
Ann Peterson  
Everett, WA |
From: Kevin Nasr  
To: gmdeitreis@smdc.army.mil  
Subject: SBX  
Date: Mon, 14 Apr 2003 15:45:53 0000  

To whom it may concern  
I live in Everett Washington and am a supporter of the SBX system. However, I am very concerned about the location of the SBX system being placed so near a residential neighborhoods, Hospitals and Airports. Please consider alternate sites.  

Thank you  
Kevin Nasr  
Everett WA

From: JOHN OLSON  
To: gmdeitreis@smdc.army.mil  
Subject: SBX X Band Radar opposition  
Date: Mon, 14 Apr 2003 20:28:03 0000  

My name is Mary Kate Olson, I am a resident of Everett, Washington. I am writing to you to tell you that I am opposed to the SBX X Band Radar being home ported in Everett, Wa. I have three young children and I am a school teacher. My primary concern is the amount of radiation levels that the residents of Snohomish County will receive, especially my own children who go to school within a mile or two of the Everett Navy Base. As I understand, tests have been inconclusive. I believe it needs to be in an area that is less populated.  

I also have lived in Everett for 7 years. I have watched this city revitalize the downtown and the waterfront. The SBX X Radar will hamper those efforts and impact negatively on the economic development of our beloved city.  

Thank you for extending the period to take public comment  

Respectfully,  
Mary Kate Olson  
Everett, Wa

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Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: DEVERY RIELLY  
Sent: Monday, April 14, 2003 10:37 AM  
To: gmdetreis@smdc.army.mil  
Subject: Rielly re: Do not locate SBX System in Everett, WA.

To: Army Space & Missile Defense Command  
Fr: Greg Rielly, Everett, WA  
Re: SBX Radar Platform

I will keep this correspondence brief.

Please be advised that as a residence of Everett, WA that I do not know of a single resident that is in favor of the SBX system being located in Everett.

The reasons are varied but very legitimate, as was demonstrated at a large community meeting of which I (and hundreds of others) attended at the Everett PUD building. I could go into many such reasons, but I will not at this time. Many of the reasons you could learn of by reviewing the video of the PUD meeting hosted by the Everett City Council and DOD.

For that matter, our City Council is 70 against locating the SBX in Everett. The City Council, in this instance, have listened to the people who elected them.

Just please know that I and many other (common citizens raising their families) are in absolute opposition to being the host city of such a project. Please locate the SBX elsewhere.

From: Karen Clark  
To: gmdetreis@smdc.army.mil  
Subject: SBX in Everett Harbor  
Date: Mon, 14 Apr 2003 06:12:51 0000

Dear Staff

I would like to voice my strong opposition to placing the SBX Radar in Everett Harbor. As a member of the business community, I believe this would be extremely detrimental to the economic and civic development of the City of Everett. I know I will relocate my business to another city if this SBX Radar is built here.

As a citizen, I would also like to know if a thorough study has been done of this radar system on the surrounding marine ecosystem.

Sincerely, Karen Clark
From: Julian Dewell
To: gmdetreis@smdc.army.mil
Subject: GMD Everett Washington DEIS comments
Date: Fri, 11 Apr 2003 20:56:34  0000

These are my additional comments and/or questions on the above matter: 1. What set back and/or protection procedures are provided for in connection with seacraft going close to the GMD? 2. Is there is any tie to NASA radar network? 3. We understand from your presentation that this unit could be land based, as opposed to water based. What effort has been made to determine a land site? 4. What type of anchorage is used and what size? Could it have an adverse effect on fish and shell fish in Pt. Gardner Bay? 5. What interference with the GMD have on local radio, television, cell phone reception and since the flight path of Paine Field is located over where the GMD will be located, during use, what effect will this have? You mentioned that Pearl Harbor would not be a suitable site, as it is close to Honolulu International Airport why not the same unsuitability, where Paine Field is involved? 6. How much shore power/energy is required? We understand that diesel fuel is used when the unit is not dockside - what emission tests and limitations have been made to control hot house and toxic gasses? 7. What effect will emissions from Kimberly Clark have on the GMD unit and what is the cumulative emissions, when considered together with Kimberly Clark. Finally, we understand that this is merely the DEIS for the test period. Your representatives admitted at the Everett meeting that a new DEIS would be prepared if the test is made at Everett and you decide that Everett or its vicinity is the place for the permanent installation.

Thank You, Julian and Alice Dewell, Everett, Wa. 98201.

Julian Dewell

From: Walt Blackford
To: gmdetreis@smdc.army.mil
Subject: STOP SBX in Everett
Date: Fri, 11 Apr 2003 23:55:14  0000

11 April 2003

SMDC EN V
Julia Elliott
US Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807

Dear Ms. Elliott,

I am writing to record my strong and unconditional opposition to the proposed SBX radar platform being considered for Port Gardner Bay and Everett, Washington.

By its size and its potential for risk to human life and wildlife from electromagnetic transmissions, a facility of this kind is totally inappropriate for a highly populated area. Moreover, given the questionable effectiveness of the missile defense strategy ("star wars") it very likely is a tremendous misuse of public funds when so many urgent educational, environmental, social, and healthcare issues are seriously under-funded.

In addition to recording my personal objection to the SBX proposal, I also want to point out that the scoping process for the EIS was flawed by lack of public notice and involvement; therefore, the process should be restarted, beginning with proper notice to all affected communities. The EIS should then re-written to include public comment received from this new process.

Thank you for your consideration.

Respectfully,

Walt Blackford

Langley, WA

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: GeckGirls
To: gmdetreis@smdc.army.mil
Subject: Proposed SBX placement in Everett, WA
Date: Sat, 12 Apr 2003 16:22:29  0000

I am writing as a concerned citizen who resides in the North end of Everett.

I am also a parent and therein lies my greatest concern. From the information I have gathered at area information meetings, I feel there are too many questions regarding safety and the future ramifications of having this system near our homes. The impact on air quality, biological resources, hazardous materials and wastes, and the overall effects of radiation have not been sufficiently addressed. We need answers. Many people complain of the aesthetic problems; my concern is in the areas I mentioned and how they could affect our children who are our future. Would you honestly want your children or grandchildren to live close to this system and have to deal with the ramifications in their adult years? I’m sure you would not choose to put your family in harms way. Please understand we do not want our families in harms way. The choice of the majority in our community is "NO, DO NOT PLACE THIS LIFE CHANGING SYSTEM IN OUR NEIGHBORHOOD."

Sincerely,
Michelle Geck
Community member, parent, preschool teacher.
Everett, Wa

From: kittygordy adams
To: gmdetreis@smdc.army.mil
Subject: SBX in Everett
Date: Sat, 12 Apr 2003 20:39:04  0000

4 12 03
Dear US Army Space Missile Defense Command,

We live on Whidbey Island and would be greatly impacted if the SBX is stationed in Everett, yet our community was not given notice or given a public meeting in which to voice our concerns or ask questions. There remain many unanswered questions following last week’s meeting in Everett, and potentially very negative consequences to the health and safety to those of us living in this region, including in the skies and seas, that have not been addressed. Therefore we respectfully ask you to STOP, GIVE PROPER NOTICE TO ALL AFFECTED COMMUNITIES, AND SCHEDULE A SERIES OF VERY PUBLIC SCOPING MEETINGS.

Sincerely,
kitty and Gordy Adams
Clinton, WA
From: elly anderson  
To: gmdestreis@smdc.army.mil  
Subject: SBX proposed home port  
Date: Sat, 12 Apr 2003 21:05:52  0000

We have visited the Everett, Puget Sound area for over ten years and will probably end up locating there because of family ties. When informed by our daughter of the Army's plan to home port the SBX Radar platform at the Naval Station Everett, I was appalled especially when there are other, less populated areas on the list of possibilities. It is clear that there are many serious health and safety questions either not addressed or entirely ignored in the DEI statement, air quality, biologic resources, hazardous materials and hazardous wastes, transportation and more. I simply cannot imagine that the Army does not have the brainpower and the resources to devise a better plan for the SBX one that will provide for real defense needs without harming real people in the process.

Elspeth M. Anderson  
Tucson AZ

From: gloria f c  
To: gmdestreis@smdc.army.mil  
Subject: Scrap SBX  
Date: Sat, 12 Apr 2003 22:33:03  0000

To the Department of Defense Director:  

I am horrified at the proposal to build a giant radar in Everett, Washington. In addition to the health hazards for humans, it is harmful to other forms of life. I believe that it is a waste of our tax dollars. My State of Washington has to cut many health benefits and much needed human services. I would willingly pay my taxes for these needs, but not for “defense” measures that are not needed.

Now that the war in Iraq is almost over. Please delete this project from your proposed plans.

Sincerely,

Gloria Chou  
Clinton, Washington
From: Mark Nagel <mdnagel@hotmail.com>
To: gmdetreis@smdc.army.mil
Subject: Public comment on SBX: No to home porting at Naval Station Everett
Date: Sun, 13 Apr 2003 00:30:03 0000

To:
SMDC EN V, Ms. Julia Elliot
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL 35807 3801

From:
Mark Nagel
Everett, WA.

Date: April 12, 2003

Subject: Proposed home porting of Sea Based X Band radar at Naval Station Everett

Dear Ms. Elliot,

My Executive Summary is thus: NO to home porting the Sea Based X Band radar at Naval Station Everett.

As a living, breathing citizen of Everett, I hereby cast my vote in OPPOSITION to the siting of the SBX here in Everett! If I could afford it, I’d send a 250’ by 230’ postcard (approximate two dimensional measurement of the SBX) stating so.

The SBX is massive. It's a prototype, a "test" system. What will its evolution bring? What will SBX II be? How about SBX III, or SBX IV? What follows in the wake of SBX I? Future configurations aren't likely to be open to public scrutiny.

NO, the SBX doesn't need to be in Everett. The missile defense system doesn't require that the SBX reside here in Everett. According to the DEIS there are no mitigating factors for Naval Station Everett should the SBX NOT be home ported there.

Why the SBX here?

What are the benefits?

What could they possibly be?

* It won't beautify Everett.
* It won't bring any substantial new businesses or jobs to the community.
* It won't make the community's water or air cleaner.
* It won't attract tourism (other than perhaps from terrorists) to Everett.
* It won't improve our community's education.
* It won't improve our traffic congestion.

IT WON'T IMPROVE THE QUALITY OF LIFE IN OUR COMMUNITY.
Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)

What are the losses/negative impacts?

* Future development of Everett the All American City (less tax base, meaning my property taxes will continue to balloon in the face of excessive government spending): The DEIS blindly stated that there are no socioeconomic issues!

* Continued restrictions on air traffic (temporary flight restrictions put in place post 9/11/2001 are likely to be made permanent): We can expect nothing but increased restrictions in the future.

* Prominent citizens leaving the area (due to health/safety concerns).

* Health.

I strongly urge all government officials to work together to make the SBX materialize elsewhere.

Sincerely,
Mark Nagel
(partial funder of the SBX and all other government projects)

From: EUCIII
To: gmdetreis@smdc.army.mil
Subject: Sea based Test X band radar platform
Date: Sun, 13 Apr 2003 03:22:46 0000

Reference: SBX

April 12, 2003
Karen P. Stolworthy
Everett, WA

SMDC EN V
Julia Elliott
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville AL 35807 3801
or
Email: gmdetreis@smdc.army.mil

To Whom It May Concern:
I am OPPOSED to the Sea based Test X band radar platform being based at Port Gardner Bay in Everett, Washington.

The SBX could emit potentially harmful levels of electromagnetic radiation. Experts say it is unlikely and other experts say it will. There is no guarantee from anyone that harmful levels of electromagnetic radiation will not be emitted from the SBX. The SBX for this reason should not be based in highly populated areas. Everett is a highly populated area. There is not enough research on the dangers of the radiation exposures from the SBX to make it safe in any populated area, such as Everett, Washington.

The population of Everett relies on the fire, police, air, and medical communication systems for security and safety. The SBX’s electromagnetic radiation output could cause a potential disruption of these services and therefore risk the lives, safety and security of...
the population of Everett, Washington. For this reason, the SBX does not belong based at Port Gardner Bay in Everett, Washington. In a time when we are suppose to be increasing homeland security, the SBX would be risking the safety and security of populated areas that are near it. The SBX belongs in an area with very low population.

The Port Gardner Bay area and the waters of Puget Sound are a popular boating area. The SBX would prevent free boating in the area waters because of security restrictions and boundaries. Most important, boaters would be exposed to harmful levels of electromagnetic radiation output from the SBX while navigating the same waters.

Many residents, including myself, paid high price for residential property with a beautiful view of the Port Gardner Bay area of Everett, Washington. The SBX would block our beautiful scenic views of Port Gardner Bay and Puget Sound. No one has said they would pay us fair market value compensation for blocking our view with the SBX. The SBX is a real "ugly eyesore" to the beautiful scenic Port Gardner Bay and Puget Sound area. I am outside at my residence much of the time. I am extremely opposed to the SBX being placed near my residence. This would expose me to harmful and dangerous levels of electromagnetic radiation output from the SBX if it is place in the Everett, Washington Port Gardner Bay area.

In conclusion, the SBX (Sea based Test X band radar platform) does not belong in the highly populated Port Gardner Bay area of Everett, Washington. Thank you for your most important consideration of NOT basing the SBX at Everett, Washington.

Sincerely,

Karen P. Stolworthy

From: egge
To: gmdercis@smdc.army.mil
Subject: Comments on SBX
Date: Sun, 13 Apr 2003 18:40:34 0000

Dear Sirs:

With regard to basing the new Sea based Test X band Radar, or SBX in Everett's Port Gardner Bay is not a good idea. The SBX can perform its strategic function just as well if it's based in a less populated area. The potential harm to Everett is too great to put it here. Long term effects of electromagnetic radiation exposure are not known and would be my main objection for the placement of this platform in Everett waters, and may also be detrimental to Everett's future economic development efforts.

Thank you for considering my concerns.

Sincerely,

Larry Egge
From: Thomas M Murphy  
To: gmdetreis@smdc.army.mil  
Subject: SBX & Everett  
Date: Sun, 13 Apr 2003 20:55:20  0000  
Importance: high

Having suffered through the Navy and DOD building the pier in Everett, I have to ask how much more do we have to suffer?

We will lose even more of our view than what we have already lost.

There is then the risk of the unknown and in the near term the unknowable. What will be the interactions between the radar w/ other ship radar, other planes’ radar (general aviation flies in this area), and w/ medical equipment at the nearby hospital. What will be the health effects and will it interact w/ radiation treatments. Will it cause problems w/ pacemakers or cardiac monitors. The list could go on but the real question is why put it in an area so populated and so far from its field of operation.

I hope it will not be in my backyard.

Thomas M Murphy

From: Barbara Birman  
To: gmdetreis@smdc.army.mil  
Subject: SBX in Everett, WA  
Date: Sun, 13 Apr 2003 23:31:39  0000

I would like to go on record as being extremely opposed to placing the SBX in the harbor near Everett, Washington. The negative impacts are too numerous to list here and the possible effects are too great even for my imagination. I am not one who goes on record as a NIMBY but this is so unacceptable that I will do anything I can to fight it. Please reconsider. There must be many other locations where it would not be so close to human habitation.

Barbara Birman
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<th>COMMENT NUMBER</th>
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<tr>
<td>P-E-0241</td>
<td>From: Judy Thomas</td>
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<td>Date: Sun, 13 Apr 2003 12:36:10 0700</td>
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<td></td>
<td>To: <a href="mailto:amdetreis@smdc.army.mil">amdetreis@smdc.army.mil</a></td>
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<td>Subject: SBX</td>
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<td>ATTENTION: Re: SBX</td>
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<td>The Missile Defense Agency has failed to give</td>
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<td>proper (read: any) notice to the “affected</td>
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<td>communities” (like us on Whidbey), that their</td>
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<td>Scoping process was fatally flawed by this</td>
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<td>lack of notice, and that the only course now</td>
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<td>is to STOP what they're doing, give proper</td>
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<td>notice to ALL “affected communities,” and</td>
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<td>schedule a series of very public Scoping</td>
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<td>meetings. Then they're going to have to go</td>
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<td>back and rewrite the EIS to reflect what they</td>
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<td>hear at the Scoping meetings.</td>
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<td>P-E-0242</td>
<td>From: linda</td>
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<td>To: <a href="mailto:gmdetreis@smdc.army.mil">gmdetreis@smdc.army.mil</a></td>
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<td>Subject: SBX comment</td>
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<td>Date: Sat, 12 Apr 2003 15:29:48 0000</td>
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<td>To Whom It May Concern:</td>
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<td>I wish to express my opposition to the plan</td>
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<td>to locate a Sea Based Test X Band Radar</td>
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<td>installation in Everett.</td>
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<td>The public has not been properly consulted</td>
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<td>about this plan. I understand the only</td>
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<td>scoping meeting on it was held in Seattle,</td>
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<td>and that no member of the public attended</td>
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<td>inasmuch as Everett had not been named as a</td>
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<td>possible site.</td>
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<td>Moreover, SBX's environmental impact is</td>
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<td>highly questionable. The daily and weekly</td>
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<td>testing of the facility may well create</td>
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<td>unacceptable levels of electromagnetic</td>
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<td>exposure and interference.</td>
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<td>Finally, it is an enormous eyesore to foist</td>
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<td>upon an otherwise beautiful part of the</td>
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<td>world.</td>
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<td></td>
<td>Thank you.</td>
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<td>Linda Beeman</td>
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<td>Clinton, WA</td>
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</table>
From: Shannon Walter  
To: gmdetreis@smdc.army.mil  
Subject: SBX in Everett, Wa.  
Date: Fri, 11 Apr 2003 16:57:46 0000

I oppose the Department of Defense proposal to locate the SBX in Everett Washington for a number of reasons. Mainly because: The negative impacts to Human Health and Safety caused by receiving long term, low level EM Radiation have not been fully studied to insure human/planet safety. The DoD indicated that Radiation "Scatter" will be an issue despite its attempts to target the array "So as to not Irradiate" people. This is an "Issue" I oppose due to undue health degradation.
The size of this structure, built on a converted ocean based oil drilling rig, and its design for heavy industry degrades the visual and aesthetic value of our local waters and sea life. Its placement would undermine the City of Everett’s current and future efforts to promote economic re development and attract investment in our waterfront and city core.
The DoD has not fully assessed the potential interference to airborne navigation and commercial communication systems, sensitive electronic and hospital and clinic based medical diagnostic equipment.
Especially unknown is the effect of the "full power" tests of the energy beam that must be run 5 to 6 times per week. In addition I oppose an industry that burns an average of 15,000 gallons of diesel fuel each day. Please count my vote against this project.  
Sincerely,
Shannon Walter  6th Generation United States Citizen

From: Will Osprey  
To: gmdetreis@smdc.army.mil  
Subject:  
Date: Thu, 10 Apr 2003 23:20:30 0000

I am writing to say that I am deeply concerned over the intent of the Missile Defense Agency to base the SBX in Everett. The city of Everett has already sent a letter to the Dept of Defense informing them that the City’s official position is that SBX does not belong in a densely populated area such as this, and Everett doesn’t want it.
South Whidbey Island definitely falls within the 13.8 miles range of this 250 ft. tall, stadium sized oil rig, fixed with an X band radar. As part of the 'affected communities,’ we should have been informed long in advance, and our input been included in the scoping process. This issue is bound to become widely discussed. If the X band finds its place here, its presence will not go ignored by our community.
I personally would consider moving away from a place I dearly love, but not without doing my utmost to create community awareness about the potential health effects of such massively high powered EMF’s, especially on pregnant women, infants in the womb, newborns and young children. Marine life would also be severely affected.
Thank you for hearing and representing the interest of Whidbey residents,

William Rubel
From: Dean Enell  
To: gmdetreis@smdc.army.mil  
Subject: That contraption in Everett  
Date: Fri, 11 Apr 2003 04:26:37  0000  

Who wants this thing -- not me. I live about 10 miles away on Whidbey Island where I will suffer the radiation that this boondoggle emits. Prove to me that this device is safe and more importantly that it is needed. Until so, throw this silly idea into the round can.

thanks,

Dean Enell  
Langley, Wash.

From: hunterjkks  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Tue, 15 Apr 2003 04:30:43  0000  

I am a registered voter and I am against the SBX. I have changed my parents message to show how I feel!!! Please read the following

Original Message  
From: Kathy Hunter  
Sent: Tuesday, April 08, 2003 10:08 AM  
To: gmdetreis@smdc.army.mil  
Subject: SBX X Band Radar  

I OPPOSE the Department of Defense proposal to use Naval Station Everett or Port Gardner Bay, Everett, WA., as a Primary Support Base for the SEA BASE TEST X BAND RADAR. My family house over looks Port Gardner Bay, I OPPOSE this location for the SBX in Test Phase or as a permanent Primary Support Base. I feel our home value would decrease considerably with the visual and aesthetic degradation of our view if the SBX was based in Everett, WA. There are unstudied negative impacts of long term exposure to low level electromagnetic radiation on human health and safety, which is an enormous concern to our family. With my parents owning a business in downtown Everett, the loss of future economic opportunities could be devastating if the SBX was located here. The re development impact for the City of Everett would be greatly affected too. PLEASE take Everett, Washington off your list for the location of the SEA BASED TEST X BAND RADAR. After I graduate from college in 2 years, I WILL NOT move back to Everett if the SBX is located in our community. Thank you Kimberly Hunter, Everett, WA.
From: "W. Mitchell Cogdill"
To: gmdetreis@smdc.army.mil
Subject: SBX
Date: Tue, 15 Apr 2003 04:39:10 0000

Dear Ms. Elliott,

I oppose the Department of Defense proposal to use Naval Station Everett as either a test site or as a permanent support base for the sea based test X band radar (SBX). Based on the information given at a recent information meeting in Everett, I firmly believe that there are possible negative effects to health and safety from radiation and magnetics as well as other pollutants which can be emitted from this structure. Furthermore, this giant object could pose problems with interference to airborne navigation (Boeing tests aircraft at nearby Paine Field), communication systems, electronics, hospital and medical equipment. Of course, just the magnitude of this 250 feet tall structure would create an eyesore on a waterfront which is being revitalized.

I do believe that other less populated sites which are being considered by the DOD would be more sensible. It is my hope as well as my family's hope that you will not select Everett for the SBX. Thank you for your thoughtful consideration.

Very Sincerely,
Marsha Cogdill
Everett, WA.

From: "Marianne Edain, Whidbey Environmental Action Network"
To: gmdetreis@smdc.army.mil
Subject: DEIS comments
Date: Tue, 15 Apr 2003 05:34:21 0000

Ms Julia Elliott,

On behalf of Whidbey Environmental Action Network, I am submitting these comments on the Ground Based Midcourse Defense Extended Test Range DEIS, dated January 2003. In particular, I am commenting on the Sea Based Test X Band Radar proposed to be based at Naval Station Everett.

Under NEPA, procedure is of the utmost importance. The information provided by David C Hasley, NEPA compliance officer, at a public meeting held in Everett on April 5, 2003 (which was videotaped and recorded by a court reporter) was that MDA had failed in its procedural obligations under NEPA. To quote: "When we began the scoping in March of 2002, this was not a part of the proposal... We were in a bit of a hurry, so we averaged between Bremerton and Everett and held the scoping meeting in Seattle. In hindsight, I wish we'd gone to the affected communities. It obviously didn’t work." Indeed it did not. Not a single person attended the scoping meeting in Seattle. One suspects that lack of public notice in the affected communities may have played a major role in such poor attendance. Whatever the case, a scoping at which no member of the public is in attendance is not a scoping. The process from that point on was fatally flawed. The DEIS which issued based on the non scoping is of necessity a fatally flawed document.

The only cure for this fatal flaw is to set aside the present document, to hold a genuine scoping meeting, with appropriate public notice, in the affected communities as defined by the communities, not by people at the opposite end of the county. We hereby formally request that you set aside the DEIS and perform legally valid scoping in the affected communities. At a minimum, we request an extension of the comment period sufficient to allow experts of our choosing to review the document and to provide us with their responses.
It is patent that no one working on the DEIS had the least bit of familiarity with this region, nor did they do the most basic research. The following statement appears on p. 4237 “Frequent rains common to the area would minimize dust and PM 10 formation.” Even a cursory glance at readily available rainfall data would have shown the author that our rainfall is highly seasonal, and that in fact we have serious drought problems during the summer months. During that time we also have air quality problems of a magnitude to require dust abatement.

This points out a larger problem with the DEIS—there are no citations given for most of the statements made. They are simply bald faced assertions which we are evidently expected to accept at face value.

In the entire DEIS there is precisely one reference to Whidbey Island, and then only as a hindrance to navigation (p. 3140). Altogether unmentioned is Camano Island, which forms one side of Port Susan Bay, where the SBX is proposed to be based. Whidbey and Camano Islands constitute Island County. Besides being non-entities and mere navigational obstructions, these two islands house upwards of 70,000 residents, 3 municipalities, and a Naval Air Station. No notice of this proposal was provided to Island County, the 3 municipalities, nor to any of the 70,000+ residents. We are now inquiring if NAS Whidbey was given notice. This lack of notice to a clearly affected community resulted in a large populace and at least 4 jurisdictions being deprived of their right to help determine the scope of the EIS, and of their right to comment on the resulting fatally flawed document. Again, the only reasonable (and legal) course of action is to return to the scoping process.

There are many other flaws in this document, particularly the failure to consider the cumulative effects of multiple repeated short term exposures of humans and wildlife, including plants, to electromagnetic pulses.

It appears, based on statements such as the one found on p. 4238, that there will be adverse effects on aviation. What appears to be at issue in this document is merely the extent of that adverse impact. NEPA is clear that an EIS is premature if the supporting documentation has not yet been produced. Please wait to issue the EIS until the actual data are available for evaluation.

On p. 4244 we find the unsupported assertion “main beam illumination on the ground will not occur.” We are not enlightened as to how or why this will not occur. This is insufficient. Either document and substantiate this statement, or delete it and do not rely on it.

On p. 4245 we are informed that a “detailed EMR/EMI survey” is underway and will be completed in Spring of 2003. The EIS is premature until this information is available. Please make it available.

In the following paragraph, we are told that “High power effects are non linear and therefore difficult to predict. Additional modeling is underway to determine potential interference distances related to high power effects.” Again, until the modeling is finished and the information available, the EIS is premature.

Under “Aircraft/Avionics” we are told that “SBX operations would be coordinated with the FAA, Coast Guard and other groups or agencies as appropriate. Therefore no health and safety impact to coastal areas, airspace/aircraft or mariners are anticipated.” In response, we are not much reassured by an agency which does not even acknowledge the existence of our county, and can’t even manage to hold a legally valid scoping meeting, can, by "coordinating" with other agencies somehow prevent the cumulative impacts of multiple short term exposures to EMR/EMI. Again, an unsupported assertion is made, in this instance "no health and safety impacts to coastal areas, airspace/aircraft or mariners are anticipated."
On p. es 13, under Potential impacts, we are informed that "A full electromagnetic radiation/electromagnetic interference survey and analysis would be conducted by the Joint Spectrum Center, in conjunction with the FAA, DOT, and other potentially affected users. The survey is used in preparing a DD Form 1494 that would be required as part of the spectrum certification and frequency allocation process." In other words, MDA has not yet done the basic research necessary to answer our questions about the health and safety, or the potential exposures of civilian residents to EMR/EMI. These analyses need to be done before issuance of an EIS. The lack of this information should have become obvious during the scoping phase. Again, NEPA requires information before conclusions.

p. 2 17/18 describes the vessel on which the SBX would be mounted. The description is inconsistent with that given at the public informational meeting of April 5, 2003 in Everett. Which is the actual proposal?

p. 3 139 describes the region of influence, and is inconsistent with other descriptions. Please state explicitly, and consistently, what the region of influence is to be, and how this is consistent with the assertion that there will be no health and safety impacts to surrounding civilian populations.

There are many more problems, but time is short. The bottom line is that this DEIS is altogether inadequate, and is based on a fatally flawed scoping process. Please go back to the scoping phase, and this time please do it right, complete with information on health effects and citations for all statements.

Marianne Edain

Whidbey Environmental Action Network is a non-profit membership-based organization dedicated to the preservation and restoration of the native biological diversity of Whidbey Island and the Pacific Northwest. If you are not already a member, please consider joining. Dues are $35 per year. Members receive our newsletter and periodic action alerts.

WEAN
Langley, WA
From: maxiepax
To: gmdetreis@smdc.army.mil
Subject: Location of SBX
Date: Tue, 15 Apr 2003 06:01:12 0000

Dear Sirs,

I oppose the use of Naval Station Everett as a test site or as a permanent primary support base for the Sea Based test X band radar (SBX).

I am concerned for several reasons:

1. I live on the bluff above Naval Station Everett, and the size and design of this structure will spoil the visual and aesthetic value of the waterfront, as well as the view from mine and all the many homes around Port Gardner Bay, and from the parks where people come to look at sunsets and sailboats, and our Navy ships when they are in port.

2. I have already experienced being unable to use my car remote at times when the Lincoln is in port, and am concerned that the SBX would have an impact on sensitive electronics in our area, which might even include hospital and clinic based medical diagnostic equipment. Have these possible interference effects been fully assessed?

3. I am also concerned about the effects of possible long term, low level EM radiation, (and radiation "scatter" as indicated by the Dept. of Defense.)

4. Lastly, I believe our City's efforts to promote economic re development and attract investment in our waterfront and the core of our city will be undermined by the presence of the SBX in our harbor.

Please do not place the SBX at Naval Station Everett. Thank you.
Maxine Kraemer
Everett, WA

May 1, 2003
SMDC-EN-V, Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL. 35807-3801

Dear Ms. Elliott,

From what I have learned about the proposed Sea-Based Test X-Band Radar (SBX) that is intended to be positioned at Naval Station Everett (Port Gardner Bay, Everett WA), I feel this is not in the best interest of the residents of Everett. There appears to be too many 'unanswered' questions regarding this technology and possible health risks associated with exposure to this type of radiation that this type of facility should be located where nobody would be at risk.

I am in favor of improving our defense strategy and technology. I suggest that SBX be installed in areas that avoid public exposure to the radiation, minimize the negative visual impact that this structure would have on the surrounding area, and that local economy does not suffer. From what I understand, the Draft Environmental Impact Statement does not thoroughly address the negative impacts on the local quality of life by implementing SBX in Everett.

As a person who operates a business with several employees situated on the Everett waterfront, I would like it to be know that I oppose installing SBX in Everett.

Sincerely,
Mike Curtis
Concerned Citizens Against the SBX
Everett, WA 98201
From: scott kerst  
To: gmdetreis@smdc.army.mil  
Subject: sbx  
Date: Tue, 15 Apr 2003 09:10:05 0000  
X-Mailer: Internet Mail Service (5.5.2653.19)

I strongly disagree that the SBX should be located by a population center like Everett Washington. It should be located in a low population or a no population area like the Marshall Islands, or Midway or Wake Island.

From: gkaajm  
To: gmdetreis@smdc.army.mil  
Subject: SBX EIS comments  
Date: Mon, 14 Apr 2003 21:52:05 0000

Glen Milner  
Seattle, WA

April 14, 2003

U.S. Army Space and Missile Defense Command  
ATTN: SMDC EN V, Mrs. Julia Hudson Elliot  
Huntsville, AL 35805

Mrs. Julia Hudson Elliot

I am commenting on the SBX or Sea Based Test X Band Radar. I live in north King County, approximately 15 miles from Everett. I believe the program should stop until more information is known about it.

I am concerned about the energy that this system produces in operation. High amounts of electromagnetic radiation are known to cause harmful effects to organism. It is also not known what type of effects these electromagnetic waves may have upon people with metal pieces (iron composites) in their bodies.

There clearly needs to be more research and public disclosure of this program.

I would have attended the public comment meeting in Everett earlier this month but I was unable to attend.

Please keep me informed of all developments with this system.

Thank you.

Glen Milner
From: Valerie Steel
To: Julia Elliott <gmdetris@smdc.army.mil>
Subject: SBX in Everett, Washington
Date: Mon, 14 Apr 2003 22:16:56 0000

April 14, 2003

SMDC EN V, Ms Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL 35807 3801

RE: SBX in Everett

Dear Ms. Elliott,

I am writing to document my opposition to the Sea Based Test X Band Radar (SBX) proposed to home port at Naval Station Everett or in Port Gardner Bay, Everett, WA.

As a four year cancer survivor, I am incensed that the Department of Defense would consider a highly populated urban area such as Everett as a location for this project. The DEIS does not address the affects of radars of this power over a long period of time, nor can it. These studies do not exist they have not been made.

According to the EPA’s most current data, Snohomish County ranks among the dirtiest/worst 10% of all counties in the US in terms of the number of people living in areas where cancer risk from hazardous air pollutants exceed 1 in 10,000. More than 590,972 people in Snohomish County face a cancer risk more than 100 times the goal set by the Clean Air Act. You are proposing to put an as yet untested device in a community that already has unacceptable levels of cancer!

To place the SBX in a populated area is a cure that would be worse than the ailment it was intended to treat. Place this radar at a site that a community does not call home.

Sincerely,

Valerie Steel
Everett, WA

Copy sent via US Postal Service

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Valerie Steel  
To: ‘Julia Elliott’ <gmdetreis@smdc.army.mil>  
Subject: SBX in Everett  
Date: Mon, 14 Apr 2003 22:52:57  0000

April 14, 2003

SMDC EN V, Ms. Julia Elliott  
US Army Space and Missile Defense Command  
PO Box 1500  
Huntsville, AL 35807 3801

RE: SBX in Everett

Dear Ms. Elliott,

Since 1990 I have been involved with the arsenic and lead contamination clean up in North Everett. The clean up is the result of practices by a smelter that was in operation briefly at the turn of the last century. At the time, they were employing commonly accepted methods of production. The clean up costs are rapidly approaching $80 million and may ultimately be more.

Now, I am concerned that this SBX radar which is being proposed for Everett may have very serious long term consequences that people in future years will have to deal with. I worry that people may suffer irreparable damage from the radiation.

I strongly oppose the placement of this questionable device in such a highly populated area.

Sincerely,

Anne Robison  
Everett, WA

---

From: George Newland  
To: gmdetreis@smdc.army.mil  
Subject: sbx platform  
Date: Mon, 14 Apr 2003 23:46:27  0000

Dear Selection Committee:

Please be advised that we are adamantly opposed to the siting of the proposed SBX platform on Everett’s waterfront. Our port facilities are much too small to accommodate a vessel of this size and nature without severe visual, social, environmental and health impacts. For all concerned citizens, please consider a sparsely populated area that can safely harbor this project. To situate this type of operation in an urban setting is ludicrous to say the least.

Also, if the decision makers visit the proposed Everett site, they will see that it is not conducive whatsoever to handling an immense cumbersome structure such as the SBX.

Sincerely,

George and Maribeth Newland  
Everett, Wa.
From: Diane Kendy  
To: gmdetreis@smdc.army.mil  
Subject: Proposed SBX in Everett  
Date: Mon, 14 Apr 2003 23:57:19  0000

Ms. Julia Elliott, SMDC E N V  
US Army Space & Missile Defense Command  
Post Office Box 1500  
Huntsville, AL 35807 3801

We strongly object to this proposal going forward without any notice to the affected communities, including all of Island County, Washington. This installation would have a HUGE impact on the entire Puget Sound area, which makes it mandatory that local residents be given an opportunity to make their comments known in open public forums.

SBX does NOT belong in densely populated areas!

Diane Kendy & Michael Nutt  
Langley, WA

From: Gloria Olson  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Tue, 15 Apr 2003 00:10:41  0000

Ms. Julia Elliott,

I am writing to you with great concern about the SBX potentially coming to Everett Washington.

My husband and I have been a citizen here our whole entire life. We have two children that are the most important issue in our lives. They are 13 and 15 with so much to look forward in the future.

I can tell you many details as to why I am praying that the SBX does not end up here but I it comes down to simply this: The health concerns of our children! Also, I am a receptionist at a near by office and my husband is an ironworker, out of Snohomish. We have worked very, very hard to provide a decent home for our family. With retirement always a concern, we are afraid that the value of our home will be worthless.

Please care about this community! It would be unfair given the fact that we have had little voice, no time, and very little information, and zero choice of this matter. This is not some isolated area without human beings.

We are families and citizens who would be effected negatively by this decision. It would crush our hopes, dreams and ideas for a prosperous Everett waterfront!

Please, I plead with whomever it may concern. This will benefit no one here. This, the SBX, DOES NOT BELONG IN A RESIDENTIAL COMMUNITY! It would simply be cruel and completely wrong. MORALLY WRONG!
Also, I ask that this process start over from the beginning! I, as a neighbor of this harbor did not have a fair chance at all! Please, our future is in your hands. Do what you would want done for your loved ones. Put yourself in our place; The fear, the vulnerability, the chance that everything you’ve worked for you may have to walk away from!

I pray, I plead, I hope.

Sincerely,

Gloria Olson
Everett, Wa.

Gloria Olson
Friendly Distributors, Inc.
Everett, WA

From: Philip Jazwieck
To: gmdetreis@smdc.army.mil
Subject: SBX in Everett WA
Date: Tue, 15 Apr 2003 00:56:12 0000

To: SMDC EN V

I went to the meeting that was held at the PUD Auditorium in Everett WA on April 5, 2003. I did not get a chance to speak so I am writing this.

I am in support of the military and what it needs to do the job that the country ask of it. I was disappointed in the citizens who did get up to speak, not one was for it they just complained about how it would affect them (noise, view, radar interference) our money that they thought could be better spent on there kids or other social problems, also the environment which I don’t see any thing different about that rig versus any other sea going vessel.

To me it just makes sense to put it where it has the easiest access to all of what ever type of support that it mite need be it people, supplies or repair. Which out of all the different locations, Washington or California would be at the top of the list. For Washington the electricity is a little better rate wise I think.

Plus I think it would look good in the marina. Hope you put it here.

Thank You
Philip Jazwieck
Everett WA

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: michael martin
To: gmdeitreis@smdc.army.mil
Subject: NO TO SBX IN EVERETT
Date: Tue, 15 Apr 2003 01:05:10 0000

We, like all residents of Everett, are very supportive of the men and women of the Navy base here. We appreciate them and welcome them as a part of our community. However, we feel it is vitally important that we express our deep concerns to the proposed SBX system in the Everett community. We simply would like to be on the record for our VERY STRONG OPPOSITION to the SBX system being located in the Port of Everett. To us, and the countless other residents we have spoken to, the very idea of the SBX system locating to this area is unthinkable and completely unacceptable. Make no mistake about it, the economic and social ramifications of this would be severe to the citizens of this community. In addition, we feel strongly it likely would impact this city’s relationship with the navy base.

We do not want this to happen. I urge you to strongly consider another site for the SBX system. Thank you.

Michael Martin and Won Chong Kim
Everett, WA

From: Richard and Karen Davies
To: gmdeitreis@smdc.army.mil
Subject: Sea Based Test X Band Radar
Date: Tue, 15 Apr 2003 02:22:49 0000

To whom it may concern:
I oppose the Sea Based Test X Band Radar (SBX) that is proposed to home port at Naval Station Everett or in Port Gardner Bay, Everett, WA.

I am worried that the effects of radars of this power to nearby residents in the surrounding community may be unsafe. According to the SBX information sheet, safe operating areas and angles are not established at this time. Living in a Radiation Hazard Zone with questionable operating areas and angles is not what Everett citizens want for their families in this recently-named All-American City.

I am concerned that the affect on air quality along the waterfront and in nearby Everett, when 14,500 gallons of diesel fuel are consumed per day for nine months of the year, will be unsafe levels of contaminants and diesel odors in downtown Everett.

The project is too big and out of scale with the rest of the city, and it will discourage other commercial non industrial development on the waterfront at a time when Everett is planning attractive and compatible access to the waterfront by both citizens and commercial developers. It took seventy-five years for Everett to clear the waterfront of the smokestacks and debris of a number of mills that resulted in the "City of Smokestacks" name. The city must now take care to preserve the natural beauty, property values, and economic potential that have been regained. The SBX project will eliminate the vision and future waterfront potential of Everett.

Surely a better military site for the SBX project can be found. It does not belong in the center of a community population. Were it your community in question, I'm sure you would agree.

Sincerely,

Karen Davies
From: Karen Charnell
To: gmdeitreis@smdc.army.mil
Subject: SBX Location
Date: Tue, 15 Apr 2003 02:28:32 0000

I am writing to oppose the location of the SBX Radar System in Port Gardner Bay in Everett, WA. My concerns are the low level radiation exposure, potential interference with cardio and radiation therapy equipment at the two hospitals located very near the waterfront, and the visual blight to this up and coming community situated on Puget Sound waterfront. Please take Everett Washington off the short list of potential locations. It is too close to residential and medical areas.

April 14, 2003

Dear US Army Space Missile Defense Command:

I am writing to express my opposition to the placement of the SBX X-Band Radar in the Port of Everett, WA. The very short time that Everett, Mukilteo, Marysville and the Island Communities have had to respond to this proposal is unacceptable. What information we have been able to garner revolves around the following:

1. Unknown health risks due to radiation emissions.
2. Anticipated significant decline in property values based on unknown health risks, coupled with loss of esthetically pleasing views of Port Gardner Bay.
3. Anticipated decline of Everett’s economy based on new business choosing to not establish in the same area as the SBX.
4. Disruption of air traffic.
5. Knowledge that if the SBX was ever called upon to fulfill its function, that it would have a seventy-five percent chance of being in port when called upon to do so.
6. Placement in Everett would be for the convenience of 54 crew members who would be staffing the SBX, including the use of city power and water. Consideration for the aforementioned risks to the community appear to not have priority status over ease and convenience for the Department of Defense.

I sincerely hope that you will remove Everett from the list of potential candidates for the SBX and place it in a non-populated area where there will be no risk to life or livelihood.

Yours truly,

Elizabeth Halgarth
Everett, WA
From: Sheila
To: gmdetreis@smdc.army.mil
Subject: X Band Radar (SBX) in Everett, WA
Date: Tue, 15 Apr 2003 04:06:29 0000

I am writing to express my opposition to the use of the X Band Radar (SBX) in the Puget Sound area of Washington state.

There has been a critical lack of notification to affected communities. Please, stop the current process and start over. The public needs to know that this is being considered and given ample opportunity to comment. I am deeply concerned at the impact this much radiation will have in such a densely populated area.

Sincerely,
Sheila Hoopman
Edmonds, WA

From: William Chandler
To: gmdetreis@smdc.army.mil
Subject: Sea Based Test X Band Radar (SBX)
Date: Tue, 15 Apr 2003 04:07:13 0000

I am furious. I am writing to voice my opposition to the Sea Based Test X Band Radar (SBX) proposed to home port at Naval station Everett or in Port Gardner Bay, Everett, WA.

I oppose this radar being placed in a large, urban such as my community of Everett. Such technologies should be placed where they will not effect any people or the potential safe functioning of their community or the beauty of their environment.

The negative impact on our waterfront is huge and is inadequately addressed by the Draft Environmental Impact Statement.

I cannot believe that you would force any community to accomodate such a potentially dangerous system and the manner in which you have tried to force this project on our community is despicable. The hearings for any project that would have such a huge impact on the community should have been widely publicized and yet most people even in Everett proper are unaware that such a dangerous eyesore is proposed for our waterfront.

Corry Venema-Weiss
Everett, WA
From: rsetlow
To: <gmdetreis@smdc.arm.mil>
Subject: SBX Near Whidbey
Date: Mon, 14 Apr 2003 22:13:53 0700

I am a new resident on Whidbey Island and just learned about the SBX project in the local paper. It appears to be a project similar to one I was familiar with in Norway, the so called, Vard Radar, as I worked in the US Embassy in Oslo during the discussion/installation controversy phase of this USAF/SPACOM project. This space surveillance radar is also known as, Globus, in Norway and received much attention in the Norwegian press/media. Though key issues are different, some overlap and SMDC probably could use the same approaches the USAF and Norway used to gain approval and safe operation near the town of Vard. If you not familiar with the Norway X band radar and related issues, I suggest SMDC track down the folks involved in HQ USAF, SPACOM, DIA, Raytheon, etc.

If you need a supporter and/or more help in this local, generally liberal/anti military environment, I'm willing to learn more about SBX program to help DOD, SMDC make the case to locate SBX in this region if agreement is not already in hand.

Regards,
Robert Setlow,
USAF Lt. Col. (retired)

From: WonChong Kim
To: "gmdetreis@smdc.army.mil" <gmdetreis@smdc.army.mil>
Subject: SBX opposition
Date: Tue, 15 Apr 2003 17:17:10 0000

Hello.

I am a resident of Everett, WA. I am writing to notify you that I oppose the proposed site of the Port Gardner Bay area for the SBX construction/location. We currently have a good relationship with the naval post located there, but should the SBX location be set in the Everett waterfront, it would definitely damage that relationship. The impact to the community would be very harmful economically and emotionally, as the town is trying to get a better profile in the public eye, and has recently made great costly steps toward improvements. Also, the area is completely populated, and the possible physical and emotional damage from such irradiation to the area, while unknown, could prove to be very costly and most likely negative in effect.

Thank You.
Won Chong Kim
Everett, WA

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)

<table>
<thead>
<tr>
<th>From: Christine</th>
<th>To: <a href="mailto:gmdetreis@smdc.army.mil">gmdetreis@smdc.army.mil</a></th>
</tr>
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<td>Subject: SBX Radar</td>
<td>Everett</td>
</tr>
<tr>
<td>Date: Tue, 15 Apr 2003</td>
<td>13:40:02 0000</td>
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</table>

Dear Sir/Madam:

I am an Everett homeowner who would like to remain one. I am opposed to the SBX being located here in the waters off a town of 95,000 people, most of whom live here because of the natural beauty of Puget Sound as well as the wildlife it attracts. All of this would be seriously threatened by the presence of the SBX.

We have pods of orcas who swim in these waters and are already suffering enough from PCB water pollution and heavy metal in their prime food, salmon, which in any case is in short supply in recent years. These animal family groups cannot suffer any further losses and sustain a population large enough to maintain a healthy genetic diversity. No information has been provided that environmental studies have been done on the impact of SBX on orcas and other wildlife, especially the effects of a fuel spill or of the EMR emitted by SBX. Not only is this an immediate threat in Gardner Bay and surrounding city of Everett, but to all that live in the waters through which the SBX would travel going to and from testing areas. Having a generator running 24 hours a day for 9 months a year will have a profound impact on the ability of orcas to communicate in the area, and this will directly affect their survival as they have to communicate to conduct their hunts. The impact of this noise on the hearing of orcas as well as on the ability of young to learn to differentiate calls has not been studied, but would surely be negatively impacted.

Unfortunately, I cannot take time to go into the many other issues raised by the SBX. Suffice it to say that for the above and myriad other reasons, I am strongly opposed to the SBX being located in Everett or anywhere in Puget Sound. I hope that decisionmakers will realize that both the government and residents of Everett are equally strongly opposed to this monstrosity, and will remain so.

Sincerely,

Christine Giannini
Everett, WA

We also have a resident population of nesting ospreys in Port Gardner Bay very near the site planned for the SBX. This is critical habitat for these majestic birds who nest on the pilings in the bay then hunt along the Snohomish River. The area is also major habitat for migrating birds who are already under threat from West Nile virus. The air pollution alone generated by burning 14,500 gallons of diesel per day while in port makes the SBX a health nightmare not only for nearby osprey and other birds, but for the entire area which, on cold, clear winter days, often suffers inversions for several days at a time when woodburning is not allowed. Diesel is a carcinogen which should be retired as a fuel ASAP. It certainly should not be burned in these amounts in the middle of a city.

P-E-0267

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Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Dave Kurtz  
To: gmdetreis@smdc.army.mil  
Subject: SBX in Everett  
Date: Tue, 15 Apr 2003 14:49:17 0000  

Let me add my voice to the thousands who are opposed to the SBX project in Everett. Everett has been a great supporter of the military, and the Navy has benefited from the positive relationship with the community here. That atmosphere of good will and cooperation is greatly endangered by this project. It will be an eyesore and a constant irritant to the community. For the good of Everett AND the military, please keep the SBX out of here!  
Thank you.  

Sincerely,  
David A. Kurtz

From: "Deane W. Minor"  
To: gmdetreis@smdc.army.mil  
Subject: SBX on West Coast  
Date: Tue, 15 Apr 2003 15:54:32 0000  

4.15.03  
To whom it may concern:  

I am a resident of Everett, Snohomish County, Washington.  

I am writing to OBJECT strenuously to the placement of teh SBX in our small harbor.  

While the health concerns from radiation may be overblown -- I hope -- there are significant other negative impacts from placing this huge device in our harbor:  

(1) it will be UGLY -- and detract from our beatiful setting.  

(2) it will negatively impact our city's efforts to improve itself economically; who would want to relocate a business in an area with this monstrosity in place?  

(3) the impact on other electronic devices is well documented.  

PLEASE SELECT A LOCATION THAT WILL NOT IMPACT THE CITIZENS OF EVERETT - OR THE CITIZENS OF ANY OTHER METROPOLITAN AREA; we all know that there are such sites available  

Thank you,  

Deane W. Minor  
Everett, WA
From: Ivy35Wood
To: gmdetreis@smdc.army.mil
Subject: SBX Location
Date: Tue, 15 Apr 2003 15:56:11 0000

I strongly OPPOSE the Department of Defense Proposal to locate the SBX in Everett, Washington. Donna Witte, Everett

From: Judy Thomas
Date: Sun, 13 Apr 2003 12:36:10 0700
To:<amdetreis@smdc.army.mil>
Subject: SBX

ATTENTION: Re: SBX

The Missile Defense Agency has failed to give proper (read: any) notice to the "affected communities" (like us on Whidbey), that their Scoping process was fatally flawed by this lack of notice, and that the only course now is to STOP what they're doing, give proper notice to ALL "affected communities," and schedule a series of very public Scoping meetings. Then they're going to have to go back and re write the EIS to reflect what they hear at the Scoping meetings.
From: Makhanchor108
To: gmdetreis@smdc.army.mil
Subject: I oppose SBX in Everett
Date: Tue, 15 Apr 2003 19:46:23  0000

I write to voice my opposition to the Sea Based Test X Band Radar (SBX) proposed to home port at Naval Station Everett or in Port Gardner Bay, Everett WA.

If this type of installation is appropriate for a densely populated area why has there been no public discourse on the issue?

I oppose it being put in Everett.

Sincerely,
Mark Anderson
Bothell, WA.
From: Dale Temple  
Subject: SBX Feedback  
Date: Tue, 15 Apr 2003 19:45:59  0000  

Below is a copy of the e-mail we sent to the US Army Space Missile Defense Command, regarding the proposed SBX radar system being home ported in Everett. I would like to receive a response from each elected official that receives this e-mail as to what your position is. A simple "For" or "Against" would suffice. Thank you.  
Sincerely,  
Dale Temple  

To Whom it May Concern:  
We are writing to express our opposition to having the SBX radar system home ported in Everett, WA. While we are ardent supporters of the navy base, there are just too many unanswered questions about the affects of this system to our health, environment and our community's economic development. We also do not believe that the notification to the people of our city was either proper or adequate.  
Sincerely,  
Dale & Laura Temple  
Everett, WA

From: kelli.trosvig  
To: gmdetreis@smdc.army.mil  
Cc: kelli.trosvig  
Subject:  
Date: Wed, 16 Apr 2003 05:33:09  0000  

I am writing to express my concern over the draft EIS and proposed siting of the SBX home port at Everett Washington. My concerns are as follows:  

Air Quality: What is the impact to air quality for the proposed SBX Test X band generators? In a maximum use scenario, how long would the generators run each day and what would be the emissions? What is the current air quality for the area and how will this additional point source add to air emissions from existing and future development plans for both the marina and the railroad switching yard located in close proximity to the site.  
I would recommend at the very minimum the exclusive use of low sulfur (less than 15ppm sulfur) diesel amended with at least 20% biodiesel alternative. The generators should be equipped with the latest and best technology for both noise and clean air emissions including catalyzed diesel particulate filters for carbon monoxide, hydrocarbon and fine particulate control. In addition measures should detailed how fueling will be performed to minimize spills and vapors.  

Endangered Species: The Port Gardner Bay represents a unique and biodiverse system for the migration and return of spawning wild salmon, various whales and occasionally orcas. Adequate measures will need to be put in place to monitor and ensure no adverse impacts to these species from air, water and non ionizing radiation emissions. Your draft EIS did not address this concern.
Electromagnetic Emissions: Please provide population dosimetry estimates for the expected and potential use of this radar system, including peak and six minute averages and a contour map showing potential exposures. What form of monitoring will be performed and what mechanisms will be in place to inform the general public of potential exposures? During the 20 minute testing each day what will be the frequency and wave form of the non ionizing radiation (maximum pulse energies, etc.). How will side beams radiation estimates be calculated?

How will potential adverse effects be studied and assessed prior to testing at the Everett Home port? At the very least I would recommend that an independent consultant be hired to assess exposures and risk for the general population including the potential for non thermal effects documented in the literature (sleep disorders, behavior and memory problems) including an analysis of existing military radar facilities impacts on the population. This analysis should be available to both the military and citizens prior to the siting decision.

In conclusion, I would like to ask that the final EIS takes into consideration that the SBX as proposed will be sited in Everett for 9 months a year. It should be considered a fixed point source and follow the most stringent guidelines of safety for environmental and public health protection.

Kelli Trosvig
Everett, WA

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From: Bikncatmom
To: gmdetrei@smdc.army.mil
Subject: SBX in Everett WA
Date: Wed, 16 Apr 2003 04:43:03  0000

I am writing to voice my opposition to the Sea Based Test X Band Radar (SBX) proposed to home port at Naval Station Everett in Port Gardner Bay, Everett WA.

I oppose this radar being placed in a large urban populated area such as Everett and its surrounding communities. The SBX should be placed in a site that will not affect any population base. It may interfere with our local hospital and medical equipment and emergency response communication systems. Our citizens are not safer within this hazard area.

The Draft Environmental Impact Statement (DEIS) does not thoroughly address the negative impacts the SBX will have on our most valuable resource, our recreational and commercial waterway, Port Gardener Bay. The DEIS does not adequately address the loss of future economic vision and redevelopment of our public waterfront properties. The impact of this enormous structure on our waterfront will have a huge negative effect on the visual attraction of the bay. The SBX must not become the visual landmark of our town.

I oppose the SBX Radar project being forced upon Everett, Washington and its people. Place this radar at one of the military sites that does not involve a community.

Sincerely,
Margaret Grospitch
Everett WA

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Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
<th>COMMENT</th>
</tr>
</thead>
</table>
| P-E-0277      | From: Tagsjp  
To: gmdetreis@smdc.army.mil  
Subject: Concerning the SBX decision  
Date: Wed, 16 Apr 2003 04:26:06 0000  
To the Decision makers for the location of the SBX:  
I applaud your move to create a system for our country to respond in a proactive manner when it comes to protecting our country. This decision of defense is one made to protect our way of life, the American way of life, a life with a high standard of living and quality. Although the SBX system is designed to protects us from opposing countries, if located in Everett, Washington it will dramatically impact our standard of living in a negative way. Locating the SBX in Everett is a total mismatch. If you really knew our city and our goals, this would be most apparent. Our city is rebounding from the down scaling of a major employer, Boeing, and its early roots as a mill town. It is a city in transition, one that is redefining itself. To do so we are drawing on our most valuable asset, our natural environment. We want the world to see Everett as a city in which they can relate to the natural environment and participate in recreation and cultural events. A city with soaring vital signs. It has taken money, tough decisions, foresight, and hard work to change our town’s image. And yet, in one ill thought out, short sighted decision you have the power to stop us in our tracks and destroy the progress our town has made. It would be a decision made by people who do not have to live with the long term consequences of any possible health risks, loss of property value, and a city with a diminished and uncertain future. If the SBX is placed in Everett, it won’t be in our “backyard”, it’ll be in our “frontyard”, only a few blocks from our downtown main streets. The SBX is an operation that should not be located in Everett or any other high density population. Please take Everett off the list of possible SBX locations.  
S. Phillips |
| P-E-0278      | From: MJ Anderson  
To: gmdetreis@smdc.army.mil  
Subject: Comment SBX in Everett WA  
Date: Wed, 16 Apr 2003 04:21:23 0000  
SMDC EN V  
Ms. Julia Elliott  
US Army Space & Missile Defense Command  
i am opposed to the SBX being homeported in Everett, Washington. The following issues are but a small sample of the numerous reasons for my opposition, which I gathered from the Draft Environmental Impact Statement.  
1. Inadequate research/studies on the effects of the radar’s electromagnetic interference on flight, marine and hospital equipment (area has 5 airports, 2 hospitals, and hundreds of commercial and recreational vessels in the immediate range of the SBX).  
2. Inadequate research/studies on the radar’s electromagnetic radiation effects on humans and wildlife. There is no reference to the several sensitive wildlife areas here, or to the Shoreline Management Act, which must be adhered to by prospective new development interests. I do not think the military should be exempt from obeying this Act.  
3. Inadequate safety mitigation for potential failures, ranging from fuel spills to “misfire” of the radar itself.  
4. Inadequate assessment of the radar’s impact on Everett’s economic vitality. For several years, Everett has worked to change its image from dirty mill town to a revitalized, family oriented area with a variety of businesses, including high tech. Homeporting the SBX here will impact our property values, our ability to bring in desperately needed new businesses, and possibly render unusable our newly designed multi use waterfront development plan. The waterfront development plan’s success will hinge on the sales of approximately 400 water view condominium units. If these units don’t sell because potential |
Residents don't want to look at the SBX every day, or are in fear of its health effects, our years of effort on this plan are a waste.

5. The stated practice of towing the radar and platform out to sea several times a year for testing defies all logic, when the radar could be homeported in an area much more accessible to the testing site. Wending this huge football stadium sized object through our highly sensitive ecological areas 10-12 times a year cannot possibly be more cost effective because the Army is saving money due to “easier access” for personnel and materials.

I request a cost trade off study from the Army, which must have been performed, comparing the money saved by homeporting the SBX in Everett for resource purposes, to the cost of towing the SBX out and back to sea up to 12 times a year.

6. Inadequate notification process to Everett and the surrounding areas of its candidacy for SBX homeporting. The Army’s excuse for a shortened public comment period was the the SBX was a late addition to the program. If it was a late addition, the entire process should have been started again from the point at which Everett became a candidate for homeporting.

I request that the entire notification process be restarted from the beginning, with adequate scoping meetings held at appropriate locations, and with an appropriate public comment period.

7. The Army has stated that it wants to be a "good neighbor" to its chosen homeport for the SBX. It is clear to me that forcing the SBX on a community that has risen up in singular opposition to this project would make the Army less than a good neighbor. In less than two months' time, the residents and government of Everett have given a massive voice to our dissent to the SBX. The Mayor of Everett and City Council have unanimously passed a resolution opposing the SBX. If the Army truly wants to be a "good neighbor", it will take its SBX to an unpopulated site, which is the appropriate place for this untested project.

Mary Jane Anderson
Everett, WA
From: Miji Ryan  
To: gmdetreis@smdc.army.mil  
Subject: EIS SBX   Everett, WA  
Date: Wed, 16 Apr 2003 03:17:30  0000  

After careful study of the material provided for the Environmental Impact Study for the proposed placement of the SBX in the Naval Station of Everett, WA I would like to register my extreme concern that the placement would severely impact the area and request that one of the other proposed locations should be chosen.

The materials on possible health considerations of the required in port tests do not address current scientific knowledge sufficiently to provide assurance to the citizens that there could not be serious consequences to them.

The city has worked diligently to make the best economic use possible of the waterfront and upgrade the area to provide a more secure financial base for the local economy. There is no doubt that the presence of the enormous SBX would completely negate these plans for relocation of industry and the location of upper scale waterfront usage. While we have been a willing host to the Naval Station, and 52 more personnel would be welcomed, we can not feel the same way about the insertion of a structure the size of a 25 story building.

I ask you sincerely to consider another location.

Miji Ryan  
Everett, WA

From: kelli ivan  
To: gmdetreis@smdc.army.mil  
Subject: SBX Platform in Everett  
Date: Wed, 16 Apr 2003 02:35:40  0000  

Even as our troops work to bring democracy in Iraq, I would hope that you allow democracy to work in the siting decision for the SBX platform. The residents of Everett have made it very clear that the vast majority do not wish to have the SBX radar platform sited in our community. This platform threatens our endangered salmon and siting the platform in Everett probably violates the Endangered Species Act. Further, since there are other acceptable locations where the local citizens actually would welcome the radar platform, I would hope that you would respond to the expressed wishes of our community and consider siting the SBX platform in one of the alternative locations. This is the only issue that I have ever seen that brought the citizens of Everett together in such a united front. Thank you for taking the time to listen. I hope that we have made our wishes very clear to you. Please take the SBX platform to another community where it will be welcomed.

Dr. Ivan Eastin
From: Glen Miller  
To: gmndtreis@smdc.army.mil  
Subject: NO SBX PLEEEEEESE!!!!!!!!!!!!!!!!!!!!!!  
Date: Wed, 16 Apr 2003 02:19:57  0000

Dear Sirs,

Please do not pick Everett as a place to locate the SBX defense system! I have carefully reviewed all aspects and information I have received on SBX.
I understand a need, but Everett does not want it. We are very very concerned about all aspects of SBX radar and platform which has been discussed again and again and again!! I need not say more! Health and view and our lifestyles are priorities!
OUR COMMUNITY HAS already given a lot to the navy and military support and feel we have done our PART!

NO SBX HERE!! PLEASE NO

Sincerely,

Glen W. Miller  
Everett, WA.

From: Ken Adams  
To: gmndtreis@smdc.army.mil  
Subject: SBX  
Date: Wed, 16 Apr 2003 00:56:04  0000

Please do not locate the SBX radar platform at Everett, WA. That area is too beautiful and populated to have something that large in the middle of everyone’s view. I’m sure there are other places to put it that are not as scenic to so many people. Thank you.

Ken Adams  
Everett, WA
From: Robert Emery  
To: gmdetreis@smdc.army.mil  
Subject: Everett SBX  
Date: Wed, 16 Apr 2003 00:37:35  0000  

Dear sir:  
I am voicing my opposition to the proposal to locate the SBX in Everett for the reasons that follow:  
- negative and unknown impact on the local salmon migratory patterns in Puget Sound,  
- negative impacts on the human population from the low level EM radiation, that is known to cause or increase incidence of cancer,  
- possible disruption and negative effect upon the annual migration of the Orca and Gray Whales and other sea life in Port Gardener Bay,  
- negative visual impact and economic impact to the Everett waterfront redevelopment,  
- unknown effects of the “full power” tests of the energy beam on local sensitive electronic equipment and life.  
Please relocate this experiment to a less populated area.  
SINCERELY,  
Robert S. Emery  

Friends of Maggie Park  
C/o Robert S. Emery President  
Everett, WA

From: Amy Burton  
To: gmdetreis@smdc.army.mil  
Subject: Placement of SBX  
Date: Tue, 15 Apr 2003 20:07:56  0000  

I am writing to you as a citizen who lives within the radius of the area that has potential of impact from the proposed SBX. While I am very supportive of the Naval Base we house, I am vehemently opposed to placing in a populated area the potential for unknown harmful effects from radiation. The Port of Everett and the City of Everett are NOT the appropriate location to place such an unknown.  

Amy Burton, Everett, Washington
From: J C O'DONNELL
To: gmdetreis@smdc.army.mil
Subject: SBX
Date: Tue, 15 Apr 2003 23:04:55  0000

Please no SBX in Everett.

J.C. and Mary O'Donnell, Everett

From: Scott Schroeder
To: gmdetreis@smdc.army.mil
Subject: SBX X Band Radar
Date: Tue, 15 Apr 2003 21:12:26  0000

Thank you for allowing us to voice our concerns over the DOD’s proposed plan to possibly site the SBX Radar Platform at Naval Station Everett.

My family lives VERY close to the Everett Navy Base. We are concerned not only with the impact such a huge structure will have on our views and property values, but also the unknown risks associated with being located so close to such a strong source of electro magnetic radiation. Locating this facility directly below a long established neighborhood of families should be re considered. Since the facility IS a sea going platform, serious consideration should be given to doing just that putting it to sea, rather than locating it in the midst of a heavily populated community. If the issue for selecting Everett as a prime choice is one of providing the facility a secure location, I'd have to think that locating it near the Navy's Indian Island facility would be an even better choice, and it would have a less adverse impact on a far smaller group of people.

For the record, we were all in favor of the Navy locating here when the base was first proposed. We are not however, in favor of becoming test animals for the Dept. of Defense. Please reconsider your proposal to site this facility in my neighborhood and choose a location more fitting for experimentation.

Sincerely,
Scott, Kim, Michael, and Kevin Schroeder.
From: "Doyle, John F."  
To: "gmdetreis@smdc.army.mil" <gmdetreis@smdc.army.mil>  
Subject: SBX Everett .. we want it here in Everett  
Date: Tue, 15 Apr 2003 20:43:04 0000  
gmdetreis:  
I think Everett needs the SBX project .. don't listen to people that are trying to kill the project because they think they live in a fancy yachtsman community. Everett is a WORKING community  
My home, Everett, has a great view of the area from the Navy base to Hat Island and the south end of Whidbey Island... I like to see the Lincoln come in and out of the port and also like to see the sail boats in the sound. The SBX would be great .. keeping Everett a vital part of the defense of the nation.  
The view of the sound would be enhanced by the presence of the SBX .. Let's be creative and welcome new technology ...  
Everett is a WORKING community .. it needs jobs. There is talk about building a new/improved dock to help attract Boeing shipping and the new Boeing projects...  
Thank you ........ looking forward to seeing the SBX in our area ..  

John Doyle

From: lynn  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Fri, 11 Apr 2003 19:18:12 0000  
ms julia elliott  
please know my family is totally opposed to having the SBX siting in Everett. I live on Whidbey Island within view of Everett. Everett doesn't want it. Whidbey doesn't want it, please listen & do what you can to keep this from happening.  
thank you for listening  
Lynn Hays & family

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: John Hurd 
To: gmdetreis@smdc.army.mil 
Subject: We want hearings on SBX!!!! 
Date: Mon, 14 Apr 2003 15:38:08 0000 

SMDC EN V, Ms. Julia Elliott
US Army Space and Missile Defense Command
PO Box 1500
Huntsville, AL. 35807 3801

Dear Ms. Elliott,

I write to voice my opposition to the Sea Based Test X Band Radar (SBX) proposed to home port at Naval Station Everett or in Port Gardner Bay, Everett WA.

I oppose this radar being placed in a large, urban populated area such as Everett and its surrounding communities. The SBX radar should be placed in a site that will not affect any population base.

The 22.5 km (13.8 miles) Radiation Hazard Area and Electromagnetic Interference Area covers a population base estimated at 400,000 people. It interferes with airplane navigation and communication controls. It may interfere with our local hospital and medical equipment and emergency response communication systems. Our citizens are not safer within this hazard area.

Current scientific studies have not analyzed radars of this power, or the effects of low EMR "scatter" over a long exposure period on Human Health and Safety. Current IEEE guidelines are based on outdated science and do not protect our health. Our children should not be raised within a Radiation Hazard Area regardless of the assurances that radiation levels are within "safe" limitations.

The Draft Environmental Impact Statement (DEIS) does not thoroughly address the negative impacts of the SBX and the security area that will surround it, on the loss of our most valuable resource, our recreational and commercial waterway, Port Gardner Bay. The DEIS does not adequately address the loss of future economic vision and redevelopment of our public waterfront properties. Home porting the SBX will forever tie the City of Everett to an industrial, military and restricted access waterfront. There is not even a socio economic section included in the DEIS.

The impact of this enormous structure on our waterfront will have a huge, negative affect on the visual attraction of the bay as well as destroy the views from surrounding homes and businesses. The loss of view, loss of desirability and loss of property values are not taken into account in this proposal. The SBX must not become the visual landmark of our town.

I oppose the SBX Radar project being forced upon Whidbey Island, WA. and its people.

Place this radar at one of the military sites that does not involve a community.

Sincerely,

John Hurd
Clinton, Wa
From: Gloria Olson  
Sent: Monday, April 28, 2003 2:57 PM  
To: gmdetreis@smdc.army.mil  
Subject: SBX IN EVERETT WASHINGTON

To whom it may concern,

I, Gloria Olson, and others in our community, are working very hard to inform our citizens of the possibility of having the SBX housed in our harbor. It has been a very emotional issue for many of us and we are racing to even have a chance of being heard.

This process was done unfairly and unjust! I request that this process of decision making start over, or better yet, just stop completely! Let's have some sense in the matter. This does not belong where my children play and we reside!

PLEASE PUT THIS IN A NON RESIDENTIAL AREA! It is a horrible feeling to know that something of this size and capacity can go into your FRONT yard, and we do not have a choice!

Could you imagine that happening to you and yours? Please, we must be able to trust our own government that they would not just drop this on us!

Sincerely,

Gloria Olson and Family
From: Tracy Hoffman
To: gmdetreis@smdc.army.mil
Subject: SBX Radar in Everett
Date: Wed, 9 Apr 2003 14:47:21 0000

We are against installing the SBX radar in Everett, WA. While we don't live in Everett we do keep a boat in the Port of Everett.

There must be a better location to place such a high power radar installation away from population.

Tracy Hoffman
Carol Grout
Bothell, WA

From: "Beckmeyer, Chris"
To: "gmdetreis@smdc.army.mil"
Subject: SBX In Everett
Date: Wed, 2 Apr 2003 20:23:54 0000

To Whom It May Concern
This letter is to beg you drop Everett as a site for the SBX platform. We’re a small community without much clout and struggling to maintain a toe hold in these tough economic times. We’ve already lost our timber industry and are losing more of more of our commercial airplane industry everyday. About all we have left to pursue is tourism and our beautiful waterfront is major part of that. Please realize that the SBX platform will destroy that as well.

I understand the necessity of the SBX. Of the six potential sites, it seems to me that Adak or Pearl Harbor would suffer the fewest detrimental effects. Adak being remote and inaccessible to the public (one of my brothers was career Navy and stationed there for years), Pearl Harbor being a huge military installation already.

Thank you very much for your consideration in extending the comment time.
Regards

Chris Beckmeyer
Everett WA

chris.beckmeyer
From: Cal_Bouma  
Sent: Tuesday, April 01, 2003 11:09 AM  
To: gmdetreis@smdc.army.mil  
Subject: Proposed SBX platform in Everett, WA

Dear Sir or Madam:

I realize the open date for comments has closed but I was away on business and missed the deadline. I would still like to submit comments on the placement of this project in Everett.

I am a steadfast supporter of our military. I am also a firm believer that technology is a necessary part of defense. However, as a local homeowner and involved citizen I am opposed to the placement of the SBX platform in Everett.

The city and residents of Everett have worked diligently in an attempt to move past being an industrial center. In order to secure a sound future in these uncertain times, Everett has planned economic development to attract people and families who will make Everett a long term home. Placement of the SBX platform in Everett will harm our plan to attract long term residents to the residential appeal of Everett.

Everett has many fine parks including the Jetty Island Bird Sanctuary. The 14th Street Boat Launch has become one of the busiest in the area for sport boaters. The up and coming waterfront with its Farmer's Market, Micro Brewery, Fish Market and Restaurants has attracted a growing number of visitors. Soon the Sounder Commuter Train will provide a link for attracting more residents who wish to live in Snohomish County but work in King County. Development of the waterfront and cleanup of industrial areas. All of these attractions will be negatively affected by the placement of SBX which will undoubtedly put a pall over local outdoor activities with its gargantuan size and brooding presence.

Sincerely,

Calvin Bouma

The City and people of Everett have strongly supported our Navy base and are proud of the men and women stationed there. Personally, I have attended many functions on the Navy base and appreciate the work on both sides to make the relationship a good one. Yet I must say the placement of the Navy Base has come with its own cost to the citizens. The construction of the base itself was a large negative visual impact. The fear of being the “target” of a terrorist or other attack due to proximity to the base is one which rests in the mind of every parent residing here in Everett. But these negatives were accepted graciously by the community as part of the price we pay for freedom. This being said, we feel we have paid our price. To add the SBX to our local price is too much. We are a community struggling with our own economic viability and future. The SBX will hamper most of our plans and change the nature of our coexistence with the Navy.

I speak for myself as well as many residents I have discussed this matter with when I ask you to locate the SBX elsewhere. Indian Island seems a much better fit when considering the size of our community here in Everett and the fact that development here will affect so many.

Sincerely,

Calvin Bouma
From: Kim Buckhalter  
Sent: Wednesday, April 09, 2003 5:43 PM  
To: gmdetreis@smdc.army.mil  
Subject: SBX Opposition

The SBX emits Electromagnetic Radiation (EMR) and creates Electromagnetic Interference (EMI). The potential disturbance area from EMR/EMI extends from the center of the SBX 13.8 miles in all directions with a fully populated array. The EMI creates a radio frequency radiation area, aircraft navigation interference area, electronic communication interference area and electro explosive device interference areas. Safe operating areas and angles are not established at this time. Within the potential disturbance areas are 5 airports, 2 low altitude air routes, 2 hospitals, City Emergency Response Communication Systems and commercial communication systems (partial list).

X band operates in a frequency range of 8-12 GHz and could potentially degrade the overall performance of other airborne systems such as fire control, weather radar, bomb/navigation in military aircraft that also operate in the X band.

Issues of Noise, Socioeconomics, Water Resources, Cultural Resources, Land Use or Environmental Justice are not addressed in the DEIS. Health and Safety and Airspace impacts and mitigation rely on a Joint Spectrum Analysis Survey and completion of DoD Form 1494 which has not yet been conducted.

As a resident of Island County I am in direct contact with the environmental impact created by this project.

Therefore I strongly oppose it.

Kim Buckhalter

From: Dvores  
To: gmdetreis@smdc.army.mil  
Subject: SBX Basing  
Date: Mon, 7 Apr 2003 23:29:11 0000

Although this is not a voting process I would, never the less, cast my vote for Everett, WA as the new homeport for the SBX platform. The natural geographic advantages and the existing infrastructure make this decision a “slam dunk.” No other areas under consideration provide the natural deep water and the existing pier “A” with a 55’ minimum draft. Everett provides a military facility with the necessary security and an existing infrastructure for periodic repair and maintenance. Unless I am mistaken Everett is closely associated with the lead contractor for the project. Not only is Everett a logical choice and a common sense choice, it is also a cost effective choice.

Eugene S. Dvornick  
Everett, WA
From: Joe Eichinger
To: gmdetreis@smdc.army.mil
Subject: SBX Everett, Washington
Date: Mon, 7 Apr 2003 21:36:48 0000

Dear U.S. Army Space and Missile Defense Command,

This email is to voice my objection for the proposed placement of the SBX radar installation at the Port of Everett, Washington.

My objections are based on the following:

1. There is no definitive study or body of evidence indicating that the proposed radiation levels over time will not create a health hazard.
2. The proposed structure will reduce property values in the nearby Everett neighborhoods.

My recommendation is that you consider placing this structure in a less populated area.

Thank you,

Joseph E. Eichinger
Everett, WA
jeichinger

From: "Bernie J.M.W. Fleming"
To: gmdetreis@smdc.army.mil
Subject: Everett Wash. basing of SBX
Date: Wed, 2 Apr 2003 20:48:16 0000

I am in favor of this project. For one thing, I appreciate any anti-missile defense established here, especially in light of our new found vulnerability to North Korea. As far as the "view" goes, those people with "it" are a small minority of this area. I would find a feature such as the SBX interesting, especially as I grow older. I also feel any military item such as this would further utilize NAVSTA Everett, our newest and most ecologically correct military facility.

Sincerely, Bernie JMW Fleming
b.e.fleming

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Larry/Rose Goulet  
To: gmdetreis@smdc.army.mil  
Subject: FW: SBX/Everett  
Date: Tue, 25 Mar 2003 02:45:36 0000

3 24 03
ATTN: SMDC EN V (Mrs. Julia Hudson Elliott)
Please see the below message.
I apologize for not sending to the correct address directly.
Sincerely,
Rose Goulet
Everett Citizen

Original Message
From: External Affairs
Sent: Monday, March 24, 2003 1:16 PM
To: gouletlr
Subject: RE: SBX/Everett

Ms. Goulet

Thank you for your email on the DEIS. However, comments on the EIS should be addressed to:
U.S. Army Space and Missile Defense Command
ATTN: SMDC EN V (Mrs. Julia Hudson Elliott)
106 Wynn Drive, Huntsville, AL 35805
by e mail at <mailto:gmdetreis@smdc.army.mil>
gmdetreis@smdc.army.mil
or by phone at 1 800 823 8823.

Public comments are invited and must be postmarked by March 24, 2003.

Thank you,
MDA External Affairs

Original Message
From: gouletlr
Sent: Monday, March 24, 2003 2:59 PM
To: External Affairs
Subject: SBX/Everett

3 24 03
I object to SBX being sited in Everett.
I have three points I would like to address.
First, Everett has I believe been a good neighbor to the Navy. The way the MDA released the info re: siting in Everett, was not in good faith as a neighbor. Short notice, allowing little community input, not contacting city council. This approach does not promote good PR.
Second, the EIS, Vol 2 of 2, Jan ’03, section 4.8.8 “Visual Impact” concludes, "Therefore, significant impacts to visual and aesthetic resources are not anticipated due to the proposed action.” This conclusion is reached after comparing the size of the SBX to The Abraham Lincoln. The height of The Lincoln is at an isolated portion of the ship, while the SBX height is for the entire platform. This conclusion leads me to believe the report is misleading and presents skewed information in other areas or in its entirety.
Third, the April 5, public info input date that has recently been scheduled, does not allow for additional input time from the community. Two sessions on the same date does not allow for wide spread access or input.
I believe, the placement of the SBX will have significant visual impact. I believe, the MDA is not acting with be best interest of the community support of the Everett Navy Base in siting the platform in our community.
I also believe my input along with the rest of our community will make no difference whatsoever. I submit it non the less.
Objecting to SBX in Everett,
Rose Goulet
From: Denis Hayner
To: gmdetreis@smdc.army.mil
Cc: posada
Subject: No SBX in Everett
Date: Thu, 3 Apr 2003 15:54:02 0000

SBX is ugly. Please put it somewhere else.

Denis Hayner
Lynnwood, WA
e mail: dhayner

From: svn <res0pj ea>
To: gmdetreis@smdc.army.mil
Subject: comment on SBX in Everett
Date: Fri, 4 Apr 2003 00:06:06 0000

To Whom It May Concern,

Well, I have no problem to have a "giant golf ball" in the Everett Navel Station. In fact, I think this will be a unique landscape for the city of Everett. Many cities may have their "the aircraft carrier" but there is not many cities to have a landscape with this one of kind structure.

When tourists take a picture of downtown Seattle, the picture is not completed without the Space Needle. If SBX platform is based in Everett in the future, tourists taking pictures of downtown Everett is not the downtown Everett without the SBX platform.

An odd looking structure is a great thing. Without SBX platform, downtown Everett is just another ordinary All American city.

Sincerely,

Andrew H.
Resident of Everett

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Kathy Hunter  
Sent: Tuesday, April 08, 2003 10:08 AM  
To: gmdetreis@smdc.army.mil  

We OPPOSE the Department of Defense proposal to use Naval Station Everett or Port Gardner Bay, Everett, WA., as a Primary Support Base for the SEA BASE TEST X BAND RADAR. As a homeowner over looking Port Gardner Bay, we OPPOSE this location for the SBX in Test Phase or as a permanent Primary Support Base. We feel our home value would decrease considerably with the visual and aesthetic degradation of our view if the SBX was based in Everett, WA.

There are unstudied negative impacts of long term exposure to low level electromagnetic radiation on human health and safety, which is an enormous concern to our family. With owning a business in downtown Everett, the loss of future economic opportunities could be devastating if the SBX was located here. The re development impact for the City of Everett would be greatly affected too. PLEASE take Everett, Washington off your list for the location of the SEA BASED TEST X BAND RADAR. Thank you Jamie and Kathy Hunter Everett, WA.

From: Christianne Loupelle  
To: gmdetreis@smdc.army.mil  
Subject: save midway atoll  
Date: Tue, 25 Mar 2003 14:18:51 0000

Why we should preserve Midway in its current state as a wildlife refuge:
1. Fifteen species of seabirds (more than 2 million birds, including albatross, tropicbirds, boobies, shearwaters, petrels, frigatebirds, terns, noddies) nest on the atoll each year.  
2. Midway is home to the largest colony of Laysan Albatross (Phoebastria immutabilis) in the world and the second largest Black footed Albatross (P. nigripes) colony. An endangered Short tailed Albatross (P. albatrus) recovery effort is also underway.
3. It is an important stopover for migrant shorebirds (curlews, plovers, turnstones).
4. The beaches, reef, and surrounding waters support endangered Hawaiian Monk Seals (Monachus schauinslandi), threatened Green Sea Turtles (Chelonia mydas), Hawaiian Spinner Dolphins (Stenella longirostris) and a vast array of rare lagoon, reef, and pelagic fishes.

Environmental Impact Statement (EIS) highlights:
A major goal of GMD ETR is to establish additional missile launch and support sites. Midway will serve as one such support site. As stated in the EIS, proposed activities GEUroecould have an effect on air quality, biological resources, and hazardous materials and waste at MidwayGEUR¥.

The main impacts discussed are those of facilities construction. GEUroecommunicator GEUrfacilities GEUreconstruction GEUrsuch as those new administrative facilities, would be built at several sites on Sand Island (MidwayGEUR(tm)s main island). These will encompass areas of up to 2 hectares (5 acres) and will be fenced and lighted for security.
They will be sited on areas of existing pavement, but some clearing/excavation may disturb nearby vegetation. An all weather road as well as plumbing/cables will be installed at these facilities. Hazardous waste may be generated from these activities and will be stored in GEURoetemporary storage tanksGEUR¥. A generator will power facilities and will create constant noise that may startle wildlife. Construction (via diesel powered equipment) may temporarily degrade local air quality.

For those interested, the several hundred page document can be found at the Missile Defense AgencyGEUR(tm)s website: http://www.acq.osd.mil/bmdo/bmdolink/html/enviro.html (Scroll down to links under GEURoeDraft Ground based Midcourse Defense Extended Test Range Environmental Impact StatementGEUR¥).

Some specific concerns that I will be addressing in my own personal letter:

1. MidwayGEUR(tm)s endemic flora and fauna, like many island ecosystems, suffer from decades of competition with aggressive invasive species. As mentioned in the EIS, over 200 plant species have been introduced to Midway since the arrival of residents in 1902. However, little discussion is provided as to how military personnel will minimize the potential for the spread of existing (and introduction of new) invasive species. What precautions will be taken and how will construction areas be restored following disturbance? Will native plants be planted, or will alien species be allowed to colonize these locations?

2. Light pollution (from security lights) is a serious threat to nocturnal birds like the Bonin Petrel (Pterodroma hypoleuca); petrels can become disoriented, colliding with buildings, etc. with lethal force. Not only should USFWS approved lights be used but efforts should be made to minimize lighting altogether. Similarly, fences, power lines, antennas, satellites, and other infrastructure may impede flight patterns and pose a hazard to seabirds, particularly albatross.

3. Increased use of motor vehicles for construction and transportation purposes may not only degrade air quality but may increase 1) casualties of na+ve albatross chicks wandering the roadways and 2) general disturbance to nesting seabirds.

4. While construction activities and facilitiesGEUR(tm) locations may be confined to inshore areas away from hauling out locations of seals and turtles, the increased levels of human disturbance will undoubtedly impact other wildlife via noise pollution (e.g. from generator operation) and regular human presence.

5. The proposed activities increase the potential for an oil spill and/or hazardous waste contamination. The remote location of the atoll could make clean up very difficult and costly.

Christianne Loupelle
Graduate Student
Department of Natural Resource Sciences
McGill University

From: Christianne Loupelle
To: gmdetreis@smdc.army.mil
Subject: save midway atoll
Date: Tue, 25 Mar 2003 14:18:40  0000

U.S. Army Space and Missile Defense Command
ATTN: SMDC EN V (Mrs. Julia Hudson Elliot)
Huntsville, AL
U.S.A.

e mail at gmdetreis@smdc.army.mil

Why we should preserve Midway in its current state as a wildlife refuge:

1. Fifteen species of seabirds (more than 2 million birds, including albatross, tropicbirds, boobies, shearwaters, petrels, frigatebirds, terns, noddies) nest on the atoll each year.

2. Midway is home to the largest colony of Laysan Albatross (Phoebastria immutabilis) in the world and the second largest Black footed Albatross (P. nigripes) colony. An endangered Short tailed Albatross (P. albatrus) recovery effort is also underway.

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
3. It is an important stopover for migrant shorebirds (curlews, plovers, turnstones).
4. The beaches, reef, and surrounding waters support endangered Hawaiian Monk Seals (Monachus schauinslandi), threatened Green Sea Turtles (Chelonia mydas), Hawaiian Spinner Dolphins (Stenella longirostris) and a vast array of rare lagoon, reef, and pelagic fishes.

Environmental Impact Statement (EIS) highlights:
A major goal of GMD ETR is to establish additional missile launch and support sites. Midway will serve as one such support site. As stated in the EIS, proposed activities could have an effect on air quality, biological resources, and hazardous materials and waste at Midway.

The main impacts discussed are those of facilities construction. IN Flight Interceptor Communication System Data Terminals, commercial satellite communications, and mobile telemetry stations will be built at several sites on Sand Island (Midway's main island). These will encompass areas of up to 2 hectares (5 acres) and will be fenced and lighted for security. They will be sited on areas of existing pavement, but some clearing/excavation may disturb nearby vegetation. An all weather road as well as plumbing/cables will be installed at these facilities. Hazardous waste may be generated from these activities and will be stored in temporary storage tanks. A generator will power facilities and will create constant noise that may startle wildlife. Construction (via diesel powered equipment) may temporarily degrade local air quality.

For those interested, the several hundred page document can be found at the Missile Defense Agency's website: http://www.acq.osd.mil/bmdo/bmdolink/html/enviro.html

Some specific concerns that I will be addressing in my own personal letter:
1. Midway's endemic flora and fauna, like many island ecosystems, suffer from decades of competition with aggressive invasive species. As mentioned in the EIS, over 200 plant species have been introduced to Midway since the arrival of residents in 1902. However, little discussion is provided as to how military personnel will minimize the potential for the spread of existing (and introduction of new) invasive species.

2. Light pollution (from security lights) is a serious threat to nocturnal birds like the Bonin Petrel (Pterodroma hypoleuca); petrels can become disoriented, colliding with buildings, etc. with lethal force. Not only should USFWS approved lights be used but efforts should be made to minimize lighting altogether. Similarly, fences, power lines, antennas, satellites, and other infrastructure may impede flight patterns and pose a hazard to seabirds, particularly albatross.

3. Increased use of motor vehicles for construction and transportation purposes may not only degrade air quality but may increase 1) casualties of naive albatross chicks wandering the roadways and 2) general disturbance to nesting seabirds.

4. While construction activities and facilities locations may be confined to inshore areas away from hauling out locations of seals and turtles, the increased levels of human disturbance will undoubtedly impact other wildlife via noise pollution (e.g. from generator operation) and regular human presence.

5. The proposed activities increase the potential for an oil spill and/or hazardous waste contamination. The remote location of the atoll could make clean up very difficult and costly.
From: Mike Mashock  
To: gmdetreis@smdc.army.mil  
Subject: SBX siting  
Date: Wed, 2 Apr 2003 16:46:14 0000

As much as I appreciate the efforts of the military to protect us, I feel the proposed location of the SBX is terribly wrong.

1. The SBX is huge, it is ugly and it is not wanted on the Everett waterfront. We have long labored to remove some of the large structures to improve our skyline. The addition of the SBX would be a step in the wrong direction it is HUGE and UGLY. It needs to be moved outside of Whidbey island where there is a greater expanse of water to 'conceal' it. And less people to view it daily. How about in the Strait of Juan De Fuca?

2. The SBX is a navigation hazard. There is a tremendous amount of sail and motor craft in Port Gardner Bay. The presence of the SBX in the fog will be a navigation hazard. There is too much risk of danger to the citizens in siting the SBX in Port Gardner Bay.

3. Radio interference? Will the systems in the SBX cause interference in our civilian radio and TV reception? In the past I have lived near the Marine Base in Kaneohe, Hawaii. The loud periodic buzz from the radar, on the radio, is still present on some of the audio tapes I made there. This MBX needs to be located further from the large Everett population center.

4. The Navy Base! We already have a large number of huge grey ships in the harbor. We are doing out share to support the Navy and to defend our country. The MBX needs to be moved to another area, I suggest either outside Whidbey Island or North of Everett to be located between Camano and Whidbey Island or in the Strait. Please do not locate (inflict) all of the 'hardware' on one community!

The feelings I am sharing with you are supported by many people in our area. Not all of us have the time or energy to contact you about this issue. Please do not site the SBX in our community.

Respectfully,

Mike Mashock

mjmash
Dear Sirs,

I attended the public forum last Saturday in Everett, WA and was disappointed in the process that was followed. Based on the public hearing comments I recommend that you extend public comments to the EIS.

I personally did not become aware of this project until approximately three weeks ago at a town hall meeting. If proper notification was accomplished I would have been notified of the Seattle scoping meetings. Without proper notification due process for the citizens of the 38th Legislative District was not accomplished.

With all due respect I request an extension of the public comment period.

John R. McCoy
WA State Representative
38th Legislative District
From: Bob and Loretta Mumford
Sent: Wednesday, February 26, 2003 10:03 PM
To: gmdetreis@smdc.army.mil
Subject: Alaskan missile defense plan

Dear Ms. Elliott,

I wanted to go on record in support of the Alaskan Missile Defense plan.

I have lived in Alaska for 27 years, having moved here as an Airman in the U.S. Air Force assigned to Elmendorf A.F.B.

I support any program that would be able to successfully challenge a missile attack, be it either conventional or nuclear, against our nation.

In this age of unrest and rouge leadership in other countries I don't see how anyone could oppose a system designed to intercept these threats. If it is best to base these systems in Alaska to protect Alaska and the West Coast then please do it. Whatever "environmental impact" the systems may come with, it is less than what impact a nuclear missile would have on our environment!

Thank you for your time.

Bob Mumford
Anchorage Alaska

From: Michelle Wilson Nordhoff
Sent: Wednesday, February 19, 2003 3:27 PM
To: gmdetreis@smdc.army.mil
Subject: Draft EIS public comment

I'd like to register my NON support for missiles and NMD in Alaska. I would like to know answers to the following 5 questions.

1. Why are there no hearings in Delta Junction and Fairbanks for the Extended Test Range?

2. How are missiles going to be transported from Ft. Greely to Kodiak?

3. Are launches from Kodiak going to affect commercial and subsistence fishing?

4. Is the military going to hold hearings in the villages of Old Harbor and Akhiok, which may be endangered by missile trajectories?

5. Is the US Military going to exempt itself from existing laws like the Endangered Species Act.

Thank you.

Another Alaskan for Peace without War,

Michelle Wilson Nordhoff
Anchorage, AK

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Mike c papa  
Sent: Tuesday, March 11, 2003 12:17 AM  
To: gmdetreis@smdc.army.mil  
Subject: Comments - GROUND-BASED MIDCOURSE DEFENSE  
EXTENDED TEST RANGE  
DRAFT EIS  

I am a resident of the City of Everett, Washington, and did not have the opportunity to attend the public meeting held here on the subject of the SBX platform, but wished to comment on it. Hence this email for the record.

My concerns are threefold; visual impacts, the effects on recreational boaters and the impact of the type of radiation this facility will generate.

1) I do not believe the statement that "because this type of activity consistently goes on at Naval Station Everett, there are no visual impacts". When the navy proposes to moor something much taller than a aircraft carrier and almost as long, this is an impact. When Dunlop Towing had their huge crane here for years before it was removed, it was an eyesore. So will the SBX platform. What does the Navy propose to do about this? If this should reduce property values of view properties, will the Navy compensate property owners?

2) I am a recreational boater also am concerned about putting even more of the public waterways off limits when this thing is moored out in Port Gardner Bay. What is the width of the security zone? Will it in fact be moored out in the bay at any time, or only be moored at the naval dock or moved out into the ocean when being used?

3) I am also concerned about the health effects of electromagnetic radiation. While docked will this facility be used? What is the effect of the type of radiation this platform emits?

I would appreciate answers to these questions. Until then I would prefer you locate this facility somewhere else, preferable a less populated location. According to the newspapers another nearby location would be Indian Island, which in my mind would be better. The Navy owns the whole island so it doesn’t matter so much whether it is a visual eyesore or not.

Another reason to put it somewhere else is for the benefit of the sailors who would serve on it. The Seattle/Tacoma/Everett area has relatively high housing costs compared to other less populated or desirable areas. I know sailors are not paid princely salaries, and it would be more difficult for them to afford housing in our area than say, Bremerton or the Indian Island area.

Thank you for taking my comments and I will await (I hope) a timely reply. Again, at this time I would stress I wish you would take this proposed facility somewhere else. The Naval base as it is here is quite enough, thank you.

Sincerely,

Michael Papa  
Everett, WA
From: Lynn Murray Willeford  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Tue, 8 Apr 2003 19:36:17 0000  

My family and I have lived and run businesses for thirty years on South Whidbey Island, which I now learn is directly in the line of your proposed BBX system to be based at the Navy’s Everett Home Port. There was no notification here of this proposal, and as people on South Whidbey are starting to hear about this draft EIS we are very concerned that #1 we were not considered in the EIS, #2 we do not know the effects of the radar on our health, and #3 we do not know what effect this system will have on our personal and business telecommunications. Can you send me a copy of the draft by mail or e-mail, please? My addresses are below. Thank you.  
Lynn Willeford  
Langley WA

From: caringwoman  
Sent: Monday, March 24, 2003 6:27 PM  
To: gmdetreis@smdc.army.mil  
Subject: Re: deis of the gmd  

Quoting caringwoman@ecomail.org:  
> I am writing to share my strong opposition to the extension of the GMD. I also  
> am writing for several groups that wanted me to include their voices with  
> mine. We all agree that we don’t want the impact that this project will have  
> here in Hawaii. It is too close to our airport, our people, and our birds &  
> other winged wildlife. We are educators, farmers, students, cooks, parents,  
> and students. We are overwhelmed facing the over 700 toxic areas at Pearl Harbor; the history of no ongoing clean up at most military posts; & the time  
> consuming tortures of trying to get a huge ever changing visitor administration to learn and practise aloha aina. What we were told at the hearing in March made it clear that there is not enough data to show that  
> birds will not be harmed long term. I think I have shared enough for the point  
> to be made. Please do all that you can to make things right; we need your help! Malama Pono, M. Doherty, Chisa Dodge, Mona Kim, Ujenna &  
> Marguerite Johnson, Gary Forth & family.  
>
From: Timothy Reisenauer  
To: gmdetreis@smdc.army.mil  
Subject: Protest SBX placement in Everett WA  
Date: Fri, 4 Apr 2003 05:54:15 0000

Ms. Julia Elliott  
SMDC EN V  
U.S. Army Space and Missile Defense Command  
P.O. Box 1500  
Huntsville, AL 35807 3801

Dear Ms. Elliott:

I am writing to urge you to communicate to the DOD that its plans to possibly station the SBX radar platform here in Everett Washington should be abandoned. Everett citizens do not want this platform in our city.

Placing the SBX here is bad for a number of reasons. It ....

* Degrades our property values significantly. The Draft EIS not only fails to address this issue but wrongly states that no mitigations will likely be necessary. Even if we put honest disagreement between bio medical researchers aside, the evidence is clear that the presence of EMR radiating structures near or on a residential property significantly negatively impacts a property's value. Such emissions (for example when transmitted by high intensity electrical lines) undeniably decreases the available pool of buyers willing to purchase the property and expose themselves or their children to the potential health risks posed by prolonged exposure to intense EMR. A decreased pool of buyers leads to a decreased demand for the property, which leads to lower property values and also lower tax revenues.

I want to clearly state that legal action which seeks significant compensation to mitigate the damages caused by this platform to our property values will be initiated when the values of our residences are negatively affected by the placement of this platform near our homes. Do you also intend to compensate most or all homeowners in the 13.8 mile potential disturbance radius? This is a major urban center with thousands of homes in that radius.

* It also erodes the value of our property by decreasing the premium value placed on non industrialized waterfront views. The costs of mitigation to the DOD will be significant since it will be necessary to compensate most or all the home owners in our areas. This will add millions of dollars to the costs of this project.

* The DOD has also failed to discuss the mitigation and compensation that will be required to reimburse the City of Everett and the Everett Port Authority. The Draft Environmental Impact Statement fails to address how the platform degrades the city's efforts to attract non industrial and non resourced based economic development to the waterfront and downtown city core. This platform significantly destroys the visual beauty of the waterfront and negatively impacts city and port property values in the following ways:

* It destroys the port authority's significant financial investment in revitalizing the 12th street canal and north marina waterfront development project. (What buyer will pay a half million dollars for a shore line condo that looks out on this monstrosity? Who will pay the premium fees required to permanently moor your yachts in the new marina when their berth looks out on this?) Legally the DOD will most certainly face legal challenges that require it to significantly compensate the city and port authority for the losses it causes in the planned waterfront development effort.

* It degrades the city's efforts to attract new downtown residents from a broader demographic class as opposed to military and industrial personnel. This initiative is counter to the city's efforts to position itself as an attractive urban residence for people working in the fields of tourism, clean technology, film making, and other service sectors.
Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)

* The DEIS utterly fails to account for the potential risks to our marine and shoreline habitat. What happens if even a fraction of the tens of thousands of gallons of diesel fuel needed to move the platform spills into our bay?

* This project risks potential environmental impacts requiring compensations of unknown magnitude in the medical and aerospace arenas as well. How well will the cardiac telemetry unit at the hospital operate on similar technology? How will the disturbance affect air traffic both from hospital airlift trauma operations and Boeing air field. The DOD will most certainly be legally challenged to compensate and mitigate Boeing and our hospital.

Personally, I can attest that the DOD has a poor record of adequately addressing the impact its technology has on our area. One small example is my automatic garage door opener at my home on Grand Ave. EMR generated by ship based radar continues to affect my automatic garage door opener. My bay door does not open and closes completely on its own. While admitting that ship based EMR was the cause, the Navy repeatedly asserts that it has fixed the problem. The problem remains an issue for my home and the homes of my neighbors. This is only one small example of the DOD’s disregard for the environmental impact that high levels of electromagnetic radiation has on our community. Unfortunately it appears to be a pattern the DOD wishes to continue.

Sincerely,

Dr. Timothy M. Reisenauer

Everett, WA
Scott, I read with interest your article in this mornings paper (as well as the Herald's editorial) regarding the placement of the SBX "complex". Although I rarely get involved in matters such as this, it has been perhaps the September 11 incident that has kicked that attitude to a different level.

While I feel nobody likes to have something like this "in their backyard", I think due to the way the world is regarding the war and terrorist attacks, the days of being able to look out of a picture window in Everett and see nothing but the sound and the olympic mountains, is a thing of the past!

I agree that more study needs to go into the environmental effects of such a complex, but the bottom line is the world has changed and we cannot afford to be as "selective" as we were in the past, over structures like this that are designed to protect us. We need to all get over that! Yes, maybe it WOULD be better in someone elses yard, but it is the attitude that some people still have that something like this is unnecessary. THAT's life as it is in the 21st century and we all should get use to it! I would venture to guess that this will probably just be the tip of the iceberg in terms of other defensive structures and mechanisms we may find necessary to build...maybe now, after all these years, Ronald Reagan's view of "Star Wars" isn't as crazy as it was once thought to be! At least THOSE structures were designed to orbit in space!

If we find ourselves thinking once we have tamed Iraq and Saddam Husseins's regime that life will go back to "normal", we all had better think again. Let us not forget all the recent threats North Korea has been "lobbing" over the Pacific. Their government is crazy enough to maybe make good on their threats someday! While that may sound outlandish, who would have EVER guessed two years ago "crazies" would fly passenger jets into the world trade center??? I am afraid the North Koreans have the ability and the tools to make what the Iraqis do and have, look like an elementary school project!

---

From: Eileen Simmons
To: gmdetreis@smdc.army.mil
Subject: SBX in Everett
Date: Tue, 25 Mar 2003 02:21:24 0000

I am strongly opposed to having the SBX stationed at the Everett Navy Base. Its sheer size makes it unacceptable. While the water depth may be appealing to those making the decision, Port Gardner Bay itself is a rather small geographic area. A structure such as the SBX would totally dominate the waterfront, and undoubtedly negatively affect any sort of positive waterfront development. In the last century, our waterfront was blighted by sawmills. Please don't locate another blight on our landscape.

I am also disturbed that we are building this, and investing untold amounts of money to do so without continuing testing.

Eileen Simmons

Everett, WA
From: Phil Sturholm  
To: gm.detreis@smdc.army.mil  
Subject: Sea Based Test x band radar SBX  
Date: Thu, 3 Apr 2003 18:16:28  0000  

As a resident of Everett I would support stationing the SBX at Everett as long as the radar will not affect the health of any humans or wildlife.

Sincerely,

Phil Sturholm  
Everett, Wa.

From: MICHE2531  
To: gm.detreis@smdc.army.mil  
Subject: Comment Sheets Needed  
Date: Thu, 27 Mar 2003 02:10:28  0000  

Dear Ms. Julia Elliott,  

There are many people in Everett, WA. and Snohomish County interested in making comments on the proposed homeporting of the SBX Test X Band Missile Radar. We understand that the Comment Period will be extended to April 24th to provide a public forum in our area.

I request that a large quantity (500) of the three part Comment Sheets be sent so that they may be given to these interested parties. I am also aware of the possibility of making comments by phone or e-mail and will make this information available to people as well.

Please respond to confirm that it is possible to receive more Comment Sheets. I would be happy to provide my shipping address. I thank you for your help in this matter.

I am also interested in understanding more about the SBX radar myself and request answers to several questions that I could not find in the text of the DEIS. They are as follows:

1. What is the peak transmitter power of the SBX?
2. What is the average transmitter power of the SBX?
3. Is the transmitter enabled for 5 6 hours per week or ON 5 6 hours per week?
4. What are the dimensions / lengths of the antennas?
5. What is the effective area of array in the radome?
6. What is the total amount of RF output?
7. What method of verification will be used to monitor RF levels?
8. Has the DoD prepared plot maps of radiation densities at different power levels for the SBX (MWperCM2), and why are they not included in the DEIS?

Thank you for assisting me in finding the answers to these questions. I look forward to your reply.

Michelle Trautman  
Everett, WA.
From: Grandview1218  
To: gmdetreis@smdc.army.mil  
Subject: (no subject)  
Date: Tue, 15 Apr 2003 03:46:25 +0000

I oppose the Dept. of Defense proposal to locate the SBX at Naval Station Everett. There are more suitable locations other than in a populated area like Everett. Please consider the other sites you have on the list.

From: sourdoughsolar  
To: gmdetreis@smdc.army.mil  
Subject: Attn: SMDC EN V re: GMD ETR DEIS  
Date: Tue, 25 Mar 2003 07:47:53 +0000

Attn: SMDC EN V  
Mrs. Julia Hudson Elliott

Comments on the GMD ETR DEIS

As you have done for the other data in the DEIS, we ask you to refer to our previous comments on all Alaska Aerospace Development Corporation development at the Kodiak Launch Complex including the initial FAA permit. This long and exhaustive process needs to take into account all our thoughtful and researched comments from all the past comment periods.

My first question: are we now seeing your final intentions for the KLC? If not, then we cannot comment adequately on your DEIS. In the past, from the initial onset of the AADC project we knew that the KLC would be strictly military as it has become. We are opposed to the military development of this site, and any rocket/missles being sent into the sky from Narrow Cape for commercial or military purposes.

The proposed barge unloading at Pashagshak beach, Bearpaw ranch, and the beaches near Burton’s ranch all have their problems. To develop Pashagshak beach would expand the KLC development beyond the current lease area and violate the Kodiak Island Borough’s Coastal Zone management plan for the area that was carefully drafted
forage fish communities that are known to spawn on those beaches. These fish are primary and important forage for the Endangered Stellar's sea lion and whales such as Humpbacks. Bear paw ranch is a prime feeding location for both Resident and migrating gray whales; they would be displaced with this disturbance. All beaches are used by the public for recreation. Tourists come from far and wide to catch Sockeye, Steelhead, Kings, Silver and Pink salmon at the mouth of the Pashagshak river. This is an important revenue source for the Kodiak Island Borough. Do you have the appropriate and required DNR permits?

With 10 15 launches a year, the levels of Aluminum oxide and Hydrogen chloride will exceed acceptable levels. Washed into the marine environment, they will pose a threat to the gray whales that feed for extensive periods of time in this area. It is an important layover zone for the gray whales on their exhaustive migration to and from the Bering Sea. With diminished resources in the Bering Sea they require these special fueling locations along the migration route. The Narrow Cape area is perhaps the most important. ENRI's past data is incomplete with respects to Aluminum oxide levels in the fresh water streams and marine environment.

The TPS X band Radar and the Sea Band Radar systems will expose the public to electromagnetic radiation. Projected at a 5 degree angle from the horizon, the public in the Narrow Cape area will definitely be affected. What are these effects? Will people in town be affected as well?

On slippery and unmaintained paved roads, how will you transport the liquid fuels and other propellants safely without disrupting school buses and other essential services along that highway?

Your southwest trajectory puts the people in Old Harbor and Akhiok as well as the scattered lodges and cabins all along the East side of Kodiak Island in danger of falling debris. This would be unavoidable in the likelihood of a launch failure. There is no way you can protect everyone in the rockets path, but you must. In addition, you must protect every single Steller sea lion because they are endangered! There are many rookeries and haulouts on the East side in addition to the Ugak haulout.

Without the FAA license, you must choose the No Action Alternative. The FAA should not give AADC this license for the KLC because the public's health and safety and the safety of the public's property will not be protected using the KLC for the GMD ETR for the reasons that we have given above. These include the hazards posed by earthquakes on a very active and shallow fault, the transport of liquid fuels and propellants, and the hazards of falling debris.

Thank you.
Sincerely,

Susan Payne
Kodiak, AK

Don Dumm
Kodiak, AK

Letter emailed March 24, 2003 10:45pm Kodiak time.
March 24, 2003

Dear Ms. Elliot,

I would like to add to the many letters that you have received from the citizens and representatives of Everett, Washington and express my opposition to locating the SBX missile defense system in our port. I cannot think of one benefit that would come as a result of locating the SBX here. I can, however, think of many negative effects.

It is unfortunate that the military presenters that were sent to answer questions about the SBX were unable to provide much information in a forum that was poorly attended due to lack of publicity about the hearing and the proposal. Further, it is unfortunate that the Draft EIS had so little concrete information in its many pages.

On the other hand, it is clear that there are multiple areas of concern to Snohomish County residents because with a microwave radiation radius of 15 miles and potential air pollution, the effects will be felt by many beyond the boundaries of Everett. The DEIS did not consider the concerns of the local and regional population as part of its review. I will list a number of concerns and questions that must be addressed.

1. Negative impacts on economic development around Port Gardner Bay: The city has promoted local development with the saying, "Great thinking with a view." The SBX structure impacts the view negatively and would be harmful to local promotion including condominium construction downtown and marina development. Property values could be negatively impacted. From the angle of my property, much of the view would be filled with the SBX. What is the impact on local economics?

2. Negative impacts on water traffic: The taxpayer money used by the Port might be compromised if additional access is denied. Already the Navy Pier restricts the use of the water lanes. What effects would there be on the uses of the Port or the marina?

3. Microwave radiation: what is the effect of the exposure to radiation on people and natural systems?

4. Electronic interference: I understand that there are many unanswered questions about the impact on local emergency response systems, local hospitals, local electronic interception, and effect on pacemakers. What would be the effect on the Navy base?

5. Truck travel on already burdened roads: There has been little discussion of this impact on travel through Everett.

6. Diesel needs and fuel spill possibilities: The 818,000 gallons of fuel on board the SBX must be considered as a risk to the Port, the residents, and the biological resources of the area.

7. Air pollution: What are the effects on air quality while burning 14,000 gallons of diesel daily when the wind will carry the pollutants across the area that already experiences air inversions that trap air west of the Cascade Mountains?

8. What is the effect of the SBX on Paine Field and the airspace around other airfields in the county?

Thank you for addressing these concerns. Doris and Clair Olivers
March 24, 2003

U.S. Army Space and Missile Defense Command
ATTN: SMDC-EN-V (Mrs. Julia Hudson-Elliott),
106 Wynn Drive, Huntsville, AL 35805
gmdetreis@smdc.army.mil

To Whom It May Concern:

I am writing to request that the Missile Defense Agency start over with the public notification, information and extended public comment process. The public must have a clear explanation of the DOD’s intentions in Hawai‘i. Outreach, notification and public information about this proposal has been wholly inadequate and unacceptable. No copies of the Draft EIS were made available on the Island of Kaua‘i, where missile launches are proposed to take place, nor were there any hearings held on Kaua‘i. No hearings were held in the Republic of the Marshall Islands.

The comment period should be extended by at least 45 days, to begin after these meetings are held, to accommodate the public interest and concern that expanded military activity would have on our environment on Native Hawaiian rights and on our economy.

--Copies of the DEIS must be made available in all public libraries on Kaua‘i and distributed to libraries and to interested parties in the Marshall Islands.
--Public hearings must be held on Kaua‘i and in the RMI, and all persons who commented on previous missile defense environmental documents should be notified about public informational meetings and given notice of the Draft EIS process.
--The DEIS fails to address environmental justice concerns related to Hawai‘i, especially disparate impacts on Native Hawaiian human and political sovereignty rights, cultural practices and cultural use of affected areas and resources.
--The DEIS fails to address cumulative environmental, social and cultural impacts of the overall military presence in Hawai‘i.

--The DEIS fails to address the status and title of the affected land and sea areas in light of the U.S. Public Law 103-150, an admission to the illegal U.S. invasion of the Hawaiian Kingdom in 1893.

--The proposed activities are impossible to decipher. The projects are inadequately described. It is impossible to assess the impacts based on the information in the DEIS. The multitude of combinations of proposed actions at a variety of possible sites is unacceptable.
--There is not a cultural consultation with the Native Hawaiian community, nor is there an adequate assessment of the impact to Native Hawaiian cultural access, rights, cultural practices.
--There is an inadequate assessment of monk seal habitat on Kaua‘i and in the NWHI.
--Turtles migrate between the lower Main Hawaiian Islands and the Northwestern Hawaiian Islands. There is no proposed mitigation for preventing interaction with our threatened and endangered turtles.
--How does this impact seabird habitat, nesting, migration, flight patterns, feeding?
--How does this impact other native species, wildlife, and threatened and endangered species?

Some of the serious deficiencies in the draft include:
--Inadequate information on hazard areas for Ground-based Inceptor and target missiles
--Inadequate analysis of cumulative impacts of all missile tests
--No details about locations of tests of the Sea-based X Band Radar in the Gulf of Mexico and in transit to the Pacific Ocean
--Incomplete safety analyses of Sea-based X Band Radar operation near Honolulu International Airport
--No mention of treaty restrictions on air-launched and sea-launched targets
--Inadequate analysis of hazards to aircraft from debris from collisions between targets and interceptors

Sincerely,

Cha Smith
Executive Director

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
<th>Comment Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-E-0320</td>
<td>The text of comment P-E-0320 was the same as that of P-E-0289. This comment was submitted by Katherine Lynch of Everett, Washington.</td>
</tr>
<tr>
<td>P-E-0321</td>
<td>The text of comment P-E-0321 was the same as that of P-E-0289. This comment was submitted by Patricia Neel of Everett, Washington.</td>
</tr>
<tr>
<td>P-E-0322</td>
<td>The text of comment P-E-0322 was the same as that of P-E-0289. This comment was submitted by Larry Fox of Freeland, Washington.</td>
</tr>
<tr>
<td>P-E-0323</td>
<td>The text of comment P-E-0323 was the same as that of P-E-0289. This comment was submitted by Mary Lee Griswold.</td>
</tr>
<tr>
<td>P-E-0324</td>
<td>The text of comment P-E-0324 was the same as that of P-E-0289. This comment was submitted by Anne Hartley of Langley, Washington.</td>
</tr>
<tr>
<td>P-E-0325</td>
<td>The text of comment P-E-0325 was the same as that of P-E-0289. This comment was submitted by Betty Taylor of Camano Island, Washington.</td>
</tr>
<tr>
<td>P-E-0326</td>
<td>The text of comment P-E-0326 was the same as that of P-E-0289. This comment was submitted by Patricia Neel of Everett, Washington.</td>
</tr>
<tr>
<td>P-E-0327</td>
<td>The text of comment P-E-0327 was the same as that of P-E-0289. This comment was submitted by Toni-Marshall-Andersen of Freeland, Washington.</td>
</tr>
<tr>
<td>P-E-0328</td>
<td>The text of comment P-E-0328 was the same as that of P-E-0289. This comment was submitted by Patricia Neel of Everett, Washington.</td>
</tr>
<tr>
<td>P-E-0329</td>
<td>The text of comment P-E-0329 was the same as that of P-E-0289. This comment was submitted by Kimberli McCabe of Everett, Washington.</td>
</tr>
<tr>
<td>P-E-0330</td>
<td>The text of comment P-E-0330 was the same as that of P-E-0289. This comment was submitted by Philip Notermann of Seattle, Washington.</td>
</tr>
<tr>
<td>P-E-0331</td>
<td>The text of comment P-E-0331 was the same as that of P-E-0289. This comment was submitted by Bill Mulliken of Everett, Washington.</td>
</tr>
<tr>
<td>P-E-0332</td>
<td>The text of comment P-E-0332 was the same as that of P-E-0289. This comment was submitted by Norma Jean Young of Clinton, Washington.</td>
</tr>
<tr>
<td>P-E-0333</td>
<td>The text of comment P-E-0333 was the same as that of P-E-0289. This comment was submitted by Frederick Olson of Langley, Washington.</td>
</tr>
<tr>
<td>P-E-0334</td>
<td>The text of comment P-E-0334 was the same as that of P-E-0289. This comment was submitted by Laurie Keith of Langley, Washington.</td>
</tr>
<tr>
<td>P-E-0335</td>
<td>The text of comment P-E-0335 was the same as that of P-E-0289. This comment was submitted by Sally Goodwin of Clinton, Washington.</td>
</tr>
</tbody>
</table>
The text of comment P-E-0336 was the same as that of P-E-0289. This comment was submitted by Robert Kenny of Clinton, Washington.
From: Christina Studio  
Sent: Wednesday, April 16, 2003 10:57 PM  
To: gmdetreis@smdc.army.mil  
Subject: SBX Star Wars Radar Missile Defense system

Ms Julia Elliott  
US Army Space and Missile Defense Command  
P O Box 1500  
Huntsville, AL  
35807 3801

Dear Ms Elliot,

I am writing to communicate my aversion to the SBX system the military wants to install next. How many billions do we have to spend to defend ourselves against incoming missiles (that don't exist) will at the same time exposing the complete biodiversity of the Puget sound untested electro magnetic waves.

I resent being a guinea pig for the military as it plans to continually spiral to ever huger heights global hegemony, while wasting taxpayer dollars on ridiculously ugly behemoths such as the SBX system.

Shame on the military for imagining such a monstrosity.

Fred Geisler  
Langley, Wa

From: elisa miller  
Sent: Wednesday, April 09, 2003 6:53 PM  
To: gmdetreis@smdc.army.mil  
Subject: Putting a SBX offshore of Everett Washington

I am a US citizen presently living on Whidbey Island. I am alarmed at the proposal to place an SBX radar station in the waters between Everett, Washington and Whidbey Island. We do not have full information about the health consequences of this unit and I do not wish to be victimized. The need and the utility of the station (and the larger defense program of which it is a part) has yet to be fully debated and fully aired. I will attend every meeting that I can and join my fellow citizens and neighbors to call for further information from you about this possible installation which appears to me to be dangerous, unnecessary and harmful.

Elisa Miller, Clinton, Washington
From: Dale Temple
To: "gmdetreis@smdc.army.mil" <gmdetreis@smdc.army.mil>
Subject: SBX Feedback
Date: Tue, 15 Apr 2003 19:16:51 0000
Importance: high
X Priority: 1
X Mailer: Internet Mail Service (5.5.2653.19)

To Whom it May Concern:

We are writing to express our opposition to having the SBX radar system home ported in Everett, WA. While we are ardent supporters of the navy base there are just too many unanswered questions about the affects of this to our health, environment and our community's economic development. I also do not believe that the notification to the people of the region was either proper nor adequate.

I question the appropriateness of even having this system in this region. It seems that Hawaii would be the best choice, followed by Midway, then Alaska.

Dale & Laura Temple

Everett, WA 98201

From: Ward Hinds
To: gmdetreis@smdc.army.mil
Cc: etuckm
Subject: SBX in Everett, WA
Date: Tue, 15 Apr 2003 18:58:45 0000
X Mailer: Internet Mail Service (5.5.2653.19)

To Whom it May Concern:

I must support the concerns that I am hearing in the medical community regarding the unknown full potential effects of electromagnetic radiation on human health from the proposed SBX radar platform. My understanding is that this radar system would be tested while in the Everett port, which would be for about 3 months of the year. I believe it is important to have extensive safety data related to human health at the long term radiation levels that would occur for residents living closest to the SBX before any decision is made to locate the SBX in Everett. Such data should take into account the potential health effects on more sensitive segments of the population and those who may be exposed to other EM radiation who would potentially suffer an additive effect on their health. Such information should be made widely available in the community, with opportunity for public discussion and input before any decision is made.

Sincerely,

M. Ward Hinds, MD, MPH
Health Officer
Snohomish Health District

Everett, WA 98201

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
From: Erich Franz
To: gmdetreis@smdc.army.mil
Subject: SBX in Everett?
Date: Tue, 15 Apr 2003 18:39:18 0000
X Mailer: Internet Mail Service (5.5.2653.19)

To Whom It May Concern,

I reserved a hi end condo in the new marina scheduled to be built in the next few years. If this monstrosity is sited in Port Gardner Bay to ruin the view, I am going to invest and live elsewhere.

Erich Franz
Everett, WA 98204

P.S. I thought Star Wars was outdated technology because most of the tests I’ve read about have failed over the past 20 years. The SBX is an insult to humanity, although I guess it provided a few jobs, and it will hold Everett hostage just when the city is starting to be economically revitalized with meaningful projects.

From: Melinda Gladstone
To: gmdetreis@smdc.army.mil
Cc: bicc
Subject: SBX Not in Everett, WA
Date: Tue, 15 Apr 2003 18:15:27 0000
X Mailer: Internet Mail Service (5.5.2653.19)

To Whom It May Concern

I gave testimony against the SBX in Everett, WA at the second public session in the PUD building on April 5, 2003. About this project: I have a plethora of health concerns; as a taxpayer, I have concerns about the cost of the project; and I have concerns regarding the democratic process. And aesthetics…well, no one can challenge the extreme visual blight of the monster.

There was not adequate news coverage (newspaper, radio) concerning the public information meetings. At the very least, the entire process of informing the public must begin again. No preliminary EIS statement was available for me to peruse and educate myself. This is not DEMOCRACY!

Air quality, water quality of Puget Sound (remember our endangered species of salmon, orca, gray whales), human health, migrating bird populations, and my grandson (who lives within the 13.8 mile radius of the SBXs transmission of electromagnetic radiation) will be adversely affected.

A resounding NO to the Army’s plans: Everett, WA already has a Navy base.

Everett, WA has finally seen some progress of changing its image from a polluting industrial waterfront. Everett, WA is a highly populated area. NO. People Power exists in Everett YES.

If plans for the SBX continue, and if the SBX becomes a reality (wherever it is stationed) the negative repercussions are far worse than what the military thinks it is protecting us from. Do not waste our money. Ask the people if we want protection in the form of this atrocity.

Melinda Gladstone
permanent mailing address:
Snohomish, WA
Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)

From: suzanne fageol  
To: gmdetreis@smdc.army.mil  
Subject: Concerned Citizen Against the SBX  
Date: Tue, 15 Apr 2003 17:46:18 0000  
X Mailer: Internet Mail Service (5.5.2653.19)

To Whom It May Concern,

I am a citizen living on Whidbey Island. I do not want the proposed SBX pointed at me or any other citizen of Island County or Snohomish County. You need to hold more hearings on your proposed testing and you need to test it in a less densely populated area actually, I am against your using such a devise at all.
Please stop and hold further hearing with regard to the use of this system.

Sincerely,
Rev. Suzanne A. Fageol  
Langley, WA.  
Whidbey Island

---

From: Dan Warnock  
To: gmdetreis@smdc.army.mil  
Subject: SBX  
Date: Tue, 15 Apr 2003 17:41:13 0000  
X Mailer: Internet Mail Service (5.5.2653.19)

SMDC EN V, Ms. Julia Elliott  
US Army Space Missile Defense Command  
PO Box 1500  
Huntsville, AL. 35807 3801

Dear Ms. Elliott,

I would like to thank you for the opportunity to give of my opinion of the SBX system. I believe the SBX is potentially an important device for the safety of our country. We have had a good relationship thus far with the navy base with its past and present Commanders. We have both benefited by working together in our community. It is important that those benefits are not lost. Its was quite clear at the community meeting in the city of Everett, by the number of people that took the time to be present and the significant number of highly respected business, professionals, environmental, social and just plan solid individuals that give the same clear message, is not hear, not in Everett.

As a former City Council member I respectfully ask you place the SBX in some other location other than Everett. The community and the Navy have built a good home here. This could and probably would, divide the support the Navy base currently has earned.

You have already heard many opinions on the health safety and economic impacts the SBX could potentially have on our community. No one is 100 hundred percent clear that either side of the debate is correct. If that can be agreed upon, than please do not make Everett and grand experiment that potentially could negatively impact so many.

Sincerely

Dan Warnock

Everett, WA 98203
From: Eve Riley
To: gmdetreis@smdc.army.mil
Subject: SBX
Date: Tue, 15 Apr 2003 17:37:57 0000
X-Mailer: Internet Mail Service (5.5.2653.19)

I am writing to oppose the proposal to place a sea based test x band radar (SBX) in Everett. My house is placed above the marina, and we appreciate the aesthetics of our beautiful port. We even enjoy the navy ships. This SBX will be extremely intrusive to the beauty of the port and the attraction to live and dine in this area...not to mention the chance of health risks and the unknown effects that it may have on the neighboring hospitals sensitive electronics. I understand the need for the SBX, but it should be tested more thoroughly before it is placed into such a populated area. If the SBX is placed in Everett, I am sure that the waterfront businesses and marinas will suffer, as well as the real estate in the area.

From: Susan Berta
To: gmdetreis@smdc.army.mil
Subject: Comments Re: SBX Radar Platform in Everett, WA
Date: Tue, 15 Apr 2003 17:36:24 0000
X-Mailer: Internet Mail Service (5.5.2653.19)

Dear Dept. of Defense,

I would like to submit the following comments to be included in your draft EIS for the proposed SBX Radar Platform to be located in Port Gardiner Bay, Everett, WA.

1. Publicity regarding the scoping meeting of this project and related information has not been done to an extent that the general public has been notified or informed about the project or given an opportunity to comment. Residents of neighboring Whidbey Island were especially in the dark about this proposal, and most of us found out about it after the public meeting in Everett took place.

2. The draft EIS therefore will be lacking vital information from a variety of interested and affected parties, as well as comments from the general public who may still be unaware of this proposal.

3. I would ask that you consider starting all over with the scoping process so that your draft EIS will accurately reflect the comments, suggestions, and objections of all communities that would be affected by this project.

4. During the scoping and EIS process for this project, please consider that this area is home to a number of marine mammals that are protected by the Marine Mammal Protection Act, including the Southern Resident Community of orcas which are currently being listed as "Depleted" by the NMFS, and are continuing assessment for a listing under the ESA. These orcas inhabit the waters around Everett and Whidbey Island 6 9 months each year, and this project would most certainly impact their travel, feeding opportunities, and navigational abilities. Port Gardiner Bay is already one of the most toxic areas in Puget Sound, affecting the entire food web of marine life. To add this project to an already threatened area, would lead to further destruction...
of habitat and degradation of the marine food web upon which we all depend.

This area is also home to a resident population of Gray Whales, which remain and feed in the waters between Whidbey and Camano Islands and Port Susan and Possession Sound from March through May each year. Other marine mammals that would be impacted by this project include Harbor and Dall’s Porpoise.

I speak for the whales because they cannot speak for themselves, and because they are dying because of unrelenting human impacts upon their habitat and food sources. I also believe this project would have negative impacts on the health of those of us living in the vicinity of the Radar Platform.

And lastly, I object to spending taxpayer’s money for this outlandish and outdated “star wars” project when we can’t afford to educate our children, provide health care for our citizens, or clean up the environmental disasters and hazardous waste sites we’ve already brought upon our society through the billions of dollars spent on military projects that weren’t needed. Please reconsider this project....

Sincerely,
Susan Berta
Greenbank, WA

Susan Berta
Orca Network
Greenbank, WA

http://www.orcanetwork.org

To: gmdetreis@smdc.army.mil
Subject: SBX placement in Everett

April 14, 2003

Dear US Army Space Missile Defense Command:

I am writing to express my opposition to the placement of the SBX X-Band Radar in the Port of Everett, WA. The very short time that Everett, Mukilteo, Marysville and the Island Communities have had to respond to this proposal is unacceptable. What information we have been able to garner revolves around the following:

1. Unknown health risks due to radiation emissions.
2. Anticipated significant decline in property values based on unknown health risks, coupled with loss of esthetically pleasing views of Port Gardner Bay.
3. Anticipated decline of Everett’s economy based on new business choosing to not establish in the same area as the SBX.
4. Disruption of air traffic.
5. Knowledge that if the SBX was ever called upon to fulfill its function, that it would have a seventy-five percent chance of being in port when called upon to do so.
6. Placement in Everett would be for the convenience of 54 crew members who would be staffing the SBX, including the use of city power and water. Consideration for the aforementioned risks to the community appear to not have priority status over ease and convenience for the Department of Defense.

I sincerely hope that you will remove Everett from the list of potential candidates for the SBX and place it in a non-populated area where there will be no risk to life or livelihood.

Yours truly,

Constance Hallgarth
Everett, WA

Exhibit 8.1.2-1: Reproductions of Email Documents (Continued)
To:  US Army Space and Missile Defense Command  
Email: gmetreis@smdc.army.mil

Fm: Laura Hartman  
Snohomish, WA

Attention Ms. Julia Elliott:

I do not understand the need for sea-based floating radar stations (SBX) when Congress has not approved a budget for building anti-ballistic defense systems in the first place. Despite lots of money thrown at studying ballistic defense, technological problems have not been solved. There is no timetable for solving them, and the proposal for the SBX may be out of date to whatever ultimately becomes approved.

The proposal raises several highly controversial issues that remain to be resolved within U.S. political and scientific institutions:

The SBX structure poses significant safety issues.

1. It is not enough for the FCC to determine that SBX’s radiation emissions are safe. The FCC is an agency responsible for communications. It has no authority in health issues, and none of the proper health agencies or EPA have undertaken any public consideration of the effects of non-thermal electromagnetic radiation on humans. Industry assertions have no credibility without independent review. University of Washington experiments have uncovered disturbing effects of radiation on mice, that raise profound questions on fertility rates of mammals.

Therefore, radiation effects on Puget Sound, the human population of Everett, the ocean ecology (analogous to dead zones around cell towers), whales, seals, on down the food chain must be fully established in the environmental review.

The comments raised at the Everett forum, that the radar would be fully turned on only sometimes, defeats the purpose of the whole enterprise. What happens during orange alerts?

Our FCC only has data for radiation levels at one-half hour durations. It is unacceptable to place human and sensitive species as guinea pigs for these levels for hours, days, weeks…at a time. Other developed nations have set their standards at one-tenth the level of the U.S.

2. A SBX carrying 800,000 gallons of diesel fuel, poses a severe environmental threat to Puget Sound’s highly sensitive fisheries and orca ecology. Maintenance of the SBX, at dock and out in salty seas will be highly susceptible to leaks, even if every weld is perfect, all contractors and bureaucrats are perfectly free of corruption and no budget cuts ever reduce its maintenance budget, and it does not become a terrorist target! (see 2.d.)

The premise for the floating radar station is flawed from the start.
1. This anti-ballistic program will not make the U.S. “safe” from terrorism. Terrorists use our own technology against us, very cheaply, enabled by our government bankrupting us on the wrong priorities - i.e. complete absence of security for huge chemical depots, nuclear waste transport (dirty bombs on our highways) and the baffling misutilization of good old fashioned police work (i.e. the CIA and FBI’s mishandling of the Moussari case.) - while promoting expensive fantasies like SBX.

2. The program will not make us safer from ballistic attack.

a. It will start a new world-wide proliferation of SBX’s. Why should the U.S. be the only kid on the block with this new toy? Billions can be made selling the technology to “rogue nations,” who can then figure out how to scramble the radar.

b. It undermines the whole concept of Detente, which was based on mutually assured destruction. Now (in theory) that the U.S. will not share in the mutual destruction, it can become, as a result of one bad election, a rogue nation itself. Even if we don't see ourselves that way, the rest of the world will, which tends to incite more low-tech terrorism.

c. Like all computer programs, like the NASA tragedies, high technology can never be made fail-safe, and even worse in this case, will create catastrophe whenever it reads false positives.

d. It is un-securable from low-tech terrorist attack. The radar station may read potential attacks from ballistic missiles that go over the atmosphere, but would not be safe from an old-fashioned cannon ball of a nearby ship, undersea attacks by suicide divers,... or submarines! As stated above the proposal is premature before the highly
As stated above the proposal is premature before the highly controversial defense systems have been proven worthy, environmental health factors have been fully reviewed and the very strategy has been approved by Congress.

Laura Hartman
<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suzanne Canja</td>
<td>P-E-0001-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Discussion on disorientation from lighting (section 4.2.2.2) will be expanded. Any lighting associated with the Proposed Action would be properly shielded following USFWS guidelines to minimize reflection. Final assembly of the facility would occur on a previously disturbed paved site inshore to minimize impacts.</td>
</tr>
<tr>
<td>P-E-0001-2</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0001-1</td>
<td></td>
</tr>
<tr>
<td>P-E-0001-3</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Equipment would be prefabricated and only final assembly would occur on a previously disturbed paved site to minimize impacts to wildlife to the greatest extent practicable. Personnel would be instructed to avoid wildlife including nesting seabirds in accordance with current rules. The limited construction and operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources.</td>
<td></td>
</tr>
<tr>
<td>Kathleen Donehower</td>
<td>P-E-0002-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Section 3.2.2 acknowledges the large variety of wildlife that occurs on Midway Atoll. However, the intermittent operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources.</td>
</tr>
<tr>
<td>Joanna Donehower</td>
<td>P-E-0003-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Section 3.2.2 acknowledges the large variety of wildlife that occurs on Midway Atoll. However, the intermittent operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources.</td>
</tr>
<tr>
<td>Michael Jones - University of Hawaii</td>
<td>P-E-0004-1</td>
<td>Program</td>
<td>4.2.2</td>
<td>Strategic Target System launches from PMRF would be included in existing missile flight test activities. Strategic Target System launches proposed for KLC in the North Pacific Targets Program would not include those proposed in the ETR EIS, however, there would be no more than nine launches of any missiles from KLC.</td>
</tr>
<tr>
<td>P-E-0004-2</td>
<td>Program</td>
<td>4.0.0</td>
<td>See chapter 2.0 of the EIS for this information.</td>
<td></td>
</tr>
<tr>
<td>P-E-0004-3</td>
<td>EIS Process</td>
<td>4.0.0</td>
<td>Comment noted and correction made.</td>
<td></td>
</tr>
<tr>
<td>P-E-0004-4</td>
<td>Safety and Health</td>
<td>4.4.4, 4.1.7, 4.5.5, and 4.3.5</td>
<td>See sections 4.4.4, 4.1.7, 4.5.5, and 4.3.5. Each missile flight test event would be modeled. The models incorporate a number of variables such as the missile mass, velocity, trajectory, altitude, reliability and descriptions of the environments that may affect the missile in flight, such as surface and high altitude winds. The Range Safety Office would communicate the extent of the clearance area, time, and date of the flight test, once they are defined, to the FAA, the U.S. Coast Guard, appropriate emergency management agencies, and local police jurisdictions for assistance in the clearance of designated land and sea-surface areas. Other areas under the flight path but not in a predicted impact or debris area would be monitored before the test event to determine the location of population or traffic. Tests do not proceed unless the Range Safety Office determines that the general population, including ship traffic, would be in a safe position.</td>
<td></td>
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</table>
Table 8.1.2-2: Responses to Email Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miriam Bennett</td>
<td>P-E-0005-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2 of the EIS indicate the SBX operating and mooring areas and general operational effects. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards. The odds that communication-electronics equipment could be affected by the SBX because of high power effects are negligible (roughly 1/10 of a second per day). New information on the potential effects of EMR on human health and communications-electronics has been added as appendix G of the EIS.</td>
<td></td>
</tr>
<tr>
<td>Ginger Decker</td>
<td>P-E-0006-1</td>
<td>Program</td>
<td>4.8.6</td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to housing, commercial, and property values, it states that given the possible visual impacts of the SBX, along with the misconception that the SBX would have adverse health impacts to the public, the proposed project could potentially lead to property value impacts. However, the impacts would be minimal due to the fact that the SBX would be an additional structure on an existing military base immediately surrounded by industrial land uses, thereby reducing the potential impacts to property values.</td>
</tr>
<tr>
<td>Marie-Anne Hudson - McGill University</td>
<td>P-E-0007-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0003-1</td>
</tr>
<tr>
<td>Matt DeBenedetti - Legato Systems, Inc.</td>
<td>P-E-0008-1</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>Section 4.8.9 states that the area is arguably visually synonymous with historical and present military/Navy uses including the aircraft carrier stationed there.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tbody>
<tr>
<td></td>
<td>P-E-0008-2</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2</td>
<td>See P-E-0005-1</td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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</tr>
<tr>
<td>Matt DeBenedetti - Legato Systems, Inc.</td>
<td>P-E-0008-3</td>
<td>Safety and Health</td>
<td>2.1.4.2 Appendix G</td>
<td>Section 2.1.4.2 and appendix G of the EIS discuss potential interference with communications and electronics equipment. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. Thus, the odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). If interference occurs, the short-term effects would not damage any electronic equipment. These odds are based on conservative calculations that assume the SBX would operate in full power mode for 20 minutes each day at maximum duty cycle. New information on the potential effects of EMR on human health and communications-electronics has been added as appendix G of the EIS.</td>
</tr>
<tr>
<td>P-E-0008-4</td>
<td>Airspace Use</td>
<td>4.8.2 2.1.4.2</td>
<td>As stated in section 4.8.2, the SBX would not exceed the FAA 3000 V/m peak power threshold. The SBX could exceed the FAA 300 V/m average power threshold out to 12.1 kilometers (7.5 miles) (65% populated radar) or 19 kilometers (11.8 miles) (100% populated radar). The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern here is not interference but is a reduction in life of the aircraft avionics. The SBX would be constrained so that the existing ground-, air-, and sea-based electronics are not impacted. As stated in the EIS, while in port, or at a nearby mooring location, the 20 minutes of daily calibration and tracking would be coordinated in both time and space so as to reduce any potential EMR interference to a negligible level. Based on the spectrum certification and frequency allocation process, the high energy radiation operating area for the SBX would be modified to fit existing airport and airspace requirements. The FAA would provide notice regarding the SBX operating area to local airports and aircraft through a NOTAM.</td>
<td></td>
</tr>
<tr>
<td>Dave Potter</td>
<td>P-E-0009-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Equipment would be prefabricated and only final assembly would occur on a previously disturbed paved site to minimize impacts to wildlife to the greatest extent practicable. Personnel would be instructed to avoid wildlife, including nesting seabirds, in accordance with current rules.</td>
</tr>
<tr>
<td>P-E-0009-2</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>As stated in section 4.2.2.1, installation and operation would follow all applicable procedures in place on Midway to prevent the introduction of alien species. However, text has been expanded.</td>
<td></td>
</tr>
<tr>
<td>P-E-0009-3</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0009-2</td>
<td></td>
</tr>
<tr>
<td>P-E-0009-4</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Procedures for minimizing the potential for and remediating spills of hazardous materials are discussed in section 4.2.3.</td>
<td></td>
</tr>
<tr>
<td>Name</td>
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<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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</tr>
<tr>
<td>Dave Potter</td>
<td>P-E-0009-5</td>
<td>Hazardous Materials</td>
<td>4.2.3</td>
<td>Approximately, 3,785 liters (1,000 gallons) of diesel fuel would be required for the generator. The fuel would be stored in an AST in the vicinity of the generator. The quantities and types of lubricating oils/hydraulic fluids would depend on fill-up/maintenance requirements, but quantities would be kept to a minimum. The AST and generator would have secondary containment to restrict/collect potential spills and leaks and absorbents would also be available.</td>
</tr>
<tr>
<td>P-E-0009-6</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Discussion on disorientation from lighting (page 4-114) will be expanded. Any lighting associated with the Proposed Action will be properly shielded following USFWS guidelines to minimize reflection. Final assembly of the facility would occur on a previously disturbed paved site inshore to minimize impacts.</td>
<td></td>
</tr>
<tr>
<td>P-E-0009-7</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>As stated in section 4.2.2.2, communication cables would be installed along an existing road.</td>
<td></td>
</tr>
<tr>
<td>P-E-0009-8</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Exotic vegetation such as ironwood trees would be removed if located within the area selected for elements of the Proposed Action. No vegetation planting has been proposed; however, if required, native species would be used to the greatest extent practicable.</td>
<td></td>
</tr>
<tr>
<td>P-E-0009-9</td>
<td>Utilities</td>
<td>4.2.3.2.1</td>
<td></td>
<td>As mentioned in section 4.2.3.2.1, pollution prevention, recycling, and waste minimization at Midway Atoll would be practiced in accordance with applicable EPA, State of Hawaii, DoD, U.S. Army, and USFWS requirements.</td>
</tr>
<tr>
<td>P-E-0009-10</td>
<td>Utilities</td>
<td>4.2.2</td>
<td></td>
<td>Thank you for your comment.</td>
</tr>
<tr>
<td>P-E-0009-11</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>The number of vehicles required as a result of implementing the Proposed Action on Midway will be minimized to the extent practicable.</td>
<td></td>
</tr>
<tr>
<td>Michael Callahan</td>
<td>P-E-0010-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Dave Beames</td>
<td>P-E-0011-1</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>Based on the additional analysis in section 4.8.9 in the EIS, the proposed project would be visible from some of the surrounding neighborhoods, and there would be a potential for a visual impact. However, the area is arguably visually similar to the present industrial and military uses and aside from the viewer being very near the SBX, it would not obscure panoramic views.</td>
</tr>
<tr>
<td>Craig Bender</td>
<td>P-E-0012-1</td>
<td>Transportation</td>
<td></td>
<td>As with other established shipping procedures, all SBX operations, including scheduling, the establishment of any required security areas, coordination with requirements of any freighters or carriers, and other shipping issues would be coordinated with and carried out by the U.S. Coast Guard (see section 4.8.7.2). The Coast Guard would also be responsible for scheduling port usage in a manner to prevent impacts to recreational or commercial water transportation in the area. This coordination would prevent impacts to commercial use of the port.</td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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</tr>
<tr>
<td>Craig Bender</td>
<td>P-E-0012-2</td>
<td>Transportation</td>
<td></td>
<td>The design for the SBX now includes retractable thrusters, and, as mentioned in section 4.8.7.2, the plan is to have the SBX at either Pier Alpha or Pier Bravo.</td>
</tr>
<tr>
<td></td>
<td>P-E-0012-3</td>
<td>Transportation</td>
<td></td>
<td>See P-E-0012-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0012-4</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Cynthia Dale</td>
<td>P-E-0013-1</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>Comment noted. No significant long-term impacts to seabirds, marine wildlife, or fish are anticipated from operation of the SBX at Naval Station Everett.</td>
</tr>
<tr>
<td></td>
<td>P-E-0013-2</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the ability of Everett to maintain and increase tourism, commercial, and residential value it states that given the possible visual impacts of the SBX, along with the misconception that the SBX would have adverse health impacts to the public, the proposed project could potentially lead to adverse impacts. However, the impacts would be minimal due to the fact that the SBX would be an additional structure on an existing military base immediately surrounded by industrial land uses, thereby reducing the impact to these resources.</td>
</tr>
<tr>
<td></td>
<td>P-E-0013-3</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Christina Donehower - McGill University</td>
<td>P-E-0014-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>As stated in section 4.2.2, installation and operation would follow all applicable procedures in place on Midway to prevent the introduction of alien species. However, the text will be expanded. Exotic vegetation such as ironwood trees would be removed if located within the area selected for elements of the Proposed Action. No vegetation planting has been proposed; however, if required, native species would be used to the greatest extent practicable.</td>
</tr>
<tr>
<td></td>
<td>P-E-0014-2</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0001-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0014-3</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Personnel would be instructed to avoid wildlife including nesting seabirds in accordance with current rules. The limited construction and operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources.</td>
</tr>
<tr>
<td></td>
<td>P-E-0014-4</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Equipment would be prefabricated and only final assembly would occur on a previously disturbed paved site to minimize impacts to wildlife to the greatest extent practicable. The limited construction and operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources.</td>
</tr>
<tr>
<td></td>
<td>P-E-0014-5</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0009-4</td>
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<tr>
<td>Name</td>
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<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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<tr>
<td>Farhana Mia</td>
<td>P-E-0015-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0003-1</td>
</tr>
<tr>
<td>Jessica Forrest</td>
<td>P-E-0016-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Personnel would be instructed to avoid wildlife including nesting seabirds in accordance with current rules. The limited construction and operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources. Midway would continue to serve as a National Wildlife Refuge under the direction of the UFWS.</td>
</tr>
<tr>
<td>F. Anthony Kurtz</td>
<td>P-E-0017-1</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>Thank you for your comment.</td>
</tr>
<tr>
<td>Jim Anderson</td>
<td>P-E-0018-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0018-2</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0011-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0018-3</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0018-4</td>
<td>Policy</td>
<td></td>
<td>Tests have shown this capability exists and additional tests are proposed to enhance the capability.</td>
</tr>
<tr>
<td></td>
<td>P-E-0018-5</td>
<td>Program</td>
<td></td>
<td>This is beyond the scope of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0018-6</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0018-7</td>
<td>Program</td>
<td></td>
<td>See P-E-0018-5</td>
</tr>
<tr>
<td>Dave Potter</td>
<td>P-E-0019-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>The statement that Midway would continue to serve as a National Wildlife Refuge under the direction of the USFWS will be added to the text.</td>
</tr>
<tr>
<td></td>
<td>P-E-0019-2</td>
<td>Program</td>
<td>2</td>
<td>Construction approximately 35 people for 6 months, operation approximately 20 people for 3 weeks, five times per year.</td>
</tr>
<tr>
<td></td>
<td>P-E-0019-3</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>Personnel would be instructed to avoid wildlife including nesting seabirds in accordance with current rules. The limited construction and operation of the Proposed Action on Midway is not expected to result in significant impacts to its unique biological resources.</td>
</tr>
<tr>
<td></td>
<td>P-E-0019-4</td>
<td>Program</td>
<td></td>
<td>See P-E-0018-5</td>
</tr>
<tr>
<td>Carolyn Heitman</td>
<td>P-E-0020-1</td>
<td>Policy</td>
<td></td>
<td>Treaty issues are beyond the scope of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0020-2</td>
<td>EIS Process</td>
<td></td>
<td>See P-E-0004-3</td>
</tr>
</tbody>
</table>
Carolyn Heitman | P-E-0020-3 | Safety and Health | 2.1.5, 2.3.1.4.3 | Refer to sections 2.1.5 and 2.3.1.4.3. The personnel exclusion areas in front of the TPS-X radar would extend for 150 meters (492 feet). The FAA would be requested to establish a warning area for aircraft to remain at least 1,500 meters (4,900 feet) from the radar site. The interference areas for EEDs would be at least 800 meters (2,625 feet) in the presence and shipping phase and 400 meters (1,312 feet) in the handling phase. Also refer to figure 2.3.1-8. Potentially hazardous materials associated with GMD ETR/SBX TPS-X operation and maintenance activities could include diesel fuel for power generation, ethylene glycol (coolant) cleaning solvents, oils/lubricants, adhesives, sealants and paints/primers. The quantities of these materials ordered and used would be kept to the minimum for the work required. Therefore, most would be consumed during use and minimal quantities of potentially hazardous waste would be generated.

P-E-0020-4 | Transportation | 2.1.1 | As stated in section 4.1.6, transportation of hazardous materials at Kodiak Launch Complex would be conducted according to applicable OSHA, EPA, DOT, DoD, and state regulations and requirements, as well as established project and launch complex Standard SOPs. The hazardous materials contained within the missiles transported to KLC include solid fuel for the rocket and fuel and oxidizer for the EKV’s Divert and Attitude Control System propellant system. No separate fueling would occur; therefore, the likelihood of release and environmental effect would be small. For potential targets, the launch operator would be responsible for transporting the fuel in accordance with DOT requirements. Because of the sealed nature of this mode of transport, the likelihood of release and environmental effect is small. Operations involving the transport of explosives (including packaging and handling for movement) would require implementation of written procedures, which would be approved by KLC/AADC. Transport operations will be conducted under the supervision of an approved ordnance officer using explosive-certified personnel as necessary. Consequently, minimal health and safety impacts would be expected during transport of missile components.

P-E-0020-5 | Program | | | There would be the use of both solid and liquid fuels. A small quantity of liquid propellants (approximately 7.5 liters [2 gallons] of liquid fuel and 5.5 liters [1.5 gallons] of liquid oxidizer) would be used by the EKV portion of the GBI. Approximately 236 kilograms (520 pounds) of hydrazine would be used in the fourth stage of the Peackeeper.

P-E-0020-6 | Land Use | 4.1.8.2.1 | As acknowledged in section 4.1.8.2.1, the ESQDs would not restrict public access to Fossil Beach.

P-E-0020-7 | Safety and Health | 2.3.1, 4.1.7 | See P-E-0020-34
<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
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<tbody>
<tr>
<td>Carolyn Heitman</td>
<td>P-E-0020-8</td>
<td>Program</td>
<td></td>
<td>PMRF currently has the capability to launch four Strategic Target System Targets per year. MDA would utilize that existing launch capability. No other additional missile launches are planned from PMRF.</td>
</tr>
<tr>
<td></td>
<td>P-E-0020-9</td>
<td>Program</td>
<td></td>
<td>The ait and QRLV are not being considered for launching in the ETR Program; they are listed in the EIS as previously launched vehicles from KLC.</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Carolyn Heitman</td>
<td>P-E-0020-18</td>
<td>Safety and Health</td>
<td>4.4.4</td>
<td>See P-E-0004-4</td>
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<td></td>
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<td>4.1.7</td>
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<td></td>
<td>4.5.5</td>
<td></td>
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<td>4.3.5</td>
<td></td>
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<tr>
<td>P-E-0020-19</td>
<td>Program</td>
<td></td>
<td></td>
<td>Range Safety will ensure launch trajectories will not impact populated areas.</td>
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<tr>
<td>P-E-0020-20</td>
<td>Safety and Health</td>
<td></td>
<td></td>
<td>An Environmental Justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. No adverse long-term impacts have been identified at any of the locations analyzed in this EIS. As such, there would be no disproportionately high and adverse human health or environmental effects on the minority or low-income populations that may be present in the vicinity of those locations. Thus, no Environmental Justice impacts are anticipated.</td>
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<tr>
<td>P-E-0020-21</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td></td>
<td>As stated in section 4.1.3.5, no significant impacts to biological resources of KLC are expected from nine annual launches. It is not likely that the Proposed Action of five total launches per year, in conjunction with current planned or anticipated launches, would exceed this level of activity. This holds true even in the unlikely chance recurrence of multiple failures along the same azimuth and at precisely the same time of flight.</td>
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<tr>
<td>P-E-0020-22</td>
<td>Land Use</td>
<td></td>
<td>4.1.8.2.1</td>
<td>The five MDA launches are included in the nine launches per year currently authorized at KLC. Section 4.1.8.2.1 on page 4-69 states that ESQDs at KLC would not impact transportation routes and public access would only be temporarily restricted for safety reasons, on the day of launch, or for a short period of time when missiles are moved within the KLC along the public road.</td>
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<tr>
<td>P-E-0020-23</td>
<td>Land Use</td>
<td></td>
<td>4.1.8.2.1</td>
<td>The rights to access Kodiak’s public recreational areas would not be subject to federal restrictions. As a state established public corporation responsible for the operation of KLC, the AADC would be involved with GMD ETR activities in collaboration with MDA. As discussed in section 4.1.8.2.1 on page 4-69, all Launch Hazard Areas would be established and maintained by AADC in accord with the ILMA for the property. Public access would only be temporarily restricted for safety reasons, on the day of launch, or for a short period of time when missiles are moved within the KLC along the public road.</td>
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<tr>
<td>Carolyn Heitman</td>
<td>P-E-0020-24</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>The rights to access Kodiak’s public roads and recreational areas would not be subject to federal restrictions. As a state established public corporation responsible for the operation of KLC, the AADC would be involved with GMD ETR activities in collaboration with MDA. As mentioned on pages 4-69 and 4-72, ESQDs and EMR hazard exclusion areas at KLC would not impact transportation routes or public property. At KLC only launch hazard areas, which are established and maintained by AADC in accord with the ILMA for the property, would temporarily restrict public access.</td>
</tr>
<tr>
<td>P-E-0020-25</td>
<td>Hazardous Materials</td>
<td>4.1.6</td>
<td></td>
<td>KLC is a small quantity generator of hazardous waste. This equates to approximately five drums of liquid waste per month, or approximately 1,041 liters (275 gallons), assuming 208-liter (55-gallon) drums. Tables 3.1.6-1 and 3.1.6-2 summarize current management practices and provide a list of potentially hazardous materials typically used and hazardous waste typically generated at KLC. Potentially hazardous materials associated with the GMD ETR activities could include solvents, cleaners, oils/lubricants, paints, primers and adhesives. Since no more than 38 liters (10 gallons) in total of these materials would be present at any one time, most would be consumed during use and minimal quantities of potentially hazardous waste would be generated. Only non-hazardous waste such as construction debris would be transported to the Kodiak Borough Landfill or other solid waste municipal landfill. Potentially hazardous waste could only be transported to an RCRA Part B permitted TSD facility.</td>
</tr>
<tr>
<td>P-E-0020-26</td>
<td>Land Use</td>
<td>4.1.8.2.5</td>
<td></td>
<td>Section 4.1.8.2.5 discusses one potential TPS-X site that does not affect public access of the area.</td>
</tr>
<tr>
<td>P-E-0020-27</td>
<td>Program</td>
<td></td>
<td></td>
<td>MDA’s proposed launches from KLC are similar to the previous launches conducted at KLC. The other radar systems on Kodiak have not interfered with any launches and do not pose a threat to missile launches at KLC.</td>
</tr>
<tr>
<td>P-E-0020-28</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td></td>
<td>It is highly unlikely that all the radars mentioned including the Chiniak radar, which at approximately 24 kilometers (15 miles) away is the closest of those mentioned, would be illuminating simultaneously and focused at the exact same area in space.</td>
</tr>
<tr>
<td>P-E-0020-29</td>
<td>Safety and Health</td>
<td>2.1.1, 3.1.6.2, 4.1.6, 4.1.7.</td>
<td></td>
<td>See P-E-0020-13</td>
</tr>
<tr>
<td>P-E-0020-30</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td></td>
<td>As stated on page 4-130, the USFWS has not noticed die-offs of birds below the COBRA DANE radar in Alaska, and no die-offs of birds are anticipated as a result of the operation of the SBX.</td>
</tr>
</tbody>
</table>
Table 8.1.2-2: Responses to Email Comments (Continued)

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<thead>
<tr>
<th>Name</th>
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</thead>
<tbody>
<tr>
<td>Carolyn Heitman</td>
<td>P-E-0020-31</td>
<td>Program</td>
<td>2.1.4</td>
<td>See figure 2.1.4-3 for the SBX Performance Regions.</td>
</tr>
<tr>
<td>P-E-0020-32</td>
<td>Program</td>
<td>The studies needed to complete the DD Form 1494 at each of the proposed locations could not be started until the siting process was completed. These studies are scheduled to be completed in the summer of 2003.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-E-0020-33</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>As discussed in section 4.1.8.2.1, public access through KLC to Fossil Beach would be limited or denied for each launch day. Furthermore, beach landing areas for optional barge delivery would require a temporary closure of short duration of the barge landing beach.</td>
<td></td>
</tr>
<tr>
<td>P-E-0020-34</td>
<td>Safety and Health</td>
<td>2.3.1 4.1.7</td>
<td>See sections 2.3.1 and 4.1.7. The 434-meter (1,425-foot) ESQD and public transit ESQD of 261 meters (855 feet) indicated on figures 2.3.1-2 and 2.3.1-3 are based on the combined explosive potential of all propellants and pyrotechnic materials associated with GBI launches from KLC, including the interceptor's boosters (solid propellant) and liquid fuel for the EKV. Figure 4.1.7-2 indicates exclusion and warning areas.</td>
<td></td>
</tr>
<tr>
<td>P-E-0020-35</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>The launch protection circles shown for launches from the RTS are defined by Range Safety for risks to humans on inhabited islands.</td>
<td></td>
</tr>
<tr>
<td>P-E-0020-36</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>The steller sea lion haulouts that have the greatest potential for impacts from the Proposed Action (noise, emissions, and debris) are shown in figure 3.1.3-2 (Ugak Island and Gull Point) and discussed in the text.</td>
<td></td>
</tr>
<tr>
<td>P-E-0020-37</td>
<td>Geology and Soils</td>
<td>3.1.5</td>
<td>Active seismic elements are important to consider in the layout and design of critical facilities and systems, however, it is not uncommon to site very critical facilities in high seismic settings. Nuclear power plant facilities along the central and southern California coast are excellent examples. The potential for surface rupture from active faults at Narrow Cape can be avoided through site-specific fault studies. Likewise, the capability to withstand probable seismic ground motions at a site can be incorporated into the facility design standards.</td>
<td></td>
</tr>
<tr>
<td>P-E-0020-38</td>
<td>Geology and Soils</td>
<td>3.1.5</td>
<td>Detailed fault studies are generally conducted for site-specific locations when a facility is proposed within or near a suspected active fault zone. The trace of such a fault may or may not be observable at the ground surface but may be indicated by any number of different map and interpretive analyses, for example alignment of land forms, photo/satellite lineament interpretation, and/or geophysical techniques. Detailed fault studies generally employ subsurface excavation to validate actual fault locations, and develop recurrence intervals based on paleoseismic evidence. Therefore, detailed fault studies would generally not be warranted for the entire KLC area unless there was an area-wide system requirement driving the need for investigation.</td>
<td></td>
</tr>
<tr>
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<tr>
<td>Carolyn Heitman</td>
<td>P-E-0020-39</td>
<td>Geology and Soils</td>
<td>3.1.5</td>
<td>The Affected Environment and Environmental Consequence sections of the Draft EIS incorporate site-specific seismic hazard studies conducted at KLC in support of the U.S. Coast Guard Loran Station, by Carver Geologic, William Lettis and Associates, and International Civil Engineering Consultants, Inc. (U.S. Coast Guard Civil Engineering Unit, 2001; 2002; and 2003). A draft of the most recent of these studies (Seismic Hazard Evaluation, Kodiak Loran Station, Phase III, Ground Motion Analysis) was received and incorporated into the Draft EIS. In addition, the phase II report provides a Seismic Source Model table (incorporated in the Draft EIS as table 3.1.5-1) which itemized the fault source segments in the region. A multi-year regional tectonic evaluation of the Narrow Cape area was in preparation, but yet published by Dr. Gary Carver in cooperation with the National Aeronautics and Space Administration. In lieu of the published findings, Dr. Carver was able to comment on the fault studies at the Loran Station.</td>
</tr>
<tr>
<td></td>
<td>P-E-0020-40</td>
<td>Program</td>
<td></td>
<td>The drawings, certified by a registered engineer, state that the 1994 UBC is the code to which the facilities are designed. As stated on D-2 a site visit was also made to compare the construction documents to the buildings.</td>
</tr>
<tr>
<td></td>
<td>P-E-0020-41</td>
<td>Program</td>
<td></td>
<td>See P-E-0018-5</td>
</tr>
<tr>
<td></td>
<td>P-E-0020-42</td>
<td>EIS Process</td>
<td></td>
<td>Public hearings were held to gather comments on the Draft EIS; thus none were included. They are part of the Final EIS.</td>
</tr>
<tr>
<td>Matt DeBenedetti - Legato Systems, Inc.</td>
<td>P-E-0021-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, 4.8.5.2</td>
<td>See P-E-0005-1</td>
</tr>
<tr>
<td>Isabel Julian</td>
<td>P-E-0022-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0014-1</td>
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<td>P-E-0022-2</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0001-1</td>
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<td>P-E-0022-3</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0014-4</td>
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<td>P-E-0022-4</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0014-4</td>
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<td>P-E-0022-5</td>
<td>Hazardous Materials</td>
<td>4.2.3</td>
<td>See P-E-0009-5</td>
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<td>P-E-0022-6</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<td>P-E-0022-7</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0003-1</td>
</tr>
<tr>
<td>Richard Gibson</td>
<td>P-E-0023-1</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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Table 8.1.2-2: Responses to Email Comments (Continued)

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<tbody>
<tr>
<td>Graeme Marsh</td>
<td>P-E-0024-1</td>
<td>EIS Process</td>
<td>3.6</td>
<td>The only new activity proposed for Hawaii as part of the GMD program is the PSB for the SBX at Pearl Harbor and mooring of the SBX off of Barbers Point. The target missile launches described in the draft EIS from PMRF on the island of Kauai are current on-going activities that have been analyzed in previous environmental documentation. For the GMD program, no additional target missile launches would be conducted from PMRF beyond those already planned. For this reason, the scoping process and hearings were not held on Kauai but in Honolulu, which is closest to the location of the new proposed activities.</td>
</tr>
<tr>
<td>David Skimin</td>
<td>P-E-0025-1</td>
<td>Air Quality</td>
<td>4.8.1</td>
<td>Comment noted.</td>
</tr>
<tr>
<td></td>
<td>P-E-0025-2</td>
<td>Safety and Health</td>
<td>4.4.4, 4.1.7, 4.5.5, 4.3.5</td>
<td>See P-E-0004-4</td>
</tr>
<tr>
<td></td>
<td>P-E-0025-3</td>
<td>Safety and Health</td>
<td>3.1.7</td>
<td>See section 3.1.7.2. By agreement with Alaska Department of Natural Resources, Division of Forestry, the City of Kodiak Fire and Rescue Department would respond to potential wildfires that could erupt in the event of a launch pad mishap. If necessary, the Fire Department would also provide assistance with road closures during launch activities. AADC/KLC emergency response personnel would also respond to any wildfires and would handle all other response and mitigation activities associated with missile launches/mishaps due to the very specific hazardous materials response training and equipment required and the noted limitations of the Kodiak Fire Department.</td>
</tr>
<tr>
<td></td>
<td>P-E-0025-4</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>Page 4-106 also states (below the table) that it would take approximately 18 years for 90 percent of the perchlorate to leach out of the solid propellant that lands in the Alaskan ocean waters (8.3 °C [47 °F]). At this extremely slow rate, the amounts of perchlorate would quickly be diluted.</td>
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<tr>
<td></td>
<td>P-E-0025-5</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>As stated on page 4-106, the temperature for fresh water would be higher and it would take about a year for 90 percent of the perchlorate to leach out. Even at this higher rate, the perchlorate would be diluted as it mixes with the surrounding water. For an accident involving fresh water areas, larger pieces of propellant would be recovered, further minimizing the potential for perchlorate contamination and resultant impacts to fish and other wildlife.</td>
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<td></td>
<td>P-E-0025-6</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Amy Winterscheidt and Bruce McCracken</td>
<td>P-E-0026-1</td>
<td>Policy</td>
<td></td>
<td>Comment noted.</td>
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<tr>
<td>Amy Winterscheidt and Bruce McCracken</td>
<td>P-E-0026-2</td>
<td>EIS Process</td>
<td>4.8.8</td>
<td>Comment noted.</td>
</tr>
<tr>
<td></td>
<td>P-E-0026-3</td>
<td>Visual Aesthetics</td>
<td>4.8.8</td>
<td>Please refer to section 4.8.8 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the redevelopment plan, it states that while it is possible that those that visit and reside in this area may be affected by the SBX, the effects would be minimal in regards to this plan.</td>
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<tr>
<td></td>
<td>P-E-0026-4</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td></td>
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<tr>
<td>Frank McCord - Cascade Bank and the Navy Relations Committee</td>
<td>P-E-0027-1</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
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<td>P-E-0027-2</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
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<tr>
<td></td>
<td>P-E-0027-3</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
<td></td>
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<tr>
<td>David Bird - McGill University</td>
<td>P-E-0028-1</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
<td></td>
</tr>
<tr>
<td>Josee Rousseau - McGill University</td>
<td>P-E-0029-1</td>
<td>Program</td>
<td>4.2</td>
<td>Midway would remain a National Wildlife Refuge for all of the alternatives.</td>
</tr>
<tr>
<td></td>
<td>P-E-0029-2</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0003-1</td>
</tr>
<tr>
<td>Lari Belisle - Anchorage ARTCC</td>
<td>P-E-0030-1</td>
<td>Airspace Use</td>
<td>4.1.2.2</td>
<td>Added information to section 4.1.2 regarding the three to four uncharted airways or flexible tracks managed by the Anchorage ARTCC that cross the north Pacific, south of KLC, and flexible tracks that cross north of the Central Pacific Route Structure that is coordinated through the Oakland ARTCC. In addition, section 4.11.1 includes information on airways in the broad ocean area.</td>
</tr>
<tr>
<td></td>
<td>P-E-0030-2</td>
<td>Socioeconomics</td>
<td>4.1.10</td>
<td>As stated in section 4.1.10 the notice given to the local communities via local newspapers, broadcast media, and commercial fishing, aviation, and tourist boat trade associations would be extensive. As such, entities with an economic interest in the use of these areas such as the commercial fishing, aviation, and tourist industries of Kodiak would not be significantly impacted by the proposed clearance areas.</td>
</tr>
<tr>
<td></td>
<td>P-E-0030-3</td>
<td>Land Use</td>
<td>3.1.8.2</td>
<td>The text of the EIS has been revised as recommended.</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Ivona Xiezopolski</td>
<td>P-E-0031-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
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<td>P-E-0031-2</td>
<td>Policy</td>
<td></td>
<td>See P-E-0020-1</td>
</tr>
<tr>
<td>Judith Evered</td>
<td>P-E-0032-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td></td>
<td>P-E-0032-2</td>
<td>Biological Resources</td>
<td>4.11.3</td>
<td>Comment noted. The Proposed Action is not expected to result in significant impacts to marine biological resources.</td>
</tr>
<tr>
<td></td>
<td>P-E-0032-3</td>
<td>Policy</td>
<td></td>
<td>This is beyond the scope of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0032-5</td>
<td>Program</td>
<td></td>
<td>See P-E-0018-5</td>
</tr>
<tr>
<td>Michael Jones - University of Hawaii</td>
<td>P-E-0033-1</td>
<td>EIS Process</td>
<td></td>
<td>The Draft EIS has been sent to the Hanapepe Public Library, Kapaa Public Library, Koloa Public and School Library, Lihue Public Library, Princeville Public Library, and Waimea Public Library. The GMD ETR program would not include additional launches from PMRF; all proposed Strategic Target System launches would be included under ongoing activities.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-2</td>
<td>EIS Process</td>
<td></td>
<td>Most activities are covered by the previous environmental documentation, and therefore scoping was not conducted in the Marshall Islands.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-3</td>
<td>EIS Process</td>
<td></td>
<td>Due to minimal impacts to the area, scoping was not conducted in the Gulf of Mexico region.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-4</td>
<td>Program</td>
<td></td>
<td>Comment noted and texted revised to state up to 10 launches per year.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-5</td>
<td>Safety and Health</td>
<td>ES</td>
<td>See the executive summary. Alaska Aerospace Development Corporation safety procedures are not applicable to PMRF/Hawaii. The sentence should read, “Adherence to FAA and DoD safety procedures relative to radar operations would preclude significant impact to health and safety.” That is typographical error.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-6</td>
<td>EIS Process</td>
<td></td>
<td>Text added to appendix A. The current document is the Ground-Based Midcourse Defense Extended Test Range EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-7</td>
<td>Program</td>
<td></td>
<td>This is an approximate propellant mass for the GBI. There is not a known third configuration of the GBI.</td>
</tr>
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</table>
Table 8.1.2-2: Responses to Email Comments (Continued)

<table>
<thead>
<tr>
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<th>EIS Section</th>
<th>Response Text</th>
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<tr>
<td>Michael Jones - University of Hawaii</td>
<td>P-E-0033-8</td>
<td>Safety and Health</td>
<td>4.1.7</td>
<td>The 434-meter (1,425-foot) ESQD and public transit ESQD of 261 meters (855 feet) indicated on figures 2.3.1-2 and 2.3.1-3 are based on the combined explosive potential of all propellants and pyrotechnic materials associated with GBI launches from KLC, including the interceptor’s boosters (solid propellant) and liquid fuel for the EKV. The size of the ESQD does not change regardless of location. 1.1 (class A) explosives pose a detonation risk. 1.3 (class B) explosives a (rapid-burn) fire hazard, minor blast or fragment hazard, but not a mass explosion hazard. Therefore, if the missile configuration should change and the propellant used is a division 1.3 explosive, the ESQD would be reduced.</td>
</tr>
<tr>
<td>P-E-0033-9</td>
<td>Safety and Health</td>
<td>4.1.7</td>
<td>A description of target missiles that may be used are provided in section 2.1.2; however, final selection of target type would be dependent on the test scenario. Therefore, no quantitative information on target ESQDs are provided. However, ESQD criteria are determined in accordance with DOD 6055.9-STD (DOD Ammunition and Explosives Safety Standards) and the responsible Service’s implementing regulations. ESQDs are missile specific and based on the combined explosive potential of all propellants and pyrotechnic materials associated with the missile/booster configuration. ESQD for any target missile incorporated into the GMD ETR program would be predicated on risk avoidance, minimization of accident impacts and protection of population centers.</td>
<td></td>
</tr>
<tr>
<td>P-E-0033-10</td>
<td>Safety and Health</td>
<td>4.4.4</td>
<td>See P-E-0004-4</td>
<td></td>
</tr>
<tr>
<td>P-E-0033-11</td>
<td>Safety and Health</td>
<td>Appendix C</td>
<td>4.1.7</td>
<td>There are inherent risks with any missile testing activity; however, protection of life and property, on and off range, is the prime concern of Range/Mission Safety personnel. In the fifteen years since the referenced incident, improvements have been made not only in the modes of disseminating flight test information, but in the programs that track and terminate flight and the models that compute launch risk exposure. Refer to appendix C. The RCC Common Risk Criteria for National Test Ranges (RCC 321-02) sets the requirements for minimally acceptable risk criteria to occupational and non-occupational personnel, test facilities and non-military assets during range testing operations. Under RCC 321-02 individuals of the general public shall not be exposed to a probability of fatality greater than 1 in 10 million for any single mission and 1 in 1 million on an annual basis. Also, U.S. Coast Guard vessels and range safety aircraft typically would patrol the area to ensure that it is clear of ships or watercraft.</td>
</tr>
<tr>
<td>P-E-0033-12</td>
<td>Program</td>
<td>See P-E-0018-5</td>
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<tr>
<td>P-E-0033-13</td>
<td>Program</td>
<td>See P-E-0018-5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Michael Jones - University of Hawaii

P-E-0033-14 Land Use 4.4.1.3 As mentioned on page 4-148, the Proposed Action of up to four target launches per year are included in the 30 launches per year currently authorized at PMRF. The GMD launches would be the same as those analyzed in the North Pacific Targets EA.

P-E-0033-15 Program 4.4.1.3 If the FAA reissues the launch site operator license for the operation of KLC, then it is anticipated there will be no more than nine launches per year at KLC per the regulations stipulated in the license.

P-E-0033-16 Program 4.4.1.3 See P-E-0004-2

P-E-0033-17 Airspace Use 4.6.2 4.8.2 2.1.4.2 DD Form 1494 is in process and will not be completed until after the EIS is final. As with other permits, once a site is selected then the permitting process would be finalized. As stated in section 4.6.2.2, the SBX operating area would be constrained so that the existing ground-, air-, and sea-based electronics are not impacted. In addition, with regard to SBX radar impact to aircraft and avionics, the concern is not interference but is a reduction in life of the aircraft avionics.

P-E-0033-18 Airspace Use 4.6.2 4.8.2 2.1.4.2 See P-E-0033-17

P-E-0033-19 Airspace Use 4.6.2 Table 2.1.4-2 is now referenced, and table 4.6.2-1 has been deleted.

P-E-0033-20 Program 1.6 Following completion of the EIS, MDA will make decisions regarding the GMD ETR. Those decisions will be documented in a ROD that will be sent to all recipients of the GMD ETR EIS.

P-E-0033-21 Safety and Health 4.4.4 As indicated in section 4.4.4, before installation and use of any new radar or telemetry unit, EMR hazard reviews would be conducted to establish potential hazards to personnel, fuels and ordnance from EMR. Although the event is not likely to occur, the analysis would consider existing HERP, HERF, and HERO arcs and potential impact of simultaneous operation of TPS-X and current radar at PMRF. The TPS-X radar is a mobile unit and would be removed on completion of GMD ETR test operations. Adherence to PMRF, FAA, and DoD safety procedures relative to radar operations would preclude potential cumulative impact and significant impact to health and safety.

P-E-0033-22 EIS Process 4.6.2 See P-E-0004-3

P-E-0033-23 EIS Process 4.6.2 Comment noted and correction made.

P-E-0033-24 Airspace Use 3.6.2 Text in section 3.6.2 has been corrected.
<table>
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<th>EIS Section</th>
<th>Response Text</th>
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<tr>
<td>Michael Jones - University of Hawaii</td>
<td>P-E-0033-25</td>
<td>Air Quality</td>
<td>4.1.1.2</td>
<td>The propellant mass and exhaust product information has been updated in sections 4.1.1.2 and 4.5.1.3.</td>
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<tr>
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<td>P-E-0033-26</td>
<td>Airspace Use</td>
<td>2.1.8</td>
<td>Figures in section 2.1.8 have been modified.</td>
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<td>P-E-0033-27</td>
<td>Airspace Use</td>
<td>2.1.8</td>
<td>See P-E-0033-26</td>
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<td></td>
<td>P-E-0033-28</td>
<td>Safety and Health</td>
<td>1 2</td>
<td>GMD testing activities could include up to five launches per year (interceptors and/or targets) from each launch facility. Since most of these would be an interceptor from one location and a target from another location, there would be approximately 10 launches per year for the entire GMD ETR.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-29</td>
<td>Safety and Health</td>
<td>4.11.3.4</td>
<td>Comment noted and text revised.</td>
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<tr>
<td></td>
<td>P-E-0033-30</td>
<td>Policy</td>
<td></td>
<td>Copies of the Fact Sheets that were made available at the the public hearings can be acquired by writing to: U.S. Army Space and Missile Defense Command, ATTN: SMDC-EN-V (Mrs. Julia Hudson-Elliott), 106 Wynn Drive, Huntsville, AL 35805; by e-mail at <a href="mailto:gmdetreis@smdc.army.mil">gmdetreis@smdc.army.mil</a>; or by phone at 1-800-823-8823.</td>
</tr>
<tr>
<td></td>
<td>P-E-0033-31</td>
<td>EIS Process</td>
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<td>Comment noted.</td>
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<tr>
<td>Ben Brisbois</td>
<td>P-E-0034-1</td>
<td>Biological Resources</td>
<td>4.2.2</td>
<td>See P-E-0016-1</td>
</tr>
<tr>
<td>Mike Milligan</td>
<td>P-E-0035-1</td>
<td>Program</td>
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<td>See P-E-0020-5</td>
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<td>P-E-0035-2</td>
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<td>See P-E-0018-5</td>
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<td></td>
<td>P-E-0035-3</td>
<td>Policy</td>
<td></td>
<td>Any new technology or activity beyond the scope of the ETR would require additional analysis.</td>
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<tr>
<td>Karen Button</td>
<td>P-E-0036-1</td>
<td>Policy</td>
<td></td>
<td>See P-E-0032-3</td>
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<td>EIS Process</td>
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<td>See P-E-0020-42</td>
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Table 8.1.2-2: Responses to Email Comments (Continued)

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<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tr>
<td>Karen Button</td>
<td>P-E-0036-9</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>According to analysis of the socioeconomic resources of the area, page 4-83 states that no significant impacts to local business such as commercial fishing and fish processing are anticipated. Areas within the flight safety zone would be cleared approximately 1 to 4 hours before a launch. The actual launch is expected to last about 30 minutes. The all clear would be given within hours and the areas can then be re-occupied. Only up to five launches per year are planned.</td>
</tr>
<tr>
<td></td>
<td>P-E-0036-10</td>
<td>Socioeconomics</td>
<td></td>
<td>This is not within the scope of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0036-11</td>
<td>Program</td>
<td></td>
<td>The purpose of the Proposed Action is to provide for more realistic flight tests in support of development of the GMD system.</td>
</tr>
<tr>
<td></td>
<td>P-E-0036-12</td>
<td>Policy</td>
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<td>See P-E-0032-3</td>
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<tr>
<td>Nola Conn</td>
<td>P-E-0037-1</td>
<td>P-E-0319</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-E-0319.</td>
</tr>
<tr>
<td>Graeme Marsh</td>
<td>P-E-0038-1</td>
<td>P-E-0319</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-E-0319.</td>
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<tr>
<td>Ronald Russell</td>
<td>P-E-0039-1</td>
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<td>Multiple</td>
<td>See responses to issues identified for comment number P-E-0319.</td>
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<td>Miguel Checa</td>
<td>P-E-0040-1</td>
<td>P-E-0319</td>
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<td>See responses to issues identified for comment number P-E-0319.</td>
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<td>Paul Miller</td>
<td>P-E-0041-1</td>
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<td>Robin Connors</td>
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<td>Marie Le Boeuf</td>
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<td>Pete Doktor</td>
<td>P-E-0044-1</td>
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<tr>
<td>Hattie Berg</td>
<td>P-E-0045-1</td>
<td>P-E-0319</td>
<td>Multiple</td>
<td>See responses to issues identified for comment number P-E-0319.</td>
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<tr>
<td>Kawika Alfiche</td>
<td>P-E-0046-1</td>
<td>P-E-0319</td>
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<td>Ednette Chandler</td>
<td>P-E-0047-1</td>
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<td>Gary Bart</td>
<td>P-E-0048-1</td>
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<td>Marti Paskal</td>
<td>P-E-0049-1</td>
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<tr>
<td>Deborah Burnham</td>
<td>P-E-0050-1</td>
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<td>Myra Lewin</td>
<td>P-E-0051-1</td>
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<td>Richard Burge</td>
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<td>Kima Douglas</td>
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<td>Dolores Blalock -</td>
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<td>Communication Design Dept</td>
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<tr>
<td>Scot Ryder</td>
<td>P-E-0055-1</td>
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<td>Kathy-Lyn Binkowski</td>
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<td>See responses to issues identified for comment number P-E-0319.</td>
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<tr>
<td>Diana Richardson</td>
<td>P-E-0057-1</td>
<td>P-E-0319</td>
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<td>See responses to issues identified for comment number P-E-0319.</td>
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<tr>
<td>Lauryn Galindo</td>
<td>P-E-0058-1</td>
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<td>John Kesich</td>
<td>P-E-0059-1</td>
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<td>Carole Madsen</td>
<td>P-E-0060-1</td>
<td>P-E-0319</td>
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<td>Shawn Dicken</td>
<td>P-E-0061-1</td>
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<td>See responses to issues identified for comment number P-E-0319.</td>
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<td>John Grant</td>
<td>P-E-0062-1</td>
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<td>Michael Douglas</td>
<td>P-E-0063-1</td>
<td>P-E-0319</td>
<td>Multiple</td>
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<td>Nancy Miller</td>
<td>P-E-0064-1</td>
<td>P-E-0319</td>
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<td>Cindy Brockway</td>
<td>P-E-0065-1</td>
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<td>James Danoff-Burg</td>
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<td>Makaala Kaumoana</td>
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<td>Yvette Crosby</td>
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<td>Kevin Correll</td>
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<td>Maire Susan Sanford</td>
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<td>Eli Harris</td>
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Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>Nancy Crom</td>
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<td>Pulelehuakenue Oshiyama</td>
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<td>Tammy Robinson</td>
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Table 8.1.2-2: Responses to Email Comments (Continued)

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Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>Rick D. Eberharter</td>
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<td>Deborah M Wright</td>
<td>P-E-0208-1</td>
<td>EIS Process</td>
<td></td>
<td>The scoping session was held in Seattle because, when the meeting was set up, several other installations in the Seattle area were still being considered. The Seattle location appeared in logical proximity to all locations, and we were ensured the scoping session was widely publicized in the Seattle area, including both the Everett and Bremerton communities.</td>
</tr>
<tr>
<td></td>
<td>P-E-0208-2</td>
<td>Noise</td>
<td>4.8</td>
<td>It is anticipated that the design of the SBX vessel would incorporate methods to minimize noise. While operating pierside, two diesel generators could be operating for up to 3 hours per day. Noise levels from these generators would be expected to dissipate to background levels within several hundred feet.</td>
</tr>
<tr>
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<td>P-E-0208-3</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>As described in section 4.8.1.2, it is anticipated that the SBX would be able to dock at Naval Station Everett and connect to utilities there. Requiring two generators for powering the 65 percent of fully populated radar for 3 hours per day. No significant emissions are anticipated from running the two generators for 3 hours per day. The SBX operation would meet all state and federal air quality requirements.</td>
</tr>
</tbody>
</table>
Deborah M Wright  
P-E-020-4  
Safety and Health  
2.1.4.2  
Appendix G  

Section 2.1.4.2 and appendix G of the EIS discuss potential interference with communications and electronics equipment. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. Thus, the odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). If interference occurs, the short-term effects would not damage any electronic equipment. These odds are based on conservative calculations that assume the SBX would operate in full power mode for 20 minutes each day at maximum duty cycle. New information on the potential effects of EMR on human health and communications-electronics has been added as appendix G of the EIS.

P-E-020-5  
Safety and Health  
4.8.5  

See section 4.8.5 and appendix G. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards and therefore additional studies are not warranted or planned at this time. As with other standards, the current standard is followed until there is an official change.

P-E-020-6  
Hazardous Materials  
4.7.4  
4.8.4  

Potentially hazardous materials associated with GMD ETR/SBX maintenance activities could include solvents, oils/lubricants, and paints/primers. The quantities of these materials ordered and used would be kept to the minimum for the work required. Therefore, most would be consumed during use and minimal quantities of potentially hazardous waste would be generated. Table 3.6.4-1 summarizes the discharge restrictions for non-hazardous, potentially hazardous, and some special waste into the ocean.
Mitigation methods would include safe distance separations and software controls, such as those currently in place on the XBR used at Kwajalein Island in the RMI. Under proposed operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. RF Radiation Hazard Safety Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. As stated in section 2.1.4, two separate, redundant computer systems would monitor all emission energy levels at locations around the radar to assure safe exposure levels would be maintained. The odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than 1 second should this occur.

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<td>Deborah M Wright</td>
<td>P-E-0208-7</td>
<td>Safety and Health</td>
<td>4.8.5</td>
<td>Mitigation methods would include safe distance separations and software controls, such as those currently in place on the XBR used at Kwajalein Island in the RMI. Under proposed operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. RF Radiation Hazard Safety Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. As stated in section 2.1.4, two separate, redundant computer systems would monitor all emission energy levels at locations around the radar to assure safe exposure levels would be maintained. The odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than 1 second should this occur.</td>
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<tr>
<td>Margaret Ann Lyman</td>
<td>P-E-0209-1</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the effects on marina traffic caused by the SBX, coordination would be adequately advertised through a NOTMAR in order to prevent any conflicts with tribal fishing areas, and to prevent any impacts on current shipping schedules, ship-borne commerce, recreational boating, or general transit.</td>
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<td>4.8.2 2.1.4.2</td>
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<td>P-E-0209-4</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>As stated on page 4-242, the SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts to biological resources are anticipated.</td>
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<td>It is anticipated that the SBX would support approximately five GMD tests per year. Each test would require the SBX to be away from the PSB for approximately 1 month.</td>
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<td>4.8.3</td>
<td>As stated on page 4-130 in the Draft EIS, since birds are not likely to remain continuously within the radar beam and the power density is not expected to exceed levels that could impact birds, the likelihood of harmful exposure is not great.</td>
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<td>Similar radar systems successfully operate with coordination between agencies as part of solution. Numerous other hardware, software, and operational guidelines will ensure the safe operation of the SBX.</td>
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<td>A socioeconomic section has been added to section 4.8.6 in the EIS.</td>
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<td>4.8.3</td>
<td>Analysis in the EIS is based on effects of other similar radar systems. As stated on page 4-130, a full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of this survey.</td>
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<td>Julian Dewell</td>
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<td>2.1.4.6</td>
<td>See section 2.1.4.6. For security purposes the SBX would follow standard security practice for U.S. naval vessels of approximately 91 meters (299 feet), but the distance could vary depending on the situation and location of the SBX. In port security distances would be similar to existing naval vessels at that location.</td>
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<td>When at home port, the SBX vessel would be moored at the pier. No adverse effects to fish, shellfish, or other wildlife are anticipated. Permanent mooring systems would be put into place at locations without docking facilities, such as Adak or Port Hueneme, after the final site is selected and an environmental review of the area is conducted.</td>
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<td>Pier-side utility requirements would be similar to a small ocean-going vessel. While the SBX is underway the estimated fuel consumption would be 54,888 liters (14,500 gallons) per day. That assumes the SBX is in transit with radar operations, and assumes six generators running 24 hours per day. While in transit the SBX exhaust emissions would be similar to other sea-going vessels and would be dispersed over a large area. The SBX operation would meet all state and federal air quality requirements.</td>
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<td>P-E-0230-7</td>
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<td>As discussed in section 4.8.1.2, the SBX is a mobile source (per 40CFR52.21(b)(5)), and as such the emissions would not be considered with stationary sources. It is anticipated that the SBX would be able to dock at Naval Station Everett, and would connect to utilities there. While at pier side, two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. No significant emissions are anticipated from running the two generators for 3 hours per day.</td>
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### Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>While at the PSB, the SBX would have hardware and software controls that</td>
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<td>physically limits the movement of the radar below 10 degrees above the horizon.</td>
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<td>While in the open ocean the hardware and software limits are reduced to a lower</td>
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<td>limit of 2 degrees above the horizon. Therefore, the beam would not directly</td>
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<td>illuminate the surface. Refer to section 2.1.4.2 and appendix G.</td>
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<td>Marianne Edain - Whidbey Environmental Action Network</td>
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<td>DD Form 1494 is in process and will not be completed until after the EIS is final. As with other permits, once a site is selected then the permitting process would be finalized. The basic assumption regarding the SBX operation while in port, or at a nearby mooring location, is that the 20 minutes of daily calibration and tracking would be coordinated in both time and space so as to reduce any potential EMR interference to a negligible level. The SBX would be constrained so that the existing ground-, air-, and sea-based electronics are not impacted. In addition, with regard to aircraft and avionics, aircraft may fly through the mainbeam of a radar, and therefore would be exposed to EMR. Military aircraft must be hardened or protected from EMR levels up to 3500 V/m (peak power) and 1270 V/m (average power). The SBX will not exceed these levels. Civilian aircraft must be hardened or protected from EMR levels up to 3000 V/m (peak power) and 300 V/m (average power) as mandated by the FAA by Notice 8110.71, Guidelines for the Certification of Aircraft Flying through High Intensity Radiated Field Environments. The SBX will not exceed the 3000 V/m peak power threshold. The SBX can exceed the 300 V/m average power threshold out to 12.1 kilometers (7.5 miles) (65% populated radar) or 19 kilometers (11.8 miles) (100% populated radar). The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern here is not interference but is a reduction in life of the aircraft avionics.</td>
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<td>The text has been modified to reflect table 2.1.4-2, which lists the maximum potential interference distances that define the ROI based on various subjects that could interact with the radar. Appendix B includes a general description of the health and safety resource area and a detailed discussion of the laws, regulations, and standards concerning maritime safety and EMR.</td>
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<td>Mike Curtis</td>
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<td>The endorsement or recommendation of home-basing the SBX in Everett is in no way tied to base closures.</td>
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<td>The FCC, DoD, IEEE, and many other industries, agencies, and organizations whose personnel work in close proximity to devices that emit both ionizing and non-ionizing radiation have conducted self and independent studies on potential EMR exposures and have shared and combined the information in order to develop guidelines/standards that are consistent and safe relative to human exposure. The IEEE set of standards is based on hundreds of studies (321 that are referenced in the latest version of IEEE C95.1-1999).</td>
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<td>Elizabeth Hallgarth</td>
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### Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>Christine Giannini</td>
<td>P-E-0267-1</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>As stated on page 4-242, the SBX vessel will incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices, in design or routine operation to minimize the potential for impacts. Design of the SBX vessel would incorporate methods to minimize generator noise. No impacts to orca communication are anticipated.</td>
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<td>4.8.1.2</td>
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<td>Deane W. Minor</td>
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<td>Mark Anderson</td>
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<td>See P-E-0026-4</td>
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<td>Dale and Laura Temple</td>
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<tr>
<td>Kelli Trosvig</td>
<td>P-E-0275-1</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>As discussed in section 4.8.1.2, it is anticipated that the SBX would be able to dock at Naval Station Everett and would connect to utilities there. Two generators would be required for powering of the 65 percent or fully populated radar for 3 hours per day. No significant emissions are anticipated from running the two generators for 3 hours per day. The SBX operation would meet all state and federal air quality requirements.</td>
</tr>
<tr>
<td></td>
<td>P-E-0275-2</td>
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<td>4.8.3</td>
<td>Comment noted. No significant impacts are anticipated to the migration and return of spawning wild salmon and whales known to frequent the Port Gardner Bay area.</td>
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### Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>Kelli Trosvig</td>
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<td>Air Quality</td>
<td>4.8.1.2</td>
<td>As discussed in section 4.8.1.2, according to 40CFR52.21(b)(5) the SBX would be considered a mobile source. A stationary source is defined as a building, structure, facility, or installation, all of which the SBX is not. Under the current test plan, the SBX would be in port for about 5 weeks at a time and then would be in transit or at the test area in the middle of the Pacific Ocean for about 4 weeks. This cycle would be repeated throughout the year.</td>
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<tr>
<td>Margaret Grospitch</td>
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<td>4.8.3</td>
<td>Analysis in the EIS is based on effects of other similar radar systems. As stated on page 4-130, a full EMR/EMI survey and analysis would be conducted by the Joint Spectrum Center, in coordination with the FAA, DOT, and other potentially affected users. An operating permit would be negotiated based on the results of this survey. The Proposed Action will comply with all applicable federal and state laws and regulations.</td>
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<td>Mary Jane Anderson</td>
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<td>Safety and Health</td>
<td>4.8.5</td>
<td>A DD Form 1494 would be completed prior to SBX operations and would assist in defining the operating area and defining safe operating angles, power levels, etc. Mitigation methods would include safe distance separations and software controls, such as those currently in place on the XBR used at Kwajalein Island in the RMI. Under proposed operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. RF Radiation Hazard Safety Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. Section 2.1.4; Two separate, redundant computer systems would monitor all emission energy levels at locations around the radar to assure safe exposure levels would be maintained. The odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than a second should this occur. To reduce the chance of fuel leaks, the SBX platform would be constructed and operated in accordance with the military, state, federal and international maritime (SOLAS) and (MARPOL 73/78) standard construction and operating requirements for safety and pollution prevention. As such, regular inspections would occur and fueling operations would be monitored and controlled. Any potential breech or leak would be handled in accordance with existing Naval and Coast Guard procedures.</td>
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<td>Ivan Eastin</td>
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<td>Comment noted. No significant impacts are anticipated to the migration and return of spawning wild salmon, such as the Chinook salmon, known to occur in the Puget Sound.</td>
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<td>Scott, Kim, Michael, and Kevin Schroeder</td>
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<td>A siting study was conducted to identify candidate locations for a PSB. Only those locations that met the exclusionary criteria and application of initial evaluative criteria were carried forward for analysis in the GMD ETR EIS.</td>
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<td>John Hurd</td>
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Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>Airspace Use</td>
<td>4.8.2, 2.1.4.2</td>
<td>As stated in section 4.8.2, the SBX would not exceed the FAA 3000 V/m peak power threshold. The SBX could exceed the FAA 300 V/m average power threshold out to 12.1 kilometers (7.5 miles) (65% populated radar) or 19 kilometers (11.8 miles) (100% populated radar). The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern here is not interference but is a reduction in life of the aircraft avionics. The SBX would be constrained so that the existing ground-, air-, and sea-based electronics are not impacted. As stated in the EIS, while in port, or at a nearby mooring location, the 20 minutes of daily calibration and tracking would be coordinated in both time and space so as to reduce any potential EMR interference to a negligible level. Based on the spectrum certification and frequency allocation process, the high energy radiation operating area for the SBX would be modified to fit existing airport and airspace requirements. The FAA would provide notice regarding the SBX operating area to local airports and aircraft through a NOTAM.</td>
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<td>P-E-0289-3</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2 of the EIS indicate the SBX operating and mooring areas and general operational effects. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards. The odds that communication-electronics equipment could be affected by the SBX because of high power effects are negligible (roughly 1/10 of a second per day). New information on the potential effects of EMR on human health and communications-electronics has been added as appendix G of the EIS.</td>
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<td>P-E-0289-4</td>
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<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the effects on marine traffic caused by the SBX, coordination would be adequately advertised through a NOTMAR in order to prevent any conflicts with tribal fishing areas, and to prevent any impacts on current shipping schedules, ship-borne commerce, recreational boating, or general transit.</td>
</tr>
<tr>
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<td>John Hurd</td>
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<td>Socioeconomics</td>
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<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to the redevelopment plan, it states that while it is possible that those that visit and reside in this area may be affected by the SBX, the effects would be minimal in regards to this plan.</td>
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<tr>
<td>P-E-0289-6</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>Please refer to section 4.8.6 for an added Socioeconomic section for Naval Station Everett. It addresses concerns regarding Visual and Health and Safety impacts on the socioeconomics of the area due to the SBX. In regards to housing, commercial, and property values, it states that given the possible visual impacts of the SBX, along with the misconception that the SBX would have adverse health impacts to the public, the proposed project could potentially lead to property value impacts. However, the impacts would be minimal due to the fact that the SBX would be an additional structure on an existing military base immediately surrounded by industrial land uses, thereby reducing the potential impacts to property values.</td>
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<td>Gloria Olson</td>
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<td>This is beyond the scope of the EIS.</td>
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<td>Chris Beckmeyer</td>
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<td>See P-E-0013-2</td>
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Table 8.1.2-2: Responses to Email Comments (Continued)

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<td>Christianne Loupelle - Dept of Natural Resources Sciences, McGill University</td>
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<td>As with other established shipping procedures, all SBX operations, including the establishment of any required security areas, would be coordinated with the U.S. Coast Guard (see section 4.8.7.2). The Coast Guard would also be responsible for scheduling port usage in a manner to prevent impacts to recreational or commercial water transportation in the area. The design for the SBX now includes retractable thrusters and the plan is to have the SBX at either Pier Alpha or Pier Bravo. The security area would be similar to the existing security area for USS Abraham Lincoln.</td>
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<td>John R McCoy</td>
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<td>Michelle Wilson Nordhoff</td>
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<td>No meetings were held in Delta Junction or Fairbanks because no ETR activities would occur in either location.</td>
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<td>Malama Pono, M. Doherty, Chisa Dodge, Mona Kim, Ujenna &amp; Marguerit Johnson, and Garth Forth</td>
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<td>P-E-0317-2</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>The proposed barge landing sites would not require any construction and all applicable permits would be obtained prior to implementation of the Proposed Action. As stated in section 4.1.8.2.1 on page 4-68, restricted access to the beach landing areas and road closures to the immediate area during unloading would occur. However, such short-term closures would not significantly impact land use. Barge beach landings would comply with the standards of the Alaskan Coastal Management Program. As well, the Proposed Action is not expected to result in significant impacts to marine biological resources.</td>
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<td>Biological Resources</td>
<td>4.1.3</td>
<td>As stated in chapter 2, up to five launches from each selected launch site would occur per year as part of the Proposed Action. According to the FAA EA, no significant impacts to water quality were anticipated as a result of launching nine missiles per year. The missile launches required as part of the Proposed Action would not exceed the number previously analyzed. As stated on page 4-105 in the Draft EIS, aluminum oxide is only a hazard to aquatic life in acidic environments when it dissociates into as free aluminum cation. Aluminum oxide should not dissolve in water with pH levels between 5 and 9.5. As summarized in the Summary Findings of KLC Environmental Studies 1998-2001, there have been no discernable effects on water chemistry to date, including from the Strategic Target System mishap.</td>
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<td>Such issues are addressed in several sections within chapter 4, including 4.1.6. All transportation of equipment and materials such as fuels would be conducted in accordance with applicable OSHA, EPA, DOT, DoD and state regulations and requirements as well as established project and launch complex Standard SOPs. SOPs for spill prevention, containment, and control measures while transporting equipment and materials would preclude impacts. The launch operator would be responsible for transporting the fuel in accordance with these requirements. The EKV tanks (containing liquid fuels or oxidizers) would protect against releases in the unlikely event of a transportation accident and therefore would meet DOT requirements. The EKV would have proper placards and only military or commercial carriers licensed to handle or transport hazardous materials would be utilized. Due to the nature of some road conditions, movement of construction equipment and material would cause temporary traffic delays; however, these delays would be temporary and infrequent; public announcements regarding potential delays would be made, and movements during off-peak travel hours would be scheduled to the greatest extent possible. Impacts to roads could also be minimized through the selection of the option of barge transports, also discussed in chapter 4.</td>
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<td>See P-E-0013-2</td>
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<td>4.8.6.2</td>
<td>As stated in 4.8.6.2, as many as 50 personnel could leave the SBX for onshore activities at Port Everett. Even given the extreme case of 50 vehicle trips per day, this level would be less than a 0.59 percent over the current level of 8,520 daily vehicle trips generated by Naval Station Everett. The likelihood of all SBX personnel leaving the Naval Station simultaneously is remote, and onshore activities would be of a limited duration (between test missions). No impacts to area roadways, including Everett city streets, are expected.</td>
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<td>Doris and Clair Olivers</td>
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<td>Hazardous Materials</td>
<td>4.8.5</td>
<td>The SBX platform would be constructed (enclosed double bottom) and operated in accordance with the military, state, federal and international maritime (SOLAS) and (MARPOL 73/78) standard construction and operating requirements for safety and pollution prevention. As such, regular inspections would occur and fueling operations would be monitored and controlled. Any potential breech or leak would be handled in accordance with existing Naval and Coast Guard procedures.</td>
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<td>Cha Smith - KAHEA: The Hawaiian-Environmental Alliance</td>
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<td>EIS Process</td>
<td>3.6</td>
<td>The only new activity proposed for Hawaii as part of the GMD program is the PSB for the SBX at Pearl Harbor and mooring of the SBX off of Barbers Point. The target missile launches described in the draft EIS from PMRF on the island of Kauai are current on-going activities that have been analyzed in previous environmental documentation. For the GMD program, no additional target missile launches would be conducted from PMRF beyond those already planned. For this reason, the scoping process and hearings were not held on Kauai but in Honolulu, which is closest to the location of the new proposed activities.</td>
</tr>
<tr>
<td>P-E-0319-2</td>
<td>EIS Process</td>
<td>3.6</td>
<td>The only new activity proposed for Hawaii as part of the GMD program is the PSB for the SBX at Pearl Harbor and mooring of the SBX off of Barbers Point. The target missile launches described in the draft EIS from PMRF on the island of Kauai are current on-going activities that have been analyzed in previous environmental documentation. For the GMD program, no additional target missile launches would be conducted from PMRF beyond those already planned. For this reason, the scoping process and hearings were not held on Kauai but in Honolulu, which is closest to the location of the new proposed activities.</td>
<td></td>
</tr>
<tr>
<td>P-E-0319-3</td>
<td>EIS Process</td>
<td></td>
<td>The Draft EIS has been sent to the Hanapepe Public Library, Kapaa Public Library, Koloa Public and School Library, Lihue Public Library, Princeville Public Library, and Waimea Public Library. The GMD ETR program would not include additional launches from PMRF; all proposed Strategic Target System launches would be included under ongoing activities.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 8.1.2-2: Responses to Email Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tbody>
<tr>
<td>Cha Smith - KAHEA: The Hawaiian-Environmental Alliance</td>
<td>P-E-0319-4</td>
<td>EIS Process</td>
<td>3.6</td>
<td>The only new activity proposed for Hawaii as part of the GMD program is the PSB for the SBX at Pearl Harbor and mooring of the SBX off of Barbers Point. The target missile launches described in the draft EIS from PMRF on the island of Kauai are current on-going activities that have been analyzed in previous environmental documentation. For the GMD program, no additional target missile launches would be conducted from PMRF beyond those already planned. For this reason, the scoping process and hearings were not held on Kauai but in Honolulu, which is closest to the location of the new proposed activities.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-5</td>
<td>Environmental Justic</td>
<td>3.12</td>
<td>An Environmental Justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. No adverse long-term impacts have been identified at any of the locations analyzed in this EIS. As such, there would be no disproportionately high and adverse human health or environmental effects on the minority or low-income populations that may be present in the vicinity of those locations. Thus, no Environmental Justice impacts are anticipated. Native Hawaiian sovereignty is a political issue that would be best addressed outside an environmental document.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-6</td>
<td>EIS Process</td>
<td>4.4</td>
<td>This is beyond the scope of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-7</td>
<td>Land Use</td>
<td>4.4</td>
<td>Political issues addressing the Hawaiian Kingdom fall outside the scope of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-8</td>
<td>Program</td>
<td></td>
<td>Comment noted.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-9</td>
<td>Environmental Justic</td>
<td>3.4</td>
<td>All missile launches and related activities at PMRF are a part of the No Action Alternative. Potential impacts to cultural resources have been analyzed in previous environmental documents. The addition of a TPS-X radar at sites analyzed for similar radars in previous environmental documents would have no effect on cultural resources. Consultation concerning cultural resources has been conducted for those previous environmental documents. SBX activities at Pearl Harbor would not impact native Hawaiian cultural resources. Operation of the SBX at the Barbers Point mooring area would be short-term and temporary and would occupy a very small area relative to any potential traditional use areas.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-10</td>
<td>Biological Resources</td>
<td>4.4.2</td>
<td>Habitat for the Hawaiian monk seal is discussed on pages 3-45 (Midway) and 3-73 (PMRF).</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-11</td>
<td>Biological Resources</td>
<td>4.4.2</td>
<td>The potential for impacts to sea turtles on land is discussed in section 4.4.2 and to free swimming sea turtles in section 4.11.2.3, Pacific Ocean.</td>
</tr>
<tr>
<td></td>
<td>P-E-0319-12</td>
<td>Biological Resources</td>
<td>4.4.2</td>
<td>The potential for impacts to seabirds is discussed in sections 4.4.2 and 4.11.2.3, Pacific Ocean.</td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
</tr>
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<tr>
<td>Cha Smith - KAHEA: The Hawaiian-Environmental</td>
<td>P-E-0319-13</td>
<td>Biological Resources</td>
<td>4.4.2</td>
<td>The potential for impacts to biological resources is discussed in sections 4.4.2 and 4.11.2.3, Pacific Ocean.</td>
</tr>
<tr>
<td>Alliance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-E-0319-14</td>
<td>Safety and Health</td>
<td>4.4.4</td>
<td>4.4.4, 4.1.7, 4.5.5, and 4.3.5. Each missile flight test event would be modeled. The models incorporate a number of variables such as the missile mass, velocity, trajectory, altitude, reliability and descriptions of the environments that may affect the missile in flight, such as surface and high altitude winds. The Range Safety Office would communicate the extent of the clearance area, time, and date of the flight test, once they are defined, to the FAA, the U.S. Coast Guard, appropriate emergency management agencies, and local police jurisdictions for assistance in the clearance of designated land and sea-surface areas. Other areas under the flight path but not in a predicted impact or debris area would be monitored before the test event to determine the location of population or traffic. Tests do not proceed unless the Range Safety Office determines that the general population, including ship traffic, would be in a safe position.</td>
<td></td>
</tr>
<tr>
<td>P-E-0319-15</td>
<td>EIS Process</td>
<td></td>
<td></td>
<td>This is beyond the scope of the EIS.</td>
</tr>
<tr>
<td>P-E-0319-16</td>
<td>Program</td>
<td></td>
<td></td>
<td>The exact route planned for the SBX from the Gulf of Mexico to its PSB is not known at this time. Coordination with appropriate agencies will occur prior to operations in the Gulf of Mexico and the trip to the Pacific.</td>
</tr>
<tr>
<td>P-E-0319-17</td>
<td>Airspace Use</td>
<td>4.6.2</td>
<td></td>
<td>As stated in section 4.6.2, the SBX would not exceed the FAA 3000 V/m peak power threshold. The SBX could exceed the FAA 300 V/m average power threshold out to 12.1 kilometers (7.5 miles) (85% populated radar) or 19 kilometers (11.8 miles) (100% populated radar). The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern here is not interference but is a reduction in life of the aircraft avionics. The SBX would be constrained so that the existing ground-, air-, and sea-based electronics are not impacted. As stated in the EIS, while in port, or at a nearby mooring location, the 20 minutes of daily calibration and tracking would be coordinated in both time and space so as to reduce any potential EMR interference to a negligible level. Based on the spectrum certification and frequency allocation process, the high energy radiation operating area for the SBX would be modified to fit existing airport and airspace requirements. The FAA would provide notice regarding the SBX operating area to local airports and aircraft through a NOTAM.</td>
</tr>
<tr>
<td>P-E-0319-18</td>
<td>Program</td>
<td></td>
<td></td>
<td>This is beyond the scope of the EIS.</td>
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</table>
## Table 8.1.2-2: Responses to Email Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cha Smith - KAHEA: The Hawaiian-Environmental Alliance</td>
<td>P-E-0319-19</td>
<td>Safety and Health</td>
<td>4.11.1.3</td>
<td>Section 4.11.1.3 discusses the potential impact from intercept debris.</td>
</tr>
<tr>
<td>Katherine Lynch</td>
<td>P-E-0320-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Patricia Neel</td>
<td>P-E-0321-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Larry Fox</td>
<td>P-E-0322-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Mary Lee Griswold</td>
<td>P-E-0323-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Anne Hartley</td>
<td>P-E-0324-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Betty Taylor</td>
<td>P-E-0325-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Patricia Neel</td>
<td>P-E-0326-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Toni Marthaller-Andersen</td>
<td>P-E-0327-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Patricia Neel</td>
<td>P-E-0328-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Kimberli McCabe - Port Gardner Bay Recovery</td>
<td>P-E-0329-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Philip Notermann</td>
<td>P-E-0330-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Bill Mulliken</td>
<td>P-E-0331-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Norma Jean Young</td>
<td>P-E-0332-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Frederick Olson</td>
<td>P-E-0333-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Laurie Keith - Whidbey Island No Spray Coalition</td>
<td>P-E-0334-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Sally Goodwin</td>
<td>P-E-0335-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Robert Kenny</td>
<td>P-E-0336-1</td>
<td>P-E-0289</td>
<td>Multiple</td>
<td>See responses to comment number P-E-0289.</td>
</tr>
<tr>
<td>Fred Geisler</td>
<td>P-E-0337-1</td>
<td>Policy</td>
<td></td>
<td>See P-E-0026-1</td>
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### Table 8.1.2-2: Responses to Email Comments (Continued)

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elisa Miller</td>
<td>P-E-0338-1</td>
<td>EIS Process</td>
<td></td>
<td>No decision on where to place the SBX will be made until the NEPA process is complete.</td>
</tr>
<tr>
<td>Dale and Laura Temple</td>
<td>P-E-0339-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>M. Ward Hinds - Snohoimish Health District</td>
<td>P-E-0340-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2</td>
<td>Sections 2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2 of the EIS indicate the SBX operating and mooring areas and general operational effects. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards. New information on the potential effects of electromagnetic radiation on human health from the proposed SBX has been added as appendix G of the EIS.</td>
</tr>
<tr>
<td>Erich Franz</td>
<td>P-E-0341-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Melinda Gladstone</td>
<td>P-E-0342-1</td>
<td>EIS Process</td>
<td></td>
<td>See P-E-0242-1</td>
</tr>
<tr>
<td>Suzette A. Fageol</td>
<td>P-E-0342-2</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Dan Wamock</td>
<td>P-E-0343-1</td>
<td>EIS Process</td>
<td></td>
<td>See P-E-0250-2</td>
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<tr>
<td>Eve Riley</td>
<td>P-E-0344-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
</tr>
<tr>
<td>Susan Berta - Orca Network</td>
<td>P-E-0345-1</td>
<td>Program</td>
<td></td>
<td>The scoping session was held in Seattle because, when the meeting was set up, several other installations in the Seattle area were still being considered. The Seattle location appeared in logical proximity to all locations, and we were ensured the scoping session was widely publicized in the Seattle area. Additional meetings were held 5 April in Everett, Washington concerns. The comment period was also extended.</td>
</tr>
<tr>
<td></td>
<td>P-E-0346-1</td>
<td>EIS Process</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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</tr>
<tr>
<td>Susan Berta - Orca Network</td>
<td>P-E-0346-2</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>As stated on page 4-242, the SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts to biological resources are anticipated. As stated on page 4-241, no significant long-term impacts to species such as the whales in the area are anticipated.</td>
</tr>
<tr>
<td>Constance Hallgarth</td>
<td>P-E-0347-1</td>
<td>Safety and Health</td>
<td>4.8.5.2 Appendix G</td>
<td>A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards. New information on the potential effects of EMR on human health has been added to what was section 4.8.5.2 and provided as appendix G of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-E-0347-2</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
</tr>
<tr>
<td></td>
<td>P-E-0347-3</td>
<td>Airspace Use</td>
<td>4.8.2</td>
<td>See P-E-0008-4</td>
</tr>
<tr>
<td></td>
<td>P-E-0347-4</td>
<td>Program</td>
<td>2.1.4.2</td>
<td>Based on five tests per year, the SBX would be at its PSB for 7 months per year. The GMD ETR testing activities would likely occur over a period of approximately 10 years following a decision to proceed. If Naval Station Everett is selected as its PSB, the SBX would likely be docked at one of the two existing piers.</td>
</tr>
<tr>
<td></td>
<td>P-E-0347-5</td>
<td>Program</td>
<td>2.0</td>
<td>See P-E-0020-11</td>
</tr>
<tr>
<td>Laura Hartman</td>
<td>P-E-0348-1</td>
<td>Safety and Health</td>
<td>4.8.5</td>
<td>See section 4.8.5. The FCC regulations are primarily based on the 1986 National Council on Radiation Protection Report, but also incorporate portions the 1991 IEEE standard. Refer to P-E-03-40-1 and P-W-0139-4 responses. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards, and therefore additional studies are not warranted or planned at this time. As with other standards, the current standard is followed until there is an official change.</td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
</tr>
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<tr>
<td>Laura Hartman</td>
<td>P-E-0348-2</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<td></td>
<td>P-E-0348-3</td>
<td>Policy</td>
<td>See P-E-0032-3</td>
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<td></td>
<td>P-E-0348-4</td>
<td>Policy</td>
<td>See P-E-0026-1</td>
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8.1.3 PUBLIC HEARING COMMENT DOCUMENTS—DRAFT EIS

Individuals who commented on the Draft EIS at one of the seven public hearings are listed in table 8.1.3-1 along with their respective commenter ID number. This number can be used to find the public hearing transcript document and each speaker’s comments and to locate the corresponding table on which responses to each comment are provided.

Public Hearing Comments

Exhibit 8.1.3-1 presents reproductions of the public hearing transcript comment documents that were received in response to the Draft EIS. Comment documents are identified by commenter ID number, and each statement or question that was categorized as addressing a separate environmental issue is designated with a sequential comment number.

Response to Public Hearing Comments

Table 8.1.3-2 presents the responses to substantive comments to the Draft EIS that were received in public hearing transcript form. Responses to specific comments can be found by locating the corresponding commenter ID number and sequential comment number identifiers.
<table>
<thead>
<tr>
<th>Commentor and Affiliation</th>
<th>ID Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Sykes</td>
<td>P-T-0001</td>
</tr>
<tr>
<td>Greg Garcia - Alaskans for Peace and Justice</td>
<td>P-T-0002</td>
</tr>
<tr>
<td>Steve Cleary - Citizens Opposed to Defense Experimentation Code</td>
<td>P-T-0003</td>
</tr>
<tr>
<td>Judy Mikels - Ventura County Supervisor</td>
<td>P-T-0004</td>
</tr>
<tr>
<td>Brian Miller - Congressman Elton Gallegly</td>
<td>P-T-0005</td>
</tr>
<tr>
<td>Charlotte Craven - City of Camarillo</td>
<td>P-T-0006</td>
</tr>
<tr>
<td>Robert Lagomarsino - Former Member of U.S. Congress</td>
<td>P-T-0007</td>
</tr>
<tr>
<td>Frank Schillo - Retired Ventura Co. Supervisor</td>
<td>P-T-0008</td>
</tr>
<tr>
<td>Anthony Volante - Councilmember from City of Port Hueneme</td>
<td>P-T-0009</td>
</tr>
<tr>
<td>Kathy Long - Ventura County Supervisor</td>
<td>P-T-0010</td>
</tr>
<tr>
<td>Alex Herrera - City of San Buenaventura</td>
<td>P-T-0011</td>
</tr>
<tr>
<td>Devon Chaffee - Nuclear Age Peace Foundation</td>
<td>P-T-0012</td>
</tr>
<tr>
<td>Bob Conroy</td>
<td>P-T-0013</td>
</tr>
<tr>
<td>Wayne Davey - Rockwell Scientific Company</td>
<td>P-T-0014</td>
</tr>
<tr>
<td>David Faubion - Ventura Peace Coalition</td>
<td>P-T-0015</td>
</tr>
<tr>
<td>Gordon Birr - The Beacon Foundation</td>
<td>P-T-0016</td>
</tr>
<tr>
<td>Bill Conneen</td>
<td>P-T-0017</td>
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<tr>
<td>Jack Dodd</td>
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<td>Norman Eagle</td>
<td>P-T-0019</td>
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<td>Henry Norten</td>
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<td>Gloria Roman</td>
<td>P-T-0021</td>
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<tr>
<td>Don Hayes</td>
<td>P-T-0022</td>
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<tr>
<td>Carolyn Heitman</td>
<td>P-T-0023</td>
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<tr>
<td>Mike Sirofchuck</td>
<td>P-T-0024</td>
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<tr>
<td>Brad Stevens</td>
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<td>Daryl Williams - Tulalip Tribes</td>
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Missile Defense Agency
Public Hearing 2/5/03 – Anchorage, AK

Public Hearing – Ground-Based Midcourse Defense
Extended Test Range

draft environmental impact statement

Mr. Michaelson: Good evening, ladies and gentlemen and thank you for
coming tonight. I am Lewie Michaelson, and I've been asked by the Missile Defense
Agency to serve as the moderator for tonight's hearing. This is one of seven Public
Hearings being held on the Ground-Based Midcourse Defense Extended Test Range
Draft Environmental Impact Statement. During the courses of tonight's hearing, we will refer to the
Ground-Based Midcourse Defense and the Draft EIS as the Draft EIS.

The public hearing is being held in accordance with provisions of the National
Environmental Policy Act and implementing regulations. The act requires federal
agencies to consider the potential environmental impacts of their activities in the
decision-making process.

The purpose of tonight's hearing is to provide you with information on the GMD
programs and proposed GMD Extended Test Range activities. We will also summarize the
findings presented in the Draft EIS and solicit your comments on the Draft EIS.

Let's look at tonight's agenda. After I finish the introduction, Colonel Kevin
Norgard, now to my left who is the Director of the Site Assessment Command for
GMD in Alaska, will describe the proposed GMD flight test activities. Then Mr. David
Harley, the Chief of the U.S. Army Space and Missile Defense Command, National
Environmental Policy Act Compliance Branch, will describe the process called for the
National Environmental Policy Act. He will also present the environmental analysis and
results of the Draft EIS.

The last item on the agenda, however, the public comment portion, is really the
most important. Remember the Draft EIS is just a draft. This is your opportunity to
tell the GMD Project Office how you can improve the analysis of potential environmental
impact before the document is finalized and before a decision is made on whether or not
to proceed with the proposed action.

Now a few administrative points on making comments tonight. If you have
already signed up to speak and I have several already that's great. If not and you'd like to
speak tonight, please go to the registration table and fill out one of the cards. Everyone is
welcome to speak, but it makes the process run more smoothly if I can call on people
from a list. We also have a reserved area up here to my left and that we will be asking
people to come up and sit in as I call the list of speakers after the presentations

Each speaker will be allowed a minimum of four minutes and may speak only
once. You may not combine or yield speaking times to other people. Elected officials will

be given the courtesy of speaking first. All other speakers will be called up in the order in
which they signed up. There is a court reporter here today, seated to my left over at that
table making a verbatim transcript of the hearing so that all of your oral comments will
be recorded accurately. As part of preparing that transcript, an audio and video recording
is being made of tonight's hearing as well. The other cameras you see are for the media.

If you are uncomfortable with public speaking, you may also provide verbal
comments by telephone. There is a toll-free telephone number indicated on the handout
that you may use for recording these comments. This is the handout that you
should have received when you came in and it has a lot of important contact information
for you.

You may also submit written comments. There are four ways to do that. You may
hand in written comments that you brought with you tonight, either to me or a person at
the registration table. Second, you may use the written comment sheets that are available
at the registration table to write down any comments and turn them in tonight. Third, you
may mail written comments to the name and address that appear on the comment sheet or
again on the handout. Or last of all, you may e-mail comments to the address listed on the
draft.

Your written comments will be entered into the formal record of public comments
on the Draft EIS, and they will be given the same consideration as oral comments offered
here tonight.

If you choose to mail in comments, please be sure that to postmark them by
March 24, 2003 to be considered in the Final EIS.

Also, if you would like to receive a copy of the Final EIS when it becomes
available there are several ways you can do that. If you have already received a Draft EIS
in the mail, you are already on the mailing list and will automatically receive the Final
EIS, unless you indicate otherwise. If you provide either oral or written comments, along
with your address you will be sent a copy of the Final EIS. If you are not on the mailing
list, you may fill out a card such as this and that will place you on the mailing list and
then you can choose what type of documentation you would like to receive. You can also
request a copy of the Final EIS through the e-mail address and copies of the Final EIS
will be placed local libraries. This will be in the Anchorage Municipal Library on
Denali Street.

Finally, it's important for you to understand the Government representatives are
not here tonight to make any decision. Their main purpose in being here is to listen
firsthand to your suggestions and concerns. With that we will begin with Colonel
Norgard's presentation.

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents
COLONEL NORGAARD: Good evening, I am Colonel Kevin Norgaard. I live here in Anchorage, I am the Director for Site Activation Command for GMD. The Mission Defense Agency, formerly known as the Ballistic Missile Defense Organization, is the Department of Defense agency responsible for developing and testing a Ballistic Missile Defense System. In the following chart, I will briefly describe the GMD Extended Test Range, provide an overview of the GMD and how it works, and address the details of the test to be made. Before I do, I would like to describe the overall concept of the Ballistic Missile Defense System under development and explain the different segments of the System.

This chart represents the flight of a ballistic missile. A ballistic missile flight path has three basic parts, which we call segments. Those segments are the boost segment (when the missile is launching and leaving the atmosphere), the midcourse segment (the middle, or ballistic phase, and the terminal segment (where the missile re-enters the earth's atmosphere). Within each of these segments, our missile program has to this point been characterized by independent programs (which we call elements). Each element worked to shoot down ballistic missiles in its particular segment of flight.

Now, however, the Missile Defense Agency is now moving towards an integrated Ballistic Missile Defense System. Instead of having discrete, stand-alone elements, we plan to eventually tie the programs for the various elements together so we can shoot down missiles in all segments of flight.

Each segment of Ballistic Missile Defense System could include several elements, which are different ways of providing a defense against the threat missile during the same phase of flight. All segments and elements are designed to work together as each element is developed. At the same time, each element could provide an effective stand-alone defense against a specific type of threat.

The GMD Element is part of the Midcourse Defense Segment of the Ballistic Missile Defense System. The GMD element is the successor to the National Missile Defense and includes the same components.

The conceptual GMD element would consist of the components shown on the slide. These components are the Ground-Based Interceptor; existing early warning radar and satellite, the X-Hund Radar, which performs tracking, discrimination, and assessment of the incoming missile, the Defense Support Program or Space-based Infrared System; the Ballistic Management Command Control, which is the central communication and control point; and finally, the In-Flight Interceptor Communications System Data Terminal, which transmits commands to the Ground-Based Interceptor while the interceptor is in flight.

The GMD Extended Test Range may not include all of these elements.

The GMD Joint Program Office is proposing to conduct more operationally realistic testing of the GMD element of the Ballistic Missile Defense System. This slide indicates the proposed locations for the various components in the Extended Test Range. As you can see, the extended test range could include components in the Lower 48 through the Pacific and into Alaska, Kodiak and near the end of the Aleutian Islands, unmanned.

The GMD testing would be of two types. One type of testing would involve increasingly robust Ground-Based Interceptor flight-testing in the Pacific region in scenarios that are operationally realistic as possible. The other would type involve validation of the operational concept through integrated ground test using GMD components. These are tests using Fort Greely and other locations analyzed in the GMD Validation of Operational Concept Environmental Assessment. These ground tests do not involve missile flights or intercepts.

The Draft EIS, which is the subject of this hearing, evaluates the first type of GMD testing, involving interceptor flight-testing. This interceptor flight-testing will be the focus of our discussion tonight.

As you can see from this slide, the existing interceptor test capability includes the use of the Kodiak Launch Complex, Vandenberg Air Force Base, the Pacific Missile Range Facility, and the Reagan Test Site at Kwajalein Atoll in the Marshall Islands.

Current testing includes launching target missiles from Vandenberg Air Force Base, and launching Ground-Based Interceptors from the Reagan Test Site, with intercepts occurring over the broad ocean area. The ground-based radar prototype at the Reagan Test Site is used to track, discriminate, and provide updates to the interceptor during flight, while a radar on Oahu is used as a tracking sensor. For some tests, target missiles are also launched from the Kodiak Launch Complex and viewed by the Early Warning Radar at Beale Air Force Base. Current capability does exist to launch target missiles from the Pacific Missile Range Facility as well. These scenarios present a very limited capability to demonstrate the effectiveness of the GMD element because the Ground-Based Interceptor can be launched only from the Reagan Test Site. This limits ability to test the system in operationally realistic environment.

The extension of the existing GMD test range would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, speeds of targets, and interceptors to closely resemble an operational scenario involving attack by one or more threat missiles. We are proposing to add dual target and Ground-Based Interceptor launch capability at the Kodiak Launch Complex and at Vandenberg Air Force Base. Also proposed are mobile target launch capability and ship-based radar. The proposed Extended Test Range would provide more operationally realistic flight-testing, as President Bush and Congress have directed.
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
ANCHORAGE, ALASKA

MISSILE DEFENSE AGENCY
PUBLIC HEARING 2/25/03 – ANCHORAGE, AK

Again, equal consideration will be given to all comments, whether they are presented here tonight, e-mailed to us or submitted by regular mail.

Once the Final EIS is complete, we will mail it to all of the individuals who requested a copy. If you are not on our mailing list you can request a copy by writing to the street address here, or the e-mail address given in the handout, or by filling out a card at the registration table tonight. That concludes the environmental portion of the meeting tonight and I’ll turn it back over now to Mr. Michaelson for continuation of the meeting.

MR. MICHAELSON: Thank you. We are ready to begin calling out the names of those you indicating that you would like to make comments tonight. We have a reserved area, right behind this gentleman seated in front of me for special speakers. What I would like you to do is I will read out the first several names and if you would like to come up and sit in those seats it will make the process run more efficiently. We will be using this podium right in front of me for public comments. I will be calling on you in the order you signed up and because we like to record your comments fully and accurately we ask that you speak clearly into the microphone, because of the acoustics it will be important that you speak clearly so that we can ensure the Court Reporter can capture everything you say. Also, at the beginning of your speaking time state your name for the Court Reporter.

We kindly request that you observe the four-minute limit for oral comments. We are using the four-minute in all the hearings in all of the states where they are being held to give everyone a fair and equal chance to make their comments. We greatly appreciate your understanding and cooperation in observing this limit.

To aid you in knowing when the four minutes are up, I have a simple method for indicating time. After three minutes, I will move my index finger indicating that you have one minute left. This should help you find a comfortable place to wrap up your comments. At the end of four minutes the Court Reporter will hold up my closed hand, indicating it is your time is finished. So it is important to look at are occasionally from your paper if that is what you are doing so you won’t miss the signal.

I have one other request, that is you please withhold any expressions whether for or against anything a speaker has to say. Speaking in public can be very intimidating, and this will ensure that everyone has an equal chance to offer their comments. This will also ensure that the Court Reporter is capturing all of your comments. Expressions until the speaker is finished. Thank you in advance.

If you choose not to make an oral comment you remember that you can also hand them in writing, mail them in or, e-mail them in so there is a variety of ways to do that and again written comments are given consideration as oral comments offered here tonight.

Again, remember there is no decision being made here tonight. The main purpose of the government representatives being here is to learn first hand of your concerns and

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
GROUNDBASE MIDCOURSE DEFENSE
EXTENDED TEST RANGE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

MS. ELLIOTT: Good evening, ladies and gentlemen. Thank you for coming tonight. I am Julia Elliott, and I am with the U.S. Army Space and Missile Defense Command. I have been asked by the Missile Defense Agency to serve as the moderator for tonight's hearing. This is one of seven public hearings being held on the Ground-Based Midcourse Defense Extended Test Range Draft Environmental Impact Statement. During tonight’s hearing, we will refer to the Ground-Based Midcourse Defense as GMD, and we will refer to the Draft Environmental Impact Statement as the Draft EIS.

This public hearing is being held in accordance with provisions of the National Environmental Policy Act and implementing regulations. The act requires federal agencies to consider the potential environmental impacts of their activities in the decision-making process.

The purpose of tonight's hearing is to provide you with information on the GMD program and proposed GMD Extended Test Range activities. We will also summarize the findings presented in the Draft EIS and solicit your comments on the Draft EIS.

Let's look at the agenda for tonight. After I finish the introduction, Commander Robert Sees of the Ground Based Midcourse Defense X-Band Radar Project Office will describe the proposed GMD flight test activities. Then Ms. Sharon Mitchell, Program Manager for the EIS, will describe the process called for in the National Environmental Policy Act. She will also present the environmental analysis and results of the Draft EIS.

The last item on the agenda, the public comment portion, is really the most important. Remember that the Draft EIS is just that — a draft. This is your opportunity to tell the GMD Project Office how it can improve its analysis of potential environmental impacts before the document is finalized and before a decision is made on whether or not to proceed with the proposed action.

Now a few administrative points on making comments tonight. If you have already signed up to speak, that's good. I have approximately five sign-up cards already. If you have not already filled out a card and would like to speak tonight, please go to the registration table and sign up. Everyone is
EVERETT, WASHINGTON

Welcome to speak, but it makes the process run more smoothly if I can call on people from a sign-up list. We will also have a reserved area up here of six seats that will be for upcoming speakers, so we can move through the process efficiently.

Each speaker will be allowed a maximum of four minutes and may speak only once. You may not combine or yield speaking times to other people. Elected officials will be given the courtesy of speaking first. All other speakers will be called in the order in which they signed up. There is a court reporter here today, seated to my left, making a verbatim transcript of the hearing so that all of your oral comments will be recorded accurately. As part of preparing that transcript, as audio and video recording is being made of tonight’s hearing as well.

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Your comments will be entered into the formal record of public comments on the Draft EIS, and they will be given the same consideration as oral comments offered here tonight.

If you choose to mail in comments, please note that they must be postmarked by March 24th, 2003 to be considered in the Final EIS.

Also, if you would like to receive a copy of the Final EIS when it becomes available, there are several ways you can do that. If you have already received a Draft EIS in the mail, you are already on the mailing list and will automatically receive the Final EIS, unless you tell us otherwise. If you provide either oral or written comments, you will be sent a copy of the Final EIS. If you are not on the mailing list, you may fill out a request at the registration table. You can also request a copy by sending an e-mail to the address

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
listed on the handout. Also, copies of the Final EIS will be placed in area libraries. A list of those libraries is available at the registration table and can also be found in the Draft EIS. The Final EIS will also be put on the Missile Defense Agency website listed on the handout.

Finally, it is important for you to understand that the Government representatives are not here tonight to make any decision. Their main purpose in being here is to listen firsthand to your suggestions and concerns. With that, we will begin with Commander Doe's presentation.

COMMANDER DOE: Good evening. My name is Commander Robert Doe, and I am a technical advisor for the GMT-IR Band Radar Project Office. The Missile Defense Agency, formally known as the Ballistic Missile Defense Organization, is in the Department of Defense agency responsible for developing and testing a Ballistic Missile Defense System. In the following charts, I will briefly describe the GMT-IR Band Radar, provide an overview of the GMT and how it works, and address the decisions to be made. But before I do, I would like to describe the overall concept for the Ballistic Missile Defense System under development and explain the different segments of the system.

This chart represents the flight of a ballistic missile. A ballistic missile flight path has three basic parts, which we call segments. Those segments are the boost segment, when the missile is thrusting and leaving the atmosphere; the midcourse segment, the middle or ballistic phase; and the terminal segment, where the missile re-enters the earth's atmosphere.

Within each of these segments, our missile program has to this point been characterized by discreet, independent programs, which we call elements. Each element worked to shoot down ballistic missiles in a particular segment of flight.

Now, however, the Missile Defense Agency is now moving towards an integrated Ballistic Missile Defense System. Instead of having discrete, stand-alone elements, we plan to eventually tie the programs for the various elements together so we can shoot down missiles in all segments of flight.

Each segment of the Ballistic Missile Defense System could include several elements, which are different ways of providing a defense against the threat missile during the same phase of its flight. All segments and elements are designed to work together as each element is developed. At the same time, each element could provide an effective
stand-alone defense against a specific type of threat.

The GMD element is part of the Midcourse Defense Segment of the Ballistic Defense System. The GMD element is the successor to National Missile Defense and includes the same components.

The conceptual GMD element would consist of the components shown on the slide. These components are the Ground-Based Interceptor; existing early-warning radars and satellites; the X-Band Radar, which performs tracking, discrimination, and assessment of the incoming missiles; the Defense Support Program or Space-Based Infrared System; the Battle Management Command and Control, which is the central communication and control point; and finally, the In-Flight Interceptor Communications System Data Terminal, which transmits commands to the Ground-Based Interceptor while the interceptor is in flight.

The GMD Joint Program Office is proposing to conduct more operationally realistic testing of the GMD element of the Ballistic Missile Defense System. This slide indicates the proposed locations for the various components in the Extended Test Range. Of particular importance locally — and it may be hard to see — is the Sea-Based Test XSS & IIT. This is

the part of the system that we are considering for homeporting in the Everett Naval Station.

The GMD testing would be of two types. One type of testing would involve increasingly robust Ground-Based Interceptor flight testing in the Pacific region in scenarios that are operationally realistic as possible. The other type would involve validation of the operational concept through integrated ground tests using GMD components. These are the tests using Fort Greely and other locations analyzed in the GMD Validation of Operational Concept Environmental Assessment. These ground tests do not involve missile flights or intercepts.

The Draft EIS, which is the subject of this hearing, evaluates the first type of GMD testing, involving interceptor flight-testing. This interceptor flight-testing will be the focus of our discussion tonight.

As you can see from this slide, the existing interceptor test capability includes the use of the Kodiak Launch Complex, Vandenberg Air Force Base, the Pacific Missile Range Facility, and the Reagan Test Site at Kwajalein Atoll in the Marshall Islands. Current testing includes launching target missiles from Vandenberg Air Force Base and launching
Ground-Based Interceptors from the Reagan Test Site, with intercepts occurring over the broad ocean area. The ground-based radar prototype at the Reagan Test Site is used to track, discriminate, and provide updates to the interceptor during flight, while a radar on Oahu is used as a tracking sensor. For some tests, target missiles are also launched from the Kodiak Launch Complex and viewed by the Early Warning Radar at Beale Air Force Base. Current capability does not exist to launch target missiles from the Pacific Missile Range Facility as well. These scenarios present a very limited capability to demonstrate the effectiveness of the GMD element because the Ground-Based Interceptor cannot be launched only from the Reagan Test Site. This limits our ability to test the system in an operationally realistic environment.

The extension of the existing GMD test range would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, speeds of targets, and interceptors to closely resemble an operational scenario involving attack by one or more threat missiles. We are proposing to add dual target and Ground-Based Interceptor launch capability at the Kodiak Launch Complex and/or at Vandenberg Air Force Base. Also proposed are mobile target launch capability and shipborne radars. The proposed

Extended Test Range would provide more operationally realistic flight testing, as President Bush and Congress have directed.

A Sea-based Test X-Band Radar, or SBX, is proposed to support the Extended Test Range flight-testing. This SBX is a multi-function radar that performs tracking, discrimination, and intercept assessment of incoming target missiles. The SBX would be assembled at an existing shipyard on the United States Gulf Coast.

Three conceptual SBX performance regions have been identified to accomplish effective radar coverage for flight-testing. The SBX would operate within the confines of one of the three performance regions based on the needs of the particular flight test scenario. Potential primary support bases have been identified based in part on their proximity to these performance regions.

Approximately 10 to 12 days before GMD operational tests, the SBX would leave the Primary Support Base to travel to its performance region in the Pacific Ocean.

The SBX would be stationed at its primary support base between flight test missions. The SBX would have a deep
draft, which would restrict it from many harbors. The SEK may dock to a deep-draft pier if it is available between missions. If a pier is not available, the SEK would most likely be moored 3 to 10 miles offshore while at the primary support base. Potential locations for the primary support base analyzed in the Draft EIS were Port of Valdez and Adak, Alaska; Naval base Ventura County/San Nicholas Island, near Oxnard, California; Pearl Harbor, Honolulu, Hawaii; Naval Station Everett, Washington; and Reagan Test Site, Republic of the Marshall Islands. Daily activities provided by the support base might include logistics, re-supply, and maintenance and repair. Radar operations in the vicinity of the Primary Support Base may include tracking of satellites and calibration devices. Vessels from the Primary Support Base would re-supply the SEK. During transit between the primary support base and the test location, periodic radar operation for satellite and calibration device tracking, including joint satellite tracks with GMD sensors and other pre-mission activities may also occur.

Activities analyzed in the Draft EIS, which may meet some of the enhanced test objectives, include launching target and/or interceptor missiles from the Kodiak Launch Complex, adding interceptor missile launches from Vandenberg Air Force Base, and launching target missiles from mobile platforms over the broad ocean area. The target and interceptor missiles could be launched in sets of two under some testing scenarios from either the Kodiak Launch Complex, the Reagan Test Site, or Vandenberg Air Force Base.

In-Flight Interceptor Communications System Data Terminals would be constructed in close proximity to the proposed Ground-Based Interceptor Launch sites and associated intercept area. Existing launch sites and test resources would continue to be used in enhanced test scenarios. Launching Ground-Based Interceptors from the Kodiak Launch Complex may require up to two additional small mobile radars and telemetry stations in South Central or Southwest Alaska for telemetry and flight safety.

Existing shipborne sensors would be used for mid-course tracking of the target missile during Ground-Based Interceptor launches from both the Kodiak Launch Complex and Vandenberg Air Force Base. The Sea-Based Test X-Band Radar would be constructed and used in tests to perform tracking, discrimination, and assessment of target missiles.

The Draft EIS analyzed three alternatives for the GMD extended test range testing. For Alternative 1, we would propose the following components: First, single and dual
Ground-Based Interceptor launches from the Kodiak Launch Complex and the Reagan Test Site; second, single and dual target launches from the Kodiak Launch Complex, Vandenberg Air Force Base, and the Reagan Test Site; and third, single target launches from the Pacific Missile Range Facility and a mobile target launch platform. Construction of two Ground-Based Interceptor sites, an additional target launch pad, and associated support facilities would be needed at the Kodiak Launch Complex. We would also construct an In-Flight Interceptor Communications System Data Terminal at the Kodiak Launch Complex and at a location in the mid-Pacific. The SBX would be used in tests for tracking, discrimination, and assessment of target missiles.

Alternative 2 would be similar to Alternative 1, with the exception that Ground-Based Interceptor launches would be from Vandenberg Air Force Base instead of from the Kodiak Launch Complex. The Ground-Based Interceptor Launch would require construction of an In-Flight Interceptor Communications System Data Terminal and modification of existing support facilities at Vandenberg Air Force Base.

Alternative 3 would combine activities proposed for Alternatives 1 and 2 and would include Ground-Based Interceptor launches from both the Kodiak Launch Complex and Vandenberg Air Force Base, and construction of the required support facilities.

Under the No Action Alternative, the GMD Extended Test Range would not be established and interceptor and target launch scenarios would not be tested under more operationally realistic conditions. The SBX would not be developed. Testing at the existing GMD test ranges using existing launch ranges would continue.

The decision to be made is whether to enhance the current GMD flight test capability by selecting from the list of alternatives presented, including the no action alternative.

The Missile Defense Agency is still evaluating the feasibility, safety, and utility to the GMD testing program of conducting a limited number of checkout Ground-Based Interceptor flight tests from Fort Greely. The possibility of such flights is too speculative to be analyzed at this time. The Missile Defense Agency will perform an EIS if and when it proposes to conduct Ground-Based Interceptor flight tests from Fort Greely.

This concludes the Program Overview. Now I would like to introduce Ms. Sharon Mitchell, who will describe the
MS. MITCHELL: Hello. My name is Sharon Mitchell. I'm with the U.S. Army Space and Missile Defense Command. I am the Program Manager for the preparation of the EIS on behalf of the Missile Defense Agency.

The National Environmental Policy Act requires that federal agencies consider environmental consequences of their proposed actions in their decision-making process. The Missile Defense Agency has decided to prepare an EIS under the National Environmental Policy Act to analyze the environmental effects of extending the current GMD Test Range.

As you may be aware, the first phase in the preparation of an EIS is to conduct what is called scoping, to identify environmental and safety issues that should be addressed in the Draft EIS. Public scoping meetings were held in Kodiak, Anchorage, Adak and Valdez, Alaska; Fairbanks; and Juneau, Alaska; and Honolulu, Hawaii; and Seattle, Washington. Other informal scoping sessions with federal and state agencies were held to obtain their views concerning the proposed action, its alternatives, and potential environmental effects within their areas of expertise or which are of particular concern to them. Following scoping, the next step was to further refine the possible alternatives being considered for GMD Extended Range testing. The Final EIS was then prepared to address reasonable alternatives, including the no-action alternative, reasonably foreseeable future actions, and information on cumulative effects. The Final EIS has been made available to federal and state agencies and to the general public for review and comment for a period of 45 days. During this comment period, public hearings are being held to receive public input. That brings us to tonight's hearing.

All comments received will be reviewed and considered in preparing the Final EIS. The Final EIS will then be made available to the public for a period of 30 days. So sooner than 30 days after the release of the Final EIS, the Missile Defense Agency will make public its decision on whether to proceed with the GMD Extended Test Range activities.

The Missile Defense Agency identified 15 environmental resource areas that normally require some level of analysis in an EIS. The Draft EIS has focused on those areas with the most potential for environmental impacts. Each resource area was addressed at each location unless it was determined through initial analysis that the proposed activities would...
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

not result in an environmental impact to that resource.

The Draft EIS analyzed the environmental issues associated with implementing the Proposed Action or its alternatives. In addition, the Draft EIS analyzed the environmental issues associated with licenses or permits required to implement the proposed action at each of the potential extended test range sites.

The Draft EIS has incorporated by reference several existing environmental analyses associated with current Ballistic Missile Defense System test assets that include the Kodiak Launch Complex, the Reagan Test Site, the Pacific Missile Range Facility, and Vandenberg Air Force Base. Also incorporated by reference is the analysis of environmental impacts contained in the OMD Validation of Operational Concept Environmental Assessment.

The Draft EIS also analyzed the potential for cumulative impacts from other Department of Defense, Government, and commercial activities in areas where OMD actions are proposed.

The potential environmental impacts identified in the Draft EIS are presented in the next several slides. For your convenience, this information has been reproduced as a fact sheet, which is available at the registration table for your review. I would like to highlight a few resource areas that may be important to you. As you can see, minimal impacts are identified from the implementation of the proposed action. Most of the impacts are minimal because the proposed actions are a continuation of existing activities at various locations.

At the Naval Station Everett, an Electromagnetic Radiation/Electromagnetic Interference survey and analysis would be conducted as part of the spectrum certification and frequency allocation process. The results of the survey would be used to define the safe operating area for the SBR. This area would not interfere with airspace operations and would allow for a safe operating environment.

The small quantities of potentially hazardous materials used during construction activities would result in generation of added wastes that would be handled by Naval Station Everett under their normal waste management procedures. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practical, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the
Sea-based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices, in design or routine operation. Handling and disposal of hazardous materials and hazardous wastes would be in accordance with State of Washington, Department of Transportation, and Department of Defense policies and procedures.

Implementation of SEZ operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units would preclude any potential safety hazard to either the public or workforce.

As you can see, the Draft EIS analyzed these resource areas for the other potential primary support bases at Naval Base Ventura County, California; Adak and Port of Valdez, Alaska; and Pearl Harbor, Hawai'i. Impacts at each of these sites are expected to be minimal.

The Kodiak Launch Complex, the Pacific Missile Range Facility, the Reagan Test Site, and Vandenberg Air Force Base all have ongoing missile operations. Impacts to air quality, hazardous materials, and health and safety would be minimal.

from continuation of existing launch activities.

Likewise, the impacts to biological resources would be similar to those from ongoing activities. We expect no adverse impacts to threatened and endangered species.

In particular at the Kodiak Launch Complex, socioeconomic impacts could be expected because of the potential for lodging shortages during the tourist season due to launch activities. To reduce the potential for a lodging shortage, the Missile Defense Agency is considering construction of an addition to the Narrow Cape Lodge and/or the construction of an additional marina.

In closing, please keep in mind that our goal is to provide decision-makers with accurate information on the environmental consequences of this proposal. To do this, we are soliciting comments on the proposed GMD Extended Test Range Testing. This feedback will support informed decision-making.

In addition to tonight's hearing, written comments on the Draft EIS will continue to be accepted until March 24, 2003, at the address shown on the slide. After the comment period is over, we will consider all comments, as we conduct the
analysis. Again, equal consideration will be given to all comments, whether they are presented here tonight, e-mailed, or submitted by regular mail to us.

Once the Final EIS is complete, we will mail it to all of the individuals who requested a copy. If you are not on our mailing list, you can request a copy by writing to the street address or e-mail address given in the handout, or by filling out a card at the registration table.

I will now turn the hearing back over to Ms. Elliott.

MS. ELLIOTT: We will now break for a 5-minute recess, and then we will begin taking your comments. If you would like to make verbal comments, please complete the verbal comment card provided at the registration table and turn it in to a person at the registration table.

Please remember that no decision is being made tonight. The main purpose for the government representatives' presence here tonight is to learn firsthand of your concerns and suggestions.

Thank you for your comments and your courtesy during the evening. 5-minute recess, please.

(5-minute recess.)

MS. ELLIOTT: We are ready to start calling out the names of those of you who indicated you would like to make comments tonight. As I mentioned earlier, elected officials will be given the courtesy of speaking first. We have a reserved area, which are the front seats up here to my right. I would appreciate it if those elected officials who plan on speaking would begin making their way up here and occupying those seats. I have a list of people signed up so far. I will be calling on you in the order in which you signed up. I will start out by calling the first several names so you can get ready to come up front here to use the mike that's in the center, almost in the center aisle. Because we want to record your comments fully and accurately, we ask that you speak clearly into the microphone. Because of the acoustics in this room, it will be especially important that you speak clearly in order to make certain that the court reporter can capture everything you say. Also, at the beginning of your speaking time, please state your name for the court reporter.

We kindly request that you observe the four-minute time limit for oral comments. We use the four-minute limit at these hearings to give everyone a fair and equal chance to make
To aid you in knowing when the four minutes are up, I have a simple method for indicating time. After three minutes, I will raise my index finger, indicating that you have one minute left. This should help you find a comfortable place to wrap up your comments. At the end of four minutes, I will raise my closed hand, indicating it is time to finish your comments. So it is important to look up from your paper occasionally to see if you are being given a signal.

I have one other request that will need to be enforced for the sake of the court reporter. That is, you must withhold any expressions either against or in favor of the speaker until the speaker is finished. Otherwise, there is no way that the court reporter can get all of the comments. So while you may be agreeing with the speaker by clapping or speaking out, you are probably making certain that we are not capturing the comments on the record. Please hold all of your expressions until the speaker is finished. Thank you in advance for your cooperation.

We also greatly appreciate your cooperation and understanding in observing the four-minute limit. Also keep in mind that oral comments are only one way to share your thoughts and concerns regarding the Draft EIS. You can also hand in written comments tonight, e-mail them, or submit them by regular mail by March 24th, 2003. As I mentioned, written comments are given the same consideration as oral comments offered here tonight.

With that in mind, we will begin. Our first speaker is John Mohr. He will be followed by Horst Potschke.

MR. MOHR: Good evening. My name is John Mohr. I'm the Executive Director at the Port of Everett. I would like to say that assuming that the no-action alternative is not chosen, the Port is generally supportive of the siting of the SBK platform in Everett. However, it is necessary for us to obtain a more complete understanding of the possible impacts associated with such a facility in Everett. Consequently, the Port recommends that the following items be further studied and evaluated in greater detail in the Project Environmental Impact Statement: One, possible impacts to ship navigation, berthing, and maneuvering at the Port's deep-water terminal area be considered; possible impacts to recreational, commercial -- recreational and commercial boat traffic in the Snohomish River Channel also be given considerations; certainly possible impacts associated with radar operations while the platform is in port including...
those related to public health and safety be given specific
consideration? and finally, possible heightened security
measures that might impede shipboard commerce as a
result of the siting of the SBX be considered. Satisfactory
answers to these questions would help the Port confirm its support of
the SBX platform in Everett. Thank you.

MS. ELLIOTT: Horst Petsold and then John Flowers.

MR. PETSOLD: My name is Horst Petsold. I speak with an
accent. I hope you understand me. I like to know where you
locate the platform in Everett. The next question is: Is
there any radiation involved in the testing which affects
the public? The next question is: Is any noise involved in the
way of electronic noise? I experience right now some
electronic noise in my house. I live close to the radio
tower. Something is going on. Apparently the Navy is
testing something, but we don't know. It's a possibility
which I would like to bring up here. Is there any other
interference during the testing period? Will the platform
work independently, or is the platform connected to any
high-voltage or whatever power? For how long will this
platform sit over here in Everett? Forever? Or only a
period of time during the testing? [Inaudible]. I have a
lot of experience in weather science, and I would like to
know if there is any possibility under the area. Thank you
for listening.

MS. ELLIOTT: John Flowers followed by Bob Jackson.

MR. FLOWERS: John Flowers. I'm an attorney in Everett.
I've practiced law in Washington since 1994, and in
California I practiced there since 1966. I'm here tonight to
speak for my adult children and my 12 grandchildren, many of
whom are too young to understand what's happening, but would
be extremely upset with their grandfather if they knew he had
an opportunity to speak out against these things and didn't
take the opportunity. I want to present to the people who
make these decisions the dilemma they are facing. I'm going
to spend most of my time -- half of my time on each dilemma.
The first dilemma is that all the defects that were pointed
out in the Star Wars system in the early '80s that caused it
to be cancelled then -- the only information I have is what I
read in the newspapers and on the Internet, but I don't
believe that those defects have been corrected. Prices have
gone way up. We can ill-afford a system that costs billions
and billions of dollars in light of our huge budget defects,
which we are dumping on our children and grandchildren.
Every Haplin-Flag type device like this one in history has
been defeated with a small inexpensive countermeasure, which

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led to more weapons, more expensive weapons, to try to overcome something else. The walls of Jericho were defeated. The walls of Rome were defeated. The Maginot Line in Europe was defeated by a simple and run around it, and this Maginot Line will be defeated as well. The cancellation of the ABM Treaty triggered off -- it's going to trigger off a massive new arms race, which the arms race earlier we experienced up to '89 bankrupted the Soviet Union, caused its collapse just before it bankrupted our country. But we just pause for a moment and present to you -- and I hope this is annexed in your analysis over the coming months -- what if this system works perfectly? What are the consequences of that? We have a long history of developing weapon systems and sharing them with, quote, allies like Osama Bin Laden, Saddam Hussein, the Shah of Iran, Ferdinand Marcos. We give them or sell them these weapons on credit and they have the possession of them, and then they have a regime change and then we have to fight the very weapons that we built. Of course, if this one is built perfectly, we're going to spend a ton of money trying to overcome it. I understand that we are going to share it with China, Russia, and any number of countries around the world who could have a sudden and unexpected regime change. Ladies and gentlemen, this is going to trigger off another arms race. I'm deeply concerned mainly for my grandchildren. Not only the expense involved, the debt we're dumping off on them, but the extreme danger we're creating for them. We ought to be vaging peace and not war. Thank you very much.

Ms. ELLIOT: Rob Jackson and then Horrie Troutman.

Mr. JACKSON: My name is Rob Jackson. Twenty years ago, before there was a naval station in Everett, I used to drive out past the Foss tug company onto a pier near the spot at which the USS Lincoln and other navy ships now dock. On the end of that pier there was small public place where I could watch sailboats and people out fishing for the day. This was a peaceful place to relax and listen to the sounds of the gulls, sea lions, and the working waterfront. Later the Navy came, and that place is gone. Now a walking and bicycle trail is being planned near the waterfront to give back some of the shoreline access. People will be able to walk down part of that trail to the mouth of Pigeon Creek No. 1 where a small park will again offer this community that close-up, relaxed look out over the bay. On the bottom of page 3 of the proposed Environmental Impact Statement, the Draft statement, it is written that -- and I quote -- "Because this type of activity consistently occurs at Naval Station Everett, no impacts to visual resources are anticipated," and quote. To whoever wrote this part of the statement, it may not seem like adding the SRK facility would have a
significant impact since there are already many ships here, but that is wrong. Because of its size and extraordinary design, this floating platform would have a huge visual impact. Besides its actual presence, the SEK facility would be a powerful symbol. It is a $900 million component in a proposed anti-ballistic missile system that many of us believe should not be built. This is our community. This is where my wife, my neighbors, and I have chosen to live. Many of us are volunteering our time and labor to make this a more desirable community. We already have our fair share of military resources in Everett. I propose that you choose the no-action alternative. If you decide otherwise, I ask that you choose another location. Thank you.

MS. ELLIOTT: Morris Trautman followed by Mark Nagel.

MR. TRAUTMAN: My name is Morris Trautman. It's been a little bit hard for us to gain information on this subject through the website and trying to find specific sites. It's hard to address specific, so I would like to just maybe address some concerns tonight and submit some more in writing later on. One of them is just the very nature of the test itself and that is the end-of-nosedness of it. From what my understanding is it that this is a funded program for a test system that really has no end to it until it goes into --

until it tests out solid and is actually set out in the ocean. If looking at that from a standpoint of a local impact, for us that presence of that thing is forever. If there is no end to the test programs and stuff as they continue, we'll look at it forever. We have already in Everett, by entertaining the Navy and some of the other sites that we have down on the waterfront, have made our contribution to aesthetic deficiencies probably. I don't feel that we're under any obligation to entertain any more or take any more additions. I think we have already made our contribution there. One of the other concerns we have is some of the emissions and stuff or the potential emissions of electromagnetic radiation and electromagnetic interference. What are the safety nets that are in place with this system? What are the redundant safety nets that are in place for the system? What are the what-if's? What if it fails? What happens? What are the implications to the local population? We have a hospital within blocks that is probably very, very sensitive to these kinds of interferences. So I would like to see that addressed. Thank you.

MS. ELLIOTT: Mark Nagel followed by David Salmon.

MR. NAGEL: My name is Mark Nagel, resident of Everett, Washington. What I saw in here, I guess, I kind of concur
with everybody else that came up before me -- a lot of questions. I really don’t see the need for this necessarily. I think it’s a continuation of some massive delusions by Edward Teller. At any rate, the visual and aesthetic resources -- again, I have no idea how anybody could determine this would have no impact. Zero impact means an absence of something. There is obviously a presence of something here. So how was this measured? Was it just height? Did somebody say, well, we already have things that are a certain height, so this falls within that height restriction? This clearly is a maze. How much of the maze is above water and is exposed? Is that the measurement that we should be looking for? With regards to measurement, the fellow before me, is there going to be any sort of independent measurements? Can we really trust our government to give us accurate numbers on the emissions that may be radiating from this unit? I would demand that there would be independent testing for various aspects of this. I know that complex systems mean complex failures. Bigger systems mean bigger failures. Are we really prepared for a big failure? It will happen. I was a little bothered by the statement that there are seven public hearings being made. There’s not seven in Everett, people. There’s one. There’s one. So don’t take that number to mean anything other than just one hearing here. I have a couple technical questions that can probably go on the record. They would probably bore everybody here. I guess the operative location is out in the ocean. I’m still, I guess, not sure exactly the various operations of this unit, where, whether this will be towed out and then turned on or it will be operating while it’s in the bay. Also, likewise I used to sail out in the bay. I’m concerned about obstruction to our normal recreation. That’s what Everett is pushing itself for is a recreational community. What I want to know is what will be the peak and average power levels and on what frequencies? You say that it’s safe. Well, there is a over-the-horizon radar in Alaska that’s known to cook birds that fly through its beam. I don’t consider that to be environmentally friendly for our feathered friends. Technical, is this a phased array or is it a conventional rotating beam? And are there any encoding activities in the outgoing radar pulses? They use all sorts of energy sources to generate data streams. Will this system take advantage of the synthetic ionospheric reflectors that are generated by the Harp -- N-A-R-F -- array on the North Slope in Alaska? And that’s it.

MS. ELLIOTT: David Salzman followed by Dale Moses.

MR. SALZMAN: My name is Dave Salzman. My question is one of trust. I trusted tonight I would come here and receive
some information so I could understand the potential problem that this might create in my community. I've got nothing so far, folks, frankly. I'm sorry about that. You show me a picture. The first thing I see here is an example with no frame of reference to Everett or anything else for that matter. Is that as big as the harbor out there, is it as big as the aircraft carrier when it comes through, or is it like a tug boat? You can't tell from what you're showing us. It's absolutely useless information. I'm a mechanical engineer, retired. I built equipment of a class that would go on that facility for offshore oil rigs. I've installed it in ports. I've installed Navy hardware in ports. Your environmental record is terrible, okay, from personal observation. If it can happen, it will happen. It happened yesterday. It was all over everything. I'm not an expert on radar, but I am an expert on my mother-in-law's garage door opener. When the aircraft carrier came in, we had hearings like this, it's sure, and everything was explained like this, I'm sure but when they turned the radars on dooms at the naval base, my God. My mother-in-law's garage door came open four or five times in the middle of the night -- an 85-year-old lady with the garage door open in the middle of the night. It didn't impress me a whole lot. What really didn't impress me was the Navy's humming and having for the next six months and denying the fact that it was the aircraft carrier. A matter of trust. If we can't trust you folks to tell us what's happening, when it's happening, give us assistance in the technical solution of problems, then we don't want you here. Okay? Is that understood? We don't want you here unless you face up to the real problems and be upfront with us. I guess that's what I would like to say tonight. This could be a problem. It might not be a problem. We probably need this. I've got a next door neighbor who is on the Lincoln tonight flying drones over God knows where from the deck of that aircraft carrier. He isn't here with his family. I've got some sympathy there, but you people when you're working in a community like this and bring this kind of facility in, let's at least be upfront after the fact when you're operational so we can solve problems as they come up. Okay? Thank you.

MR. ELLIOTT: Dale News and then Richard Windt.

MR. NEWS: My name is Dale News. I have been a citizen here in the county for about nine years. I currently work for the County. I don't intend to speak for the County. I would like to state a case that I'm in favor of the SED project coming here. The previous speaker said we don't want you. I don't include myself in that "we." I suspect there are a few other people that would not want to be included in
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that "we" either. I don't speak for anyone else. I'm only speaking for myself. I may bring a slightly different perspective than some of the folks in the room. I was a navy officer for 35 years. I was in a project office, the cruise missile project office. I went through a couple sitting exercises, so I would like to speak a bit from what the project may see in bringing the SRK to Everett. Specifically I think the whole area here in Puget Sound, particularly Everett, could be superb for the project. You've got a workforce that's the best of any location that I have ever been stationed. You've got a quality of life here in the area and several people have spoken to that already, but that also attracts a very high caliber of engineer and of technician, and I think that would be important for the project from your standpoint as well. I think you will also find a high level of support from the community if you were to be here and working from here. Yes, there are perhaps some interesting histories of garage door openers. I happen to be involved in that area, and I might point out that it doesn't happen anymore. We solved the problem. It took the leadership of the community and some technical expertise in all to get to it. There will be problems with this, I'm sure, but I think from what I've seen in the community that the leadership and the elected officials and so forth will work to solve those problems. I may not be totally -- get

everybody in this room to agree with me, but I think it's a very strong pro-military community and a pro-government and a pro-defense community as well, and I found that nine years ago when I first arrived. It's one of the reasons why my family and I have stayed. Lastly, I can't speak for the naval station anymore, but I think you will find it a host organization that can give you some pretty darned good service. I may have a little bit of bias in that because I had something to do with it for a couple years. So in conclusion, I hope that you will continue the project. I can't speak for its technical abilities, but I think it's the kind of thing the country needs to be investigating unfortunately, but nevertheless needs to do it. I would like to see Everett have a piece of it. Thank you very much. I might also point out I enjoy watching ships, and this is just another ship to watch. It's fun to watch sailboats. It's fun to watch eagles. It's also fun to watch ships. Thanks.

MS. ELLIOTT: Richard Windt followed by Osil Ghosh/Loevell.

MR. VINOT: Good evening. My name is Richard Windt. I'm on the Everett Board of Parks Commissioners. I was a lieutenant in the navy. My brother is in the army, lieutenant colonel retired. He lives in Huntingville. He has repeatedly been based in Kauai, Vandenburg, and Redstone

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Arsenal. I'm familiar with the need for some of these things, and yet I cannot think of a worse place than Everett to put this. It's a large metropolitan area, and you don't place things like this in a large metropolitan area. You place them in Valdez. Almost all the other points that you plan on locating this are better. Jetty Island is a beautiful beach. It's just like an ocean beach. You get out there, and you're completely away from everything.

Beautiful. We send boats across there all summer long so our citizens can go over there and enjoy it. What they will be looking at is a 250-foot-high dome sitting right out there. Everett has the largest marina north of Marina del Rey in California. It's a pleasure-boat capital. There were sailboat races out there Sunday. I have been stopped in my boat going by the naval base. What is the area of restricted flow around this when it's out there? Is it really going to interfere with pleasure boating in the city? I just think it's poor planning to put this in Everett. I hope you do not consider Everett the base for this. Thank you.

Ms. Elliott: Gail Chimi/Lowell.

Ms. Chimi/Lowell: First of all, I want to thank everybody for coming here tonight because I'm an average citizen living in an above-average city, and I think that our voices of the average citizen needs to be heard. I'm a 57-year resident of Snohomish County, and I have been actively involved in my community and the City of Everett for a number of years. I just learned about this Monday, so my questions aren't really fine-tuned. But the question of livability and what that means to me does not mean that. We have taken our fair share. The Navy is here. They've done a good job of integrating into the community, but when the EIS was done before they came, the people that were hired to do the EIS as far as the bay and everything, environmental impacts, they quit in protest because what their studies showed and what they found to be true was not the final report. So that does go to trustworthiness and accountability. Also, the fair share is the whole Puget Sound area. We've got Whidbey Island, Bremerton, Fort Lewis, Everett. We've done our fair share. View is very important. In microwave tower fights, view was an overriding consideration, and that's just one little poll sticking up. I see that as a real detriment. I wonder about the wake coming in and out. Tourism -- I don't really think people are going to come to say, 'Where is this new radar thing?' We have given up a lot of our waterfront, and we are just now trying to take it back and give more to the people of Everett that have put their lives on doing everything to make it a better city. Are there any appeals to this, and what's the process? I also want to talk about the no-entry.
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zene and how far that would be. Is it going to be different than what the ships are now? I ask you to take a no-action position and to choose -- if you do decide to go ahead with this, to take it out of Washington state. Thank you.

MS. ELLIOTT: That is all the cards that I have. Is there anyone here who did not submit a card and would like to speak?

MR. SELDEN: My name is Walter Selden, and I live in Everett. My first observation is if this is under full strength, this thing should be put far away from us. That would be testing. If you want to test it under full strength, you can't do that here. I guess how do you do it in half measure? How long is it going to be here? Would it be there and where would it be? Consistent questions. I agree with everyone with one exception. If I ran a business that was a -- and this was my business, would I want this in our bay under quarter-strength or a small-percentage strength, and what effect on us would that be? So if you're testing it, can you not test it under full strength where it needs to be tested full strength? It seems to undermine the whole theory of it being used here is to be here at all. The other thought is, without being completely flippanant, it seems when I saw that picture I thought of the moon. My last word

MS. ELLIOTT: Thank you.

MR. WILLIAMS: My name is Daryl Williams. I live in Marysville, Washington. I work for the Tulalip Tribes in their Governmental Affairs Office. I'm not going to go into any detailed comments right now because just we found out about this two days ago and haven't had anything to review yet. First of all, I would like to say that we think the Navy has been a good neighbor for us here in Everett. When the base was being developed, we were involved in negotiations for that base because of impacts to our commercial fishing operations. The tribes of this country negotiated treaties that basically allowed the United States to take title to the land, but the tribes gained certain rights as a part of that and our commercial fishing operations are one of those rights retained in our treaties. The tribes also realize that some sacrifices have to be made in order to provide the early-warning systems that this country needs for military actions. I think that the tribes and the military can work together to work out a solution that's agreeable to both of us if this area is selected. I would like to invite a meeting between the military and the
tribe to discuss the issues. With that, I thank you.

MS. ELLIOTT: Is there anyone else? Thank you for your
courtesy tonight; thank you for your interest; and thank you
for your participation. Good night.
HONOLULU, HAWAII

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***ROUGH DRAFT ONLY***

HEARING MODERATOR (Mr. Michelson): Good evening, ladies and gentlemen. Thank you for coming tonight. I am Lewis Michelson, and I have been asked by the Missile Defense Agency to serve as the moderator for tonight’s hearing. This is one of several public hearings being held on the Ground-Based Midcourse Defense Extended Test Range Draft Environmental Impact Statement. During tonight’s hearing, we will refer to the Ground-Based Midcourse Defense as GMD, and we will refer to the Draft Environmental Impact Statement as the Draft EIS.

This public hearing is being held in accordance with provisions of the National Environmental Policy Act, and its implementing regulations. This act requires federal agencies to consider the potential environmental impacts of their activities in the decision-making process. The purpose of tonight’s hearing is to provide you with information on the GMD program and present GMD Extended Test Range activities. We will also summarize the findings presented in the Draft EIS and solicit your comments on the Draft EIS.

Let’s look at the agenda for tonight. After I finish the introduction, Commander Robert Dee of the Ground-Based Midcourse Defense X-Head Radar Project Office will describe the proposed GMD flight test activities.

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1. Then Mr. David Harley, the Chief of the U.S. Army Space and Missile Defense Command, National Environmental Policy Act Compliance Branch, will describe the process called for in the National Environmental Policy Act. He will also present the environmental analysis and results of the Draft EIS.

2. The last item on the agenda, though the public comment portion, is really the most important. Remember that this is a Draft EIS, and it is just that — a draft. This is your opportunity to tell the GMD Project Office how it can improve its analysis of potential environmental impacts before the document is finalized and before a decision is made on whether or not to proceed with the proposed action.

Now a few administrative points on making comments tonight. If you’ve already signed up to speak -- and we have several already -- that’s great. If you have not, please go to the registration table and fill out an card. Anyone who would like to speak tonight, we’d appreciate it, as long as we can do it from a sign-up list. Everyone is welcome. We also have a reserved area up here that I’ll ask people to come sit in when we get ready to take speakers after the presentations.

Each speaker will be allowed a four minutes, and they speak only once. You may not dominate or yield speaking times to other people. All other speakers will be

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called in the order in which they signed up.

There's a court reporter here today, seated to my
left, making a verbatim transcript of the hearing so that
all of your all comments will be recorded accurately. As a
part of preparing that transcript, an audio recording is
being made of tonight's hearing as well. You may have also
noticed the television cameras here. Those are not part of
the military's effort here. That's cable television who's
here tonight doing that.

If you're uncomfortable with public speaking, you
may also provide verbal comments by telephone. There's a
toll-free number indicated on the handout that you may use
for recording those comments. Hopefully everyone gets one
of those when they came in. It has a lot of important
information on the process and how to continue to be
involved and make comments.

You may also submit your comments in writing, and
there are four ways to do that. First, you may hand in
written comments you brought with you tonight either to me
or to the person at the registration table. Second, you
may use the written comment sheet, again available at the
registration table, and hand that in. Third, you may mail
written comments to the same address that appear on the
comment sheet. And, finally, you may e-mail comments to
the address listed on the handout.
And with that, we will begin with Commander Des' presentation.

MR. AILA: Can I ask you a question, sir? I have a question regarding your presentation.

HEARING MODERATOR (Mr. Michaelson): I'm sorry.

As far as the ground rules for the meeting tonight?

MR. AILA: Over.

HEARING MODERATOR (Mr. Michaelson): Yes. What is your question?

MR. AILA: Well, two questions. First, is this -- my understanding is this is a scoping?

HEARING MODERATOR (Mr. Michaelson): No, that is incorrect. Scoping was already held on this at the time of the notice of intent. This is a public hearing on the Draft EIS. That's at a later stage of a National Environmental Policy Act process.

MR. AILA: So we're past -- we're past scoping?

HEARING MODERATOR (Mr. Michaelson): Correct.

Was there a second question?

MR. AILA: Was a meeting held on Cahet?

HEARING MODERATOR (Mr. Michaelson): For scoping?

MR. AILA: Yes.

HEARING MODERATOR (Mr. Michaelson): David?

MR. HAULEY: Yes.

HEARING MODERATOR (Mr. Michaelson): Yes.
answered before we start.

HEARING MEDIATOR (Mr. Michaelson): Okay, can
you come up and see this microphone and ask your question,
because I want to make sure there's anything procedural,
we get it straight to begin with, and the court reporter
don't hear you speaking from there.

MR. ALA: And I can only speak to the part of
the proposal that has to do with Hawaii. I can't speak for
the other area.

HEARING MEDIATOR (Mr. Michaelson): Could you
identify your name too.

MR. ALA: For the record, my name is William
Johnson. I'm a lawyer. I come from Mahiku, West Maui.

HEARING MEDIATOR (Mr. Michaelson): Thank you.

MR. ALA: -- which is on the western side.

HEARING MEDIATOR (Mr. Michaelson): All right.

What's your second question?

MR. ALA: Second question. First of all,
(inaudible). I come from a rural society, an oral
society. So four minutes is not enough for me to, I think,present my thoughts to you, which is what your purpose is
here tonight. Okay? So can we have some flexibility? I
mean, there aren't that many folks in here tonight: that
maybe the four minutes could be extended or maybe I can
speak for four minutes, and if anybody's -- everybody's

done and there's time, we can come back.

HEARING MEDIATOR (Mr. Michaelson): We have, you
know -- actually, I haven't gotten to the part where I
explain about the four minutes and why we do it, but I will
go ahead and explain it now.

Basically, this is the seventh of seven hearings.
And we've used that four-minute limit at all of them --
California, Alaska, and at Washington and here. And in
order to provide consistency of opportunity for everyone,
we don't allow more time here, less time there. Then we
got this uneven set. So four minutes will be the limit
for -- for all comments.

MR. ALA: I disagree because, you know, I'm not
in Alaska. It's not in the Marshallese. I'm not in
California. I'm in Hawaii where my ancestors were from,
and we're an oral society.

HEARING MEDIATOR (Mr. Michaelson): Okay.

MR. ALA: And I don't think four minutes is
enough. So if you want to say that for the record and you
want to make your decision, that's fine.

HEARING MEDIATOR (Mr. Michaelson): Okay.

MR. ALA: But four minutes isn't enough.

HEARING MEDIATOR (Mr. Michaelson): All right.

Thank you.

COMMANDER NEGIS: But we can take additional
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Each segment of the missile defense system would include several elements which are different ways of shooting down the threat missile during that phase of flight. All the elements are designed to work together as each element is developed. At the same time, each element can provide an effective stand-alone defense for a specific type of threat.

The GMD element is part of the Midcourse Defense Segment of the missile defense system. The GMD or Ground-based Midcourse Defense element is a successor to the National Missile Defense and includes the same components.

The conceptual GMD element would consist of the components shown on the slide. These components are the Ground-based Interceptor, existing early warning radars and satellites, the X-band Radars, which perform tracking, discrimination, and assessment of the incoming missile; the Defense Support Program or Space-based Infrared System; the Battle Management Command and Control, which is the central communications and control point; and, finally, the In-Flight Interceptor Communications System Data Terminal.

We normally abbreviate that as ID -- abbreviate that as IDT. That transmits commands to the Ground-based Interceptor while the interceptor's in flight.

The GMD Joint Program Office is proposing to conduct more operationally realistic testing of the GMD element of the Ballistic Missile Defense System. This slide indicates the proposed locations for the various components of the Extended Test Range.

Of particular interest here in Hawaii, out at PEARL, we've already been launching targets. That part would continue. We've also got the Sea-based X-band Radar, which includes an IDT to talk to the Interceptor onboard the platform. That would be a vessel that would take the X-band Radar and could relocate to test areas. In between the test, it would return to a port that would be its primary support base, Oahu's in consideration for the location of the primary support base.

The GMD testing is of two types. One type of the testing would involve increasingly robust Ground-Based Interceptor flight testing in the Pacific region in scenarios that are as operationally realistic as possible.

The other type is the validation of the operational concept through integrated ground tests of the GMD component. These tests include ICBM recovery and other locations analyzed in the GMD Validation of Operational Concept Environmental Assessment. The ground tests do not involve missile flights or intercepts.

The Draft EIS that's the subject of this hearing evaluates the first type of GMD testing which does include...
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
1. Air Force Base.
2. The In-Flight Interceptor Communication System
3. Data Terminals would be constructed in close proximity to
4. the proposed ground-based interceptor launch sites and
5. expected intercept areas. Existing launch sites and test
6. resources would continue to be used in the enhanced test
7. scenarios. Launching ground-based interceptors from the
8. Kodiak launch complex may require up to two additional
9. small mobile radars and telemetry stations in South Central
10. or Southwest Alaska for telemetry and flight safety.
11. Existing submarine radars would be used for
12. midcourse tracking of a target missile during ground-based
13. interceptor launches from both the Kodiak Launch Complex
14. and Vandenberg Air Force Base. The Sea-Based Test X-Band
15. Radar would be constructed and used in tests to perform
16. tracking, discrimination, and assessment of target
17. missiles.
18. The Draft EIS analyzed three alternatives for the
19. OAHU Extended Test Range testing. For Alternative 1, we
20. proposed the following components: First, single and dual
21. ground-based interceptor launches from the Kodiak Launch
22. Complex and the Kaisugan Test Site; second, single and dual
23. launches from the Kodiak -- target launches from the Kodiak
24. Launch Complex, Vandenberg Air Force Base, and the Kaisugan
25. Test Site; third, single target launches from the Pacific

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
The Draft EIS has been made available to the public, to federal and state agencies for review and comment for a period of 45 days. During this comment period, public hearings, like the one being held tonight, are being held to receive public input.

All comments received will be reviewed and considered in preparing the Final EIS. The Final EIS will then be made available to the public for a period of 30 days. And so, as soon as 30 days after release of the Draft EIS, the Missile Defense Agency will make public its decision on whether to proceed with the Ground-Extended Test Range activities.

Now, the Missile Defense Agency has identified 15 environmental resource areas that normally require some level of analysis in an EIS. The Draft EIS has focused on those areas with the most potential for environmental impacts, such as the draft EIS was tailored in such a way that the proposed activity would not result in environmental impact to that resource.

The Draft EIS analyzed the environmental issues associated with the proposed action for its alternatives. In addition, the Draft EIS also analyzed the environmental issues associated with the lease, the draft EIS was tailored in such a way that the proposed action would not result in environmental impact to that resource.
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

1. At Pearl Harbor, an Electromagnetic Radiation/Electromagnetic interference survey and analysis would be conducted for the radar as part of the spectrum certification and frequency allocation process. Results of the survey would be used to determine potential interference issues and define the safe operating area for the EIR. This area would be defined to minimize interference with airspace operations and allow for safe operating environment.

2. The small quantities of potentially hazardous materials which may be used during construction activities would result in generation of added waste that would be handled by Pearl Harbor under their normal waste management procedures. The Sea-based X-band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain their hazardous waste aboard for shore disposal. The EIR vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residues and engaging in spill and pollution prevention practices during the routine operation. Handling and disposal of hazardous materials and hazardous waste would be in accordance with State of Hawaii, Department of Transportation, and Department of Defense policies and procedures.

3. Implementation of the EIR operational safety procedures, including establishment of controlled areas, and limitations in the areas subject to illumination by the radar units would preclude any potential safety hazard to either the public or the workforce.

4. Coordination would be required with U.S. Coast Guard to preclude potential delays of ships using the area, as well as to establish any required security zones at the moving sites.

5. This slide shows the other sites proposed for primary support bases which were analyzed in the Draft EIS and the resource areas that were determined to have a potential environmental concern. Impacts at Naval Base Ventura County, California; Naval Station Everett in Washington; and at Alak and the Port of Valdez in Alaska are similar to those described at Pearl Harbor and are also expected to be minimal.

6. The Kodiak Launch Complex, Pacific Missile Range Facility, the Reagan Test Site, and Vandenberg Air Force base all have ongoing missile operations. Impacts to air quality, hazardous materials, and health and safety would, therefore, be minimal from continuation of these existing launch activities.

7. Likewise, the impacts to biological resources would be similar to those from the ongoing activities and.
therefore, we expect no adverse impacts to threatened
or endangered species.

In particular, at Kodiak Launch Complex, these
accommodations during the tourist season due to our launch
activities. To reduce this potential shortage, the Missile
Defenses Agency is considering construction of an addition
to either the Narrow Cape Lodge and/or construction of an
additional campground in that area.

In addition to tonight’s hearing, written
comments on the Draft EIS will continue to be accepted
until March 24th, 2003, at the address shown on this slide.

After the comment period is over, we will consider all
comments as we conduct our analysis. Again, I’d like to
stress, equal consideration will be given to all comments
whether they’re presented here tonight, e-mailed, or
submitted by regular mail to us.

And once the final EIS is complete, we will mail
it to all the individuals who requested a copy. And if
you’re not on our mailing list, you can request a copy by
writing to the street address or email address given in
the hand out or by filling out a card at the registration
table tonight.

I’d like to -- now I’d like to turn the hearing
back over to Mr. Michaelson.

HONOLULU, HAWAII

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

HONOLULU, HAWAII

What is your name?

Mr. KEO PERFORMANCE: I'm John Keowani.

HEARING MODERATOR (Mr. Michelson): Okay.

What's the question?

Mr. KEO PERFORMANCE: My question is: Do you have an interpreter? You're in Hawaii.

HEARING MODERATOR (Mr. Michelson): We are --

Mr. KEO PERFORMANCE: For you -- for you, you know, you need to have somebody that will be able to interpret.

HEARING MODERATOR (Mr. Michelson): We were --

Mr. KEO PERFORMANCE: Have you folks brought an interpreter?

HEARING MODERATOR (Mr. Michelson): Okay. We're going to answer that question.

Mr. KEO PERFORMANCE: Okay.

HEARING MODERATOR (Mr. Michelson): An interpreter was not brought. We are recording this on a tape, and if anyone speaks in Hawaiian, we will be able to translate it from that. But we do not have a translator here. Okay?

So I'm ready to start calling the names. First up are Doreen Bedford, Kyle Kajihara, Fred Dodge, Bessie Manealai, and Todd Worthman. Would you please come up and sit in your seats up front here.

And Doreen Bedford, you are first.

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We need you to rectify and restore the well-being of this area far more than we need you to continue your history of your destruction here and all over this earth. We are your people. We, your people, are telling you, our military, that you must change now.

May your poli hau always be full. Vincent Kana’s Loko.

Aloha and thank you.

Hearing Moderator: Kyle Kajihira.

Mr. Kajihira: Aloha Kahun.

Unknown Speaker: Aloha.

Mr. Kajihira: My name is Kyle Kajihira. I’m the program director for the American Friends Service Committee. The AFSC is a Quaker organization that works for peace and justice. And we oppose the development and deployment of missile defense systems in general and this particular Ground-Based Midcourse Extended Test Range.

One of our tenants is that I think it’s misleading to call this missile defense because this system is really about offense. The so-called missile defense --

This is quoting Joseph Gerson who wrote “The Politics and Geopolitics of Missile Defenses.”

Quote, “So-called missile defenses have been conceived as a shield to reinforce U.S. offensive strikes.

The idea is to make it safe for the U.S. to threaten or to initiate first strike.”

And this analysis is confirmed by the announcement of the new U.S. nuclear posture, which includes first nuclear strike as one of the range of possible options. This was never on the table before because deterrence was the -- was the -- the guiding doctrine.

Also. missile defense is a Trojan horse, which --

which helps the Pentagon and aerospace industry to militarize space under the pretense of defense. Right now, there are international treaties that preserve space for peace. But U.S. missile defense and space command policies are moving towards the militarization of space.

We’re concerned that missile defense violates international treaties and is destabilizing. And in July,
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
they said there was no document there. There are no

hearings on Kealii. This is the only hearing. The fact

that you have only two --

Mr. Kajihiro: Okay. Let me just finish this --

this point, if I could --

Mr. Kajihiro: -- about the public participation.

The fact that there were only two comments from

Honolua in your scoping process tells you something about

the inadequacy of the public participation.

Mr. Kajihiro: Okay.

Mr. Kajihiro: So I would like to request that a

10-day extension be given to the comment period so that we

can notify people that is this process underway and

that people can make their comments known.

Mr. Kajihiro: Okay. Thank

you.

Mr. Kajihiro: And that’s part of my

testimony. Thank you.

Mr. Kajihiro: All right.

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HONOLULU, HAWAII

Thank you.

Mr. Dodge: Aloha to you and dear people. I’m

like to face --

Mr. Kajihiro: Sir, I’d

prefer asking you’re -- those people came to hear what you

had to say --

Mr. Kajihiro: Right. Well, let me --

Mr. Kajihiro: -- that --

Mr. Kajihiro: -- do it this way.

Mr. Kajihiro: I’m just --

Mr. Kajihiro: Just look

over this way occasionally, would you? All right?

Mr. Dodge: Yeah. I’m doing this on purpose.

Mr. Kajihiro: I know that.

but --

Mr. Dodge: Yeah

Mr. Kajihiro: -- the point

is --

Mr. Dodge: Yeah

Mr. Kajihiro: -- they care

here to listen to you.

Mr. Dodge: Yeah. My name is Fred Dodge. I

happen to be a medical doctor. I’m a family practitioner
HONOLULU, HAWAII

1 at the Kaimuki Comprehensive Health Center, but I'm here mainly today as a citizen of Kalama.
2 There are many things unacceptable with the SMC, the Ground-Effect Windtunnel Defense, and the Draft RPS. And you've heard the two previous speakers address some of this. I'm sure other -- there will be some other people that will submit testimony either tonight or to you. But I will limit my comments to two issues.
3 First, the Sea-based X-Band Radar. It's a very strong radar, and I believe it to be very dangerous to humans and other living things. It heats tissues -- radar does. As a result of heating tissues, this type of electromagnetic radiation can and has caused in humans and animals a range of conditions ranging from cataracts to death. Furthermore, it can interfere with airplane and airport electronics.
4 The -- I noticed that you had said in your presentation that the effect on air travel -- air transport would be minimal. That kind of scares me because, as a physician, I can tell patients that some of the medications I use for some very serious illnesses that require serious medications can result in side effects when we try to minimize this, as you do.
5 An example would be -- I've been around medicine for a long time, but when I first started, many physicians

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
HONOLULU, HAWAII

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
 priorities in our country today in black and white. And
2 The Advertiser is usually a very pro-business newspaper, and
3 it's very characteristic of this lack of funds for
4 education as Fred mentioned, healthcare, which is not
5 happening in the United States.
6 I'm here to talk about the opposition that is
7 widespread to the -- what I believe and many believe as
8 part of a U.S. hegemony and domination -- political,
9 economically, and militarily -- primarily through superior
10 technology, militarily, troop strength, and superior
11 weaponry, which is part of a racist militaristic and
12 jingoistic society that has systematically oppressed --
13 HEARING MODERATOR (Mr. Michaelson): Excuse me,
14 MR. MORIYAMA: -- and in a war against the
15 poor --
16 HEARING MODERATOR (Mr. Michaelson): Excuse me,
17 Todd, are you --
18 MR. MORIYAMA: -- people of color.
19 HEARING MODERATOR (Mr. Michaelson): -- reading
20 from something?
21 MR. MORIYAMA: Yes.
22 HEARING MODERATOR (Mr. Michaelson): Yeah, it's
23 going way too fast for her to pick it up, so --
24 MR. MORIYAMA: Okay, I'll speak slower.
25 The other issue in the land itself on Hawaii is

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
HONOLULU, HAWAII

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
HONOLULU, HAWAII

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1 Hawai'i, because there are the folks that are affected the most. And it's very--it's really expensive for them to fly over here. This meeting should have been on Hawai'i, and there should have been another meeting on Oahu, because you plan to put something out here in Kāne'ōhe. Not Barbers Point. Kāne'ōhe.

2 So I'm going to use the rest of my time to fix what you've broken and offer a pole.

3 "(Fusga in Hawaiian.)"

4 And I would point out that -- it's pretty close to my house now, so I'll step back. The pole was to make things pono once again, because it wasn't pono.

5 But realize that, right after your presentation occurred, the heavens opened up, and it rained. Waikiki, the sky father who I mentioned in the pole, cried. And he cried because this process wasn't pono. And it was real.

6 tale-tell because it was right after you guys did your presentation and then opened it up.

7 So I'll come back.

8 HEARING MODERATOR (Mr. Micheli): Okay.

9 Next -- next speaker is Terry Keo'ala-Raymond.

10 Mt. KEE'O'ALI-RAYMOND: Aloha kekou.

11 UNIDENTIFIED SPEAKER: Aloha.

12 Mt. KEE'O'ALI-RAYMOND: *(Hawaiian speaking.)*

13 I'm going to make my comments short. First of all, this whole process is very intimidating, as Bill said.

14 Do I want to underscore how sensitive this process is for our kind of people, okay?

15 Another comment I would like to make is: I would really like to know what efforts you made to do your outreach to the community to bring them here for real and for you to listen to their -- to their mana'o. You don't have that many people here. How come? And yet this thing is so busy, and it will have such a huge impact on our people here in *(Kealakekua)*, which is the Pacific. The North Pacific.

16 So please, on you folks for not doing a better job to get people to come out here. It makes a joke out of the process, actually. If you don't have people in this part of your process to come out and to say stuff -- say stuff.

17 Okay. The other thing I would like to say is I would also like to underscore what Kyle brought up that in order to repair this hernia, given this system, right, that you have a 60-day extension, which is allow people the time to come and make their comments, and that you do hold a meeting in Hawai'i where there are many people in out islands who do have something to say because of their experience physically being near the facilities that we're talking about.

18 And, by the way, the Pacific edge facility, as I

EXHIBIT 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
HONOLULU, HAWAII

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
HONOLULU, HAWAII

1. state your name.

   ML. MURRAY: Karen Murray.

2. HEARING MODERATOR (Mr. Michaelson): Thank you.

3. Very much.

   ML. KEOLEO'OKA'I-RAYMOND: There's so many levels
4. to this thing, you know. But what it basically comes down
5. for us is that this -- the military -- the American -- the
6. United States military has done more damage to Hawaii than
7. any terrorist, than anything that happened at Pearl Harbor.

   There are -- when -- at a time when kupu are
8. telling us, oh, there was so much sea life. There was so
9. much -- like, you could get oysters from Pearl Harbor, you
10. know. At a time when there is so many -- such high
11. incidences of deformity in the fish embryos -- two heads,
12. bent spines -- showing up.

   And then you have the other level. I mean, from
13. a cultural level, why are we supposed to trust the American
14. culture that does so much damage to its own people?

15. They -- they feed -- after seeing what happened with Mad
16. Cow Disease in England, they go ahead and do the same
17. thing. They do the same thing to create Cow Disease, and
18. they didn't care because of the bottom line. They didn't
19. care.

20. Now, look, they take a wonderful food, like --
21. like salmon, and they can't even do that right. They're

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Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
I'm the director of nationalism and native rights from the Office of Hawaiian Affairs.

I had not intended to speak this evening, but I have heard the concerns of the community, and I want to express my concern as well.

We found out at the Office of Hawaiian Affairs about this hearing the way that everybody else here did — through a small ad in the newspaper. We were not contacted as is usually the protocol. I wish to withhold any substantive comments, but I must protest about the procedural aspects of this — of this entire comment period. It was not done, as it was said before. It's wrong. And I encourage you to consider extending the comment period as well.

Thank you.

Moderator (Mr. Michaelson): Thank you.

That exhausts the number of speakers each that I have, but in case anyone else has in fact been inspired to speak, I want to make sure everyone has had their first opportunity before we ask people who would like to speak for a second time.

Is there anyone who has not yet spoken here tonight who would like to do so? If not, if it's all right with you, I'll call all the names again, and if you'd like to come up to speak a second time, please do so.
the injustice that was done. So you can’t have true
reconciliation. You can’t have true environmental justice
if you’re not dealing with some restoration of the harm
that was done even if it was 100 years ago, you know.
Environmental justice is not an empty exercise of
compliance, yeah. It has to be about addressing a harm.
Is it has to be about fixing a broken relationship.
One of the things that are also not adequately
addressed in cumulative impacts. And when we talk about
cumulative impacts, we’re talking about more than just
what’s happening on that little launch area at the Kauai
test facility, you know. Cumulative impacts for people in
Hawaii as it pertains to military actions includes the
140,000 acres that the military occupies here. You know,
15 one quarter of this island is controlled by the military.
That is a quarter of the land that is not available for the
public to use, that’s not available to native Hawaiian
19 practitioners to do the things that they need to do so that
their culture can survive, yeah. So those are cumulative
impacts.

Not only that, the Army is now proposing to
22 acquire 23,000 acres on Maui Island, another 2,000 acres
here on Oahu as part of its transformation. That’s added
to the cumulative impacts. Last night, we -- I mentioned
the outnet — regarding Waikane Valley. The Marine

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1. Corps wants to go back and train in Waikane, and the
community strongly opposes it.
2. The military is the largest polluter in Hawaii.
3. It has over 1,500 contaminated sites, and it’s 
still --
4. they’re still finding more every year.
5. So those need to be considered in your document.
6. When you look at what are the impacts, there are cumulative
impacts that affect all of us.
7. And, finally, you know, programs like missile
defense are promoted as a way of defending democracy,
defending freedom and our rights. But, you know, what’s
happening when these programs get instituted and
restrictions are placed on these lands, it’s making the
people here less free. How do you measure the impact of
that?
8. The people of the west side of Maui are less
free to use their beaches and the resources there. We are
less free to go up to Kula and Kaena Point and use those
resources when the testing is going on, an endzone area
is created, a new zone is created. So how do you measure
that impact in the Environmental Impact Statement?
9. I think your document is inadequate and you need
to come back and, as William said, you know, talk to the
community on our terms.
10. Thank you.
HONOLULU, HAWAII

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
a lot of people here, it could be because of what people
mentioned that hasn’t been really -- people haven’t
really been contacted. And, therefore, I would again state
that my agreement with the 30 day extension so that more
people can be allowed to express and more dialogue be
continued.

Also, if we look at the -- again, the racial --
the racial breakdown of who is occupying what power and we
look at communities of color and the poor, I’d want to
reiterate again that it does seem that our justice system
and our political and military decisions are often not in
favor of -- or I would say the war against people of color,
against the poor, and against the indigenous people. Just
have to talk to the native Americans. They’re (inaudible)
the (*hakaimanai) that are in solidarity with what I’m
saying. These ideas are not new.

Again, I want to reiterate that the world
momentum is growing. The momentum here in Hawaii, as well
as in the mainland, is overwhelming. And I think it’s
about time that we start adopting a society based on
inclusivity rather than exclusivity -- again, a society
that is (not by, and for the people) not governed by a
bunch of talking-heads or puppets or people that are of
privilege or have money that decide what happens to the
rest of the people.
EXHIBIT 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

HONOLULU, HAWAII

P-T-0051

1. that would make a pretty good lawsuit to stop the whole
2. thing if you didn’t do that. So he mentioned that. You
3. guys better catch on to that one.
4. With regards to cultural resources, just because
5. there’s no pile of rocks out there doesn’t mean that the
6. proposed area is not a cultural resource or would not have
7. impact on cultural resources because if the area is chosen
8. and the dredging is established there, there’s sure to be a
9. security zone around this vessel, for lack of a better
10. word.
11. And depending on where you put the vessel, the
12. security zone would enclose myself and my fellow fishermen
13. from Waianae and from Kailua and Kualoa from access to an area
14. where we’ve had access to, uh, for, you know, countless
15. generations -- all the guys that are behind me -- my
17. It also doesn’t take into account the impact on
18. historical cultural -- prehistorical -- well, prehistorical
19. is a better -- a bad way to say it -- all historical
20. cultural resources from the -- from the view of
21. (**Nakihana), an Oahu chief whose Kalesio was his
22. favorite fishing grounds. And that would put him in about
23. the 15th century, which would impact Hawaiian cultural
24. resources by preventing people from fishing that ground who
25. have genealogical ties to that ground. So it’s not just a

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pile of rocks. We have to constantly tell the Army the same thing, too, so you're not alone in that one.

In closing, I would seriously recommend you consider a 30-day extension, as mentioned by other speakers. If you want the truth and you want the input, what's 30 more days.

Have a meeting on Kauai because there are guys -- outside of this Kauai, there are the guys that are most impacted. Those are the guys who have Kupuna buried under the ground in which you're crossing over and doing your testing and operating. Okay? Make that pornos. Talk to those guys.

And ultimately, I would recommend that there not be any deployment of this MX platform on Kauai. Okay?

Thank you very much for the opportunity. Thanks for -- I see some understanding now and some heads being nodded and your faces and stuff. So just remember next time, most important thing, pole first.

For you, it's very important that you not try to write those Hawaiian words down if you're not Hawaiian because when you speak Hawaiian and when you believe Hawaiian, words can bring life, and if you mispronounce them, words can bring death. So you have to be very, very careful. For yourself, I would recommend you not try to put those down. Okay?

Thank you.

HEARING BEGINS: I have led a couple of new words turned it to be of people who would like to speak, so I'm trying to decide here whether to -- since we only have three more of the words that were going to speak a second time, let's go ahead and do those, and then we'll take the new speakers.

So the next person that would have a second chance is Terry Fako'o'ilani-Raymond.

MR. KENGOHANAMO: I just forgot to ask one question, actually, that I would like to have answered, and that is: What right do you have to the air space if someone -- I need to have you folks define that for me, to explain it to me, and to document to me what right you have to the air space.

And, also, in the cultural part of this, you need to understand how our people see space, yes. Not as the heavens, what it means to us. And, also, you have to understand how our people view the ocean. That is like your land, yes. That is similar. You know, this is where we have our -- our navigations that have gone on. This is where we come from, yes. It is our Kaua'i, it talks about us as a people coming from the ocean, you know. So our ties to the ocean are very deep. Okay?

So I -- but I do want you -- someone to explain...
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
HONOLULU, HAWAII

MR. NISHI: Ohayô.

HEARING MODERATOR (Mr. Michaeleoni): Thanks, if you'd just start by giving us your name and then go ahead.

MR. NISHI: My name is William Nishihara. My name is William Nishihara.

(phonetic). I'm a member of oba [obaa], uh, and nuclear free and independent Pacific.

From my understanding, what it looks like you folks are trying to do is further U.S. domination of the Pacific region. And things that have come out recently in the -- in the so-called war on terrorism, I don't see how what you folks are trying to implement is going to make any of us any safer. We're talking about people -- we're talking about a military machine that is in some ways the resources of the next person on the list. And you guys want more and more, more domination, more resources so that -- so that the whole of the U.S. military and the interest behind it can -- can continue a stranglehold on the planet.

I'm totally against this -- opposed to this. It doesn't -- I don't see how it's going to make any of us any safer.

That -- that's about all I have to say.

HEARING MODERATOR (Mr. Michaeleoni): Thank you very much for coming down.

Kalia Nishihara.

MR. NISHI: Ohayô.

HEARING MODERATOR (Mr. Michaeleoni): Thanks. If you'd just start by giving us your name and then go ahead.

MR. NISHI: My name is William Nishihara.

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I'm totally against this -- opposed to this. It doesn't -- I don't see how it's going to make any of us any safer.

That -- that's about all I have to say.

HEARING MODERATOR (Mr. Michaeleoni): Thank you very much for coming down.

Kalia Nishihara.
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
MR. HUNTER: My name is Chris Kekua Hunter. I wasn't going to come up and speak, but just seeing the disrespect displayed when someone's just trying to give you this simple -- just asking you simple questions, the simple extension of a little bit of time because our ideas are more than five minutes long --

HEARING MODERATOR (Mr. Michaelson): Can you raise the microphone so we can hear you.

MR. HUNTER: -- because of the fact that our ideas are more than four minutes long, we would not be able to squeeze them into that small of a period of time, and the -- just the callousness that -- almost arrogance, I guess.

I've been -- I've been taught all my life to respect my elders, but it's times like these that I really have a hard time thinking of that when I see the tyranny of my community just being slammed like that. And it's almost as if we're being in a position, but I know that most of the people here have probably just come off work, know that it's going to be a long night for them. I know it's probably going to be one for me. It's probably going to be a long night for everybody here. But just a little bit of civility displayed to everybody else who's here would go a long way.

MR. HUNTER: I just want to address some of the people out here who I see who I really respect and admire. I bring up my son because I was raised to believe in fighting for what I believe in, and it didn't mean holding a gun. It didn't mean going on to somebody else's land and taking away from them who I don't need. It didn't mean creating a bigger and more expensive means of killing other people. It didn't mean taking to excess the resources of the world and handing it, and when the people cry out for water, when they cry out for land, when they cry out for justice, get it shoved down their throat in the name of the American way.

So I'm raising my son to live on what we call land. And I don't think that you guys understand what that would mean because you mean every effect that you make upon the environment, you have to understand the consequences.

We don't leave diapers on the beach. We don't leave our rubbish behind. We have a small car to minimize...
HONOLULU, HAWAII

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
they will. If it turns out it’s a speculative-type 
question or something that needs to be resolved with other 
technical experts before it would appear in the Final EIS, 
then they may have to decline to try and answer that 
question. 
So who would like to ask the first question?
(Witness, court reporter was instructed to go 
on the record.)
KODIAK, ALASKA

GROUND-BASED MIDCOURSE DEFENSE
EXTENDED TEST RANGE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

PUBLIC HEARING
Monday, February 24, 2003
6:00 - 9:00 p.m.
Kodiak High School Commons

(On record)

MR. MICHAELSON: Good evening, ladies and gentlemen. We are going to be having a presentation tonight so we encourage any of you who may be optically challenged or otherwise to move to the front row which will be reserved for speakers.

Thank you for coming tonight. I am Lewis Michaelson, and I've been asked by the Missile Defense Agency to serve as a moderator for tonight's hearing. This is one of seven public hearings being held on the Ground-Based Midcourse Defense Extended Test Range Draft Environmental Impact Statement. During tonight's hearing, we will be referring to the Ground-Based Midcourse Defense as GMD and referring to the Draft Environmental Impact Statement as the Draft EIS.

This public hearing is being held in accordance with provisions of the National Environmental Policy Act and implementing regulations. The Act requires federal agencies to consider the potential environmental impacts of their activities in the decision-making process.

The purpose of tonight’s hearing is to provide you with information on the GMD program and proposed GMD Extended Test Range activities. We will also summarize the findings presented in the Draft EIS and solicit your comments on the Draft EIS.

Looking at the agenda for tonight, after I finish the introduction, Colonel Kevin Norwood, the director of the Site Activation Command for GMD in Alaska, will describe the GMD flight test activities. Then Mr. David Halsey, the Chief of the U.S. Army Space and Missile Defense Command, National Environmental Policy Act Compliance Branch, will describe the process called for in the National Environmental Policy Act. He will also present the environmental analysis and results of the Draft EIS.

The last item on the agenda, the public comment portion, is really the most important. Remember that the Draft EIS is just that -- a draft. This is your opportunity to tell the GMD Project Office how you can improve the analysis of the potential environmental impacts before the document is finalized and before a decision is made on whether or not to proceed with the proposed action.

Now a few administrative points on making comments tonight. If you've already signed up to speak, that's great. I have four cards so far. If you've not already filled out a card and would like to speak tonight, please go to the registration table and sign up. Everyone is welcome to speak. It just makes the procedure run more smoothly if I can call on people from a list. We've also reserved as I said the first row up here for upcoming speakers so we can move through the process efficiently, and I'll let you know when it's time to come up.

Each speaker will be allowed a maximum of four minutes and may speak only once. You may not combine or yield speaking times to other people. Elected officials will be given the courtesy of speaking first, and all other speakers will be called on in the order in which they signed up. There's a court reporter here today who is seated to my left. She'll be making a verbatim transcript of the hearing so that all of your oral comments will be recorded accurately. As a part of preparing that transcript, an audio and video recording is being made of tonight's hearing as well.

If you are uncomfortable with public speaking, you may also provide verbal comments by telephone. There is a toll-free number indicated on the handout that you received when you came in tonight. Look like this. In effect, if you don't get one of these, make sure you do. It has a lot of very important information on how to participate in this process.

You may also submit written comments, and there are four ways to do that. First, you may hand in

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Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
written comments that you brought with you tonight, either to me or to the registration table. Second, you may use the written comment sheet that looks like this that are available at the registration table, and you can write down any comments and turn them in tonight. Third, you may mail written comments to the same and address that appear on the comment sheet and also on the handout. And, last, you may e-mail comments to the address listed on the handout.

Your written comments will be entered into the formal record of public comments on the Draft EIS, and they will be given the same consideration as oral comments offered here tonight.

If you do choose to mail comments, please note that they need to be postmarked by March 24th, 2003 to be considered in the Final EIS.

If you’d like to receive a copy of the Final EIS when it becomes available, there are several ways you can do so. If you have already received the Draft EIS in the mail, you’ve already been mailed a list and will automatically receive the Final EIS unless you indicate otherwise. If you provide oral or written comments and provide us with your address, you will also be sent a copy of the Final EIS. If you are not on the EIS mailing list and you would like to receive one, then there’s another form at the registration table you can fill out to make sure you are on the mailing list. Also copies of the Final EIS will be placed in area libraries. In the case of Kodiak, it is at the city library. Finally, there’s an e-mail address that you can indicate ... you can write it and indicate that you’d like to be placed on the mailing list. The Final EIS will also be posted on the Missile Defense Agency website.

Finally, it is important for you to understand that the Government representatives are not here tonight to make a decision. Their main purpose in being here is to listen firsthand to your suggestions and concerns. With that, we will begin with Colonel Negorgard’s presentation.

O’Mara, Rep. Col. Norgard: Good evening. My name is Colonel Kevin Norgard and I am here in Alaska as the Director of Site Activation Command for the CMD program. The Missile Defense Agency, formerly known as the Ballistic Missile Defense Organization, is the Department of Defense agency responsible for developing and testing a Ballistic Missile Defense System. In the following text, I will briefly describe the CMD Extended Test Range, provide an overview of the CMD and how it works, and address the questions that were asked. Before I start, I’d like to describe the overall Ballistic Missile Defense System under development and explain the different segments of the system.

This chart represents the flight of a ballistic missile. A ballistic missile flight path has three basic parts: the boost phase, the portion in which the missile is burning; the atmosphere; the midcourse phase, which is from midcourse to the final phase of the flight; and, the terminal phase, which is when the missile enters the earth’s atmosphere. Within each of these segments, our missile program has to this point been characterized by discrete, independent programs which we call elements. Each element works to destroy one ballistic missile in that particular segment of flight.

Now, however, the Missile Defense Agency is moving towards an integrated Ballistic Missile Defense System. Instead of having discrete, stand-alone elements, we plan to eventually tie together the programs of the various elements so we can destroy down missiles in all segments of flight.

Each segment of the Ballistic Missile Defense System could include several elements, which are different ways of providing a defense against the threat missile during the same phase of flight. All segments and elements are designed to work together as each element is developed. At the same time, each element could provide an effective stand-alone defense against a specific type of threat. The GMD element is part of the Midcourse Defense Segment. The GMD element is the successor to National Missile Defense and includes the same components.

The conceptual GMD element would consist of the components shown on this slide. The components are: the Ground Based Interceptor, existing early warning radars and satellites, X-band Radar, Defense Support Program or Space Based Infrared System, Battle Management Command and Control, that is the central communication and control point, and, finally, the In Flight Interceptor Communication System, which transmits commands to the Ground Based Interceptor while it's in flight. The GMD Extended Test Range may not include all of these elements.

The GMD Program is proceeding to conduct more operationally realistic testing of the GMD element of the Ballistic Missile Defense System. This slide indicates the proposed locations for the various components in the Extended Test Range. As you can see, the Extended Test Range could include a component of sites in the Lower 48, throughout the Pacific, and here in Alaska at Kodiak and Shemya.

The GMD testing would be of two types. One type of testing would involve increasingly robust Ground Based Interceptor flight testing in the Pacific region in scenarios that are operationally realistic as possible. The other type would involve validation of the operational concept through integrated ground tests using the GMD components. These are the tests using Fort Greely and other locations analyzed in the GMD Validation of Operational Concept Environmental Assessment. These ground tests do not involve realistic flight or intercepts.

The Draft EIS, which is the subject of this hearing, evaluates the first type of GMD testing involving interceptor flight testing. This interceptor flight testing will be the focus of the discussion tonight.

As you can see from this slide, the existing interceptor test capability includes the use of the Kodiak Launch Complex, Vandenberg Air Force Base, the Pacific Missile Range Facility, and the Reagan Test Site at Kwajalein Atoll in the Marshall Islands. Current testing includes launching target missiles from Vandenberg Air Force Base and Ground-Based Interceptors from the Reagan Test Site with intercepts occurring over the broad area.

The ground-based radar prototype at the Reagan Test Site is used to track, discriminate, and provide updates to the interceptor during flight, while a radar on Cuba is used as a tracking sensor. For some tests, target missiles are launched from the Kodiak Launch Complex and viewed by the Early Warning Radar at Senti Air Force Base. Current capability does not exist to launch target missiles from the Pacific Missile Range Facility as well. These scenarios present a very limited capability to demonstrate the effectiveness of the CMD element because the Ground Based Interceptor can only be launched from the Reagan Test Site. This limits our ability to test the system in an operationally realistic environment.

The extension of the existing CMD test range would increase the realism of CMD testing by using multiple engagement scenarios, trajectories, geometries, distances, and speeds of targets and interceptors to closely resemble an operational scenario involving attack by one or more threat missiles.

We are proposing to add dual target and Ground Based Interceptor launch capability at the Kodiak Launch Complex and/or at Vandenberg Air Force Base. Also proposed are mobile target launch capability and shipborne radars. The proposed Extended Test Range would provide more operationally realistic flight testing as President Bush and Congress have directed.

A Sea-Based Test X-Band Radar, or SBR, is proposed to support the Extended Test Range flight testing. This SBR would be a multi-function radar that would perform tracking, discrimination, and intercept assessment of incoming threat missiles. The SBR would be assembled at an existing shipyard on the United States Gulf Coast.

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Three conceptual SBN performance regions have been identified to accomplish effective radar coverage for flight-testing. The SBN would operate within the confines of one of these three performance regions based on the need for the particular flight test scenario. Potential primary support bases have been identified based on their proximity to these performance regions. Approximately 10 to 12 days before GMD operational tests, the SBN would leave the Primary Support Base to travel to its performance region in the Pacific Ocean.

The SBN would be stationed at its primary support base between flight test missions. The SBN would have a deep draft, which would restrict it from many harbors. The SBN may dock at a deep draft pier if it is available between missions. If a pier is not available, the SBN would most likely be moored 3 to 20 miles offshore while at the primary support base. Potential locations for the primary support base analyzed in the Draft EIS are the Port of Valdez and Adak, Alaska; Naval Base Ventura County/San Nicolas Island near Camp Pendleton, California; Naval Station Everett in Washington; the Reagan Test Site, and Pearl Harbor, Honolulu, Hawaii.

Daily activities provided by the support base might include logistics, re-supply, and maintenance and repair. Radar operations in the vicinity of the Primary Support Base may include tracking of satellites and calibration devices. Vessels from the primary support base would re-supply the SBN. During transit between the primary support base and the test location, periodic radar operations for satellite and calibration device tracking, including joint satellite tracks with GMD sensors and other pre-mission activities may also occur.

Activities analyzed in the Draft EIS, which may meet some of the enhanced test objectives, include launching target and/or interceptor missiles from the Kodiak Launch Complex, adding interceptor missiles from Vandenberg Air Force Base, and launching target missiles from mobile platforms over the broad ocean area. The target and interceptor missiles could be launched in sets of two under some test scenarios from either the Kodiak Launch Complex, the Reagan Test Site, or Vandenberg Air Force Base.

In-Flight Intercepter Communications System Data Terminals would be constructed in close proximity to the proposed Ground-Based Interceptor launch sites and expected intercept areas. Existing launch sites and test resources would continue to be used in enhanced test scenarios. Launching Ground-Based Interceptors from the Kodiak Launch Complex may require up to two additional small mobile radars and telemetry stations in South Central or Southeast Alaska for telemetry and flight safety.

Existing shipborne sensors would be used for mid-course tracking of the target missile during Ground-Based Interceptor launches from both the Kodiak Launch Complex and Vandenberg Air Force Base. The Sea-Based Test X Band Radar would be constructed and used in tests to perform tracking, discrimination, and assessment of target missiles.

The Draft EIS analyzed three alternatives for the GMD extended test range testing. For Alternative 1, we would propose the following components: First, single and dual Ground-Based Interceptor launches from the Kodiak Launch Complex and Vandenberg Air Force Base, and the Reagan Test Site; second, single and dual target launches from the Kodiak Launch Complex, Vandenberg Air Force Base, and the Reagan Test Site; and, third, single target launches from the Pacific Missile Range Facility and mobile target launch platforms. Construction of two Ground-Based Interceptor sites, an additional target launch pad, and associated support facilities would be needed at the Kodiak Launch Complex. We would also construct an In-Flight Intercepter Communications System Data Terminal at the Kodiak Launch Complex and at a location in the mid-Pacific. The SBN would be used in tests for tracking, discrimination, and assessment of target missiles.

Alternative 2 would be similar to Alternative 1, with the exception that Ground-Based Interceptor launch would be from Vandenberg Air Force Base instead of from the Kodiak Launch Complex. The Ground-Based Interceptor launch would require construction of an In-Flight Intercepter Communications System Data Terminal and modification of existing support facilities at Vandenberg Air Force Base.

Alternative 3 would combine activities proposed in Alternatives 1 and 2 and would include Ground-Based Interceptor launches from both the Kodiak Launch Complex and Vandenberg Air Force Base, and construction of the required support facilities.

Under the No Action Alternative, the GMD extended test range would not be established and interceptor and target launch scenarios could not be tested under more operationally relevant conditions. The SBN would not be developed. Testing at the existing GMD test ranges using existing launch areas would continue. The decision to be made is whether to enhance the current GMD flight test capability by selecting from the list of alternatives presented, including the No Action Alternative.

The Missile Defense Agency is still evaluating the feasibility, safety, and utility to GMD testing program of conducting a limited number of checkout Ground-Based Interceptor flight tests from Fort Greely. The possibility of such flights is too speculative to be analyzed at this time. The Missile Defense Agency will perform an EIS if and when it proposes to conduct Ground-Based Interceptor flight tests from Fort Greely.

The Federal Aviation Administration, or FAA, which is the cooperating agency for this Draft EIS, will also rely on this analysis to make its environmental determination for a launch site operator's license at the Kodiak Launch Complex. The FAA's alternatives for environmental impacts would be evaluated, which may include the existing launch site operator's license with no modification, issuing a license for the list of activities as identified in Alternative 1, issuing a license for the list of activities as identified in Alternative 2, and the FAA's No Action Alternative, which would be to not issue a license renewal for the Kodiak Launch Complex.

At the conclusion of this environmental review process, the FAA will issue a separate decision document to support its licensing determination. The FAA will also conduct an analysis of the results of the FAA's analysis presented in the Final EIS and release information contained in the FAA's environmental impact statement, Environmental Assessment of the Kodiak Launch Complex, and will assume responsibility for its decision, and any related mitigation measures.

This concludes the program overview. Next I'd like to introduce Mr. David Hasley, who will describe the Environmental Analysis Process.
state agencies and as well as Native Alaskan groups were held to obtain their views concerning the proposed action, its alternatives, and potential environmental effects within their areas of expertise or which are of particular concern to them.

Following scoping, the next step was to further refine the possible alternatives being considered for GMD Extended Range Testing. The Draft EIS was then prepared to address the reasonable alternatives, including the No Action Alternative, reasonably foreseeable future actions, and information on cumulative effects. The Draft EIS has been made available to the federal and state agencies and to the general public for your review and comment for a period of 45 days. Now, during this comment period, public hearings like the one tonight are being held to receive public input.

All comments received will be reviewed and considered in preparing the Final EIS. The Final EIS will then be made available to the public for a period of 30 days, and no sooner than the 30 days after release of the Final EIS, the Missile Defense Agency will make public its decision on whether to proceed with the GMD Extended Range Test activities.

The Missile Defense Agency has identified 15 environmental resource areas that normally require some level of consideration in an EIS. The Draft EIS is focused on those areas because of the potential environmental impacts. Each resource area was addressed at each location where it was determined that through initial analysis that the proposed activities would not result in an environmental impact to the resource.

The Draft EIS analyzed the environmental issues associated with implementing the Proposed Action or its alternatives. And in addition, the Draft EIS analyzed environmental issues associated with licenses or permits required to implement the proposed action at each of the potential extended test range sites. As an example, the FAA's findings will be included in the Final EIS statement of decision, a report of the proposal to renew the launch site operator's license for the Kodiak Launch Complex.

The Draft EIS has also incorporated reference to several existing environmental analyses associated with current Ballistic Missile Defense System test ranges that include the Kodiak Launch Complex, the Reagan Test Site, the National Missile Defense System, and Vandenberg Air Force Base. Also incorporated is an analysis of environmental impacts contained in the GMD Validation of Operational Concept Environmental Assessment.

The Draft EIS also analyzed potential for cumulative impacts from other Department of Defense, Government, and commercial activities in areas where GMD actions are proposed.

Likewise, the impacts to biological resources would be similar to those from ongoing activities. Wildlife monitoring by the Kodiak Launch Complex concluded that there would be temporary short-term effects on wildlife near the launch complex. However, we expect no adverse impacts to wildlife or threatened or endangered species.

As part of the Geology and Soils Impact analysis, we looked at whether facilities built at the Kodiak Launch Complex complied with current building code requirements. In fact, the 1994 building code, which was in effect when the current facilities were built, was more stringent than the current International Building Code of 2000. In addition, we expect no adverse effects to the soil chemistry in the area.

With respect to the Hazardous Materials and Hazardous Waste, quantities generated would not exceed the amount anticipated for normal operations at Kodiak Launch Complex. And the Kodiak Launch Complex would manage this in accordance with their current plan.

Under Health and Safety, the Proposed Action volume would not increase the risk to workers and the general public over their current operations. The number of launches would continue to be determined based on the need to access to the hazardous operations area or in the interest of national security as has been seen previously at the Kodiak Launch Complex.

As well, access to Fossil Bends and other nearby public areas would continue to be limited only during the hazardous operations or in the interest of national security or during the construction and operation of Hazardous Waste. There could be an increase in the amount of funds available for tourism and the number of launches at the Kodiak Launch Complex. However, the economic impacts of the proposed action are not significant. The costs of constructing an addition to the northern Cape Camp and for the construction of an additional man camp.

With regard to Subsistence, there would be a slight increase in the amount of land available for subsistence use because of additional security fencing at the Kodiak Launch Complex. The areas proposed for fencing are not significant and include a small area to the north of the complex.

At the Port of Valdez, the small quantities of potentially hazardous materials used during construction activities would result in the generation of low-level waste that would be accommodated in accordance with existing protocol and regulations. The Sea-Based Test X-Band Radar would follow the U.S. Navy's requirements that, to the maximum extent practical, ships should retain hazardous waste aboard for shore disposal.

In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as blanking decks and clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices. Handling and disposal of hazardous materials is hazardous waste would be in accordance with the State of Alaska, Department of Transportation, and Department of Defense policies and procedures.

Also Implementation of NRC operational safety procedures, including establishment of controlled areas and limitations in the areas subject to illumination by the radar, would preclude any potential safety hazard from either the public or the workforce. An Electromagnetic Radiation/Electromagnetic Interference survey and analysis would be required as part of the site certification and frequency allocation process.

KODIAK, ALASKA

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
KODIAK, ALASKA

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

Fully and accurately, we ask that you speak clearly into the microphone. Because of the acoustics in this room, it will be especially important that you speak clearly and make sure that the court reporter can capture everything that you say. Also at the beginning of your speaking time, please state your name for the court reporter.

We kindly request that you observe the four-minute time limit for oral comments. We're using the four-minute limit in all of the hearings everywhere that they're being held to give everyone a fair and equal chance to make their comments. We greatly appreciate your cooperation and understanding in observing this limit.

To start you in knowing when your four minutes are up, I have a simple method for indicating times. After these minutes, I'll raise my index finger like this, indicating that you have one minute left. When all four minutes (sic) are left, I'll raise my closed hand like this indicating that it's time for you to wrap up your comments.

It's important for you to look up occasionally from your comments if you're reading them so that you'll see the signal. I have one other request and that is, speaking in public can be very intimidating for people, and that may be why you've withheld any expressions either against or in favor of what the speaker has to say until the speaker is finished. This will also ensure that the court reporter can capture all of your comments. Thank you in advance for your cooperation.

And remember, if you choose not to make oral comments here tonight, remember that you can also provide those comments in writing, either written, e-mailed or by regular mail. And again, those comments are given the same consideration as oral comments given here tonight.

The speakers that I have signed up to speak so far in order are: Carolyn Heitman, and I apologize in advance if I mispronounce any of these. Mike Stroshine, Brad Stevens, and Wayne Stevens. If the four of you would please come up and sit in these chairs up here. And the first speaker, Carolyn Heitman, you can go right to the podium if you'd like. Wait till everyone sits down. Pull that middle microphone out so that you can talk.

MS. HEITMAN: Is that good?

MR. MICHAELS: That's good. Try and get as close as you can so we can hear you real well. And again if you would please state the name for the court reporter when you begin, I appreciate it.

MR. HEITMAN: My name is Carolyn Heitman. Just trying to run through this in four minutes, I'll get what I can down. One of my concerns was from the 1979 EA for the KLCC. There's been a great change. One of them now is I'm looking at the Draft EIS; it's up to 11 launch vehicles. We've got five launch vehicles, four targets, and one interceptor, that's 11. That's the only launch site proposed to launch all 11. And that's been __ think the original had like four.

Another thing is the radars; the X_Band. I'd like to see more information on the X_Band radar, its transmission. We see in the Draft EIS that any transmission 31 miles out can be a hazard to aircraft. I want to know what the impacts will be on our migratory birds that fly through the path of the radar, what's transmitting the high power. The radar is assuming it's going to be traveling from Valdez to Adak and then the North Pacific area so which means I'd assume it would pass by Kodiak.

There was an article in the Wall Street Journal August of 2002 which was talking about the problem X_Band on the platform. It said that in this article it said it's being built by Boeing and Raytheon. And that the radar would be linked to as many as 10 Ground_Based interceptors in Alaska. And that it
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

<table>
<thead>
<tr>
<th>COMMENT NUMBER</th>
<th>MR. MICHAELSON:</th>
<th>MS. HEITMAN:</th>
<th>MR. MICHAELSON:</th>
<th>MR. SIROFCHUCK:</th>
<th>MR. MICHAELSON:</th>
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<tbody>
<tr>
<td>3</td>
<td>Thank you.</td>
<td>Min-noon.</td>
<td>Our next speaker is Mike Sirofchuck.</td>
<td>Thank you. I’d like to recommend that the GMD...</td>
<td>Could you state your name, please.</td>
</tr>
<tr>
<td>4</td>
<td>MR. SIROFCHUCK:</td>
<td>Fmr.</td>
<td>I'm sorry. My name is Mike Sirofchuck.</td>
<td>I thought you heard it when he said that. I would recommend that you pursue the No Action Alternative as described in the Executive Summary in Section E2.11.1 on page ES-9. A statement was made earlier that wasn’t exactly incorrect, but it left out some important information, that is, why did the Department of Defense decide to do an Environmental Impact Statement for the Kodiak Launch Complex.</td>
<td>I'm sorry. My name is Mike Sirofchuck.</td>
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<td>5</td>
<td></td>
<td></td>
<td>The Department of Defense did not want to do an Environmental Impact Statement. And I'd just like to remind the officials here this evening and the public that a coalition of Alaskan grassroots groups joined with the National Resources Defense Council and filed suit against the Department of Defense, and the settlement of that court action was the Environmental Impact Statement for the Kodiak Launch Complex. So that decision did not come freely from DOD and certainly not willingly.</td>
<td>What I suspect is the entire credibility of this Draft Environmental Impact Statement insofar as it relates to the Kodiak Launch Complex. It is based on highly questionable information, much of it provided by the Alaska Aerospace Development Corporation. We know how many launch sites have been out there in the past year that AADC really needs business. But asking the AADC to provide environmental information is sort of like asking the fox to determine if the hen house is safe from predators.</td>
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<td>For example, in the lake directly beneath the ridge where sites are proposed to be built, there's currently an active beaver lodge and beaver activity occurring along all of the Fossil Beach Road. Nowhere in the Draft Environmental Impact Statement is there any mention of this activity. Now, you might say well, these sites aren't going to have a couple of beavers down there. The question is what else has been missed. This is just one detail right there literally within sight of where you would stand at the sites, you can't miss it. So what else has been missed in the many environmental assessments and surveys out there. Quite a bit I would expect.</td>
<td></td>
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<td>7</td>
<td></td>
<td></td>
<td>One of my main concerns is land use. I sat through quite a few meetings during the 18 months that the Panhandle Comprehensive Plan was being drafted. One thing that was very clear was that the community of Kodiak wanted the land around the Narrow Cape preserved for recreational purposes. Almost all the land on road system that borders the land is privately owned except for the state owned land at Narrow Cape. Carolyn has already addressed the access problem.</td>
<td>Construction of a may camp for 60 people and adding to the “Narrow Cape Lodge” with an additional facility for 60 people means that there would be anywhere from 120 to 200 people living out in that area. The impacts on sportfishing, hiking, hunting, both subsistence and sport, are far too vast to imagine that number out there. It would greatly impact that area and totally contradict the wishes of the community in terms of the use of that area. This needs to be studied much more closely. And I would recommend that CMD take a good look at that Panhandle plan and take into account the wishes of the community as they were expressed in an 18 month public process. Thank you.</td>
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<td></td>
<td>MR. MICHAELSON:</td>
<td>Thank you very much. Next speaker is Brad Stevens.</td>
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Public Hearing
02-24-03, Kodiak, AK

Public Hearing
02-24-03, Kodiak, AK

No. 11
MR. STEVENS: Good evening. My name is Brad Stevens. I have been consulted with on this subject, and I think that the conclusion that there will be no or minimal impacts to the public is largely based on information that is either incorrect, inappropriate, incomplete, or dubious nature. And I'd like to point out some examples of that.

There's a blanket statement that there will be no environmental impacts to the aquatic resources, and this is based on work conducted by the University of Alaska for the KLC. I have read all of their documents, and I find them to be highly questionable for a number of reasons. They did not use appropriate and accepted sampling designs. They used inadequate techniques. They changed the methods in mid-study without calibration. They didn't obtain replicate samples. They did not sample control sites, and they made no statistical comparisons.

Yet despite this, they say that there are no impacts. Whether the data that they show does indicate that there were elevated levels of aluminum and reduced stream macrophyte (phy) indices surrounding or associated with particular launch sites. I would recommend that continued sampling of aluminum and pH levels be conducted in streams around the KLC including control streams that are outside the influence of rocket washdowns. And this sampling should be conducted in fish and other subsistence resources within the nearby streams.

There are many places in this document referring to where access would be restricted, other people have spoken to that. I'd like to say that I think it is not very clear. I don't think the AADC and the military organizations involved should outline to the community exactly the number of... the date, the number of opportunities and the length of any planned closures. The reasons that those closures might occur are given just about anything under the sun, including launches, construction, storage of fuel, rocket transport, storage, and security-related activities, whatever those are.

Carolyn pointed out the fact that the fuel must be stored there, there is a safety distance of 1425 feet. Yet the storage sites are within 500 feet of the road. That is not acceptable. How can you do that? And it says that you would require you closing the road or closing access or requiring people to come out there and drive through the safety zone which is really not a safety zone of the storage areas to get to Fossil Beach. That's got to be changed.

Finally, I want to address subsistence uses. The document suggests that there are essentially no subsistence uses of Fossil Beach. And as far as I can tell there was... they didn't make an effort to find what the subsistence uses are. In fact, the Department of Fish & Game did an extensive survey in the area. And we received that information and I learned that in a typical year, 25,000 pounds of subsistence resources are taken from intertidal areas alone.

And there aren't very many of those on the road system that people have access to as Mike pointed out. So it's hard to believe that none of that came from the Narrative Cape. Whether those resources are impacted by pollution or not, whether people have the conclusion that they're impacted is going to affect how they use those resources or don't use those resources and will create pressures on other areas along the road. So that's another thing.

MR. MICHAELSON: Thank you very much. The next speaker is Wayne Stevens. Speakers after him should please come to the reserved area here, Mike Milligan, Pam Foreman, and Dr. Gary Currier. And again if you'd begin with your name.

MR. STEVENS: Good evening. My name is Wayne Stevens. I'm the Executive Director of the Kodiak Island Chamber of Commerce, Thank you for being here this evening and holding this public hearing. Just speak quickly to your socioeconomic impact portion of your study and remind you to make sure that you fully utilize and maximize the potential of all resources available in this community before executing any impacts to the local economy. We do have a burgeoning number of bed and breakfasts. We have substantial hotel accommodations, support services, and before you build separate, distinct, and individual facilities there at Narrow Cape, we'd like to ensure that those resources here on the road system in the community are utilized to the maximum. Thank you.

MR. SCHLOSSBERG: Thank you. The next speaker is Pam Foreman.

MR. MILLIGAN: My name is Mike Milligan and I represent myself. I was less than three years ago that President Clinton was proposing to put a hundred missiles in Alaska. I think that the process has gone through some good examinations and we're starting to filter down to a system which I feel is more viable. The challenge is that we're opposed to missile defense, to that proposal on a global perspective and to explain to me how the world would be safer if you were to dismantle the system which they just deployed their first and ballistic missile system last October. From my way of thinking, the world would not be safer if they were to outmaneuver that system that they just deployed.

But having said that, I do have some concerns. I share some of the environmental concerns that we're hearing tonight and that you'll continue to hear. The first concern I have is with the Aero system that is that we want to continue to support missile defense. I do support it, but that support is that qualified support. And that qualified support is based around the use of the kill technology. I don't see that that's an issue. And the document. I don't think that that was reflected over in the document that I would like to see. I would like to see the document and to pursue that technology. If I choose to not pursue that kill technology, then we're going to re-engineer another AES. And as you know, the Aero is not a kill system. It's an explosive system. So if we go to a different kind of system, I want to see that reflected in the document.

And I would also like to see a commitment in the document to use solid fuel rockets. You've heard some concerns about liquid fuel. Now, what I take from the document in reference to those liquid fuels is that as the propellant, liquid fuel in particular, is the most important. I can accept that. We're talking about, you know, maybe 50 gallons of extremely dangerous but highly expensive and very serious materials that are much more dangerous. And I would like to see a commitment in the document saying at this time that we do have a commitment to use solid rocket fuels. I appreciate everyone who's concerned for preserving the fact that we are using existing assets. We're using Minuteman missiles. We're using a missile that was formerly stationed on our air force bases in the launch complex. We get rid of that asset. That asset was formerly stationed on our air force bases in the launch complex. We get rid of that asset. We want to deploy it in a nuclear missile complex. So we used that for something else. Using it for something else. It's certainly good, but I don't see it addressed. Thank you. I don't see it addressed in the document what we're going to use for launch vehicles following the use of these assets. And I think that needs to be addressed.

And in closing, I just want to reiterate what you're going to hear from others is that the access is extremely important to me. I think the access has been improved to some extent with the road work that's been done for the facility, but I want to see a commitment in the document to maintain the access for the public. Thank you.

MR. MICHAELSON: Thank you. The next speaker is Pam Foreman.

MR. MILLIGAN: Hi, my name is Pam Foreman and I am with the Kodiak Island Convention & Visitors Bureau. My comment is also in regard to the possible construction of additional facilities in the Kodiak area. I am...
our current local facilities prior to building any additional facilities out there or considering building additional facilities out there. We currently have many months during the year where our local facilities are unoccupied and occupancy rates are low. There are a few months during the summer months that I will grant you that it will be a bit of a squeeze to try to get additional people in. But I encourage you to maximize the use of those facilities first.

MR. MICHAELSON: Okay. The last speaker I have a card from so far is Dr. Gary Carver. Why don't you pull that card up. Thanks.

DR. CARVER: Thank you. My name is Dr. Gary Carver. I am a geologist and I specialize in seismic hazard assessment and seismic geology. First, I would like to say that in reading the Draft EIS, I noted that the section on geologic hazards I think is quite adequate but is in a very general way identifiable. The nature of the seismic hazards at the Narrows Cape area, however, I am concerned about one of the panels made in your slide presentation under geology where you refer to the current facilities as they are constructed and designed exceed the present codes. This is based on the material that's presented in Appendix D of the Draft EIS, and is based on a comparison between the 1994 IBC code that was used at the time of the design and construction of the present facilities with the present codes that have been adopted in Alaska, the 2000 IBC.

Of concern to me are two input parameters into the calculations for the IBC numbers. The first of these is the site class v which the consultants at ASCO used a site class A which is a very firm rock site class. It's based on the shear wave velocity of the rock.

I phoned the ASCO people and talked with the preparer of the worksheets that are presented in Appendix D and he explained to me that he had no specific information about the rocks under the Kodiak Launch facility. And he used instead a general number for the bedrock that's widely found on most of the rest of the Kodiak Island. As it turns out, Narrows Cape is underlain by very soft materials with relatively low seismic shear wave velocities, and I think that the seismic class A is inappropriate, that probably a seismic class B would be required.

The consequence of this is a different multiplier or parameter that goes into the calculations. Second is a seismic use group. The consultant that prepared this used a seismic use group 2. This refers to the use of the facility. And in the IBC manual and codes it specifies that facilities used for critical defense purposes, for critical national defense purposes, should use a seismic use group 4. This also results in a substantially different coefficient being entered into the calculations. I worked through the calculations with these two different coefficients in them and found that indeed the numbers were quite different. That the 1994 IBC codes to which the facility is presently built are far from what is required under the 2000 codes.

This may be a moot point because of the seismic use group. Those facilities do not care what the use is. They care about what the ground motion is. And secondly, the UBC codes do not take into account surface fault rupture. And yet in the seismic hazard section of this document, you correctly identify several faults which are capable of surface fault rupture at the site. And the research that I've done there and others suggest that there are yet to be identified the active faults with the potential for surface fault rupture through the facility.

So I dispute the conclusion that was presented and would like to see it reviewed. Thank you.

MR. MICHAELSON: Thank you very much. That exhausts the number of speaker cards that I have. Is there anyone else who has been inspired to add comments to that who's not already spoken?

If not, we are going to adjourn this meeting to the first room that you were in to be made available the opportunity for those that are here to answer any other questions that you may have. I would keep in mind that anything that you say in there is no longer on record, but again anything that you have additionally that you would like to say can be provided either on the 800 number or provided in writing in different ways. With that, we will adjourn the meeting at 7:33. Goodnight.

(Green comment)
CERTIFICATE

STATE OF ALASKA

THIRD JUDICIAL DISTRICT

I, Jacqueline K. Hetzer hereby certify:

That the foregoing proceedings were taken electronically before me.

That the foregoing pages numbered 1 through 14 contain a full, true and correct transcript of the Public Hearing regarding the Ground Based Midcourse Defense Extended Test Range Draft EIS held on February 24, 2003, transcribed by me to the best of my knowledge and ability from one electronically-recorded tape recorded by me.

That I am not related to any of the parties in these proceedings, and that I am not financially interested in said proceedings or the outcome thereof.

DATED at Kodiak, Alaska, this 2nd day of March, 2003.

SIGNED AND CERTIFIED TO BY:

Jacqueline K. Hetzer
Court Reporter and
Notary Public
My commission expires: 06-09-06

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
LOMPOC, CALIFORNIA

PUBLIC HEARING
STATE OF CALIFORNIA
ENVIRONMENTAL IMPACT STATEMENT

GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE
ENVIRONMENTAL IMPACT STATEMENT

Hearing Held
February 25, 2003
6:30 p.m.
At
Lompoc City Hall - City Council Chamber
100 Civic Center Plaza
Lompoc, California

APPEARANCES:

JULIA ELLIOTT
Hearing Moderator
U.S. Army Space and Missile Defense Command
COMMANDER ROBERT GREEK, Technical Advisor
GMD X-Band Radar Project Office
SHARON MITCHELL, Program Manager
Missile Defense Agency
ALSO PRESENT:
MS. SHERYL STUBBE, Marketing Representative
Teledyne Solutions, Inc.
6010 Bradford Drive, Suite 200
Huntsville, Alabama 35805
(256) 693-5973

DAN PERRY
CST
300 Voyager Way
Huntsville, Alabama 35806
(256) 313-9511

File #7843

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
LOMPOC, CALIFORNIA

6:30 P.M.

GOOD EVENING, LADIES AND GENTLEMEN.

Thank you for coming tonight. I am Julia Elliott, and I am with the U.S. Army Space and Missile Defense Command. I have been asked by the Missile Defense Agency to serve as the moderator for tonight’s hearing. This is one of seven public hearings being held on the Ground-Based Midcourse Defense Extended Test Range Draft Environmental Impact Statement. During tonight’s hearing, we will refer to the Ground-Based Midcourse Defense as GMD, and we will refer to the Draft Environmental Impact Statement as the Draft EIS.

This hearing is being held in accordance with provisions of the National Environmental Policy Act and implementing regulations. The act requires federal agencies to consider the potential environmental impacts of their activities in the decision-making process.

The purpose of tonight’s hearing is to provide you with information on the GMD Program and proposed GMD Extended Test Range activities. We will also summarize the findings presented in the Draft EIS and solicit your comments on the Draft EIS.

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

LOMPOC, CALIFORNIA

front that will be for upcoming speakers, so we can move
through the process efficiently.

Each speaker will be allowed a maximum of 4
minutes, and may speak only once. You may not combine or
yield speaking times to other people. Elected officials
will be given the courtesy of speaking first. All other
speakers will be called in the order in which they signed
up. There is a court reporter here tonight seated to my far
left making a verbatim transcript of the hearing so that all
of your oral comments will be recorded accurately. As part
of preparing that transcript, an audio and video recording
is being made of tonight’s hearing as well. If you are
uncomfortable with public speaking, you may also provide
verbal comments by telephone. There is a toll-free
telephone number indicated on the handout that you may use
for recording those comments.

(SLIDE NO. 4 - ADMINISTRATIVE POINTS - continued)

You may also submit written comments. There are 4
ways to do that. First, you may hand in written comments
that you brought with you tonight, either to me or to a
person at the registration table. Second, you may use the
written comment sheets that are available at the
registration table to write down any comments that you wish
to make and turn them in tonight. Third, you may mail
written comments to the name and address that appear on the
comment sheet. Or last of all, you may e-mail comments to
the address listed on the handout for tonight’s hearing.

Your comments will be entered into the formal
record of public comments on the Draft EIS, and they will be
given the same consideration as oral comments offered here
tonight.

If you choose to mail in comments, please note
that they must be postmarked by March 34th, 2003, to be
considered in the final EIS.

(SLIDE NO. 5 - ADMINISTRATIVE POINTS - continued)

Also, if you would like to receive a copy of the
final EIS when it becomes available, there are several ways
you can do that. If you have already received a Draft EIS
in the mail, you are already on the mailing list and will
automatically receive the final EIS, unless you tell us
otherwise. If you provide either oral or written comments,
you will be sent a copy of the final EIS. If you are not on
the mailing list, you may fill out a request at the
registration table.

You can also request a copy by sending an e-mail
to the address listed on the handout. Also, copies of the
final EIS will be placed in area libraries. A list of those
libraries is available at the registration table and can
also be found in the Draft EIS.

The final EIS will also be put on the Missile
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
The conceptual GMD element would consist of the components shown on the slide. These components are the
Ground-Based Interceptors existing early warning radars and satellites; the X-Band Radar, which performs tracking,
discrimination, and assessment of the incoming missile; the
Defense Support Program or Space-Based Infrared System; the
Battle Management Command and Control, which is the central
communications and control points; and finally, the In-Flight
Interceptor Communications System Data Terminal, which --
which transmits commands to the Ground-Based Interceptor
while the interceptor is in flight.

(SLIDE NO. 9 - PROPOSED GMD EXISTING SITES AND COMPONENTS)
The GMD Joint Program Office is proposing to
conduct more operationally realistic testing of the GMD
element of the Ballistic Missile Defense System. This slide
indicates the proposed locations for the various components
in the Extended Test Range.

Of particular interest here, locally, down at the
bottom of the screen, you'll see the Vandenberg, with the
IdT, which is the In-Flight Interceptor Communications Data
Terminal, which alters the interceptors shown as OBI,
Ground-Based Interceptor, and targets. Targets are already
being launched for the program at Vandenberg. Nearby, the
Sea-Based Test X-Band Radar and IdT, one potential home port
for the OBI is San Nicholas Island down off Port Hueneme.

8

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
to the interceptor during flight, while a radar on Guam is
used as a tracking sensor. For some tests, target missiles
are also launched from the Kodiak Launch Complex and viewed
by the Early Warning Radar at Beale Air Force Base. Current
capability does not exist to launch target missiles from the
Pacific Missile -- excuse me -- the current capability does
exist to launch target missiles from the Pacific Missile
Range Facility as well. These scenarios present a very
limited capability to demonstrate the effectiveness of the
GMD element because the Ground-Based Interceptor can only be
launched from the Reagan Test Site. This limits our ability
to test the system in an operationally realistic
environment.

(SLIDE NO. 11 - CONCEPTUAL EXTENSION OF GMD TEST RANGES)

The extension of the existing GMD test range would
increase the realism of GMD testing by using multiple
engagement scenarios, trajectories, geometries, distances,
speeds of targets, and interceptors to closely resemble an
operational scenario involving attack by one or more threat
missiles. We are proposing to add dual launch -- dual
target and Ground-Based Interceptor launch capability at
Kodiak Launch Complex and/or at Vandenberg Air Force Base.
Also proposed are mobile target launch capability and
shipborne radars. The extended test range would provide
more operationally realistic flight testing, as President

1 Bush and Congress have directed.
2 (SLIDE NO. 12 - CONCEPTUAL SEA-BASED TEST X-BAND RADAR)
3 A Sea-Based -- a Sea-Based Test X Band Radar, or
4 SBX, is proposed to support the embedded test Range
5 flight-testing. This SBX is a multi-function radar that
6 performs tracking, discrimination, and intercept assessment
7 of incoming target missiles. The SBX would be assembled at
8 an existing shipyard on the United States Gulf Coast.
9 (SLIDE NO. 13 - POTENTIAL SUPPORT BASES AND
10 CONCEPTUAL SBX PERFORMANCE REGIONS)
11 Three conceptual SBX performance regions have been
12 identified to accomplish effective radar coverage for flight
13 testing. The SBX would operate within the confines of one
14 of the three performance regions based on the needs of the
15 particular flight-test scenario. Potential primary support
16 bases have been identified, based in part on their proximity
17 to these performance regions. Approximately 60 to 120 days
18 before GMD operational tests, the SBX would leave the
19 Primary Support Base to travel to its performance region in
20 the Pacific Ocean.
21 The SBX would be stationed at its primary support
22 base between flight test missions. The SBX would have a
23 deep draft, which would restrict it from many harbors. The
24 SBX may dock at a deep draft pier if it is available between
25 missions. If a pier is not available -- is not available

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

1 target launcher from the Pacific Missile Range Facility and
2 mobile target launch platform. Construction of two
3 ground-based interceptor sites, an additional target launch
4 pad and associated support facilities would be needed at the
5 Kodiak Launch Complex. We would also construct an In-Flight
6 Interceptor Communications System Data Terminal at the
7 Kodiak Launch Complex, and at a location in the
8 mid-Pacific. The SRE would be used in tests for tracking,
9 discrimination, and assessment of target missiles.
10 (SLIDE NO. 16 - PROPOSED ACTION - ALTERNATIVE 2)
11 Alternative 2 would be similar to Alternative 1,
12 with the exception that Ground-Based Interceptor Launches
13 would be from Vandenberg Air Force Base instead of from the
14 Kodiak Launch Complex. The Ground-Based Interceptor launch
15 would require construction of an In-Flight Interceptor
16 Communications System Data Terminal and modification of
17 existing support facilities at Vandenberg Air Force Base.
18 (SLIDE NO. 17 - PROPOSED ACTION - ALTERNATIVE 3)
19 Alternative 3 would combine activities proposed
20 for Alternatives 1 and 2, and would include ground-based
21 interceptor launchers from both the Kodiak Launch Complex and
22 Vandenberg Air Force Base, and construction of the required
23 support facilities.
24 (SLIDE NO. 18 - NO ACTION ALTERNATIVE)
25 Under the No Action Alternative, the GMD
Extended
the Program Manager for the preparation of the EIS on behalf
1 of the Missile Defense Agency.
2
3 (SLIDE NO. 21 - DRAFT EIS PROCESS)
4 As you may be aware, the first phase in the
5 preparation of an EIS is to conduct what is called a
6 scoping, to identify environmental and safety issues that should be
7 addressed in the Draft EIS. Public scoping meetings were
8 held in Kodiak, Anchorage, Adak and Valdez, Alaska;
9 and Lompoc, California; Honolulu, Hawaii; and Seattle,
10 Washington. Other informal scoping sessions with federal
11 and state agencies were held to obtain your views concerning
12 the proposed action, its alternatives and the potential
13 environmental effects within their areas of expertise, or
14 which are of particular concern to them. Following scoping,
15 the next step was to further refine the possible
16 alternatives being considered for the GMD Extended Range
17 Testing. The Draft EIS was then prepared to address
18 reasonable alternatives, including the No Action
19 Alternative, reasonably foreseeable future actions, and
20 information on cumulative effects. The Draft EIS has been
21 made available to federal and state agencies and to the
22 general public for review and comment for a period of 45
23 days. During this comment period, public hearings are being
24 held to receive public input. That brings us to this
25 hearing tonight.

1 (SLIDE NO. 22 - FINAL EIS PROCESS)
2 All of the comments received will be reviewed and
3 considered in preparing the final EIS. The final EIS will
4 then be made available to the public for a period of 30
5 days. No sooner than 30 days after the release of the final
6 EIS, the Missile Defense Agency will make public its
7 decision on whether to proceed with the GMD Extended Test
8 Range activities.
9 (SLIDE NO. 23 - ENVIRONMENTAL AREAS CONSIDERED)
10 The Missile Defense Agency identified 15
11 environmental resource areas that normally require some
12 level of analysis in an EIS. The Draft EIS has focused on
13 those areas with the most potential for environmental
14 impacts. Each resource area was -- was addressed at each
15 location unless it was determined through initial analysis
16 that the proposed activities would not result in an
17 environmental impact to that resource.
18 (SLIDE NO. 24 - SCOPE OF THE DRAFT EIS)
19 The Draft EIS analyzed the environmental issues
20 associated with implementing the proposed action or its
21 alternatives. In addition, the Draft EIS analyzed the
22 environmental issues associated with licenses or permits
23 required to implement the proposed actions at each of the
24 potential extended test range sites.
25 The Draft EIS has incorporated by reference

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Under Health and Safety, the Proposed Action will not increase the risk to workers and the general public of current operations. Notices of launches will continue to be announced in advance. Launch activities would be within the current level of activities.
Minimal impacts of land use would occur as a result of site preparation of new construction. All of the proposed activities would be in accordance with Coastal Zone Consistency requirements.

LOMPOC, CALIFORNIA

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

1. Lodging shortage, the Missile Defense Agency is considering
2. the construction of an addition to the Narrow Cape Lodge
3. and/or construction of an additional mess,
4. (SLIDE NO. 28 - POTENTIAL ENVIRONMENTAL IMPACTS
5. continued- NAVAL BASE VENTURA COUNTY,
6. NAVAAL STATION EVERETT, ADAK, VALDEZ, AND PEARL HARBOR)
7. At the Naval Base Ventura County, near Oxnard,
8. California, an Electromagnetic Radiation/Electromagnetic
9. Interference survey and analysis would be conducted as a part of the spectrum certification and frequency allocation process. The results of the survey would be used to define the safe operating area for the SEK. This area would not interfere with airspace operations and would allow for a safe operating environment.
10. The small quantities of potentially hazardous materials used during construction activities would result in generation of waste that would be handled by Naval Division Ventura County under their normal waste management procedures. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practical, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping decks clear of debris, cleaning spills and residue...
and engaging in spill and pollution prevention practices, in
design or routine operation. Handling and disposal of
hazardous materials and hazardous waste would be in
accordance with the State of California, Department of
Transportation and Department of Defense policies and
procedures. Implementation of SMR operational safety
procedures, including establishment of control areas, and
limitations in the areas subject to illumination by radar
units, would preclude any potential safety hazard to either
the public or workforce.

As you can see, the Draft EIS analyzed these
resource areas for other potential primary support bases at
Naval Station Everett, Washington; Adak and Port of Valdez,
Alaska; and Pearl Harbor, Hawaii. Impacts at each of these
sites are expected to be minimal.

In closing, please keep in mind that our goal is to
provide the decision makers with accurate information on
the environmental consequences of this proposal. To do
this, we are soliciting comments on the proposed SMS
Extended Test Range Testing. This feedback will support
informed decision-making.

SLIDE NO. 29 - PUBLIC COMMENT PERIOD AND ADDRESS

In addition to tonight’s hearing, written comments
on the Draft EIS will continue to be accepted until March
24th, 2003, at the address shown on the slide. After the
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

LOMPOC, CALIFORNIA

1 name of those of you who indicated you would like to make
2 comments tonight. As I mentioned earlier, elected officials
3 will be given the courtesy of speaking first. Are there any
4 elected officials here tonight who, even though you did not
5 sign a registration card, would like to speak? I don't have
6 any handed to me. Okay, we have a reserved area here in the
7 front. This front row across is the reserved area for those
8 who wish to make comments tonight. I will be calling on you
9 in the order in which you signed up. I will start out by
10 calling the first several names so you can get ready to come
11 up front here to use the podium. Because we want to record
12 your comments fully and accurately, we ask that you speak
13 clearly into the microphone. Because of the acoustics in
14 this room, it will be especially important that you speak
15 clearly in order to make certain that the court reporter can
16 capture everything you say. Also, at the beginning of your
17 speaking time, please state your full name for the court
18 reporter.
19
20 We kindly request that you observe the four-
21 minute time limit for oral comments. We use the four-minute
22 limit at these hearings to give everyone a fair and equal
23 chance to make their comments. To aid you in knowing when the four minutes are
24 up, I have a simple method for indicating time. After
25 three minutes I will raise my index finger, indicating that
26 you have one minute left. This -- this should help you find
27 a comfortable place to wrap up your comments. At the end of
28 four minutes, I will raise my closed hand indicating it is
29 time to finish your comments. So it is important to look up
30 from your paper occasionally to see if you are being given a
31 signal.
32
33 I have one other request that need to be enforced
34 for the sake of the court reporters that is, you must
35 withhold any expressions, either against or in favor of the
36 speaker until the speaker is finished. Otherwise, there's
37 no way that the court reporter can get all of the comments.
38 So while you may agree with the speaker by clapping or
39 speaking out, you are probably making certain we are not
40 capturing the comments on the record. Please hold all of
41 your expressions until the speaker is finished. Thank you
42 in advance for your cooperation.
43
44 We also greatly appreciate your cooperation and
45 understanding in observing the four minute limit. Also keep
46 in mind that oral comments are only one way to share your
47 thoughts and concerns regarding the Draft H12. You can also
48 hand in written comments tonight, e-mail them, or submit
49 them by regular mail by March 24, 2002.
50
51 As I mentioned, written comments are given the
52 same consideration as oral comments offered here tonight.
53
54 With that in mind, we will begin.
LOMPOC, CALIFORNIA

Our first speaker is Sheila Baker, and Sheila will be followed by MacGregor Eddy, Elden Bud Booth, James Carucci, and Robert Parker.

Those persons would come and sit in the front row up here. Thank you.

SHEILA BAKER,

offered public commentary on the GMD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MS. BAKER: Hello, my name is Sheila Baker, and I'm from San Luis Obispo County, and I would like to thank you for offering this opportunity for us to comment and also say no thank you for this whole system. I'm against this system. There are several reasons, expensive, very very expensive, and I think at a time when our counties and our state and our country is really suffering financial burdens, it's ridiculous.

Regardless the environment, it kind of hurts my heart to hear that San Nicholas Island is being involved in this. It's a beautiful place. The ocean around it is beautiful.

There was a -- there have been a couple of rocket explosions, missile explosions. One of them was a belief, was the fifth WDL that when it exploded down, they had to

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
LOMPOC, CALIFORNIA

1. MACOOGGRODDY.
2. offered public commentary on the OMB Extended Test Range.
3. Draft Environmental Impact Statement (EIS) as follows:
4. MS. EDGY: Hello, my name is Gordo Edgy, I'm a registered nurse, and I'm particularly interested in the health and safety consequences of any public program using our tax dollars.
5. There's a few things that I am think are unsaid behind what is being presented here today. The first is, is that this program is necessary because the initial program was a colossal and publicly embarrassing waste of money and --
6. internationally and nationally, and there is no guarantee that the second one will not be that. Certainly it will be a colossal amount of money.
7. As to what we get for it, we need to take a look.
8. What are we -- what are we spending our money on? I pick up this newspaper, it's every newspaper in California right now is talking about, for lack of eight billion dollars, which is a minuscule part of what's being spent here, gang prevention programs in L.A., fire programs, parks and recreational, all being cut. So that's the first thing is the money.
9. The second thing is that the main environmental justification in the program that is used most often is

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
LOMPOC, CALIFORNIA

1 concern -- and the money could be better used for production.
2 -- for protection against, for example, gangs in Los
3 Angeles.
4 And then the third concern that I have is that the
5 example that we set for the rest of the world as the world's
6 wealthiest nation and the world's, now, only super power,
7 the victors in the cold war, the example that we set for the
8 priorities for poorer nations to spend their wealth on
9 weapons rather than the health and well being and the future
10 of all the children.
11 So someone once said about the initial space
12 program, that it's not that we set foot on the moon, it's
13 that we set eye on the earth. That we looked at the earth
14 and realized that this is our planet and we're all
15 responsible for it.
16 So would like to say that the best action would
17 not only be no expansion of this Missile Defense Program,
18 but to stop the currently operating ones. That's what would
19 be environmentally sensitive.
20 Thank you very much for your time.
21 MS. ELLIOTT: Elden Bud Boothe.
22 ///
23 ///
24 ///
25 ///

ELDEN BOOTHE,

1 offered public commentary on the DND Extended Test Range
2 Draft Environmental Impact Statement (EIS) as follows:
3
4 MR. BOOTHE: My name is Elden Boothe. I view this EIS
5 as an exercise in futility. The military industrial complex
6 will get whatever money it can from whatever they want from
7 the supine congress that is in control of our country.
8 how this system is designed, they say, to protect
9 us from a nonexistent threat, from a nonexistent enemy.
10 Therefore, it can never be proven to be a failure, since it
11 will never be used. The cold war MAD system that will
12 have, Mutual Assured Destructive, has served us well.
13 Now we very carefully point out, our leaders very
14 carefully point out, that this system is not designed to
15 protect us from Russia and China, the only two countries
16 that could shoot a nuclear tip missile at this country. But
17 they say, those are our friends, so, therefore, we don't --
18 we don't design this system to protect from them.
19 It's a win-win situation for the Military
20 Industrial Complex, because since it will never be used, it
21 can never be proven that it does not work. Although,
22 leading scientists have said it can be overcome in many
23 different ways if any country was desired to attack us, that
24 will never happen.
25

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
1. But down the road, there is something that truly
does bother me. That is the upcoming Star Wars Program as
pointed out by the Space Command’s Vision For 2020, in which
Earth’s circling satellites with high intensity lasers,
fueled by nuclear reactors, encircling the globe, will be
able to destroy anything on earth. If that -- if that was
to come to pass -- and incidentally, that is -- the term for
that is Visions For 2020. That’s not vision 20/20 that’s
the year 2020. And if that -- if that was to come to pass,
our control of the earth would be complete, but in the
process, we could in fact be destroying the earth.
Thank you very much.
3. MR. ELLIOTT: James Carucci.
4. JAMES CARUCCI,
offered public commentary on the OMD Extended Test Range
Draft Environmental Impact Statement (EIS) as follows:
5. MR. CARUCCI: The regulations for implementing NEPA are
found in 40 CFR -- section 1501.7 says, about
6. scoping, says that an agency shall review their scoping. If
7. -- I want to read the quote correctly.
8. "If substantial changes are made later in the
9. Proposed Action, or if significant new circumstances or
information arises, which bear on the proposal or its
10.
11. impacts."
12. Clearly President Bush’s announcements to involve
13. Vandenberg in the placement of the weapons system has a
connection to this study and to the Extended Range. Not
stopping now and reworking is just not smart, as well as, I
think, against the regulations. I would strongly urge Space
Command, the Army, the contractors, to rethink their
position on this and rescope. There’s a connection between
the two.
14. 40 CFR 1508.8 defines affects as, “ecological,
aesthetic, historic, cultural, economic, social or health,
whether direct, indirect, or cumulative.”
15. How is the Extended Test Range, which then brings
the placement of four or five D --- Ground-Based Interceptor
silos to Vandenberg, how is that not an indirect impact,
having the test range first and the full system later?
16. Earlier, Commander Beeh, is it? Said, quote,
17. "targets are already being launched at Vandenberg."
18. unquote. Soon you’ll be able to say GBI is already being
Launched from Vandenberg, unquote.
19. It seems to me there’s a plan to make this EIS
proxy, or a prequel, prequel document to the placement of
the weapons system. Vandenberg has not had active weapons
since the Atlas was stood down around 1965. So from 1985 to
1995, we had nuclear weapons at Vandenberg. The first

nuclear weapons stood on alert at Vandenberg. Now you're
brining us active weapons. Don't call them defensive
weapons, they're active. You have a choice to launch them.
It seems, again, that whether this effect is
direct or indirect, there's clearly a connection between the
Extended Test Range and the four GMI weapons to be implanted
at Vandenberg. I would urge the Army and the Air Force to
rethink this EIS and to bring it all together in one
document. Thank you.

MR. ELLIOTT: Robert Parker.

ROBERT PARKER,
offered public commentary on the GMI Extended Test Range
Draft Environmental Impact Statement (EIS) as follows:

MR. PARKER: My name is Robert Parker, and it's a
mystery to me why these public hearings are even held.
They're a waste of the taxpayers' money, because this
conclusion to this environmental review, it was already
decided and this is all a waste of time. It's just a
charade.

But I have doubts about the credibility and the
integrity of the military officials, the different agencies
that might be involved in this. I can tell you from
my personal experience that the Air Force, several or many of

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1  the people there, from the Commander of Air Force Space
2  Command down, would prefer to pull a tree to tell a lie
3  than stand on the ground and say the truth.
4  And in the 1960's, near the Dugway Proving
5  Grounds, or down in there, 4,000 sheep dropped over dead, and
6  the Army denied responsibility. We all know what happened
7  about Pearl Harbor, how Admiral Nimitz and General Short
8  were made scapegoats.
9  So if there is an accident, we're not -- we can't
10 -- these people will tell you will a lie, straight-faced,
11  look you right in the eye and tell you a damn lie, and if
12  this is your, or if the concern to safety is sincere and
13  genuine, what should be done is issue cyanide pills to every
14  man, woman, and child that might be anywhere near this when
15  there's an accident, and there will be an accident. Then
16  these people will avoid an agonizing death. Cause there's
17  gonna to be blunders. And if the people who are pushing
18  this system are really sincere, they should go and live in
19  and near these areas and prove their sincerity, as to
20  whether the possibility of an accident. Thank you.
21  MR. ELLIOTT: Justin Hughes.
22  ///
23  ///
24  ///
25  ///
JUSTIN RUGGE,

offered public commentary on the GMD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MR. RUGGE: Yes, Justin Rugge, and I would like to comment on the EIS and in support of what I have seen so far. I think we have to reflect on the fact that we've been testing vehicles here at Vandenberg for many, many years. There is a proven environmental credibility here which can be used to apply to any new activities, and there has never been any proven detrimental effect on people or the environment, based on the testing that's had -- has gone on before. And I think it's not a great leap of faith to say that we can go ahead with further testing of the type presented here.

I think we have to work on good engineering, environmental data and take it from there. That's the history of engineering development, and this is a good viable program, as far as environmental considerations are concerned.

I support this program. I think we have to look at the fact that for the last 50 years we have had no deterrent whatsoever except a nuclear deterrent, and the missile and missile technology being developed here will be useful in the future to apply it to other scenarios and

other situations whether it's applied here smartly or not.

The fact is we need this technology.

I can only point out again, as I pointed out at this last meeting here, in that 12 years ago we had a nut running around in Iraq named Saddam Hussein, and he started shooting his SCUDS at everybody in the region, and as a part of his activity he killed 26 Americans, and -- by one of the SCUDS that was shot down early on, but the warhead continued to tumble into the area around Saudi Arabia.

This missile system we're proposing here is meant to get the missiles early so that that type of thing doesn't happen, and we only improve our protection in the world from people like Saddam Hussein, who should be put out of his misery sooner than later, by developing systems like this and being ready. Not waiting until somebody drops a bomb on you before you start thinking about it.

So I hope that you'll be able to conclude what you're doing here in the development of this EIR and put out the final version of it, of the EIS, and it will not deter in any way your plans to get this system developed. Thank you.

MR. ELLIOTT: That is all the cards that I have. Is there anyone who did not turn in a card and would like to make comments?
LOMPOC, CALIFORNIA

1 LOVIN BRONSON.
2 offered public testimony on the Draft GM Extended Test
3 Range Environmental Impact Statement (EIS) as follows:
4
5 MR. BRONSON: My name is Lorin Bronson and I live in
6 Lompoc. North Korea can make us now. We have a moral
7 obligation to defend ourselves. You opponents are the same
8 people who are wrong about communism and our policy in
9 Southeast Asia. You were at that time, and still are,
10 unwilling to accept responsibility for helping murder
11 2,000,000 Cambodians.
12 As for the environment, free countries have the
13 best environment. It's the dictatorships that have the
14 worst environment.
15 MS. ELLIOTT: Sir?
16 MR. BRONSON: Yes.
17 MS. ELLIOTT: May I request you to fill out this card
18 for me, please. Thank you.
19 MR. PARKER: I have a question for you. How can you --
20 hey, sir --
21 MR. BRONSON: You're out of order.
22 MR. PARKER: I am not.
23 MR. BRONSON: Yes, you are.
24 MS. ELLIOTT: Yes, sir. Is there anyone else who have
25 not spoken that --

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
1 REPORTER'S CERTIFICATE
2 PUBLIC HEARING
3 GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST RANGE
4 ENVIRONMENTAL IMPACT STATEMENT
5
6 State of California  )
7 ) ss.
8 County of Santa Barbara  )
9
10 I DIANA L. SOLIS, CSR 9715, Certified Shorthand
11 Reporter of the State of California, for the County of Santa
12 Barbara, do hereby certify that the foregoing pages are a
13 true and correct transcript of the proceedings held on
14 February 25, 2003, in the above-entitled cause.
15
16 DATED: Santa Maria, California, this 26th day of March,
17 2003.
18
19
20 DIANA L. SOLIS, CSR 9715
21 Certified Shorthand Reporter
22
23
24
25

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
OXNARD, CALIFORNIA

PUBLIC HEARING
ON THE
GROUND-BASED MIDCOURSE DEFENSE
EXTENDED TEST RANER
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Hearing Held
February 24, 2003
6:30 p.m.
at
Oxnard Public Library
251 South A Street
Oxnard, California

REPORTED BY: Kristy K. Keener, CSR No. 6422
Santa Barbara Court Reporting Company
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APPEARANCES:

Julia Elliott
Hearing Moderator

U.S. Army Space and Missile Defense Command

Commander Robert Dees
Ground-Based Midcourse Defense X-Band Radar
Project Office

Sharon Mitchell
U.S. Army Space and Missile Defense Command

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Oxnard, California: Monday, February 24, 2003
6:30 p.m.

Ms. Elliott: Good evening, Ladies and gentlemen. Thank you for coming tonight. I am Julia Elliott, and I am with the U.S. Army Space and Missile Defense Command. I have been asked by the Missile Defense Agency to serve as the moderator for tonight's hearing. This is one of seven public hearings being held on the Ground-Based Midcourse Defense Extended Test Range Draft Environmental Impact Statement. During tonight's hearing, we will refer to the Ground-Based Midcourse Defense as GMD, and we will refer to the Draft Environmental Impact Statement as the DENV.

This public hearing is being held in accordance with provisions of the National Environmental Policy Act and implementing regulations. This act requires federal agencies to consider the potential environmental impacts of their activities in the decision-making process.

The purpose of tonight's hearing is to provide you with information on the GMD program and proposed GMD Extended Test Range activities. We will also summarize
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
written comments that you brought with you tonight, either to me or to a person at the registration table. Second, you may use the written comment sheets that are available at the registration table to write down any comments that you wish to make and turn them in tonight. Third, you may mail written comments to the same address that appears on the comment sheet. Or, last of all, you may e-mail comments to the address listed on the handout for tonight's hearing.

Your comments will be entered into the formal record, and they will be given the same consideration as oral comments offered here tonight.

If you choose to mail in comments, please note that they must be postmarked by March 26, 2003, to be considered in the Final EIS.

(SLIDE NO. 5 - ADMINISTRATIVE POINTS - continued)

Also, if you would like to receive a copy of the Final EIS when it becomes available, there are several ways you can do that. If you have already received a Draft EIS in the mail, you are already on the mailing list and will automatically receive the Final EIS unless you tell us otherwise. If you provide either oral or written comments, you will be sent a copy of the Final EIS. If you are not on the mailing list, you may fill out a request at the registration table. You can also request a copy by sending an e-mail to the address listed on the handout. Also, copies of the Final EIS will be placed in area libraries. A list of those libraries is available at the registration table and can also be found in the Draft EIS. The Final EIS will also be put on the Missile Defense Agency Web site listed on the handout.

Finally, it is important for you to understand that the Government representatives are not here tonight to make any decision. Their main purpose in being here is to listen firsthand to your suggestions and concerns.

And with that, we will begin with Commander Dee's presentation.
would like to describe the overall concept of the
Ballistic Missile Defense System under development and
explain the different segments of the System.
(SLIDE NO. 7 - BALLISTIC MISSILE DEFENSE SYSTEM)
This chart represents the flight of a ballistic
missile. A ballistic missile flight path has three
basic parts which we call segments. Those segments are
the boost segment, when the missile is thrusting and
leaving the atmosphere; the midcourse segment, or the
middle or ballistic phase; and the terminal segment,
where the missile re-enters the earth's atmosphere.
Within each of these segments, our missile program has
to this point been characterized by discrete,
individual programs, which we call elements. Each
element worked to shoot down ballistic missiles in a
particular segment of flight.
Now, however, the Missile Defense Agency is now
moving towards an integrated Ballistic Missile Defense
System. Instead of having discrete, stand-alone
elements, we plan to eventually tie the programs for the
various elements together so we can shoot down missiles
in all segments of flight. Each segment of the
Ballistic Missile Defense System could include several
elements, which are different ways of providing a
defense against the threat missile during the same phase
of its flight. All segments and elements are designed
to work together as each element is developed. At the
same time, each element could provide an effective
stand-alone defense against a specific type of threat.
The GMD element is the Midcourse Defense
Segment of the Ballistic Missile Defense System. The
GMD element is the successor to National Missile Defense
and includes the same components.
(SLIDE NO. 8 - REPRESENTATIVE GMD CONCEPT)
The conceptual GMD element would consist of the
components shown on the slide. These components are the
Ground-Based Interceptors existing early warning radars
and satellites; the X-Band Radar, which performs
tracking discrimination and assessment of the incoming
missiles; the Defense Support Program for Space-based
Infrared System; the Ballistic Management Command and
Control, which is the central communications and control
points and, finally, the In-Flight Interceptor
Communications System Data Terminal, which transmits
commands to the Ground-Based Interceptor while the
interceptor is in flight.
(SLIDE NO. 9 - PROPOSED GMD SiteS AND COMPONENTS)
The GMD Joint Program Office is proposing to
conduct more operationally realistic testing of the GMD
element of the Ballistic Missile Defense System. This

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
slide indicates the proposed locations for the various
components in the Extended Test Range.

Two elements are of particular concern for us
in this area. One is the Sea-Based Test XLR and IDT
pictured down here. We've also got Vandenberg Air Force
Base, just down the road, which has targets,
interceptors, and IDT.

The GMD testing would be of two types. One
type of testing would involve increasingly robust
Ground-Based Interceptor flight testing in the Pacific
region in scenarios that are as operationally realistic
as possible. The other type would involve validation of
the operational concept through integrated ground tests
using GMD components. These are tests using Fort Greely
and other locations analyzed in the GMD Validation of
Operational Concept Environmental Assessment. These
ground tests do not involve missile flights or:
intercepts.

The Draft EIS, which is the subject of this
hearing, evaluates the first type of GMD testing
involving interceptor flight testing. This interceptor
flight testing will be the focus of our discussion	onight.

(SLIDE NO. 10 - CURRENT GMD TEST RANGE)

As you can see from this slide, the existing

Interceptor test capability includes the use of Kodiak
Launch Complex, Vandenberg Air Force Base, the Pacific
Missile Range Facility, and the Reagan Test Site at
Kwajalein Atoll in the Marshall Islands. Current
testing includes launching target missiles from
Vandenberg Air Force Base, and launching Ground-Based
Interceptors from the Reagan Test Site, with
interceptors occurring over the broad ocean area. The
ground-based radar prototype at the Reagan Test Site is
used to track, discriminate, and provide updates to the
interceptor during flight, while a radar on Oahu is used
as a tracking sensor.

For some tests target missiles are also
launched from the Kodiak Launch Complex and viewed by
the Early Warning Radar at Beale Air Force Base.
Current capability does exist to launch target missiles
from the Pacific Missile Range Facility as well. These
scenarios present a very limited capability to
demonstrate the effectiveness of the GMD element because
the Ground-Based Interceptor can be launched only from
the Reagan Test site. This limits our ability to test
the system in an operationally realistic environment.

(SLIDE NO. 11 - CONCEPTUAL EXTENSION OF GMD TEST RANGE)
The extension of the existing GMD test range
would increase the realism of GMD testing by using
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

primary support base and the test location, periodic radar operation for satellite and calibration device tracking including joint satellite tracks with GMD sensors and other pre-mission activities may also occur.

(SLIDE NO. 14 - PROPOSED TEST ACTIVITIES)
Activities analyzed in the Draft EIS, which may meet some of the enhanced test objectives include launching target and/or interceptor missiles from the Kodiak Launch Complex, adding interceptor launch missiles from Vandenberg Air Force Base, and launching target missiles from mobile platforms over the broad ocean area. The target and interceptor missiles could be launched in sets of two under some testing scenarios from either the Kodiak Launch Complex, the Reagan Test Site, or Vandenberg Air Force Base.

In-Flight Interceptor Communications System Data Terminals would be constructed in close proximity to the proposed Ground-Based Interceptor launch sites and expected intercept areas. Existing Launch sites and test resources would continue to be used in enhanced test scenarios. Launching Ground-Based Interceptors from the Kodiak Launch Complex may require up to two additional small mobile radars and telemetry stations in South Central or Southwest Alaska for telemetry and flight safety.

Existing shipborne sensors would be used for mid-course tracking of the target missile during Ground-Based Interceptor launches from both the Kodiak Launch Complex and Vandenberg Air Force Base. The Sea-Based Test X-Band Radar would be constructed and used in tests to perform tracking, discrimination, and assessment of target missiles.

(SLIDE NO. 16 - PROPOSED ACTION - ALTERNATIVE 1)
The Draft EIS analyzed three alternatives for the GMD extended test range testing. For Alternative 1 we would propose the following components: First, single and dual launched Ground-Based Interceptor Launches from the Kodiak Launch Complex and the Reagan Test Site; second, single and dual target launches from the Kodiak Launch Complex, Vandenberg Air Force Base, and the Reagan Test Site; and third, single target Launches from the Pacific Missile Range Facility and a mobile target launch platform.

Construction of two Ground-Based Interceptor silos and an additional target launch pad and associated support facilities would be needed at the Kodiak Launch Complex. We would also construct an In-Flight Interceptor Communications System Data Terminal at the Kodiak Launch Complex and at a location in the 
mid-Pacific. The SKE would be used in tests for
tracking, discrimination, and assessment of target
missiles.

( SLIDE NO. 16 - PROPOSED ACTION - ALTERNATIVE 2)

Alternative 2 would be similar to Alternative
1, with the exception that the Ground-Based Interceptor
launches would be from Vandenberg Air Force Base.

The Ground-Based Interceptor launch would require construction of an
In-Flight Intercepta Communications System Data
Terminal and modification of existing support facilities
at Vandenberg Air Force Base.

( SLIDE NO. 17 - PROPOSED ACTION - ALTERNATIVE 3)

Alternative 3 would combine activities proposed
for Alternative 1 and 2 and would include Ground-Based
Interceptor launches from both the Kodiak Launch Complex
and Vandenberg Air Force Base and construction of the
required support facilities.

( SLIDE NO. 18 - NO ACTION ALTERNATIVE)

Under the No Action Alternative, the GMD
Extended Test Range would not be established, and
interceptor and target launch scenarios would not be
tested under more operationally realistic conditions.
The SKE would not be developed. Testing at the existing
GMD test ranges using existing launch areas would
continue.

(SLIDE NO. 19 - MISSILE DEFENSE AGENCY’S
DECISION TO BE MADE)

The decision to be made is whether to enhance
the current GMD flight test capability by selecting from
the list of alternatives presented, including the No
Action Alternative.

The Missile Defense Agency is still evaluating
the feasibility, safety, and utility of the GMD testing
program of conducting a limited number of checkout
Ground-Based Interceptor flight tests from Fort Greely.
The possibility of such flights is too speculative to be
analyzed at this time. The Missile Defense Agency will
perform an EIS if and when it proposes to conduct
Ground-Based Interceptor flight tests from Fort Greely.

This concludes the Program Overview. I would
like to introduce Ms. Sharon Mitchell, who will describe
the Environmental Analysis Process.

MS. MITCHELL: Hello, my name is Sharon
Mitchell. I’m with the U.S. Army Space and Missile
Defense Command. I’m the program manager in regards to
preparation of the EIS on behalf of the Missile Defense
Agency.

(SLIDE NO. 21 - DRAFT EIS PROCESS)
The National Environmental Policy Act requires
that federal agencies consider environmental
consequences of their proposed actions in their
decision-making process. The Missile Defense Agency has
decided to prepare an EIS under the National
Environmental Policy Act to analyze the environmental
effects of extending the current GMD Test Range.
As you may be aware, the first phase in the
preparation of an EIS is to conduct what is called
scoping to identify environmental and safety issues that
should be addressed in the Draft EIS. Public scoping
meetings were held in Kodiak, Anchorage, Adak, and
Valdez, Alaska; Oxnard and Longos, California; Honolulu,
Hawaii; and Seattle, Washington. Other informal scoping
sessions with federal and state agencies were held to
obtain their views concerning the proposed action, its
alternatives, and potential environmental effects within
their area of expertise or which are of particular
concern to them.

Following scoping, the next step was to further
refine the possible alternatives being considered for
the GMD Extended Range testing. The Draft EIS was then
prepared to address the reasonable alternatives,
including the no-action alternative, reasonably
foreseeable actions, and information on cumulative
effects. The Draft EIS has been made available to

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1  federal and state agencies and to the general public for
2  review and comment for a period of 45 days. During this
3  comment period, public hearings are being held to
4  receive public input. That brings us to this hearing
5  tonight.

(SLIDE NO. 22 - FINAL EIS PROCESS)
All of the comments received will be reviewed
and considered in preparing the Final EIS. The Final
EIS will then be made available to the public for a
period of 30 days. No sooner than 30 days after the
release of the Final EIS, the Missile Defense Agency
will make public its decision on whether to proceed with
the GMD Test Range activities.

(SLIDE NO. 23 - ENVIRONMENTAL AREAS CONSIDERED)
The Missile Defense Agency identified 15
resource areas that normally require some level of
analysis in an EIS. The Draft EIS has focused on those
areas with the most potential for environmental
impacts. Each resource area was addressed at each
location unless it was determined through initial
analysis that the proposed activities would not result
in an environmental impact to that resource.

(SLIDE NO. 24 - SCOPE OF THE DRAFT EIS)
The Draft EIS analyzed the environmental issues
associated with implementing the Proposed Action or its

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
alternative. In addition, the Draft EIS analyzed environmental issues associated with licenses or permits required to implement the proposed action at each of the potential extended test range sites.

The Draft EIS has incorporated by reference several existing environmental analyses associated with current Ballistic Missile Defense System test assets that include Krotov Launch Complex, the Reagan Test Site, the Pacific Missile Range Facility, and Vandenberg Air Force Base. Also incorporated by reference is the analysis of environmental impacts contained in the GMT Validation of Operational Concept Environmental Assessment.

The Draft EIS also analyzed the potential for cumulative impacts from other Department of Defense, Government, and commercial activities in areas where the GMT actions are proposed.

The potential environmental impacts identified in the Draft EIS are presented in the next several slides. For your convenience, this information has been reproduced as a fact sheet, which is available at the registration table, for your review. I would like to highlight a few resource areas that may be important to you. As you can see, minimal impacts were identified from implementation of the proposed action. Most of the impacts are minimal because the proposed actions are a continuation of existing activities at the various locations.

At the Naval Base Ventura County, an Electromagnetic Radiation/Electromagnetic Interference survey and analysis would be conducted as part of the spectrum certification and frequency allocation process. The results of the survey would be used to define a safe operating area for the SHN. The area would not interfere with airspace operations and would allow for a safe operating environment.

Small quantities of potentially hazardous materials used during the construction activities would result in generation of solid waste that would be handled by Naval Base Ventura County under their normal waste management procedures. The Sea-Based Test X-Band Radar would follow U.S. Navy requirements that, to the maximum extent practicable, ships shall retain hazardous waste aboard ship for shore disposal. In compliance with the Uniform National Discharge Standards, the Sea-Based Test X-Band Radar vessel would incorporate marine pollution control devices, such as keeping their docks clear of debris, cleaning spills and residues, and

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
OXNARD, CALIFORNIA

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
EXHIBIT 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

Again, equal consideration will be given to all comments, whether they are presented here tonight, e-mailed, or submitted by regular mail to us.

Once the Final EIS is complete, we will mail it to all the individuals who have requested a copy. If you are not on our mailing list, you can request a copy by writing to the street address or e-mail address given in the handout or by filling out a card at the registration table.

I will now turn the hearing back over to Mr. Elliott.

MS. ELLIOTT: We will now break for a five-minute recess, and then we will begin taking your comments.

If you would like to make verbal comments, please complete the verbal comments card provided at the registration table and turn it in to a person at the registration table.

Please remember that no decision is being made tonight. The main purpose for the government representatives' presence here tonight is to learn firsthand of your concerns and suggestions.

Thank you for your comments and your courtesy during the evening.

(Brief recess.)

MS. ELLIOTT: We're ready to begin. We are ready to start calling out the names of those of you who indicated you would like to make comments tonight. As I mentioned earlier, elected officials will be given the courtesy of speaking first. We have a reserved area, which are the first six seats up here, and those are the six seats over here to my left. I would appreciate it if those elected officials who plan on speaking would begin taking their way up here and occupying those seats. We have in order Judy Mikels, Brian Miller, Charlotte Crenna, Robert Lagomarsino, Frank Bobilo, Anthony Volante, Kathy Long, and Alex Herrera.

Is that correct?

I have a list of people signed up so far. I will be calling on you in the order in which you signed up. I will start out by calling the first several names so you can get ready to come up front here to use the microphone. And because we want to record your comments fully and accurately, we ask that you speak clearly into the microphone. Because of the acoustics in this room, it will be especially important that you speak clearly in order to make certain that the court reporter can capture everything you say. Also, at the beginning of your speaking time, please state your name for the court reporter.
OXNARD, CALIFORNIA

We kindly request that you observe the four-minute time limit for oral comments. We use the four-minute limit at these hearings to give everyone a fair and equal chance to make their comments.

To aid you in knowing when the four minutes are up, I have a simple method for indicating times. After three minutes, I will raise my index finger indicating that you have one minute left. This should help you find a comfortable place to wrap up your comments. At the end of four minutes, I will raise my closed hand indicating it is time to finish your comments. So it is important to look up from your paper occasionally to see if you are being given a signal.

I have one other request that will need to be enforced for the sake of the court reporter, and that is you must withhold any expressions either against or in favor of the speaker until the speaker is finished.

Otherwise there is no way that the court reporter can get all of the comments. So while you may be agreeing with the speaker by clapping or speaking out, you are probably making certain we are not capturing the comments on the record. Please hold all of your expressions until the speaker is finished, and thank you in advance for your cooperation.

We also greatly appreciate your cooperation and understanding in observing the four-minute limit. Also, keep in mind that oral comments are only one way to share your thoughts and concerns regarding the Draft EIS. You can also have written comments tonight, e-mail them, or submit them by regular mail by March 24, 2003. As I mentioned, written comments are given the same consideration as oral comments offered here tonight.

So with that, our first speaker, Judy Mikels.

JUDY MIKELS

offered public commentary on the OHD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MS. MIKELS: Thank you very much and welcome once again.

Are we on? I don’t think so.

I can yell real loud if it’s just the court reporter you’re worried about.

Okay, very quickly. We have -- I have submitted a letter as a formal written comment. So I will be very, very brief.

Welcome to Ventura County. I’m really here.

My name is Judy Mikels. I’m a Ventura County supervisor. I currently serve as chair of the board.
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

OXNARD, CALIFORNIA

1 and I'm also co-chair of Regional Defense Partnership
2 21st Century, which is a base support group, and I'm
3 merely here to tell you how supportive we are of our
4 Navy partners, how happy we are to have Naval Base
5 Ventura County and its employees here.
6 We have been briefed on the Sea-Based X-Band
7 Radar Test Platform. We would look forward to having it
8 here, and we would certainly welcome the personnel to
9 our county who would be involved in this very important
10 defense testing. You are always welcome here. I am
11 available at any time. I have left my card for any
12 technical comments. We'd be happy to do that.
13 We've reviewed -- I have reviewed at least the
14 executive summary of the XIR. I will admit that I will
15 never read the full XIR. I can't do that because you
16 never read all of those things. I don't understand
17 them. But it looks to me that you have done the
18 right and looked in the right corners, turned over the
19 right rocks, and the information that at least I have
20 been in the draft I am very comfortable with, and I
21 thank you for being here this evening and giving not
22 only myself but all of the citizenry of this area an
23 opportunity to comment on the Draft EIS.
24 Thank you.
25 MS. ELLIOTT: Brian Miller.

1 BRIAN MILLER
2 offered public commentary on the OMD Extended Test Range
3 Draft Environmental Impact Statement (EIS) as follows:
4 MR. MILLER: Thank you again for the
5 opportunity to comment. My name is Brian Miller. I am
6 the district chief of staff for Congressman Bilson
7 Gallegly. The congressman regrets not being here
8 tonight, but would like to add his strong support for
9 the siting of the Missile Defense Agency’s Sea-Based
10 X-Band Radar in San Nicolas Island. He too submitted a
11 letter at your earlier scoping meeting for the written
12 comment.
13 San Nicolas Island, which is located 60 miles
14 off the coast of Point Mugu and in part of Point Mugu’s
15 36,000-square-mile sea test range, would be an ideal
16 location for the X-Band for two reasons.
17 First, the range can be expanded north to Big
18 Sur, south to the U.S.-Mexican border, and west into the
19 Pacific Ocean, to include 126,000 square miles which
20 would be ample room for testing. Additionally, San
21 Nicolas Island has a 10,000-square-foot runway and
22 offers an unobstructed area over which the Navy and many
23 DoD activities currently test their weapon systems.
24 Second, the island is supported by an array of

P-T-0005
mainland facilities located at Naval Base Ventura
County. These include a naval-operated port, airlift
capabilities, Laguna Peak which rises 1,500 feet above
the ocean and hosts an instrumented extended
line-of-site coverage over the sea range and San Nicolas
Island, all of which is fiber-optically connected to a
wide variety of laboratories and command centers.
The Navy, Congress, and U.S. taxpayers have
contributed greatly to the unique capabilities that
currently exist at Point Magu, and these assets could be
easily leveraged to provide facilities required for the
extended test range without duplicating expensive
infrastructure.

Thank you.

MS. ELLIOTT: Thank you.

Charlotte Craven.

CHARLOTTE CRAVEN

offered public commentary on the GMD Extended Test Range
Draft Environmental Impact Statement (EIS) as follows:

MS. CRAVEN: Thank you for the opportunity to
speak here tonight. My name is Charlotte Craven. I'm
mayor of the city of Camarillo, California, and I'm vice
chairman of the Regional Defense Partnership for the

21st Century. I'm here to speak in favor of the
approval of the EIS to extend the GMD Test Range for
several reasons.

The missile activity is just a continuation of
ongoing activities. The local portion would be 60 miles
offshore at San Nicolas Island. The range would be off
the surface of the water away from marine life, and the
study found no new environmental issues. So I'm here to
state community support mainly for the Extended Test
Range using the San Nicolas Island facility as
appropriate in the testing.

MS. ELLIOTT: Thank you.

Robert Lagomarsino.

ROBERT LAGOMARSINO

offered public commentary on the GMD Extended Test Range
Draft Environmental Impact Statement (EIS) as follows:

MR. LAGOMARSINO: Very good. My name is Robert
Lagomarsino, and I am a former member of the U.S. House
of Representatives for some 10 years. Prior to that I
served 12 years in the California State Senate, and
before that I was on the City Council and mayor for the
City of Ojai.

I want to endorse and strongly go with the

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
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<tr>
<th>COMMENT NUMBER</th>
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<tr>
<td>1</td>
<td>spoken last time.</td>
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<td>2</td>
<td>And to put some advantages on the San Nicolas site, it's centrally located in the Pacific. There's no impact on commercial flights. I think this makes it fairly unique among the sites that you're looking for.</td>
</tr>
<tr>
<td>3</td>
<td>We already have the capabilities for support of it through the Pacific Missile Range and from Naval Base Ventura County, and I think it's more realistic to have a radar, X-Band Radar defending the continental United States right close off the offshore.</td>
</tr>
<tr>
<td>4</td>
<td>And in looking at the Draft EIS on page 33, with the Impact and Mitigation Summary, Naval Base Ventura County, Port Hueneme, the air quality, airspace, biological resources, hazardous materials, health and safety, utilities, and visual and aesthetic resources basically have no impact. And I think this is a sound decision, you're on the way to making a decision that will reflect easily in the San Nicolas site for the X-Band Radar.</td>
</tr>
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<td>5</td>
<td>Thank you very much.</td>
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<td>6</td>
<td>MS. ELLIOTT: Thank you.</td>
</tr>
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<td>7</td>
<td>Anthony Velez.</td>
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FRANK SCHILLO

offered public commentary on the GMD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MR. SCHILLO: My name is Frank Schillo. I'm a retired county supervisor, as of last month, and I support the X-Band Radar at San Nicolas Island, and I want to thank you very much for providing me with the executive summary of the EIS that was sent in the mail. I had an opportunity to review it before I had

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Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
OXNARD, CALIFORNIA

P-T-0009

1 facilities, communications, security, and logistic support facilities. They are all key elements to a successful ETR project and a Sea-Based X-Band Radar.
2 I thank you, Commander Deso, and your team for the opportunity to come before you this evening to show my strong support and also thank you and your staff for an outstanding presentation and an excellent Draft EIS.
3 Thank you very much.
4 MS. ELLIOTT: Thank you.
5 Kathy Long.

P-T-0010

1 offered public commentary on the OMD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:
2 MS. LONG: Thank you and good evening and thank you for providing this opportunity in this community for a public hearing to take place on this important contribution to the community. I am too a member of the RDE 21. My name is Kathy Long, Ventura County Supervisor, and the Port of Hueneme, part of the Naval Base Ventura County, is in part of my district. And the letter I have provided tonight is to provide for the public record the support for the operation of OMD testing activities at Port Hueneme.

P-T-0011

1 MT. VOLANTE: Good evening. My name is Anthony Volante. I am a councilmember from the City of Fort Huéene, California. I am a retired colonel, United States Air Force, with the relative rank of brigadier general, the State of California. I'm also a member of the Regional Defense Partnership 21, which supports our military installations here in Ventura County.
2 I came before you on October 22, 2002, supporting the placing of the Sea-Based X-Band Radar component of the Extended Test Range Project at San Nicolas Island. I come before you this evening to tell you that my city strongly supports the placing of this project at San Nicolas Island. I will also have a letter requesting continuous support from the City Council strongly urging your support of locating SBRX on San Nicolas Island and Naval Base Ventura County as the primary support base.
3 Enhanced testing capacity provided by SBRX and ETR project is vital to maintaining the aggressive posture on national security. Naval Base Ventura County and San Nicolas Island provide excellent harbor

P-T-0012

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3
In reviewing the scope of the EIS, it would appear that the draft document sufficiently covers the intent of the project. Naval Base Ventura County located on Port Hueneme is uniquely suited and positioned to provide an outstanding site free of excessive encroachment and compatible with existing programs and capable of expanding facility and personnel vital to the project. The base has space, range, and resource options at the disposal of this proposed project. The deep water port is both essential and available to this project. The large ocean range with the extended San Nicolas Island base of operations 60 miles from close public encroachment make the site well-suited to significant defense testing with minimal negative impact.

NMC has been a leader in environmental stewardship of San Nicolas Island and has a track record of accommodation among its military partners that provides the necessary expanded operations required for this project. The robust testing and analysis considered part of this project must be undertaken under the safest conditions possible. Port Hueneme's open sea range with proximity to air and naval command is powerful and guarantees the least risky test environment.

The County of Ventura stands ready to work in partnership with our military partners and those engaged in the continued environmental impact study. We appreciate you being here this evening.

Thank you.

MS. ELIOT: Thank you.

Alex Herrera.

ALEX HERRERA:

offered public commentary on the GMD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

Mr. Herrera: Good evening. My name is Alex Herrera, and I'm with the City of San Buenaventura, and I'm here to show the City of San Buenaventura's support for this project as expressed by the mayor's two previous letters that are already part of the record. Also, I'm here to represent Councilmember Neil Andrews and his support for this project. He asked that I read a statement for the record.

As a city council member from the City of San Buenaventura, I have every confidence based on the materials provided to date in the Draft EIS that this project could be developed in and offshore of the County of Ventura with minimal unmitigable environmental
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)

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1 Impacts. While I cannot speak for the entire City Council on this matter at this time, I am the designated representative of the city's Regional Defense Partnership for the 21st Century, and as such I'm charged by my colleague with the task of remaining informed of the events and developments involving military installations and activities in this geographic area that could impact our city. I believe that upon completion of the review provided, any environmental impacts identified in the review are vigorously mitigated to the extent feasible. This project will have the enthusiastic support of our citizens."

1 I'd like to make this part of the record for Councilman Andrews. And again, we would like to show, the City of San Buenaventura would like to show its support for this project, and we welcome the GMD testing in this area.

1 Thank you.

1 MS. ELLIOTT: Thank you.

1 Are there any other elected officials who would like to speak and did not sign up yet?

1 If not, we will begin with the rest of you.

1 Our first speaker Devon Chaffee, and the next one will be Bob Convey.

1 / / /
1 security.
2 Furthermore, the Foundation believes that the
3 current missile defense development is not subjected to
4 sufficient congressional oversight, and the Foundation
5 is concerned about the tendency of NMD projects to run
6 over budget and over deadlines.
7 The Nuclear Age Peace Foundation is not an
8 environmental organization and does not itself have the
9 expertise to evaluate the Agency's assessment of the
10 radar's effect on the marine life of Port Hueneme. The
11 Foundation does, however, believe that any of the
12 possible negative ramifications listed in the EIS, such
13 as disruption to local bird populations and
14 complications in the local air flight patterns, are
15 unacceptable given the lack of need for expanding the
16 test bed.
17 Also, given my correspondence with
18 environmentalists following missile defense developments
19 in Alaska, I am concerned that the Draft EIS may be
20 underestimating the impact of the X-Band Radar on local
21 marine life populations, the bird population, in
22 particular.
23 For these reasons the Foundation opposes the
24 stationing of a Sea-Based X-Band Radar in Port Hueneme.
25 Through and moving beyond the missile defense project, a
26 joint initiative with the International Network of
27 Engineers and Scientists against Proliferation, the
28 Nuclear Age Peace Foundation supports the development of
29 nonproliferation, disarmament, and missile control
30 alternatives to missile defenses.
31 We plan to continue urging members of the Santa
32 Barbara and Ventura county communities to join us in
33 opposing missile defense operations in our region. The
34 Foundation will be issuing further public comments in
35 written form.
36 Thank you.
37 MS.elliott: Thank you.
38 Bob Conroy. And the next speaker will be Wayne
39 Davey.
40
41 BOB CONROY
42 offered public commentary on the GMD Extended Test Range
43 Draft Environmental Impact Statement (EIS) as follows:
44 MR. CONROY: Good evening. My name is Bob
45 Conroy. I'm a private citizen. I live in Camarillo.
46 I would like to show my strong support for the
47 X-band Radar sitting at San Nicolas Island. Taking
48 advantage of the Pacific Missile Range
49 36,000-square-mile instrumented range is very

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Intelligent from the NDA standpoint. As you know, it's the largest instrumented testing training range in the world. I think the opportunity to site your radar there would be a good selection.

The County of Ventura strongly supports the Navy -- it has for many years -- at all three bases, Point Mugu, Point Magu, and the Air National Guard Base.

I have reviewed the EIS. I see no downsides from the standpoint of the MDAs and I, therefore, encourage the selection of that site.

Thank you.

Ms. Elliott: Following the next one will be David Fauchon.

Wayne Davy: Offered public commentary on the OHD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

Mr. Davy: Hello. My name is Wayne Davy. I am currently vice president and chief financial officer at Rockwell Scientific Company. Rockwell Scientific is a privately owned company located in Thousand Oaks and Camarillo. I am here tonight speaking on behalf of my company Rockwell Scientific. I am also speaking tonight as a business supporter of having the Sea-Based X-Band Radar System at Naval Base Ventura County.

This program is a strategic opportunity for our region and Department of Defense, Naval Base Ventura County, and San Nicolas Island is the most logical location for this program, based on our region's existing infrastructure and accessibility. This program is also strongly supported by the business community in this region. The company I represent, Rockwell Scientific, is one of many examples of the supporters. Rockwell Scientific has been based in this region for over 40 years. We are a nationally recognized research and development company doing work for the U.S. Government, numerous defense contractors, several long-term customers, and many commercial customers. Our full-time and contract head count totals in excess of 500 well-paying jobs. We have approximately 140 Ph.D. scientists on our staff, and many of them will be working on this program.

We also play a major role in designing imaging systems for several national missile defense programs, and so we're really aware of this program. Rockwell Scientific will also design and develop several high-speed electronics and power components which will be used in the Sea-Based X-Band Radar System. Many
other local and regional companies are also well positioned to support this major program being based in Naval Base Ventura County. It is our belief that all of the health, environmental, and safety issues associated with this program will be adequately addressed.

Thank you very much for the opportunity to speak today in support of this important project.

Thank you.

DAVID FAUBION

offered public commentary on the OED Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MR. FAUBION: My name is David Faubion, city of Ventura. I came unprepared without a speech, but just based on what I’m hearing and just the sheer audacity of this, it’s a legend that SCT is unworkable, that it’s extremely too costly, and it’s extremely unnecessary.

So where is the logic in the paradise of Ventura County, albeit one that’s heavily militarized? So what? It’s by default an environmental hazard because it’s unnecessary, it’s unworkable, and it’s extremely too costly. So, therefore, it shouldn’t be done because any impact that it has environmentally is too much. There’s nothing more to say about it.

Thank you.

MS. ELIOTT: Thank you.

Gordon Birch and then William Connors.

GORDON BIRCH

offered public commentary on the OED Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MR. BIRCH: My name is Gordon Birch. I’m a resident of the Channel Islands beach area. I’m also a technical analyst for the Beacon Foundation. We will be submitting our report in writing.

And I attended your scoping meeting, I believe it was in December, and I see the presentation today has changed considerably from the scoping presentation in that I did not see any mention today of San Nicolás Island being a contender for the Sea-Based Radar docking or mooring. I noticed on your graphics you had three circles that were strictly mid-Pacific sea baring. So I’m wondering if that’s still a viable alternative.

Back to the process, when I received the mailing for tonight’s meeting here, it came by Priority Mail, and it cost you guys $4.95 to mail it. I think a first-class stamp would have been just as appropriate.
OXNARD, CALIFORNIA

1 And also, as far as the process is concerned, I
2 notice that the only library in the area that has the
3 EIS on file is here at the Oxnard library. The City of
4 Port Hueneme, its library or any of the other Ventura
5 County libraries did not receive a copy. I checked with
6 them, and they were not on the mailing list, and I think
7 you should include at least the City of Port Hueneme's
8 public library on the final EIS so everyone in the area
9 will have a chance to review it, primarily since they're
10 the closest neighbor to the Port Hueneme Harbor, and I
11 believe they should be apprised of anyone else in the
12 area, especially since now within the Naval Base Ventura
13 County and Port Hueneme you have it listed as the
14 primary suspect base and mooring for the sea-based
15 radar.
16 I don't know if that's in the EIS as much or
17 what its ramifications are, but there is a bottom line
18 statement here that says no impact of visual resources
19 are anticipated. And this thing is ten times as tall as
20 the tallest house in my neighborhood. So there is a
21 visual impact, believe me, and the device is so large,
22 it won't even fit through the Panama Canal, and I don't
23 think it will fit inside the Port of Hueneme either, and
24 if it's going to be moored, it's going to have to be
25 moored off of Port Hueneme somewhere, if they're

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
BILL CONНЕЕН

offered public commentary on the GMD Extended Test Range

Draft Environmental Impact Statement (EIS) as follows:

MR. CONНЕН: My name is Bill Conнен. I’ve

been a resident of Camarillo for 25 years. I’m a Navy

veteran, and I actually retired here because it’s such a

lovely place to live and also because the bases here

provide a way to really accomplish things, and I came

out here from Washington, D.C., which is really a

difficult place to get anything done. Actually during

my time in the Navy, I served as a vice commander of the

Pacific Missile Test Center, which is a predecessor to

the current organization. As such, I had an opportunity

to fly in and out of San Nicolas Island a lot, and it’s

a really isolated location. It’s far off the coast, 60

miles, but it seems like a lot farther than that when

you’re trying to operate projects which is what we did

out there.

San Nicolas Island has been a base for a lot of

different Navy projects that also respect the habitat of

some endangered species out there. So that’s a very

important consideration, and the Navy’s taken that into

account and I think has done a wonderful job over the

years of respecting the environment.
Additionally, operating on the sea range
leverages the existing operational linkages with
Vandenberg Air Force Base which is part of the extended
test range in protecting both targets and missile
interceptors. It benefits from both the -- from the
logistics connectivity with both the Fort of Huisnum
through surface craft and the airfield at Point Mugu,
both of which are owned and controlled by the Navy to
can provide you dedicated service should you decide to
base the X-Band Radar at San Nick.

As you've seen from the meeting tonight,
including all the elected officials and both current and
former and their representatives, there's a widespread
support in Ventura County for all the military
activities, specifically taking their time to come here
tonight to express their support for having the X-Band
Radar at San Nick. You certainly will be welcome here,
and if you have any questions for us, certainly let us
know, and we'll be happy to answer them, but we're
hopeful that in your decisions, we know you have a lot
of data to look at, all the locations that are around
the Pacific, but we hope you'll be favorably impressed
both with population, the geography, and the technical
capabilities of Ventura County in general and Naval
Base Ventura County in particular, and San Nicolas.
Island as your primary support base for the X-Band Radar.

Thank you.

MR. ELLIOTT: That is all of the comment cards that I have. Is there anyone who has not spoken and would like to speak?

NORMAN EAGLE

offered public commentary on the Oxnard Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MR. EAGLE: My name is Norman Eagle. I'm a resident of Oxnard, and I was a naval engineering officer in World War II.

I tried to read through the two volumes of the impact statement that was deposited here in the library, and I could not get very far with it, frankly. The technical requirements are way, way above my head right now, and I am concerned that we are getting evaluations of the impact statement from individuals who don't have the proper qualifications to make judgments on it. I think the statement speaks for itself. It's two volumes that I saw, and I believe that there are two other volumes somewhere. I may be wrong about that.

But it's obvious that there were thousands of

non-hours that went into the studies that now comprise this impact statement. I'm concerned about the process of making an impact evaluation, impact statement because we have -- what we have is a Defense Department project that is being put forward by the Defense Department. We have an agency within the same Defense Department doing the impact evaluations.

I think that there is a conflict of interest there, quite obvious. What residents of this area require is an independent assessment, an independent evaluation. We need to have experts unbiased, unbiased, that is, not paid by the Defense Department, not paid by any specific interest group, but an objective public evaluation unit. Other than that, what we're going to have is Ken Lay appointing an evaluation or auditing committee for Kroon Corporation.

Thank you.

MR. ELLIOTT: Also, sir, will you please fill out a card. Well, I don't have one here. Get one from the registration table, and someone's going to get one for you.

Thank you.

Anyone else?
HENRY MORTEN

My name is Henry Morton. I am a resident of Oak View. I speak for myself. I didn't come here to talk, but I needed to add a couple of comments. I'm strongly in favor of locating the X-Band Radar at San Nicolas Island. One thing I'd like you to have to consider is that the potential nature of the coast of the western United States causes air traffic flying north and south to fly inland and causes ships traffic to (inadvertently). It's just natural for that. Looking out beyond San Nicolas Island, there is really nothing out there. And so also because of the deep ocean aspect of the fall-off, the shelf of San Nicolas Island, there is really less biological issues to be addressed than nearer inland to the coast. And I look at that as a unique advantage beyond other areas around the Pacific Rim.

Thank you.

Gloria Roman

offered public commentary on the GMD Extended Test Range Draft Environmental Impact Statement (EIS) as follows:

MS. ROMAN: Good evening. My name is Gloria Roman. I am also a resident of Oxnard, and I am concerned about the hazardous waste. Our elected officials don't seem to -- one lady mentioned she don't even understand what she read, and she's not concerned about the hazardous waste, what kind of waste? I'm concerned about that. What is the waste, hazardous waste that you mention on your slides up there? And you know, what happened to the missile? We ought to be concerned about this here too.

MS. ELLIOTT: Thank you.

Anyone else?

Thank you all for your courtesy, your interest, and your participation tonight. Thank you kindly.

(Proceedings concluded at 8:00 p.m.)
STATE OF CALIFORNIA
COUNTY OF VENTURA

I, KRISTY N. KEENER, CSR NO. 6422, Certify

Shorthand Reporter of the State of California, do hereby
certify that the foregoing pages are a true and correct
transcript of the proceedings held on February 24, 2003,
in the above-entitled cause.

DATED: Newbury Park, California, this 34th day of

KRISTY N. KEENER, CSR NO. 6422

Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
Exhibit 8.1.3-1: Reproductions of Public Hearing Documents (Continued)
448 Remember you have till March 24, 2003 to submit your comments on the Draft EIS and 449 as we stated before there are many ways to do that. We will conclude tonight’s meeting. 450 Thank you very much.

451 CERTIFICATION: This hearing was recorded by both audio and video equipment and 452 transcribed by the undersigned to the best of his ability and reflects the contents 453 presented. A. L. COZZETTI, Court Reporter and Transcriber. DATED: 5/14/03, at 454 Anchorage, Alaska.
<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Sykes</td>
<td>P-T-0001-1</td>
<td>Program</td>
<td></td>
<td>See P-E-0006-1</td>
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<tr>
<td></td>
<td>P-T-0001-2</td>
<td>Policy</td>
<td></td>
<td>See P-E-0032-3</td>
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<tr>
<td></td>
<td>P-T-0001-3</td>
<td>Safety and Health</td>
<td>ES</td>
<td>Health and Safety for GBI and target are discussed in table ES-2, page es-24, of the Draft EIS.</td>
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<td></td>
<td>P-T-0001-4</td>
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<td>4.11.3</td>
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<td>P-T-0001-5</td>
<td>Program</td>
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<td>Greg Garcia - Alaskans for Peace and Justice</td>
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<td>Program</td>
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<td>P-T-0002-6</td>
<td>Program</td>
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<td>See P-E-0018-5</td>
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<tr>
<td>Steve Cleary - Citizens Opposed to Defense</td>
<td>P-T-0003-1</td>
<td>Safety and Health</td>
<td>2.1.4.2</td>
<td>As indicated in section 2.1.4.2, the SBX can exceed the 300 V/m average power threshold at 12 kilometers (7.5 miles). The average power threshold is based upon reducing the time of exposure of aircraft avionics to high intensity radiated field environments in order to preclude shortening the life of the aircraft avionics. The concern is not interference, but a reduction in life of the aircraft avionics. Additional information on the potential effects of EMR on communications-electronics, including aircraft avionics, is provided as appendix G of the EIS. Mitigation measures such as the redundant software that would help minimize potential interference to aircraft systems are discussed in section 2.1.4 as well as in appendix G.</td>
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<tr>
<td>Experimentation Code</td>
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<td>Appendix G</td>
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<tr>
<td>Steve Cleary - Citizens Opposed to Defense Experimentation Code</td>
<td>P-T-0003-2</td>
<td>Safety and Health</td>
<td>2.1.7</td>
<td>GMD launches would not be from Fort Greely. As stated in section 2.1.7 and appendix C, each missile flight test event would occur over unpopulated areas or minimally populated areas to reduce potential risk to the general public. Each flight test would be modeled. The models incorporate a number of variables such as the missile mass, velocity, trajectory, altitude, and descriptions of the environments that may affect the missile in flight, such as surface and high altitude winds. Modeling that is done long ahead of the actual test would use averages, including average weather predictions. Additional modeling done on the day of test verifies safety under actual test conditions. Databases include data on real time local weather conditions, including wind direction and intensity, mission profile, launch vehicle specifics, and the surrounding population distribution. Given a mission profile, the risks will vary in time and space. Therefore, a launch trajectory optimization is performed by the range for each proposed launch, subject to risk minimization and mission objectives constraints. The debris impact probabilities and lethality are then estimated for each launch considering the geographic setting, normal jettisons, failure debris, and demographic data to define and modify launch hazard/clearance areas and destruct lines to confine and/or minimize potential public risk of casualty or property damage. Tests do not proceed unless the Range Safety Office determines that the general population, including ship traffic, would be in a safe position.</td>
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<td>Judy Mikels - Ventura County Supervisor</td>
<td>P-T-0003-3</td>
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<td>Brian Miller - Congressman Elton Gallegly</td>
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<td>Program</td>
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<td>See P-E-0006-1</td>
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<td>Program</td>
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<td>Charlotte Craven - City of Camarillo</td>
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<td>See P-E-0032-2</td>
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<td>See P-E-0006-1</td>
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<td>Robert Lagomarsino - Former Member of U.S. Congress</td>
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<td>Program</td>
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<td>P-T-0007-3</td>
<td>Airspace Use</td>
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<td>Thank you for your comment.</td>
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<td>Land Use</td>
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<td>Frank Schillo - Retired Ventura Co. Supervisor</td>
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<td>Anthony Volante - Councilmember from City of Port Hueneme</td>
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<td>Kathy Long - Ventura County Supervisor</td>
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Table 8.1.3-2: Responses to Public Hearing Comments (Continued)

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<th>Resource</th>
<th>EIS</th>
<th>Response Text</th>
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<tr>
<td>Alex Herrera - City of San Buenaventura</td>
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<td>Program</td>
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<td>Program</td>
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<td>See P-E-0006-1</td>
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<tr>
<td>Devon Chaffee - Nuclear Age Peace Foundation</td>
<td>P-T-0012-1</td>
<td>Program</td>
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<td>See P-E-0032-3</td>
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<td></td>
<td>P-T-0012-3</td>
<td>Biological Resources</td>
<td>4.7.3</td>
<td>Comment noted. However, the radar beam would be in motion, making it extremely unlikely that a bird would be in the intense area of the beam and would remain there for any considerable length of time. The power density is also not expected to exceed levels that could impact birds.</td>
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<td>P-T-0012-4</td>
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<td>4.8.2 2.14.2</td>
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<td>Bob Conroy</td>
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<td>Wayne Davey - Rockwell Scientific Company</td>
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<td>P-T-0014-2</td>
<td>Socioeconomics</td>
<td>4.8</td>
<td>Thank you for your comment.</td>
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<td>P-T-0014-3</td>
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<td>David Faubion - Ventura Peace Coalition</td>
<td>P-T-0015-1</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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### Table 8.1.3-2: Responses to Public Hearing Comments (Continued)

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<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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<tr>
<td>Gordon Birr - The Beacon Foundation</td>
<td>P-T-0016-1</td>
<td>Program</td>
<td></td>
<td>The three circles indicate proposed operating areas.</td>
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<td>P-T-0016-2</td>
<td>Policy</td>
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<td>See P-E-0026-1</td>
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<tr>
<td></td>
<td>P-T-0016-3</td>
<td>Policy</td>
<td></td>
<td>A copy of the Draft EIS has been sent to the Ray D. Prueter Library in Port Hueneme, and it has been added to the distribution list.</td>
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<td></td>
<td>P-T-0016-4</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
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<td>P-T-0016-5</td>
<td>Program</td>
<td>2.3.1.7</td>
<td>If NBVC Port Hueneme is selected as the PSB location for the SBX, the actual port is not wide enough to allow the SBX to have pier side operations. However, San Nicolas Island provides an excellent mooring location. Mooring would probably be on the leeward side of the island. Water depths there allow for mooring approximately 800 meters (2,625 feet) offshore.</td>
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<td>2.1.8</td>
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<td></td>
<td>4.3.5.2.5</td>
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<td>4.6.5.2</td>
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<td>P-T-0016-8</td>
<td>Program</td>
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<td>See Impacts and Mitigation Summary in Document.</td>
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<td>Bill Conneen</td>
<td>P-T-0017-1</td>
<td>Program</td>
<td>2.0</td>
<td>The only new activity proposed for Hawaii as part of the GMD program is the PSB for the SBX at Pearl Harbor and mooring of the SBX off of Barbers Point. The target missile launches described in the draft EIS from the PMRF on the island of Kauai are current on-going activities that have been analyzed in previous environmental documentation. For the GMD program, no additional target missile launches would be conducted from PMRF beyond those already planned. For this reason, the scoping process and hearings were not held on Kauai but in Honolulu, which is closest to the location of the new proposed activities.</td>
</tr>
<tr>
<td>Jack Dodd</td>
<td>P-T-0018-1</td>
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<td>See P-E-0006-1</td>
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<td>See P-E-0006-1</td>
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<td></td>
<td>P-T-0018-3</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<tr>
<td></td>
<td>P-T-0018-4</td>
<td>Biological Resources</td>
<td>4.7.3</td>
<td>Comment noted. Most DoD installations tend to have large numbers of sensitive resources since they are aggressively managed and public access is generally controlled.</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Jack Dodd</td>
<td>P-T-0018-5</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<td>P-T-0018-6</td>
<td>Program</td>
<td>See P-E-0006-1</td>
<td></td>
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<tr>
<td>Norman Eagle</td>
<td>P-T-0019-1</td>
<td>EIS Process</td>
<td>Multi-disciplinary team of experts with no conflict of interest.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-T-0019-2</td>
<td>Policy</td>
<td>See P-E-0032-3</td>
<td></td>
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<tr>
<td>Henry Norten</td>
<td>P-T-0020-1</td>
<td>Airspace Use</td>
<td>4.8.2</td>
<td>See P-E-0008-4</td>
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<td></td>
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<td></td>
<td>2.1.4.2</td>
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<td></td>
<td>P-T-0020-2</td>
<td>Biological Resources</td>
<td>4.7.2</td>
<td>Comment noted. No significant adverse long-term impacts to biological resources are anticipated as a result of the Proposed Action.</td>
</tr>
<tr>
<td>Gloria Roman</td>
<td>P-T-0021-1</td>
<td>Hazardous Materials</td>
<td>4.7.4, 4.8.4</td>
<td>See P-E-0208-6</td>
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<td>P-T-0021-2</td>
<td>Hazardous Materials</td>
<td>4.7.4, 4.8.4</td>
<td>See P-E-0208-6</td>
</tr>
<tr>
<td>Don Hayes</td>
<td>P-T-0022-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
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<tr>
<td>Carolyn Heitman</td>
<td>P-T-0023-1</td>
<td>Safety and Health</td>
<td>2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, 4.8.5.2</td>
<td>See P-E-0005-1</td>
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<td></td>
<td>P-T-0023-2</td>
<td>Program</td>
<td>Test interceptors have been proposed for KLC. However, test launches are not planned for Fort Greely.</td>
<td></td>
</tr>
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<td>P-T-0023-3</td>
<td>Policy</td>
<td>See P-E-0020-1</td>
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<tr>
<td></td>
<td>P-T-0023-4</td>
<td>Program</td>
<td>A mobile telemetry unit and mobile C-band radar may be placed at King Salmon as discussed in chapter 2. The program does not currently plan on using the existing radars at King Salmon and Chiniak. These radar do not impact operations at KLC.</td>
<td></td>
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<tr>
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<td>P-T-0023-5</td>
<td>EIS Process</td>
<td>The GBI configuration proposed is the Orion 50SXLG.</td>
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</tr>
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<td>P-T-0023-6</td>
<td>Program</td>
<td>See P-T-0023-4</td>
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<td>P-T-0023-7</td>
<td>Safety and Health</td>
<td>2.3.1, 4.1.7</td>
<td>See P-E-0020-34</td>
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</tr>
<tr>
<td>Carolyn Heitman</td>
<td>P-T-0023-8</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>Section 4.1.8.2.1 states that public access would only be temporarily restricted for safety reasons, on the day of launch, or for a short period of time when missiles are moved within the KLC along the public road.</td>
</tr>
<tr>
<td>Mike Sirofchuck</td>
<td>P-T-0024-1</td>
<td>Policy</td>
<td>4.1.8.2.1</td>
<td>The decision to produce an EIS, including analysis of proposed activities at KLC, was done in accordance with CEQ Regulations (40 CFR 1502.14(d)).</td>
</tr>
<tr>
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<td>P-T-0024-2</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>Upland areas have been selected to the greatest extent practicable to minimize impacts to wetlands and the wildlife that depend upon them. Beaver is one of the species listed on page 3-7 as occurring at KLC.</td>
</tr>
<tr>
<td></td>
<td>P-T-0024-3</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>As discussed in section 4.1.8.2.1, the Proposed Action would only temporarily restrict public access and fail to significantly impact any aspect of land utilization.</td>
</tr>
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<td>P-T-0024-4</td>
<td>Socioeconomics</td>
<td>4.1.15</td>
<td>The additional personnel associated with the project would not all be involved in sport fishing, hiking, and hunting. In addition, those involved in these activities would go to other areas in addition to Narrow Cape. Section 4.1.15 has been revised to state that personnel would be restricted to KLC during working hours and significant impacts to subsistence hunting, recreational hunting, hiking, or other recreational activities or areas are not anticipated.</td>
</tr>
<tr>
<td>Brad Stevens</td>
<td>P-T-0025-1</td>
<td>Biological Resources</td>
<td>4.1.3</td>
<td>Additional sampling of aluminum and pH levels would be conducted in accordance with AADC guidelines.</td>
</tr>
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<td>P-T-0025-2</td>
<td>Land Use</td>
<td>4.1.8.2.1</td>
<td>The exact dates and length of closures have not been established at this time. The five MDA launches are included in the nine launches per year currently authorized at KLC. Section 4.1.8.2.1 on page 4-69 states that ESQDs at KLC would not impact transportation routes and public access would only be temporarily restricted for safety reasons, on the day of launch, or for a short period of time when missiles are moved within the KLC along the public road. In addition, there is no plan to close roads or limit access during construction.</td>
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<tr>
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<td>P-T-0025-3</td>
<td>Safety and Health</td>
<td>2.3.1, 4.1.7</td>
<td>See P-E-0020-34</td>
</tr>
<tr>
<td></td>
<td>P-T-0025-4</td>
<td>Socioeconomics</td>
<td>4.1.15</td>
<td>Text has been revised in section 4.1.15 to state that several documents were analyzed to determine the effects to subsistence caused by the program and that the program would only effect a small amount of the intertidal areas for up to a single day of closure approximately five times per year. This would result in minimal impacts to subsistence.</td>
</tr>
<tr>
<td>Wayne Stevens - Kodiak Chamber of Commerce</td>
<td>P-T-0026-1</td>
<td>Program</td>
<td>4.1.10</td>
<td>Coordination with local accommodations will be the priority method for accommodating personnel in support of the GMD effort. Construction of additional facilities at Narrow Cape would be secondary.</td>
</tr>
<tr>
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<td>Comment #</td>
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<tr>
<td>Wayne Stevens - Kodiak Chamber of Commerce</td>
<td>P-T-0026-2</td>
<td>Socioeconomics</td>
<td>4.1.10</td>
<td>Text has been revised in section 4.1.10 to state that coordination with existing accommodations will be carried out to maximize their use while minimizing any potential long-term impacts. Construction of additional facilities at Narrow Cape is a secondary mitigation.</td>
</tr>
<tr>
<td>Mike Milligan</td>
<td>P-T-0027-1</td>
<td>Program</td>
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<td>See P-E-0006-1</td>
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<td>See P-E-0018-5</td>
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<td>P-T-0027-3</td>
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<td>See P-E-0020-5</td>
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<tr>
<td>Pam Foreman - Kodiak Island Convention &amp; Visitors Bureau</td>
<td>P-T-0028-1</td>
<td>Socioeconomics</td>
<td>4.1.10</td>
<td>See P-T-0026-2</td>
</tr>
<tr>
<td>Gary Carver</td>
<td>P-T-0029-1</td>
<td>Geology and Soils</td>
<td>Appendix D</td>
<td>The calculations in appendix D were re-run using a seismic class B for the bedrock at KLC. However, even when the seismic class B is factored into the overall equation, the answer does not change.</td>
</tr>
<tr>
<td></td>
<td>P-T-0029-2</td>
<td>Geology and Soils</td>
<td>Appendix D</td>
<td>The facilities at KLC proposed by MDA are test facilities and, as such, would not be classified as facilities used for critical defense reasons. Critical defense facilities are those that are required for post-earthquake recovery or those housing mission-essential functions that are absolutely critical to mission continuation of the activity. The proposed GMD test facilities at KLC would not meet either of these criteria and therefore the calculations would stand as presented in appendix D of the Draft EIS. As stated in the Draft EIS, all available information and current codes will be considered in the design of the GMD facilities.</td>
</tr>
<tr>
<td>John Mohr - Executive Director, Port of Everett</td>
<td>P-T-0030-1</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0209-2</td>
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<td>2.1.4, 2.1.8</td>
<td>See P-E-0005-1</td>
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<td>4.3.5.2.5</td>
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<td>4.6.5.2</td>
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<td>See P-E-0209-2</td>
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<tr>
<td>Horst Petsold</td>
<td>P-T-0031-1</td>
<td>Safety and Health</td>
<td>2.1.4</td>
<td>See P-E-0005-1</td>
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<td>4.6.5.2</td>
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<td>4.8.5.2</td>
<td></td>
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<tr>
<td></td>
<td>P-T-0031-2</td>
<td>Noise</td>
<td>4.8</td>
<td>The beam from the SBX would not remain stationary during operation for any period of time, thus the odds of interference from high power effects with any electronic equipment on the ground would be slight, 0.0001% of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than 1 second, should this occur.</td>
</tr>
<tr>
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<td>P-T-0031-3</td>
<td>Utilities</td>
<td></td>
<td>As mentioned in section 2.1.4.3, electrical power requirements for the SBX platform if moored near a PSB would generally be accommodated by three of the on-board generators: one for daily ship functions and two for powering the radar, as needed. However, when mooring at Naval Station Everett Pier Alpha or Pier Bravo would be utilized. A utility hookup, similar to other vessels at Naval Station Everett, would be used for on board lighting and other basic needs. Utility levels would be typical of that for other ships and would be considered routine.</td>
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<td>P-T-0031-4</td>
<td>Program</td>
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<td>See P-O-0099-3</td>
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<td>John Flowers</td>
<td>P-T-0032-1</td>
<td>Program</td>
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<td>See P-E-0018-5</td>
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<td>P-T-0032-2</td>
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<td>See P-E-0020-1</td>
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<td>Bob Jackson</td>
<td>P-T-0033-1</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0011-1</td>
</tr>
<tr>
<td>Morrie Trautman</td>
<td>P-T-0034-1</td>
<td>Program</td>
<td>4.8.9</td>
<td>The GMD ETR testing activities would likely occur over a period of approximately 10 years following a decision to proceed.</td>
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<td>P-T-0034-2</td>
<td>Safety and Health</td>
<td>4.8.5</td>
<td>See P-E-0208-7</td>
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<td>Mark Nagel</td>
<td>P-T-0035-1</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0011-1</td>
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<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0209-2</td>
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### Table 8.1.3-2: Responses to Public Hearing Comments (Continued)

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<tr>
<td>Mark Nagel</td>
<td>P-T-0035-4</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>A discussion of power densities is provided in the health and safety section on pages 4-218 and 4-219. The power density is calculated to be 2.5 milliwatts per cubic centimeter at a distance of 150 meters (492 feet) for the fully populated radar and 85 meters (279 feet) for the 65 percent populated radar. MPELs, which define the maximum time-averaged RF power density allowed for uncontrolled human exposure and is independent of body size or tissue density being exposed, are capped at 5 milliwatts per cubic centimeter for frequencies greater than 1,500 MHz. OSHA has established a radiation protection guide of 10 milliwatts per cubic centimeter or electromagnetic energy of frequencies of 10 to 100 MHz.</td>
</tr>
<tr>
<td>Dave Salsman</td>
<td>P-T-0036-1</td>
<td>Program</td>
<td>2.1.4</td>
<td>The SBX is a phased array radar. The SBX Project Office has no knowledge of any encoding activities, and no knowledge of the HARP array.</td>
</tr>
<tr>
<td>Dale Moses</td>
<td>P-T-0037-1</td>
<td>Program</td>
<td></td>
<td>The dimensions of the SBX are provided in table 2.1.4-1.</td>
</tr>
<tr>
<td>Richard Windt</td>
<td>P-T-0038-1</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0209-2</td>
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<tr>
<td>Walter Selden</td>
<td>P-T-0039-1</td>
<td>Program</td>
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<td>See P-E-0347-4</td>
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<td>Daryl Williams - Tulalip Tribes</td>
<td>P-T-0040-1</td>
<td>EIS Process</td>
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<td>See P-E-0250-2</td>
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<td>Sheila Baker</td>
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<td>Program</td>
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<td>See P-E-0006-1</td>
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<tr>
<td>P-T-0041-2</td>
<td>Safety and Health</td>
<td>4.1.6 4.1.8</td>
<td></td>
<td>Emergency response would be required in the event of a pre-launch or post-launch event which resulted in the partial destruction of a missile. Such an event could result in the rupture of a rocket engine and exposure of the solid or liquid fuel. In the event of such mishap, spillage of the propellants could occur. The incident would be handled as an explosive ordnance event, and remaining potentially hazardous materials would be regarded as hazardous waste for management purposes. Removal and disposal of nonhazardous and hazardous waste from the accident location would be in accordance with applicable state and federal requirements.</td>
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<td>Program</td>
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<tr>
<td>MacGregor Eddy - Vandenberg Action Coalition</td>
<td>P-T-0042-1</td>
<td>Program</td>
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<td>See P-E-0018-5</td>
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<td>MacGregor Eddy - Vandenberg Action Coalition</td>
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<td>See P-E-0004-4</td>
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<td>Elden Boothe - Vandenberg Action Coalition</td>
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<td>See P-E-0032-3</td>
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<td>James Carucci</td>
<td>P-T-0044-1</td>
<td>Policy</td>
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<td>See P-E-0032-3</td>
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<td>P-T-0044-2</td>
<td>EIS Process</td>
<td>2.3.2.1</td>
<td>The ETR's proposed activities do not include the placement of any new GBI silos at Vandenberg AFB. LF-21 and LF-23, currently used for Booster Verification testing, would be used for interceptor testing.</td>
</tr>
<tr>
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<td>Policy</td>
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<td>Hobert Parker</td>
<td>P-T-0045-1</td>
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<tr>
<td>Suzanne Marinelli</td>
<td>P-T-0046-1</td>
<td>Program</td>
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<td>Decisions concerning the overall management of the GMD Test Program are outside the scope of this EIS.</td>
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<td>P-T-0046-3</td>
<td>EIS Process</td>
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<td>The Draft EIS has been sent to the Hanapepe Public Library, Kapaa Public Library, Koloa Public and School Library, Lihue Public Library, Princeville Public Library, and Waimea Public Library.</td>
</tr>
<tr>
<td>Todd Morikawa - Fellowship of Reconciliation</td>
<td>P-T-0047-1</td>
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<td>Policy</td>
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<td>See P-E-0032-3</td>
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<tr>
<td>Doreen Redford</td>
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<td>Kyle Kajihiro - American Friends Service Committee</td>
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<td>Ads were placed in both the Honolulu papers and The Environmental Bulletin.</td>
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<td>P-T-0049-10</td>
<td>Program</td>
<td>The only new activity proposed for Hawaii as part of the GMD program is the PSB for the SBX at Pearl Harbor and mooring of the SBX off of Barbers Point. The target missile launches described in the draft EIS from the PMRF on the island of Kauai are current ongoing activities that have been analyzed in previous environmental documentation. For the GMD program, no additional target missile launches would be conducted from PMRF beyond those already planned.</td>
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<td>Fred Dodge</td>
<td>P-T-0050-1</td>
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<td>2.1.4 2.1.8 4.3.5.2.5 4.6.5.2 4.8.5.2</td>
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### Table 8.1.3-2: Responses to Public Hearing Comments (Continued)

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<th>Response Text</th>
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<tr>
<td>William Aila</td>
<td>P-T-0051-3</td>
<td>Program</td>
<td></td>
<td>It is acknowledged that Pearl Harbor is not deep enough to permit the SBX to enter the harbor. However, the harbor can host a resupply ship that would service the SBX. A mooring site off of Barbers Point has been proposed for the SBX.</td>
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<tr>
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<td>P-T-0051-4</td>
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<td>See P-E-0024-1</td>
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<tr>
<td></td>
<td>P-T-0051-5</td>
<td>Cultural Resources</td>
<td>4.6</td>
<td>As stated in section 4.6, cultural resources were not analyzed because there is minimal potential for impacts. While some mooring locations may have traditional importance, such as native fishing grounds, the SBX would occupy a very small area on a temporary basis. The remaining time the area would remain open with no security restrictions related to the program.</td>
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<td>Terri Keko'olani-Raymond - Nuclear Free and Independent Pacific</td>
<td>P-T-0052-1</td>
<td>EIS Process</td>
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<td>Ads were placed in both papers.</td>
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<td></td>
<td>P-T-0052-3</td>
<td>EIS Process</td>
<td></td>
<td>Not affecting state of Hawaii lands, the SBX would be moored outside 4.8-kilometer (3-mile) limit.</td>
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<tr>
<td></td>
<td>P-T-0052-4</td>
<td>Airspace Use</td>
<td>Appendix B</td>
<td>Under PPL 85-725, Federal Aviation Act of 1958, the FAA is charged with the safe and efficient use of our nation's airspace and has established certain criteria and limits to its use. The method used to provide this service is the National Airspace System. This system is “…a common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information and manpower and material.”</td>
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<tr>
<td>Peter Yee - Office of Hawaiian Affairs</td>
<td>P-T-0053-1</td>
<td>EIS Process</td>
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<td>Karen Murray</td>
<td>P-T-0054-1</td>
<td>EIS Process</td>
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<td>See P-E-0024-1</td>
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<tr>
<td>William Gosline - 'Ohana Kou / Nuclear Freedom and Independent Pacific</td>
<td>P-T-0055-1</td>
<td>Policy</td>
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<td>See P-E-0026-1</td>
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## Table 8.1.3-2: Responses to Public Hearing Comments (Continued)

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<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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</thead>
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<tr>
<td>Kalama Niheu - Ohana Kou / Nuclear Freedom and Independent Pacific</td>
<td>P-T-0056-1</td>
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<td>See P-E-0026-1</td>
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<td>Gail Chism/Lowell</td>
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<td>Visual Aesthetics</td>
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<td>See P-E-0026-3</td>
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<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
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<td>P-T-0057-3</td>
<td>EIS Process</td>
<td></td>
<td>The NEPA process allows for public input. All comments received on the Draft EIS are considered in preparing the Final EIS. The decision on whether to proceed with the Proposed Action or alternatives can not be made until 30 days after the Final EIS is released. Comments received on the Final EIS will also be considered by the decision maker.</td>
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<td>P-T-0057-4</td>
<td>Safety and Health</td>
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<td>Justin Ruhge</td>
<td>P-T-0058-1</td>
<td>Program</td>
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8.1.4 ORAL COMMENT DOCUMENTS—DRAFT EIS

Individuals who commented on the Draft EIS over the phone or at a city forum in Everett, Washington, are listed in table 8.1.4-1 along with their respective commenter ID number. This number can be used to find the transcript document and each speaker’s comments and to locate the corresponding table on which responses to each comment are provided.

Transcript Comments

Exhibit 8.1.4-1 presents reproductions of the oral comment documents that were received in response to the Draft EIS. Comment documents are identified by commenter ID number, and each statement or question that was categorized as addressing a separate environmental issue is designated with a sequential comment number.

Response to Transcript Comments

Table 8.1.4-2 presents the responses to substantive comments to the Draft EIS that were received in oral form. Responses to specific comments can be found by locating the corresponding commenter ID number and sequential comment number identifiers.
Table 8.1.4-1: Public Comments on the Draft EIS (Oral Comments)

<table>
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<td>P-O-0001</td>
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<td>Mary Ann Gianantoni</td>
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<td>Ann McLaren</td>
<td>P-O-0003</td>
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<tr>
<td>David B. Johnson</td>
<td>P-O-0004</td>
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<tr>
<td>Susan Dougal</td>
<td>P-O-0005</td>
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<td>Elliott Menashe</td>
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<td>Ty Costa</td>
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<td>Lynn Hayes</td>
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<td>Billie King</td>
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### Table 8.1.4-1: Public Comments on the Draft EIS (Oral Comments Continued)

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<td>John McCoy - 38th Legislative District (state representative)</td>
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Exhibit 8.1.4-1: Reproductions of Oral Comments

Message delivered: 18 Mar 03: 12:22 PM CST; 20 seconds

The name is Barbara Ikeda, it's about your SBX...whatever that is...please no more military stuff on this island...enough already...you're making us a target...we've been a target since World War II...so please, no, no...enough already...

Message delivered: 23 Mar 03: 2:36 PM CST; 51 seconds

Hello my name is Mary Ann Gianantoni...and I am a resident of Honolulu, Hawaii...and I am calling with regards to the proposal to place the SBX...the giant floating radar off Barbers Point...also called Kalaeloa here in Hawaii...and my comment is that I am very very strongly opposed to this...and I hope that it never happens...my number is... ...thank you very much.
Message delivered: 23 Mar 03: 4:15 PM CST; 24 seconds

Hello this is Ann McLaren...and I think the proposed Radar Station...it seems like its a very bad idea with a lot of potential health hazards...so I'm opposed to that proposal...thank you...

Message delivered: 6 Apr 03: 4:22 PM CST; 29 seconds

Yes, my name is David B. Johnson. And I'd like to express my support for bringing the SBX Missile Defense Radar Platform into the Everett area. I'm a resident of Snohomish...I think it would be a good thing. I think the military presence in the northwest is eventually going turn out to be very positive for us here...thank you...My phone number is......thank you.
Yes, my name is Susan Dougal, calling from Everett, Washington. My number is... I live in Everett is close to where this new SBX and radar will be coming. We don’t want it, we do not want it. Yesterday in speaking with Mr. Hasley, it seemed evident from the conversations with the group, that it was not a winner for Everett on any one of the areas of comment...health, safety, the rest of them...particularly health and safety. Now, my concern or suggestion is that one of the places that would want the thing built, should be considered, not one that has all the amenities for the government. Let’s help the people. It seems from what Mr. Hasley said to me personally, that the ADAC up in Alaska, they would be grateful to have the job to build all the parts and pieces, and have it. Now to me that is a safer environment by far, less populated and all the other things. Personally, I don’t want the thing at all, but if it has to be, that’s a good consideration. Please, realize we do not need it in Everett...thank you. My name again, Susan Dougal...thank you. And consider ADAC, Alaska, or just keep it to the smaller range the way the papers would suggest...if you did not think it needed to go further, just keep it where it is. The kind of situation that is in your papers to provide the offer that is an alternative and I’m really for that too...no more than what we’ve got already...thank you.

Hello, I’m calling to make comments on the SBX project and the Environmental Impact Statement. My name is Elliott Menashe, and I’m in Quinton, Washington...and I would like to state that from what I understand there is a definite potential threat to marine resources, there are potential health hazards, there would be enormous aesthetic impacts, noise impacts, many others...and that it would constitute a major target in a densely populated area. And from my understanding, it would be totally absurd to issue a DNS given the scope and size of the project. Thank you very much. Bye.
Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)

Message delivered: 7 Apr 03: 12:00 AM CST; 65 seconds

Say, this is name is Ty Costa, Snohomish, Washington. Why at the cost of our public defense here, are we asking for an environmental statement on something that would protect us from a ballistic missile with a nuclear warhead on it and it won't come with a environmental impact statement on it. Are we asking for an environmental statement to propose this? I'm going to write a comment. I have some other questions...one question in particular, when this 20 second burst of electromagnetic field goes off, can you feel that?...I've got some real questions on that...give me a call...ask me, it's...thank you.

Message delivered: 11 Apr 03: 2:20 PM CST; 21 seconds

My name is Lynn Hays, I'm calling from Whidbey Island, Washington. My family is completely opposed to the SBX that's proposed for Everett, Washington. I live on Whidbey and in complete view of it...and my entire neighborhood is opposed...please pay attention to what we have to say...thank you.
Message delivered: 11 Apr 03: 3:02 PM CST; 59 seconds

Hello, I understand that this is also the number that we call to protest to the SBX...this is Billie King. I have lived all my life in the city of Everett...and one of the best things about Everett is the old historic area and the views we have there and from other parts of the city of our waterfront. Our Navy does not impose on those views, and it's become a really good part of Everett...but the SBX in our harbor would really be something like having people come to Everett to look at the freak...so please put that thing somewhere else...thank you.

Message delivered: 11 Apr 03: 10:56 AM CST; 40 seconds

Hi, My name is Susan Kampion...I live on Whidbey Island...and no, no, I do not want this put in our region...these kind of...this is a dangerous thing and we really need to examine it closely...why do we only have till the 15th to comment...this is just amazing...I assume it's probably going to be pushed through without caring about what anybody thinks...and I would really like to see this not happen here...thank you...
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<th>Comment Number</th>
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<tr>
<td>P-O-0011</td>
<td>Message delivered: 11 Apr 03: 1:03 PM CST; 59 seconds</td>
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<td>1</td>
<td>My name is Karina Johnson Werner...I live on Whidbey Island...and I am terribly oppose to the placing of this thing across from me...as a mother, as a therapist, as a gardener, as a human being, I fear the implication that it has. As far as I know, having gone to the meeting that was just shortly notified...is that the scoping has not been done properly...and I think you need to postpone that and get a better group on what the people here really want or don't want...and I hope that that makes a difference...the many voices that probably you would be hearing from...Karina Johnson Werner, ...I wish you a good day.</td>
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<td>P-O-0012</td>
<td>Message delivered: 10 Apr 03: 10:33 AM CST; 54 seconds</td>
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<td>1</td>
<td>This is Patricia Rohan...and I live in Clinton, Washington...and I want to comment on the SBX Project. I oppose the SBX radar project and all the Star Wars defense projects because they have been shown to be ineffective and I feel that our taxpayer's money can be better spent in many other ways. I am also concerned about the human and environmental health dangers that such a large magnetic radar station would create here in the Puget Sound...it is just not the place for something like this where there are so many people living...thank you.</td>
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<td>Message delivered: 10 Apr 03: 10:13 AM CST; 20 seconds</td>
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<td>2</td>
<td>Hello my name is Rohan...I would like to comment that I oppose this SBX radar project and all of the projects that go along with the Star Wars Program...they've not proven to be useful, effective...and it's a big waste of taxpayers money...thank you.</td>
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My name is Betty Shabbington...I live just above the Naval Air Base...and I oppose the Department of Defense proposal to locate the SBX in Everett, Washington for a number of reasons. The possible negative impacts to human health and safety caused by receiving long term low level EM radiation has not been studied. The DoD indicates that the radiation scatter will be an issue despite its attempt to target the array so as to not irradiate the people. The size of this structure built on a converted Asian based oil drilling rig and its design for heavy industry, degrades the visual and aesthetic value of our local waterfront. Its placement would undermine the city of Everett's current and future efforts to promote economic redevelopment and attract investment in our waterfront and city corridor. The DoD has not pleased us that the potential interference to airborne navigation and commercial and communication systems, sensitive electronics, and hospital and clinic based medical diagnostic equipment. Especially unknown is the effect of the full powered test of the energy beam that must be run five to six times a week. I have little grandchildren and they come here and visit with me...and the last thing that I would ever want to even fear or consider would be any harm to the future...which is invested in my grandkids...so anything that has to do with putting something in the waterfront, clearly doesn't make any sense...you know we already have enough negative impact on our waters without having to building infrastructure out there...so I would appreciate it very much if my voice was counted and that you guys do not build...thanks...and have a good day.

Message delivered: 9 Apr 03: 8:14 PM CST; 62 seconds

Last name Brown...at ..., Everett, Washington... received flyer regarding the SBX unit to be placed in or around Everett, Washington, waters. I'm opposed to this until further study has been made to advise us as to the possible problems this unit will cause in this area...I thank you...my phone number is ......residing at ..., Everett, Washington...please advise...thank you.
Linda Edling...and I’m suggesting that your scoping procedure was flawed and the environmental impact is inaccurate...and I think we need more time to explore this, thank you.

Hi, I'm calling to provide comment on a proposed SBX missile defense unit being proposed possibly for Everett, Washington...and I'm calling to voice a concern...I am oppose to the building of that in Everett for a number of reasons...it's a high density population area...and my name is Pam Roy, Everett, Washington,...it's Monday, April 14...thank you very much...bye.
<table>
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<th>COMMENT NUMBER</th>
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| P-O-0017      | Message delivered: 14 Apr 03: 4:21 PM CST; 3 minutes, 7 seconds  
Hello, my name Susan Cyr...I live on Whidbey Island, adjacent to Everett, Washington in Puget Sound. My phone number is ... and my address if you need it is ...; Langley, Washington. I'm calling to comment about the proposed SBX radar missile defense system, proposed for Puget Sound...I am very much opposed to this idea...I was opposed to it when Ronald Reagan was President...and I don't care if they are more advanced than they were at that time, I feel like that it is unsafe for the people of our community, it is a target and I believe that kind of defense is no defense at all, it is in fact more harassing to the world community than anything else...And I believe we need to invest our dollars in our children's education and in the environment and in being a presence of...a worthy presence in the world and not a bully and then we wouldn't have to worry about missile defense systems...I am very much opposed...and that was one of my sons in the background cheering...and my husband is in concurrence, his name is Craig Cyr...and again I'm very much opposed to this and if there is another period of public comment, I would like to come in person and do so...and we found out in our local newspaper on the following week that there had been a public meeting for input on Saturday the 5th of April and we found out about it after the fact...and I've worked in public information in various state and federal agencies for public comments for large public works, and things like that nature, I worked in Seattle doing that kind of communications work, and I know that sometimes the public information process is not as widely publicized as it ought to be...and I'd like to see that change...so perhaps we can start over and have another comment period...thank you very much for listening...and again, I am definitely opposed to this kind of defense, I believe it does not do anything except endanger our own people and further aggravate the world. |
| P-O-0018      | Message delivered: 14 Apr 03: 1:02 PM CST; 3 minutes, 14 seconds
Yes, my name is Laura Hartman, and I live at ..., Snohomish, Washington...and I'm supplementing these comments with an email today, but I have a few questions actually to go with my comments...and that is that this program for a floating radar station seems a bit premature since we don't really have a ballistic defense system in place...and I have not been able to get the online version of the Environmental Impact Statement...and so I'm...I think that more information needs to be put out there regarding the funding source and what Congress has actually approved under the ballistic defense system...but the program budget, planning budget...I am opposed to this premature set up radar station for it's environmental hex on Puget sound...800,000 gallons of fuel, and this close to the sensitive fisheries and ecology area...is not, it's not appropriate...and the effects of radiation need to be more clearly established, not by FTC which is not authorized to claim that there...that the effects of radiation are benign, we need some input from EPA on this, which I haven't seen the environmental review, but since there has been no public review by the EPA on humans or I assume that this is similar with there being washed away...around there are known dead zones, there are known affects on birds, and it's completely an inappropriate place for an island of diesel fuel...and then there is the whole question on anti ballistic, the ballistic defense system in the first place...this close to a populated area, the radar system would act as a terrorist target, there is no guarantee that it will actually do the job its being slated for...until the defense department is further along in this whole concept, building a radar station seems to be premature...and I will be supplementing these statements in my email from ......thank you. |

Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)
Hello, this A.T. Young, I live in Langley, Washington, which is right across from Everett, Washington...and I'm concerned about the SBX project because of a couple of things...one is the scattered radiation and Whidbey Island is right in line with the testing ray...it doesn't seem like there is enough known about that...and it concerns me, I think that I need a little more information to know about health effects and environmental effects about that...and also, you know I also sort of object to the fact that it has been such a short notice for us from the public hearing, to the comment period, it's very short, and you know I will do my best to keep up with it and study it, but I think this process is going too quickly and the effects is unknown...thank so much for the work you're doing...bye.

Yes, this is Mr. Bruno in Everett on ......I don't understand why you're putting such a monstrosity out there in the Bay that ruins our view and everybody else that comes up in the Grand Avenue Park to look out on the marina...when there's 65,000 other places to put this thing at...on the naval base of Whidbey Island or Port Angeles, I don't understand why you have to come in and ruin a city with something so obstructive, so I...this is my opinion against it...and I hope you can do a little more research in finding a proper place for this without ruining everybody's view and destroying property values, and etc., etc.
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<tr>
<td>P-O-0021</td>
<td>Yes, first name is Thomas…Mitchell…and just calling to say that although I’m not oppose to this system, I’m oppose to having a structure that size based in the Everett vicinity…thanks…bye</td>
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<tr>
<td>P-O-0022</td>
<td>Hi, my name is Claire Bird…and I just want to say for myself and my family that we fully oppose the SBX…and located…possible location in Everett…Everett waterfront…for many reasons…property values, how that would affect our property values, the new development that's planned for the Everett waterfront would possibly be changed due to that, I know it would be changed…and just long term health issues as well…but mostly due to the fact that Everett has…you know…a lot of good potential and I see that as having a very negative impact on it…and we have just lovely homes just above that would overlook that and it would be very bad…so, we fully oppose that…and I just wanted to let you know, thanks…bye.</td>
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My name is Gloria Chou...and I live on Whidbey Island, Washington across from Everett...and I'd like to register my strong opposition to the launching of the SBX. I know there are people whose health...many many people whose health would be affected very negatively...so I would like to make sure that Ms. Julia Elliott gets this message that I and many other people on Whidbey Island which faces Everett do not want this to be launched...thank you...

Hello my last name is Chou first name (couldn't understand)...I live in Clinton on Whidbey Island, across from Everett...and I would like to leave a message for Ms. Julia Elliott...that I strongly oppose the SBX for launch in Everett. I think it has been established on the harmful affect of electromagnetic waves and radiation on soft tissues and babies, especially unborn babies...so please take this into consideration and stop it...thank you.
Message delivered: 14 Apr 03: 10:13 AM CST; 22 seconds

Yeah, I'm a citizen of the United States and I think that there needs to be public input...public input time needs to be expanded and also we need time for public input on SBX environmental impact statement needs to be redone...thank you.

Message delivered: 11 Apr 03: 4:21 PM CST; 1 minute 16 seconds

Hi, my name is Carly Davenport...I live at ..., Everett Washington...and I oppose the Department of Defense proposal to locate the SBX in Everett, Washington for a number of reasons. These are the possible negative impacts to human health and safety caused by receiving long-term low-level EM radiation...has not been fully studied...the DoD indicates that radiation scatter will be an issue despite its attempts to target the array so as to not irradiate people...the size of the structure built on a converted ocean based oil drilling rig and its design for heavy industry, degrades the visual and aesthetic value of our local waterfront. The placement would undermine the city of Everett's current and future efforts to promote economic re development and attract investment in our waterfront and city core. The DoD has not fully assessed the potential interference to airborne navigation and commercial communication systems, sensitive electronic, and hospital and clinic based medical diagnostic equipment. Especially unknown is the effect of the full powered test of the energy beam that must be run five to six times per week...thanks...good bye.
My name is Richard Marshall...I'm a resident of Seattle, Washington...and I'm calling regarding the editorial that was in the "Seattle Times"...we had heard about the project, the SBX project, and the possible location of this up in Everett, Washington...and it seems that this location for it, was one of several possible locations, some of which were certainly more remote from various aspects that would be involved with it including air national and domestic air transportation overhead, other types of civilian facilities and civilian populations, in its immediate vicinity...so it seems to me that what needs to be done at this point is to do more investigation of where this could be sited, where it could be permanently sited if possible, where it would not have much as infringing involvement on the local population as this would, and also be in that regard possibly even easier to carry out its mission away from other factors that might disturb it. I don't know what those might be as far as the local radiation problems or other things, but anyhow, this is just in a response to this because it sounded as though there was some input requested as far as citizens are concerned, so this is one of them...thank you very much.

Hi, I'm calling to make a comment on the draft environmental impact statement, and I just wanted to say that I just find it appalling that you would consider dropping this monstrosity into Puget Sound which is one of the most wildlife rich places in this entire country, if not in the entire world....this is not Lake Erie here and you need to research this much more deeply and look somewhere else...I think the people maybe came out and made the mistake of just looking at the area from the Navy base, this is not just the Navy Base here, when you go around the corner from that, you go up the Snohomish River which is the biggest (estuary) in Washington, on the west coast it is the biggest (estuary)...all kinds of birds come through here, and you just can't put this thing here with the EMRs that it puts out, with the diesel...we're going to oppose this thing, and even if you put it here, we're still going to oppose it...just find somewhere in the middle or nowhere or just drop the whole idea of missile defense, there's nobody shooting missiles at us, we don't need this thing...my name is Christine Giannini and I'm a homeowner in Everett, Washington...please go away...take your big ball and take it somewhere else...thanks...bye.
Message delivered: 15 Apr 03: 10:05 AM CST; 39 seconds

Hello, my name is Pearl Beach and I live in the Everett area, and I think this is just a crazy paranoia thing, and I don’t understand why they want to build the stupid thing in the first place, the Russian missile system...got a missile agreement and everything...so I don’t understand why the heck they want the dumb thing in the first place....why here...so I think this thing is a bunch of nonsense...thank you.

Message delivered: 13 Apr 03: 11:35 PM CST; 55 seconds

This is Beverly Bruno, I live at …, Everett...and I think that this would be a detriment to the neighborhood...and just when we’re trying to clean up the whole city of Everett, and then to have this out there would devalue our city and what we’re trying to accomplish in the Puget Sound area...I think that it could be located somewhere else where residents and businesses will not have to look at it or be affected by it...and I just recently found out about this in the last couple of days...I oppose...and I just don’t know what else to say...thank you for taking my call and I hope that this can be resolved and put it some place where it won’t be a hazardous or an eyesore...thank you.
Message delivered: 11 Apr 03: 4:05 PM CST; 1 minute 9 seconds

Yeah, hi...my name is Timothy Webb, I live on Y...and I oppose the Department of Defense proposal to locate the SBX in Everett, Washington for a number of reasons. These are the possible negative impacts to human health and safety caused by receiving long-term low-level EM radiation not been fully studied...the DoD indicates that radiation scatter will be an issue despite its attempts to target the array so as to not irradiate people...the size of the structure built on a converted ocean-based oil drilling rig and its design for heavy industry degrades the visual and aesthetic value of our local waterfront...its placement would undermine the city of Everett's current and future efforts to promote economic re-development and attract investment in our waterfront and city core...the DoD has not fully assessed the potential interference to airborne navigation and commercial communications systems, sensitive electronics, and hospital and clinic-based medical diagnostic equipment...especially unknown is the effect of the full powered test of the energy beam...must be run five to six times per week...thank youYbye bye.

Message delivered: 11 Apr 03: 7:51 PM CST; 32 seconds

Deloris Bustad...I didn't hear all of what I was suppose to say...what all was I suppose to put in...oh ... in Everett...and the SBX I'm not in favor of it, it's got to many complications for health concerns as far as I'm concerned...and my husband is also not in favor of it...and we live real close to the waterfront.
Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)

Message delivered: 11 Apr 03: 6:57 PM CST; 2 minutes 58 seconds

Hello, my name is Annette Bustad, I'm at ... in Everett, Washington......I was commenting on the SBX...I am not in favor of having this put here in Everett, so I did want to call...and I have a lot of concerns about it...numerous concerns, I've attended a lot of the meetings, I'm a read the papers, I'm aware of what's going on...and I'm...one of the other things that's just been noted...I've been involved up at the Pre-Natal, the new Birthing Center on Pacific and Everett....I'm very concerned as far as the placement of the SBX being placed...you know...within just... you know...a two or three mile radius of not just...you know...ourselves, our lives, our homes, our TVs, a lot of things are going on even before the SBX is in that are very very skewed that everyone is talking about...so besides for all the other things that are going on...these babies...just so you all know...and I'm going to be contacting a couple of the...director and a couple of the doctors up there...I actually have a preemie grandchild that was born up there six weeks early....blah blah blah...they have oxygen, their heart, their movement, their blood level...they have them electronically hooked up to all these monitors...and these frequently go off...beep beep beep they go off flat-line and the nurse comes in and she just resets it and she says oh that happens all the time, it happens all the time...so I'm going to be trying to get some more involvement...and just so you all are known...so you guys aren't all beat up on...that there is large issues to this Pre-Natal, the Birthing Center that's on Pacific...if any of...one of your top officials could get a hold of Providence Hospital...see if you can get a hold of one of the Directors, ask for comments from a couple of the head doctors up there...that would be of the utmost importance...I would just have all of the respect if one of the officials would do something like that...I'm going to do what I can on my end

Message delivered: 11 Apr 03: 6:44 PM CST; 2 minutes 7 seconds

My name is Patricia Neel and I live in Everett, Washington...and I am opposed to even provisional or temporary testing of this SBX in the Port of Everett...at the Port Gardner Bay. I am concerned because of the hospitals, because of the impact on people, because of the number of people that are involved, because of the area of folks who would be impacted, because it's visually going to diminish what we've worked really hard for in Puget Sound...which is to have a...you know a environmentally safe and friendly area as well as visually beautiful...I think that it is in stark opposition to what the city of Everett is trying to do in terms of...rebuild the core part in the heart of our downtown and waterfront...just a few hundred feet from where this proposal, this proposed SBX radar thing is to be placed is a place I love to go for dinner to look out over the water...and a place where there is a Sunday market with farmers from the area coming...and I just don't think that being in the shadow of the size of this proposal will, it will negatively impact me personally as well as my community...so again my name is Patricia Neel...I'm very much opposed to the Sea Based Test X Band Radar...thank you.
Message delivered: 11 Apr 03: 6:19 PM CST; 11 seconds

Hi, my name is Mary Davidson, I live on Whidbey Island...and I am definitely for this...go for it...we need the protection, o.k...bye, bye.

Message delivered: 12 Apr 03: 3:09 PM CST; 1 minute 14 seconds

Hi my name is Jason Brasfield...and I would like to know you know...do I go into your lawn and throw trash in it...do I go in like, you know...trash your area where you live...like I do not, I'm absolutely opposed to you putting up a 25 story radar tower in the Everett sea port...that is serious, like, I don't even think that you have merit in what you guys need to do, I'm sick and tired of you guys spending billions of our budget just so you can destroy more of US property, o.k., you don't need it alright, and that's my opinion, and I'm going to voice it at the...and I am very very angry that we do not have enough time to protest this because you guys did not make it known to the public that you were putting this up until the deadline came down to that point...if you want to have this go, then let's rumble with this because we'll protest the hell out what you're trying to do...we do not need this, we have your damn base here, we don't need another 25 foot story here, I do not want this here...thank you, bye.

Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)
Message delivered: 12 Apr 03: 10:55 AM CST; 1 minutes 32 seconds

Hi my name is Claudia Elliott...and I'm just calling to tell you that I think your SBX Band Radar thing for the Port Gardner Bay and Everett is really a poorly thought through idea...I mean, my goodness you got several hundred thousand people in the radius of that thing including my daughter and son in law, and two grandsons, and a baby on the way...and I just don't think that's a good place to put it...I mean, I don't even know that we need to have it, but if you know there's some federal agency that says oh no we must have it to keep ourselves safe from Lord knows what...put it someplace were there is not so many that is going to be impacted by radar, that's just, that's just foolishness, that's like throwing the baby out with the bath water...I mean, the best way to fight terrorism is to help people...and that's not happening right now in the war, but hopefully it will...radar bands were there are people, you affect more innocent people than would be affected by terrorists act far away...so I'm just saying I'm opposed to SBX Band Radar in Port Gardner Bay, I know it's only just one person, but I'm one person who takes my responsibility as a citizen seriously. Thanks for your time...I pray that this has an impact on decision making things...Again my name is Claudia Elliott.

Message delivered: 12 Apr 03: 6:14 PM CST; 1 minute 21 seconds

This is Jeff McCune...Saturday, April 12, about a little after 4:00 PM local time...I'm a resident of South Whidbey Island...I'm sorry I'm late getting this comment to you...I hope it's in time, according to the paper it talks about the 15th as the cut off time. I'm totally in favor of whatever it takes to deter these terrorists, etc., from invading our good democracy here...and I'd be happy to have this, any place and any time...we are at war and the sooner these ding bats in this country understands...these liberals understand this...they're going to get their heads out of their you know what...and we need to have this, of course we need to have it. If you need to reach me, you can reach me at.... I have...I can go on and on...I think it might be one of the ideas to design it...make it look a little bit more attractive to the public, but a dog gone aquarium underneath the thing...spruce it up a little bit...but the point is we need it...and I fully support it, and if I need...you need to get me put this in writing I will...thanks for the availability of this number, I appreciate it...bye for now.
Message delivered: 12 Apr 03: 12:33 PM CST; 1 minute 16 seconds

My name is John Vandalen...and I live at ... Avenue here at Everett, Washington...I have a view of the Puget Sound where the radar unit will be situated...if Everett was chosen...and I don't have a problem with it...my only concern is that a radio operator, a ham radio operator, that I would have some interference from it when it was active...other than that, the visual impact does not bother me and the economics that it would provide would be slight because it there would be just an additional crew to man it and it could probably be manned remotely anyway...I don't have a problem with it...I am in disagreement with the city government of Everett and that I think it should be here in Everett...any questions or comments from me...I'm at ......thank you and appreciate you guys looking at Everett....bye bye

Message delivered: 12 Apr 03: 12:39 PM CST; 2 minutes 21 seconds

Hi, my name is Martin Schmidt...that's Martin Schmidt...I'm a resident of Whidbey Island near Coupeville in Washington...the other day I learned for the first time that here on Whidbey Island, in Washington State, the beautiful Puget Sound, I learned that you hope to install an SBX radar station on a floating platform the size of an oil drilling platform, a total height of 250 feet...right in the city of Everett, or right in front of the City of Everett, in plain view of everybody in Everett as well as those of us on Whidbey Island here...and I thought to myself, you know, are you nuts...and not only that, but we learned that this all has to do with Star Wars technology that's already cost the US taxpayer's 60 billion dollars so far, and doesn't even work...and no consideration was given as to how the people and I'm one of the people feel about it...I insist that you stop this, this is ridiculous to put something like this here, particularly without concern for the people who live here and what not...and I think you should be ashamed of yourselves. My name again is Martin Schmidt, I live in Coupeville, and my telephone is ......and your email that was given in our local paper, the "South Whidbey Island Record", as gmdebreis@smdc.arm.mil doesn't work...thank you...well not thank you...you should thank me.
I am completely opposed to the SBX being located in the waters between Whidbey Island and Everett...I live on Whidbey Island, I have for many years, and I am completely and totally opposed to this...my name is Evelyn Hays...thank you.

Message delivered: 13 Apr 03: 11:34 PM CST; 27 seconds

This is a resident by the name of Reis. We live on the...near the Rucker Hill...and we'd like to comment that every effort be made to place the radar station that was from the discussion at a different location...thank you.
My name is...my last name is Casey...I am a registered voter in the state of Washington...and I just want to comment that I am very much alarmed at the notion of setting up an SBX site near Everett, Washington...it is far too populated an area for risking such potentially dangerous a project...therefore I urge you to do what you can to prevent it...and my words would be addressed, I believe, to Ms. Julia Elliott...I didn't understand all that she said on your introduction...so anyway that's it, my last name is Casey...thank you very much.

Hello, my name is Sara O'Farell, I'm calling representing myself, my mother Ann, and my father Douglas. We strongly oppose this project...the idea of positioning a large field of potential threat to human health and the health of wildlife using our tax dollars does not sound like a good idea when there are so many Washingtonians that need primary health care for instance...yeah, we very much oppose this project...and...thank you.

This is Sara O'Farell once again...and I just wanted to leave my address, , Langley, Washington, ...that's south Whidbey Island...just wanted to leave that in case you needed it for comment purposes...thank you so much.
Message delivered: 15 Apr 03: 4:51 PM CST; 35 seconds

My name is Charlotte Laborde...and I'm a resident of Everett and I oppose the SBX.

Message delivered: 15 Apr 03: 4:58 PM CST; 1 minute, 4 seconds

I want to voice my strong opposition to having the facility located off the coast of Everett, Washington. I think this is an entirely inappropriate facility to be so close to our shore line...especially since our hospitals are located very very close to the coast...and I just wanted to express my strong opposition...I felt that there are other options for this facility that would not be so close to a city as the choice of Everett...so when I read it in the paper, Alaska and Marshall Islands, both of those especially at certain areas of Alaska would be not very populated...Marshall Islands far enough off water there, offshore would be away from a populated area...thank you.
This is Nena O'Neil, ...I've lived here for nearly 50 years and I've seen Everett overcome a lot of obstacles, but this obstacle would be the crowning blow and the crushing blow for our wonderful city that's growing slowly but surely into the new world. Please do not put that...I've never been a MD in my life and I'm all in favor of defense completely, but we do not in our little small bay need a huge structure like that one...please do not bring it to Everett...thank you...

Hello, this is Karen Miller, I'm calling about the SBX proposed siting here in Everett, Washington...I'm a resident of Everett, Washington and I am concerned about the quality of the Sound, especially our local bay here, and I'm also concerned about the quality of life...I don't own a mega million dollar house on the bluff...so I can't really speak a lot to my property values, but I do own a little tiny house that I plan to retire to...and I really like north Everett and I don't really see what's left of...it's not aesthetically pleasing...I'm trying to say this a gracefully as I can, but, you know, it's kind of an ugly little eyesore thing...well it's not even little, I can't even say it's little...but anyway, you get my drift...thanks, my phone number is...and my address is..., Everett, Washington......bye...
Message delivered: 15 Apr 03: 11:26 PM CST; 53 seconds

Hello, my name is Ralph Minor...I live in Seattle, Washington. I just became aware of the plan to put this mammoth structure in the Port of Everett...and I wanted to express my extreme displeasure at this idea...I was raised in Everett, and I have many friends who still live there and they have alerted me to this...and I think this is a terrible terrible idea for all kinds of reason...the visual pollution, the possible danger from electromagnet radiation...and it sounds like you've got other alternatives out in the Marshall Islands or in Pearl Harbor if you can resolve the electromagnetic issues...but please, this does not belong in Everett...thank you very much..

Message delivered: 15 Apr 03: 4:51 PM CST; 35 seconds

Hello, I am June Evers...and I oppose to locate the SBX in Everett. I'm a resident of Everett, Washington, and I don't think enough research has been done and study has been done to be able to put this thing in the port...and I am also oppose to how large and how obstructive it would be to our view...thank you...bye.
Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)

Message delivered: 16 Apr 03: 10:30 AM CST; 57 seconds

My name is Mary DiJulio...at present I'm living and working in Puyallup, Washington...my phone number is.... I have lived in Everett, Washington and I may live there again. I wish to express my opposition to the project being forced upon Everett, Washington and its people. A suggestion by some friends who live in Everett...place this radar at one of the military sites that does not involved common communities...so please take this into consideration...and thank you...my name...did I spell it...DiJulio...

Message delivered: 15 Apr 03: 11:57 PM CST; 2 minutes, 2 seconds

Hello, yes, this is Janice Hartson....I am calling from the Everett area, and as a Everett resident to comment on the SBX naval platform that the defense department proposes to anchor at the Naval station in Everett. I am at this point against having it anchored in the area...it would be detrimental to the harbor activity as well as the visual environmental environment there...we are also voters in the area and do know that the area is sensitive as far as the wetlands and the estuaries that are nearby...the Navy in itself has impacted the area quite a bit with regards to wildlife and boating...the presence of the platform in itself, would, I believe, be a great eyesore...even if it is parked close to the anchored area where the Naval ships are and when not in use or in operation would be then, as commented earlier in the "Everett Herald"...be out in the bay area where it would be anchored and probably provide a visual discrepancy against the pristine panoramas that now occupy the Port Gardner Bay area...I hope that all comments that I have made are made with consideration and I hope that other people call in to make comments regarding the nixing of this project...thank you very much...home phone......thank you.
Message delivered: 14 Apr 03: 5:42 PM CST; 31 seconds

I am Bernadine Casey, a voter in the state of Washington, I'm not sure I have the right office, but I wanted to register opposition to the building of a SBX site near Everett, Washington. I believe that it is far too dangerous to sit in a highly populated area. I believe it would be a big mistake to put it there...thank you.

Message delivered: 9 Apr 03: 7:25 PM CST; 56 seconds

Yes, my last name is Govedare...I'm calling to strongly oppose any question of bringing this contraption, this SBX radar project to Everett...I live on Whidbey Island and I would be absolutely appalled to have to look at this...85...250 feet tall contraption in our beautiful Puget Sound...not to mention the health ramifications which I understand is considerable...and I am simply calling to object to your considering this location...there are too many people living nearby...we have such a beautiful natural environment here...we do not need anything of this nature...so please do not continue to pursue this project in Everett...thank you very much...
Message delivered: 16 Apr 03: 6:51 PM CST; 45 seconds

Yes, hello, my name is Diane Rogers...and I live right outside of Everett, Washington...and I just wanted to voice a comment regarding the radar platform...I've read a little about it and it seems to me that it's a necessary thing, but I think there would probably be a better place for it to be stationed than in a primarily residential area that is under development...I think that, you know, the powers to be would find a place that would be more suitable...There is an issue regarding the radiation and...I don't think that has been investigated thoroughly...so I would have to say I would vote against that being placed in the Everett Harbor...thank you...bye, bye.

Message delivered: 14 Apr 03: 10:03 PM CST; 1 minute, 50 seconds

My name is Richard Marshall...I'm a resident of Seattle, Washington...and I'm calling regarding the editorial that was in the “Seattle Times”...we had heard about the project, the SBX project, and the possible location of this up in Everett, Washington...and it seems that this location for it, was one of several possible locations, some of which were certainly more remote from various aspects that would be involved with it including air national and domestic air transportation overhead, other types of civilian facilities and civilian populations, in it's immediate vicinity...so it seems to me that what needs to be done at this point is to do more investigation of where this could be sited, where it could be permantly sited if possible, where it would not have much as infringing involvement on the local population as this would, and also be in that regard possibly even easier to carry out its mission away from other factors that might disturb it, I don't know what those might be as far as the local radiation problems or other things, but anyhow, this is just in a response to this because it sounded as though there was some input requested as far as citizens are concerned, so this is one of them...thank you very much.
**Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)**

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<tr>
<td>P-O-0057</td>
<td>Hello, my name is Betty Elliott...I live in Clinton, Washington, which is just across the water from the Everett Naval Base. I have talked with many people locally who are really fearful about this SBX installation that is expected to occur...and especially I hear fears for health concerns and the impact on many electronic devices, including pacemakers. I am vehemently oppose to this being put there, can't understand it, don't feel we were given any information ahead of time to deal with this...I know this is probably a losing cause...but I wanted to register may complaint loud and clear...thank you very much.</td>
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<tr>
<td>P-O-0058</td>
<td>Hi, my name is Harry Elliott...I live in Clinton, Washington...and I am strongly objecting to the SBX that's planned for the harbor in Everett, Washington...we live within site of that base and...the Navy base there...and it just, in my opinion from what I've read and what I've heard, it's just too dangerous to have that close to not only to individuals who live close to that, but also to hospital and other things...we know very well what the danger there is in radar and airport approaches and other places...controversy about radiation from power line and so forth, and yet we're putting this right in people's back yards. I think that too many decisions are made on the basis of paranoia by this administration and I just want to let you know that I strongly object to that and I hope that something could be done not to build this apparatus...thank you.</td>
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Message delivered: 15 Apr 03: 12:10 PM CST; 10 seconds

Juanzon Kim, Kim is the last name.

Message delivered: 15 Apr 03: 12:11 PM CST; 47 seconds

This is Juanzon Kim calling from Seattle, Washington...I live in Everett, Washington...and I'm calling to let you know that I would like to put in my vote against having the location of this SBX in the Everett Gardner Bay Port...we have a good relationship with the military currently with the base down there and I think that this probably would hurt that relationship as well as hurt our economy...I would hope that you would be able to find a better location much better suited to an area where there wouldn't be a population that would be adversely impacted by such a construction.

Message delivered: 15 Apr 03: 1:33 PM CST; 50 seconds

My name Charles R. Burdshal...I oppose the going ahead with the SBX too at this time...I think further public comment needs to be allowed and further information needs to be developed for the public...it appears that the environmental impact is inaccurate in that it's...or it's lacking in its scope and research...so it...we need to remedy that...thank you.
Hi, my name is Michael Martin and I live at ... in Everett...and I'm calling to put in my comments about the SBX system...we're very very strongly opposed to this for many reasons and...just want our voice to be heard and I'm sure you've heard some of the reasons why people are against it in this area...we feel it's going to have a very significant impact on economic and social issues of our community as well as most likely, unfortunately, a negative impact on our relationship with the Navy base there...I don't know how else to state that...the reality is that it's going to have a huge impact...we think that it's really best placed somewhere else due to the large population of the area and some of the economic issues of the community as well as the possible environmental issues to the community as well...so...again this is Michael Martin...very opposed to the SBX system being placed here...and serious ramifications of it...thank you.

My name is...my last name is Casey...I am a registered voter in the state of Washington...and I just want to comment that I am very much alarmed at the notion of setting up an SBX site near Everett, Washington...it is far too populated an area for risking such potentially dangerous a project...therefore I urge you to do what you can to prevent it...and my words would be addressed, I believe, to Ms. Julia Elliott...I didn't understand all that she said on your introduction...so anyway that's it, my last name is Casey...thank you very much.
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<th>COMMENT NUMBER</th>
<th>Message delivered: 15 Apr 03: 4:51 PM CST; 35 seconds</th>
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<tr>
<td>P-O-0063</td>
<td>Hello, I am June Evers...and I oppose to locate the SBX in Everett. I'm a resident of Everett, Washington, and I don't think enough research has been done and study has been done to be able to put this thing in the port...and I am also oppose to how large and how obstructive it would be to our view...thank you...bye.</td>
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<tr>
<td>P-O-0064</td>
<td>Message delivered: 15 Apr 03: 4:51 PM CST; 35 seconds</td>
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<td></td>
<td>My name is Charlotte Laborde...and I'm a resident of Everett and I oppose the SBX.</td>
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Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)
I want to voice my strong opposition to having the facility located off the coast of Everett, Washington. I think this is an entirely inappropriate facility to be so close to our shore lines...especially since our hospitals are located very very close to the coast...and I just wanted to express my strong opposition...I felt that there are other options for this facility that would not be so close to a city as the choice of Everett...so when I read it in the paper, Alaska and Marshall Islands, both of those especially at certain areas of Alaska would be not very populated...Marshall Islands far enough off water there, offshore would be away from a populated area...thank you.

This is Nena O'Neil, ... in Everett...I've lived here for nearly 50 years and I've seen Everett overcome a lot of obstacles, but this obstacle would be the crowning blow and the crushing blow for our wonderful city that's growing slowly but surely into the new world. Please do not put that...I've never been a MD in my life and I'm all in favor of defense completely, but we do not in our little small bay need a huge structure like that one...please do not bring it to Everett...thank you...
Hello, this is Karen Miller, I'm calling about the SBX proposed siting here in Everett, Washington...I'm a resident of Everett, Washington and I am concerned about the quality of the Sound, especially our local bay here, and I'm also concerned about the quality of life...I don't own a mega million dollar house on the bluff...so I can't really speak a lot to my property values, but I do own a little tiny house that I plan to retire to...and I really like north Everett and I don't really see what's left of its beauty spoiled by more structures that aren't aesthetically pleasing...I'm trying to say this a gracefully as I can, but, you know, it's kind of an ugly little eyesore thing...well it's not even little, I can't even say it's little...but anyway, you get my drift...thanks, my phone number is and my address is Everett, Washington, ...bye... 

Message delivered: 15 Apr 03: 11:26 PM CST; 53 seconds

Hello, my name is Ralph Minor...I live in Seattle, Washington. I just became aware of the plan to put this mammoth structure in the Port of Everett...and I wanted to express my extreme displeasure at this idea...I was raised in Everett, and I have many friends who still live there and they have alerted me to this...and I think this is a terrible terrible idea for all kinds of reason...the visual pollution, the possible danger from electromagnet radiation...and it sounds like you've got other alternatives out in the Marshall Islands or in Pearl Harbor if you can resolve the electromagnetic issues...but please, this does not belong in Everett...thank you very much.
Message delivered: 9 Apr 03: 10:43 PM CST; 1 minute, 12 seconds

My name is David Roodzant...I live in Marysville, Washington...I would just like to give you a little bit of positive input on the SBX plan...I'm very thankful that the military and our Commander in Chief has the foresight to see the need for this installation...I hope that you won't be deterred by a few ball babies that want to cry about it...if you just look one mile north of the installation there in Port Gardner Bay you'll see Kimberly Clark which is far taller and uglier and smells a whole lot worse, and nobody's crying about that...I would like to see more of these built...I would like to see a supersize long range Patriot missile system in conjunction with these...I think that this is very important to the defense of our country...I think it's something we need to do now...and it's just my input...I hope it's a positive input for you...thank you very much.

Message delivered: 15 Apr 03: 8:56 AM CST; 1 minute, 50 seconds

Hi, I'm calling to make a comment on the draft environmental impact statement, and I just wanted to say that I just find it appalling that you would consider dropping this monstrosity into Puget Sound which is one of the most wildlife rich places in this entire country, if not in the entire world....this is not Lake Eerie here and you need to research this much more deeply and look somewhere else...I think the people maybe came out and made the mistake of just looking at the area from the Navy base, this is not just the Navy Base here, when you go around the corner from that, you go up the Snohomish River which is the biggest (estuary) in Washington, on the west coast it is the biggest (estuary)...all kinds of birds come through here, and you just can't put this thing here with the EMRs that it puts out, with the diesel it's going to be burning and polluting the air...we're going to oppose this thing, and even if you put it here, we're still going to oppose it...just find somewhere in the middle or nowhere or just drop the whole idea of missile defense, there's nobody shooting missiles at us, we don't need this thing...my name is Christine Giannini and I'm a homeowner in Everett, Washington...please go away...take your big ball and take it somewhere else...thanks...bye.
Message delivered: 15 Apr 03: 10:05 AM CST; 39 seconds

Hello, my name is Pearl Beach and I live in the Everett area, and I think this is just a crazy paranoia thing, and I don’t understand why they want to build the stupid thing in the first place, the Russian missile system...got a missile agreement and everything...so I don’t understand why the heck they want the dumb thing in the first place....why here...so I think this thing is a bunch of nonsense...thank you.


I have had a number of folks come to me to express concern about the ship that you are bringing in. One of those issues that we still have to work out is the security buffer zone because of the recreational and commercial fishing that goes on in the area. That needs to be worked out.

Then also you didn't mention how long this vessel was going to be here, how long is this program going to be. Again in regards to the fishery, commercial and recreational, would you be out in Port Gardner Sound, sitting out there in the middle of the fishing grounds?

I think those -- and a lot of the other folks will bring forward more questions, but those are the more consistent questions that were brought to me. Thank you.
Richard P. Jones, Mukilteo, Washington; .... All the questions at once or one at a time? I didn't understand that part. It's been said that the decision-makers are not here. Who are they? That's the first question.

To comment first, we have numerous air restrictions around here; in fact, more than almost any other place in the country. Will there be additional air space restrictions or permanent air space restrictions or restricted areas of any kind associated with this deployment here?

Third question is: I have heard something about high-power radar testing and low-power testing. Did you intend to conduct high-power testing while you're in port here? That was not clear in the statement.

Those are my questions.

Which is a temporary flight restriction.

You are saying, then, that you do not intend to extend that any longer than it would otherwise have been there?

Are you now considering that to be a permanent flight restriction as a result of putting this facility there?

Somewhat more blunt, then: If the current TFR was not there today, would you be asking for something?


I would like to thank the representatives of the Department of Defense for being here today to answer the questions and concerns of this community. I would also like to thank the City of Everett and especially Kate Reardon, Communications Director, for providing this forum. Also a great thanks to the citizens of our area. Not just Everett, but our surrounding communities for coming out today.

My first knowledge of the proposed SBX Test X-Band Radar came on February 25th, 2003, through Brian Kelly's first article in the Everett Herald. I immediately located the draft online and began studying it and then attended the DoD meeting two days later on February 28th, 2003. The purpose of the meeting was to provide comment on the DEIS. Strangely, the DEIS was not available at the meeting, nor were questions answered during the public comment format.

The initial scoping process to develop the DEIS was to have involved this community. It did not. The five other sites that have been evaluated in the DEIS have had meetings within their communities. The scoping meeting intended for Everett, as you have said, was held on October 17th, 2002, in Seattle, King County -- not in Everett and not in Snohomish County. As a matter of record, in the DEIS no comments were taken at that meeting -- zero. As of Friday, March 14th, our own city government or a portion thereof had no information about the SBX and had not been able to locate the draft. The overwhelming majority of our residents still do not know about the SBX or its potential impact on our lives and environment, and substantive information has not been given to the residents albeit today.

We have had no knowledge, and we have had no voice. This draft does not represent our concerns. It does not represent a realistic region of influence, and it most certainly does not adequately assess the impacts to this community or provide any mitigations. We have been forced by this lack of public process into a hyper mode to educate our constituents and get our comments to you by April 15th.

I want to point out that this community has been denied one full year and one month of public process concerning the development of the DEIS. You have forced this community into a comment period of six weeks and four days, and in my opinion that is wholly inadequate.

I respectfully insist that the entire process should be started from the
beginning. I would like to ask these four questions: Was there any communication to Snohomish County officials or City of Everett officials before February 2003? If so, what form did that communication take, from what agency, and to whom? Are these communications a matter of public record? Why was the scoping meeting held outside of Snohomish County or Everett on October 17, 2002? Thank you.


I'm glad to hear that you are not going to be operating fully while in port. Thank you for that information. You have raised some questions in my mind about transporting this large vessel out to the Pacific Ocean. How many trips a year do you foresee this vessel taking? To those points on the map that you showed us? To the Marshall Islands, to the Hawaiian Islands, to those areas?

My questions then range around the environmental costs as well as the financial costs of that plan. The distance, the great distance from Port Gardner Bay out to the middle of Pacific Ocean, is quite a distance. We have a very fragile ecosystem in the Puget Sound that I think we all appreciate. We talked about the fishing industry and other things, but we also have a very fragile ecosystem here.

So I understand this vessel will carry 800,000 gallons of diesel fuel. This is a concern to us, having been close to Alaska when those accidents have happened. The costs of the diesel fuel going and coming and the environmental risks are pretty great. I would certainly like to have more reassurances that this is going to be handled in a much more financially responsible manner.

I would like to see it out in the Marshall Islands is what I'm trying to say. I think it's not a good idea to have it here in a populated area where you could be out away from – this concerns me -- and be closer to your test site. I'm for homeland defense, believe me I am, but this – I just want to question the financial and environmental concerns, the cost to our country.

So six trips a year? That's actually 12 passes through our Puget Sound area.
My question is in regard to health and safety. I understand that during your high-power testing, you could be radiating as much as 300 volts per meter. I understand that you’re trying to keep that above a 10-degree horizontal. My concern is that current avionic systems are typically only designed right now to about 100 to 150 volts per meter for commercial aircraft. Some systems that are being designed today are only 20 volts per meter, and the older systems are even less than that. My concern is the power that’s being put from this could be anywhere from 3 to, say, 15 times what these systems are designed for.
I understand you’ll have interlocks for safety and things to try and prevent aircraft from coming into contact with this energy, but also realize that we are talking about an aircraft system which doesn’t even address commercial systems that aren’t designed to withstand these types of levels.
My concern is that when your system fails, which there is always the potential, have you guys done an analysis in terms of health and safety that could cause problems to the community and to our systems? And if you have done that analysis, would you make that information public?

My name is Elizabeth Marshall, E-L-I-Z-A-B-E-T-H, M-A-R-S-H-A-L-L. I live at ... in Everett. I’m a family practice physician, and I have worked in this community for 10 years. I’ve practiced medicine for 15 years. I’m primarily concerned about the health effects on our local community of the SBX.
I have been doing research into electromagnetic radiation in the scientific literature, and it’s unclear at this point as to whether or not EMR is dangerous.
There are studies that indicate that children growing up under these power lines have increased risk of leukemia and lymphoma, and there are similar studies indicating other forms of soft-tissue tumors in primarily children exposed to environmental electromagnetic radiation.
As a physician, I know that for 15 years we’ve prescribed estrogen to woman with studies showing pros and cons of the benefits and adverse effects of estrogen. And 15 years later as of 2002, we now have a definitive study showing that estrogen is harmful and increases the risk of stroke and breast cancer in women. I believe that we have not yet determined whether electromagnetic radiation is dangerous, and similar to estrogen, we don’t want to find out many years from now that we have radiated our children in Everett because of the SBX.
I also know as a physician that there is a scatter effect with radiation. You may angle it at 10 degrees, but when we do an x-ray in the office, the technicians or any family members present wear a lead shield. That is a direct, single beam that’s focused on an individual, but there is a lead shield worn because of scatter effect. I am convinced that you cannot have a high-power -- I don’t know the term -- radiation beam that is not going to scatter to our local citizenry and potentially affect the children and the adults here.
Therefore, this leads me to a question: As a mother and physician, I want to know, yes or no -- and I believe the answer is no -- can you definitively tell us there have been rigorous scientific studies showing that low-dose radiation is not harmful?
I just would like to say that four days ago in the proceedings of the National Academy of Science, a report came out. This is on April 1st, and I will quote this: A team said they exposed human cell cultures to varying x-ray doses in the lab. To their surprise, they found that damage from low radiation levels lingered days to weeks longer than damage caused by more powerful radiation. The radiation can cause breaks in DNA that go across both strands of the double helix.
Scientists had assumed that the body moves to repair these breaks at the same rate, no matter what the dose of radiation, but Lobrich's team found this may not be true. It could be, they propose, that the body simply does not recognize lower levels of damage and does not move to repair it. When these damaged cells divide and multiply, the unrepai red damage multiplies along with them, they suggested. We have not determined this. I would like you to answer that question.

My name is Marianne Edain, spelled M-A-R-I-A-N-N-E; last name E-D-A-I-N; ..., Langley, Washington. I'm from that part of Puget Sound that evidently the Navy hasn't figured out exists: Island County. What you are proposing is going to have dramatic effects on Island County. As far as I can tell, no jurisdiction in Island County was given any sort of information. I spoke with the county commissioner's office this week, and they were shocked, surprised, and had never heard of such a thing. I am at a great disadvantage because nobody in Island County had heard of this and therefore had no opportunity to examine DEISs or otherwise. It's very difficult to comment on a document one has not seen. That being the case, I heard you say that the original scope of this document did not include the proposal to put this SBX here. That being the case, the document is fatally flawed under NEPA and needs to go back to the beginning. I'm sorry. You need to start at a scoping which includes the actual proposal. That being the case, I ask that you stop this process right now, go back to the beginning, do a proper scoping in the communities where you actually intend to place this thing, and hear from the public. A scoping meeting where zero public comment is taken is not a scoping meeting. I'm sorry.

On the issue of the ionizing radiation and using the FCC limits, there is a concept of prudent avoidance. In fact, NEPA requires that if one does not have all of the information, one assumes a worst-case scenario. A worst-case scenario then requires prudent avoidance of the potential damage. That being the case, we suggest that the place for this, if anywhere on this planet, is somewhere far out to sea. But even then, I have not had the opportunity to examine your DEIS, but I suspect that the review of the effects on marine mammals, for instance, has been shallow -- is probably the term -- and again, I'm speaking without having seen the document.

If you do not go back and scope this proposal over, at the very least it is absolutely essential that you provide appropriate time for comment, that you extend the comment period, and that you notify all of the jurisdictions which will be affected by your proposal.
Stephanie Allen, S-T-E-P-H-A-N-I-E, A-L-L-E-N; ..., Mukilteo, 98275. I just actually had one question. This was with regard to, as we heard before, the temporary restricted air spaces. I don't know -- the people here are probably not pilots. I'm a pilot based in Paine Field. I've also been a resident here for a while. This temporary restricted air space that we have here with three others, of which I believe there are only 25 left now in the nation except for maybe New York -- that we have four temporary flight restrictions. These were put in after 9-11 because they say that we are a perceived risk for a terrorist attack. Supposedly this is unsubstantiated, but it is supposed to be a perceived risk.

Now, if we put something like this SBX system out there, it seems to me that our risk is going to be up because we have essentially a system here that looks like it might be a little bit more fragile than the Lincoln. Is this going to happen? Are we going to find out -- because nobody has asked this question. It's a risk, a potential, even though supposedly it's been unsubstantiated in the past. Is our risk for a terrorist attack going to go up with this kind of equipment sitting out here in our bay?

Just to define, what our restricted air space is the 3-nautical-mile radius centered around the Lincoln at the home port. This, as far as I can tell you as a pilot, is completely, completely inadequate for protecting anything. You are not really. It's gotten to me to look more like an agenda of promotions to make you think that we are safe, and that is not true. I am concerned as a resident and as a pilot about any potential increase in the risks that we have here.

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My name is Mary Jane Anderson. That's Mary -- two words -- Jane. Anderson is A-N-D-E-R-S-O-N. ..., Everett, Washington. I have two separate, distinct questions. I'll ask the first one because I think it will be a short answer. You have a concept of this SBX at a certain size. I'm in product development, and I know that nothing ever comes out the way it starts. What's the possibility that this thing could grow in size?

What about the dome itself?

Thank you. My other question is in the EIS it does say that your region of influence is Naval Station Everett. A couple other people have commented that we feel that this isn't quite enough. My specific question is: If you know anything about the history of Everett, we were a mill town. We're trying desperately to raise our socioeconomic viability here. We have done a lot with redoing the marine waterfront area and getting more people.

I notice that on your slide show you said that socioeconomic impact was not included in this review. Why not? I think we should go back and do a socioeconomic review based on what Everett needs to survive.

For the record, I would like to express that on March 19, 2003, I sent both an e-mail and a letter in timely response to the initial question and comment period. As of yet, I have not received a response. So today I would like to reiterate a few of my concerns, but as time is of the essence, I'll not attempt to review the entire letter. However, I'm hoping that my initial response will be considered in its entirety.

That being said, my questions are as follows — and I came in late, so I'm not sure what you've already answered. I'll just, for the record, go through my questions, and maybe you can answer whatever hasn't been touched on.

In order for my safety engineer friends to properly calculate the exact EMR exposure to my home and my three children, ages 2, 3, and 5, I'm told that it is essential to be informed about the power or energy emanating from the source.

Secondly, there have been conflicting reports about the length of time the SBX will sit at port. Could you please clarify what my exposures be during this time frame, how often will my family be exposed, and at what dosage.

Are there reliable safety records available from either another working facility of this type or its prototype that may give conclusive data as to the effects or illnesses that we should anticipate? Will diesel fuel residues be emitted? I have been hearing about diesel fuel. If so, what will the exposure to my community's air and water be, and how will that be controlled?

Have you consulted with safety and health professionals about this project? If so, can you provide additional results? In your GMD ETR draft, mention was made about small quantities of hazardous waste that could potentially spill or be emitted.

Could you tell us about these substances and how much and if any other by-products or materials, which have not been disclosed yet, will be leak into the environment?

Your report stated that no visual impacts are anticipated because this type of activity consistently -- quote, unquote -- occurs at the Naval Station Everett. I beg to differ. This has never consistently occurred. It does not compare to the Lincoln. Statements like this only perpetuate distrust in the same way that conducting your initial citizen comment meeting in Seattle did.

Doris Olivers, O-L-I-V-E-R-S, … in Everett.

I'm opposed to the SBX being located in Everett, and I think that it's imperative that you consider all the other communities that are around this area and the county. One of my concerns is the negative impact on economic development around Port Gardner Bay. The City has promoted local development with the saying "Great thinking with a view."

It's still unclear nine months in port — I think your description of it being 83 feet taller than the Lincoln and less in length are a little disingenuous because it's a huge bulk. It's as large as Husky Stadium. It's half the height of the Space Needle for comparison. I think the SBX structure impacts the view negatively and would be harmful to local promotion including condominium construction downtown and marina development. Property values could be negatively impacted.

From the angle of my property, much of the view would be filled with the SBX when it's in port. What is the impact on our local economics?

I think that you've discounted the microwave radiation, but I personally believe in the precautionary principle. I would prefer not to take risks and have a choice about what risks I do take.

I'm not sure that the questions about electronic interference have been responded to well enough. It's my understanding that there could be local effect to hospitals and electronic interception and the emergency response. I think this needs to be looked at more closely. I'm concerned about the truck travel on already burdened roads. You haven't said anything about how many supply trucks there would be coming in.

About the fuel spill possibilities, is this a double-hull construction? On air pollution, I think that we don't need to add to our already troubled air. We have a lot of inversions here on this side of the Cascade Mountains. Nobody has addressed the noise of these generators running. I would like to see you put it in a less populated area. Thank you.
I'm Vernon Huffman, H-U-F-F-M-A-N, from ... in Everett. I have only just recently found out about this, and I would like to add my voice to the protests about the process that's been followed. Not having read the EIS, I'm not sure exactly what's in there, but from what I heard today, it sounds like you are saying if it's in base, if it's in Everett, it's only going to be used for maintenance and testing. You won't actually be running it at full potential.

I hope you are not telling me that if you get word that there is a missile coming in, you're not going to kick this thing up to its full potential and use it for the best you can to save us from incoming missiles. If we heard that one has been launched and you're sitting in port, you're going to start it up in port, Right? Even if it turns out that that was a false alarm, we are all going to feel the radiation effects. Is that in the EIS?

I wish I had the confidence that you do that the military never makes mistakes. My life experiences just can't back that up.

My name is Karen Pauley, P-A-U-L-E-Y. I live at ... in Everett. First of all, I don't think that you adequately answered the question about the socioeconomic effects of this on our community. There are no assessments of the impact to the City of Everett's future economic development plans or the future waterfront redevelopment plans. Plans to draw new business and higher income living to our waterfront and downtown areas are in jeopardy because of the negative impact of the SBX. Why is this completely ignored in the DEIS? Also I wondered if any of the other neighboring communities such as Mukilteo -- I know there are people here from Whidbey Island. Have they been informed of the meetings that are occurring? I guess I'll just leave it at that.
My name is Mr. Tim Reisenauer, R-E-I-S-E-N-A-U-E-R. My address is ..., I have a private practice near Naval Station Everett. I also write a regular guest column in one of the local newspapers. I am concerned about how the electrical magnetic radiation from the SBX will impact the MR fields around any of the number of the devices that we use in our neighborhood. I’m concerned about the cardiac telemetry unit at our hospital, about the medical diagnostic equipment near my office, and also about the PCs and the data storage systems that we use. I want to tell you a story. It has to do with the electromagnetic scanner. It’s a story about something that happened to me recently. One morning I woke up and I kissed my wife and kids, and I headed out the back to get into my car to go to work. Like all mornings, I pressed the remote which raises the bay door in my detached garage. Nothing happened. I re-pressed it several times. Still nothing happened. 15 minutes later after several new batteries for my remote, I was no nearer to getting my car untrapped from the garage. By the time I got to work, I was muddy, sporting skinned knuckles, and was late for my first patient of the day. This story has repeated itself multiple times since then. More startling yet, my garage bay door spontaneously opens by itself. With a repairman scratching his head and me wanting to find out what was broken, I began asking neighbors for advice. Surprisingly, I learned that I don’t have a faulty garage door at all. Instead I discovered that whenever the DoD tests ship-board radar systems two miles away, the electromagnetic radiation from the array causes difficulty with electronic systems like -- you guessed it -- garage door openers. It turns out my neighbors’ garage doors were also doing the hokey-pokey. The DoD promised to fix it; said it would stop. It hasn’t. Here is another story: It’s a related could-be story not unlike my experience. Imagine it is two years from now, and the SBX is moored in the harbor. Also imagine, Commander, that the DoD is doing its high-power test that day and, quote, trying not to radiate things they don’t want to, end quote. Now, this is a concern because in my office sits my first patient of the day. She’s a young gal waiting for a heart transplant because the damaged one she has can’t do it any longer. She has a miniature cardiac defibrillator implanted in her heart. It’s a device similar, as you know, I’m sure, to the ones medic squads and ERs use to help when the heart stops from a heart attack. Its job is to zap her back to life whenever it senses unhealthy electromagnetic charges around the heart. She is crying, and she tells me that many times her device fired that last month because her heart is so weak. I’m holding the computer that I use in my hand to take notes. That digitally converts my written notes into a type of electronic medical record. It also puts out patients’ entire medical history. Suddenly the screen on my tablet goes blank, and my computer won’t reboot. The motherboard is scrambled, and this patient’s medical records are gone -- vanished. I also want you to know and the people here to remember what I told you about my patient’s implanted heart device. Remember this device decides whether or not to fire based on sensing electromagnetic activity in the area near her heart. Ask yourself what happens to her next in my story. I will tell you this: My patient’s garage door will not open either.
My name is George Newland, N-E-W-L-A-N-D. I'm at ... here in Everett.
I heard a lot of good input here today. I guess if I can follow up with a few questions: Is there really any strategic reason this thing has to be in Everett other than easy maintenance access? The vision impact is huge. I don't know if many of you remember that not too many years back we had an oil platform in here, and the noise coming off it was terrific. The light issue was terrific to everyone that was within any distance of it, particularly the hospital. That's a real concern I do have. The radiation effects, I wholeheartedly agree. I don't think there has been enough study on it, and it scares the heck out of me. It's not the government's kids. It's our kids and our grandkids that live here. Also when you do have it in port, how is this thing going to (inaudible) other than, I think, someone mentioned that if you do have an alert, you may or may not fire it. That's pretty spooky. Third, why can't it be located in a much less populated area?

Thank you very much. My name is Sean Edwards. The first name is spelled S-E-A-N. Last name is E-D-W-A-R-D-S. My address is ... Everett, Washington 98201.
I live in the Port Gardner neighborhood. I look right out over the harbor from my second-story apartment. I value my view very much. It's one of the nice things about living here in Everett. I'm also able to walk to work. I think that's pretty great. I'm concerned about the SBX Draft EIS because I think it does not address a number of issues. I will state my opposition as a resident of the city to this proposal. In particular I'm personally concerned about, as I stated, the visual impacts of this. I also think that some very good points have been raised today about the potential health impacts of this.
I'm also concerned about the local socioeconomic impacts, and as the presenters stated earlier, the socioeconomic item was not one of the bold items. That means, I think, that it wasn't addressed in detail for Everett. I might be wrong about that, but in any case, I think that's a major problem here because myself and many other people in this community are working hard to revitalize this community economically and in other ways.
However, my main point here has to do with the section in the EIS in Volume 2 regarding biological resources, potential impacts on biological resources. I believe that there is a serious omission there. It's not surprising, considering that the location of Everett was added late in the process, but if you take a look at that section, it's pretty clear that the authors did not take into account our local environmental and habitat conditions and our local ecosystem. It talks about Pacific Ocean animals and habitats, blue whales and other things, dolphins and things. We have a gray whale here. We have a few different kinds of dolphins. Importantly for Everett and this region of Puget Sound, we have Dungeness crab, which is an important economic resource. We have forage fish, which are important elements of the food chain. For other organisms like salmon, chinook being listed as threatened, and bull trout being listed as threatened as well, those have not been addressed in this DEIS. I'm surprised that state and federal agencies haven't alerted you to that already. I'm sure they will.
Anyway, finally I would like to say thank you for your time, and I'm sure you have been working hard.
My name is David Gladstone, G-L-A-D-S-T-O-N-E. My mailing address is ... Snohomish, Washington 98291. Firstly, I think this entire project is a total waste of taxpayer money. With all the other important issues that we have to deal with in this country this is a waste of our money and should be stopped before any more money is expended on it.

More specifically, I agree with the previous speaker’s comments about our biological resources. The Everett area is also well known for its osprey colony, and I would say that of all the material I saw in the presentation so far, the only reference to harmful material was radiation. There were no slides and nothing spoke to the electromagnetic factors, and my understanding is that’s a significant part of this SBX. There are health risks and problems associated with electromagnetic waves that certainly were not addressed in the presentation and need to be taken into account.

As far as the visual impact, I think the device is a monstrosity and has a significant adverse impact on anyone trying to enjoy the natural surroundings that we have, that we came to live here with. The naval base is bad enough as it is. Don’t add anymore to it. We don’t want you in Everett.

I am Deborah Wright, D-E-B-O-R-A-H, Wright, W-R-I-G-H-T, at ... in Everett, 98203. I am almost into Mukilteo. The base surrounds where your site is proposed to be, and I can see directly over there to the Navy base.

I agree with the past speakers. I have many concerns about this project of yours. Michelle Trautman had asked some questions, and I didn’t feel like I heard the answers to her questions as well as some others of my own.

I don’t know on what date the City of Everett or Snohomish County were informed about this proposal. I don’t know what -- I did hear there was an advertisement in the paper. That went way below my radar. I don’t know to whom, if there was any official notified, or from what agency. I didn’t hear the answer to that. Also, are these correspondences on public record? I also would like to make a Public Information Request for all documents relating to the SBX both received and sent from July 2002 to present.

That’s really important because even though the scoping was done, we weren’t aware of it. So we are feeling rushed. We are feeling scared. We are feeling threatened. It’s hard to be appropriate in that kind of frame of mind. I do oppose the project based on what I know. Thank you.
I welcome the opportunity to speak in vigorous opposition to this entire Antibalistic Missile Defense System because I think it poses a grave and serious danger to the health and safety of our nation. I thought this system was put to bed and cancelled back in the '80s, but now it's reared its ugly head again. The reason it was cancelled in the '80s is because it was technically not feasible. Now, the defense establishment and the military industrial complex wants to deploy it now before it's even fully tested.
That's not my main concern. My main concern is that it will reignite the arms race. In order to even do the testing that you're referring to, we had to cancel the Antibalistic Missile Treaty because these tests would be in violation of that. I'm very concerned about what this does to the arms race. We will be testing it, and other nations will try to overcome it. Every Maginot Line defense kind of thing like this in the world throughout history has been overcome with a defense mechanism, a countermeasure that costs a tiny fraction of what the system costs to build.
I understand the Administration wants to share it with other countries like China, Russia, and other people. What I want to point out to you and everyone else who is listening is that we've shared these terrible weapons with people in the past, with what we thought were friendly regimes. Then they had a regime change, and we had to fight against the weapons we dispersed to them. Osama Bin Laden comes to mind. Saddam Hussein comes to mind. The Shah of Iran comes the mind. There are a number of people. We are creating that kind of situation here. We are going to spend billions upon becomes upon billions of dollars perfecting it, and it will trigger off the arms race because people will try and overcome it. They can overcome it with a one-percent expenditure of what we are spending. Then when we give it away and then when they have a regime change, we will have to fight against it.
Lastly, we are dumping the cost of all this on our children and grandchildren. I think it's outrageous. It needs to be stopped.

I'm Marion Skalley, M-A-R-I-O-N, S-K-A-L-L-E-Y. I live at ... in Everett. I am a mother of three children ages 6, 8 and 9. I'm very concerned about the health implications of the SBX in our community. I firmly believe that the SBX will negatively impact our community. I have no doubt that Everett will see existing families leave the area. The few military families and personnel that the SBX would bring to the community I think is a drop in the bucket and a laughable argument in favor of the people that will leave.
I'm an attorney. I'm skilled in the asking of questions and of analyzing answers. I sat through the entire first session, and I am disappointed in the answers that I received. I think that most of the answers were evasive and the questions were not answered.
I might add in reference to the comment on the garage door opening, my garage door opens constantly, and on my security system on occasion the panic button has gone off for no reason, and the police have showed up at my house. I have one simple question, and it's really not a sarcastic question. As I sat here in the first session and sat here now, my question is: What can we do to keep the SBX from coming to our community? Is it signatures? Is it petitions? What can we do to keep it from coming?

I have three specific questions, and one is rhetorical: What is the genesis of this ludicrous program? Is it terrorism? I don't expect an answer from that. I'm just asking myself and asking everyone in this room.

Then I have two specific questions. One goes back to the woman who gave comment three people before I did, and I want to know: If there were public comment periods in Hawaii -- I believe you said, David, in Hawaii and Alaska and in Seattle, I who read the public notices, I because I gave you my permanent mailing address, want to see photocopies of the public notices. That's a question in front of all these people. I want to see it in my mailbox.

I'm here for two reasons: The health concern for humans and the planet and the health of other species. Right now I'm here because of my concerns for the democratic process which is why I want to see the public notices. I would have been in Seattle had I known. Something of this impact should have been first page, first page. Not in the public notices that are in like 6-point type.

My second question is to you, Commander, and specifically during the slide where you had conceptual sea-based test of the X-Band Radar, your quote is: What is good for the oil industry is good for us. Could you please tell me what that means? That is so bizarre. If you are timing me for three minutes, their input was part of that three minutes. I just want to say I'm in control of my health, and what's good for the oil industry is not good for my health. Secondly, I heard about this yesterday. That is so ridiculous. I heard about this yesterday. I would have had 20 of my friends here today.

My name is Valerie Steel, V-A-L-E-R-I-E, S-T-E-E-L. My home is at .... I'm glad to see we're using flags here. I was kind of taken aback when I attended the meeting at the end of February when the moderator used a closed fist as a symbol to stop the public from commenting. I thought it was a pretty pugnacious gesture. I think you guys would really be well served to use these in the future.

I live directly east and about four blocks away from where this is going to be. I appreciate a drawing that shows this in direct relation to the brick building that is at Kimberly Clark.

I think it's about 13 stories high, 12 stories high. It would give me some really accurate perspective on how this looks. Speaking of Kimberly Clark, she is going to be your nextdoor neighbor, and it's the largest polluter in Snohomish County for airborne particulates. It pumps over 1,289,520 pounds of garbage into the air per year. This is based on EPA studies from 2000.

Two questions: One, did you calculate the cumulative effect of that pollutant and your pollutant? And two, how does this radar stuff affect airborne particulates? Does it morph them into something new? Does it cause them to be heavier and possibly fall to the water sooner, creating bad sediment for the biological features and activities that have to occur in our Sound area?

The people of Washington have worked hard for years under the Shoreline Management Act to protect, enhance, and preserve our shorelines. Granted, you are not in the shoreline, but you are directly adjacent to shorelines of statewide significance. The estuary is home to hundreds of thousands of species. This thing is sited in a federal migratory bird path. To me this is going to disturb flight patterns. I guess the question I would really like answered is: Is it true that this thing will fry birds if they fly in its path? I heard this to be the case. What about the effect of the beam on airborne particulates?
My name is Olemara Peters, O-L-E-M-A-R-A, P-E-T-E-R-S. I'm at ..., Redmond, Washington. I want to thank you all for traveling to hear us. I for one heard about this whole phenomenon first at 8 o'clock this morning and then only passed along by several layers of word of mouth; although, I listen to three radio stations several hours a day. I have to concur with the proposal to restart the process in each community that's concerned. Not that this is the only public process that hasn't been public. I have seen a lot of them lately, but I would like to see a lot of them a little more public.

I question safety and health based on FCC safety and health criteria. The FCC's Radio Frequency Safety Guidelines -- they are not even standards -- are 2,000 times more lax than those of some European countries. And even at that level, they are not being monitored in this country. The Telecom Act of 1996 preempts local authority over wireless emissions, safety, and health violations; yet all violation complaints to FCC headquarters get farmed out to EPA and the FDA, and they don't have the personnel either. FCC is planning to further loosen those guidelines. Almost nobody I encountered has heard about any of this preemption.

Relatedly, the Telecom Act dismantled most of our antitrust protection about media relations, and the FCC is now planning to dismantle what's left. So big money will have complete control over what we're allowed to know. The SBX proposal, from what I've heard so far, sounds like one more layer of the rising tide of...being told the impacts of and that no agency is monitoring the total of. I would not trust any RF emission plan based on FCC health and safety standards until our representative government, including that regulatory agency, is left more intact than they have been demonstrating so far.

With all due respect and thanks to each of you individually, I would be glad to hear your project associating itself with a more credible standard than the FCC's whether it's here or Pearl Harbor or anywhere else. Thank you.

My name is Bob Jackson. I live at ... in Everett, 98201. Thank you for coming back to Everett for a hearing and for extending the deadline for comments. I think it's a compromise, and I hope that it would be extended further than this. I hope you will consider that. If it's possible, I would like a copy of the PowerPoint presentation to be given to Michelle Trautman.

Now it's time for the people of Everett to fulfill our democratic role by giving our response to the proposal, and I hope everybody will take advantage of this time and make their comments by the 15th.

I'm a little concerned about the objectivity of the Draft EIS and the rigger of the science that's being used to justify some of your conclusions. For example, in Chapter 4 on Page 244, there is a discussion about the electroexplosive devices like fire extinguishers, air bags in the cars, and ejection seats in military aircraft.

The X-Band Radar emissions could have two possible effects on these devices: They could be made not to work or they could be inadvertently initiated. There is a chart showing the required separation distance of these devices from the SBX. If the SBX were tied up to a dock, it appears that cars with air bags may come within that distance. You seek to assure drivers by saying that, quote, there is no predicted potential for an inadvertent initiation of vehicle airbags because of metallic body/frame; the vehicle provides sufficient shielding. This fails to take into the account the cars which have bodies which aren't made of metal. These include fiberglass bodies on some models of Corvette, Taurus, Monte Carlo, Grand Prix. Saturns are made from sheet-molded composites. I would urge you not to let speed drive your deadlines when it's concerned with safety.

As has been said before, we in Everett are really striving hard to improve our negative image. If you had come here 20 years ago, 30 years ago, it really smelled. That's pretty much gone now. It's a thing of the past, but we are really trying to build on a positive image. I don't think this ungainly SBX in the Port Gardner Bay is going to be helpful. We realize that we're surrounded by water, and it's our greatest opportunity to define Everett in a positive way.
I just hope that before you leave, you go out to some of the parks and take a look from those parks and see what the views are like. I suggest Harborview Park. Go down to Pigeon Creek No. 1 to see the little park that we're going to build down to the waterfront or go to Grand Avenue Park. Thank you very much.

My name is Bill Hawkins, H-A-W-K-I-N-S. I live at ... in Everett, 98204.

Thank you for coming today. Thank you for coming to an All-American city: Everett, Washington. There was a comment made a long time ago by none other than, I believe, Thomas Jefferson who said that we have a responsibility to be skeptical of our government, respectfully skeptical. I believe some days I don't even fall into the respectable part, but I'm deeply concerned about the overall prospects of this project, what it has to international treaties, what it has to the idea of accelerating an arms race. I know I don't have to tell people in the military because that's probably the last thing that you want to be involved in is some kind of nuclear altercation with some other nation. At the same time, I wanted to call to your attention a couple of things that came to my mind when I saw this. First of all, I was disarmed by an early newspaper report that seemed to imply that this would simply be a storage place for this device between its actual being out at sea and used there. This morning I was listening to KUOW and came to the conclusion that no, it doesn't sound like it's a storage place but has the potential of actually being operated here in the port, and at least on the maintenance basis it would be operated.

These are my concerns that come out of that: I would like to echo what other people have said about the radiation concerns, particularly low-level radiation as a human impact and also the potential to interfere with so many devices that we now run our lives with daily from our computers to our pacemakers to our automobiles. I have a car that's fully computerized. If that computer goes down, I'm locked in it -- never mind it won't run.

The other point I would like to say in that, too, is I've work with antenna systems in my life -- phased arrays -- before they were called phased arrays. I can guarantee you that there isn't anyone out there that actually radiates exactly where you point it. You know there is spillover. So I'm concerned about that. I'm concerned about noise pollution not being considered in there. I live six and a half miles south. I hear the diesel trains.

The other thing is the power consumption in this county. The statement was made recently by the Board that they intended to fill in our future power needs as much as possible by conservation.

Exhibit 8.1.4-1: Reproductions of Oral Comments (Continued)
I think you owe it to the community to tell us exactly what the load will be as a percentage of the present Navy load and what it will be projected in the future. If there is a moment that comes that you have to run it off bayside, off the power mains, what that will be. The final point also is the air pollution. We live in a state that has a three – we’re in a tricounty air pollution district. They’re not the EPA. They have no measuring capability. When all these generators are running, the emissions accumulative with that mill, I have a feeling we are going to have a problem on certain days and particularly when there is any kind of conversion. I hope that those issues will be adequately addressed, and the others I will send to you in writing. Again, thank you for coming to an All-American city.

My name is Maury Trautman, …. Everett, Washington 98201. And yes, I do belong to Michelle. I’m a fourth generation resident of Everett. My children represent the fifth generation. Hopefully their children will be the sixth. I share ownership in several businesses in Everett that employ approximately 200 people. The deployment and home-basing of the SBX Radar System in Port Gardner Bay is a great concern to both myself and my employees. We have chosen to live and work in Everett because of the opportunities the future of the city represent.

Much has been done; much is in process; much is planned. From the revitalization of the downtown corridor, Evergreen Way, and the transportation center to the new Everett Event Center and county administration buildings under construction and the initiation of contracts between the Port of Everett and Maritime Trust Corporation for the development of the North Marine Site, Everett’s view is changing. Let’s not block that view.

Recently the city adopted a new slogan, one designed to enhance its image and attracting new business and families to settle and prosper in Everett: Everett: The thinking city with a view. What will happen to that view?

The SBX brings the threat of long-term electromagnetic radiation on the health and safety of the citizens of Everett, the potential degradation of air and noise pollution, decreased access to our shorelines and waterfront, negative impact on property values, and the unarguable blight on the views and vistas of the city and waterfront. I ask you: Who will come? Then I would ask you: Who will stay?

I for one, as a business owner, would look very seriously at relocating my businesses out of the sphere of influence of the SBX. I will take those jobs with me. To try and attract good employees to live and work in an environment burdened with potential threats represented by the SBX will be very difficult. The citing of the SBX in the areas of population density the size of Everett is inappropriate. Each generation of Everetttites is given custody of the legacy of those generations who have come before us. It is our duty to grow and enhance that legacy and pass it on to the next generation. Let’s not let the SBX be the legacy of this generation.
I do have a couple questions that I would like to ask. One, you say that the SBX will not be sited in the bay, in Port Gardner Bay. What happens when piers at the Navy base are at capacity and the Lincoln is in port and all supported ships? Where will the SBX be moored at that time?

Is the endorsement or rejection of home-basing in Everett of the SBX tied to the next round of base closures in any way? I'm glad to have that on public record. Thank you.

I'm Mike Papa, .... The last speaker asked, I guess, the question I ask. I'm a recreational boater, and that was one of my concerns of what effect this might have on recreational boats because, to say the least, The Herald just confused me because it implied it would be anchored out in the bay. For the record, it won't be anchored out in the bay?

The other question I had, and maybe this is kind of minor, but when it's entering or leaving port, is the distance that boaters will have stay away from it any greater than any other Navy ship?
My name is Jean Burger, J-E-A-N, B-U-R-G-E-R, ..., Everett. I retired here last year to be with my daughter and grandchildren. I would like to say one thing about the advertising. I know it's been discussed a lot, but if that picture would have been in a paper, you would have had a good turnout. If nothing else, maybe a low-flying Navy plane could have dropped leaflets. You would have had a big crowd; trust me.

As far as the noise goes, I live on the ravine, and I hear everything at the base. I have had to complain to the City. Sometimes they're redoing their ships and they say, well, they'll stop the generators at 4 in the morning, which is nice because at least I get two hours of sleep. For you that have this, is this your report? Let's look at where it says Impacts and Mitigation Summary, Naval Station Everett. Air quality: This Sea-Based Test X-Band Radar would not be considered a stationary source and would not require a Prevention of Significant Deterioration Review or a Title V Permit. Air emissions from the operation of this Sea-Based Test X-Band Radar would be in compliance with appropriate State Implementation Plans.

Now, it's disingenuous to call this mobile when it will be stationary at our port for how many months did you say? -- in order for you to get around appropriate testing. My question is: Is it mobile or is it not? But how many months is it going to be in? I see. How months do you consider permanent versus mobile?

So you're saying it's going to be in our port at least nine months out of the year, and that's not permanent? So that way you don't have to have these extra tests. Nice.

My name is Julian Dewell, J-U-L-I-A-N, D-E-W-E-L-L. I reside in ..., Everett, Washington. I have a number of questions which I will submit in writing to the addresses that were listed. I have one question, though, that I would like to have answered: As I understand the Draft Environmental Statement that you have prepared, it is for the purposes of the test of this dome and not for the permanent use of the dome after the testing. As I understand it, the Draft Environmental Impact Statement is based upon the testing analogy. What you have said to me is that the speed of this dome to leave the dock to arrive out in the middle of the harbor is at a speed of about 5 or 6 knots or something in that neighborhood. Not the speed of a sailboat. If it was to be used for purposes of detecting a ballistic missile coming from a foreign shore, it would be necessary for it to be, if I understand it correctly, to be located in the middle of the harbor someplace in order to detect those ballistic missiles because it's not going to be doing its job from dockside in Everett.

If the test is correct -- in other words, you decide to go forward with it -- does that mean that this device will then be docked out in the middle of the harbor as opposed to bringing it in for maintenance periodically but leaving it out there on the a permanent basis?

Then the Draft Environmental Impact Statement is solely for your testing purposes. I assume there would be another Environmental Impact Statement issued in connection to wherever the permanent location of this device is.

Is there any reason for a water-based as opposed to a land-based location?
My name is Desmond Skubi, D-E-S-M-O-N-D, S-K-U-B-I. I live at … here in Everett, 98201. I would just like to state my opposition to the expenditure of huge sums of money on this program. Here in Washington state our legislature is trying to cope with a $2.6 billion deficit that will result in tens of thousands of people losing access to their health care services. That will degrade the quality of our public education and have many other adverse impacts here in our local state. In our federal government we have gone from a surplus of funds to a huge and growing deficit at least in part because of such expenditures on programs such as this. We have abrogated international and high ballistic treaties unilaterally. I’m opposed to this project. I would also like to pose one question that I have not heard addressed here: I’m curious what alternative locations were considered for stationing this proposed project, and what the basis of deciding to move forward with Everett is. Thank you.

My name is Berit Reisenauer, and I’m 10 years old. It’s spelled B-E-R-I-T, R-E-I-S-E-N-A-U-E-R. If this comes to Everett, we would move. I don’t want to move. Thank you.
Message delivered: 13 Mar 03: 11:30 AM CST; 116 seconds

My name is Joe Hunziker...I'm calling regarding the extension of the missile range program...and to express my full support and encouragement to proceed with the program. I feel qualified to comment on it...strongly qualified in as much as that I have been involved mentality clear back for 52 years starting in 1951 at the Naval Air Missile Test Center where I spent three (3) years under Commander Eric Bruce Bower and I was assigned to Island Facility's Department...a special department...logistical department that tracked missiles from Mugu to San Nicholas Island, and Santa Cruz, Santa Rosa...I've been on all of those islands...and I'm calling to give you guys full support and encouragement to proceed with this very...very necessary extension of our security arm for this country...especially now. I've resided in Burbank these past 45 years...my phone number is...again good luck and I wish you guys all the encouragement in the world to proceed with this excellent program. The Navy takes great care of those islands by the way...as far as any preservation of any historical artificacts...like Indian burial grounds...I know all about that stuff...good luck to you...bye.
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<td>2.1.4.2</td>
<td>Section 2.1.4.2 and appendix G of the EIS discusses potential interference with communications and electronics equipment. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. Thus, the odds that communication-electronics equipment could be affected by the SBX because of high power effects during the course of one day are 1/1,000,000 or 0.0001% of the time (roughly 1/10 of a second per day). If interference occurs, the short-term effects would not damage any electronic equipment. These odds are based on conservative calculations that assume the SBX would operate in full power mode for 20 minutes each day at maximum duty cycle. New information on the potential effects of EMR on human health and communications-electronics has been added as appendix G of the EIS.</td>
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<td>2.1.4</td>
<td>Sections 2.1.4, 2.1.8, 3.8.2, and 4.8.2 of the EIS indicate the SBX operating and mooring areas and potential influence on airspace. Additional information on the potential effects of EMR on communications-electronics, including avionics, has been added as appendix G of the EIS.</td>
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<td>John McCoy - 38th Legislative District (state representative)</td>
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<td>It is anticipated that the security zone required by the SBX would be similar to the existing security in use currently at Naval Station Everett. However, it would be the subject of an interservice support agreement.</td>
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<td>The testing has been scheduled through 2007 for the SBX, anything beyond that is not known at this time. It is anticipated that between 2005 and 2007 the SBX would be in port as much as 9 months out of the year, underway 1 month at a time for 3 months or more. The SBX is not intended to stay out in the Sound, it is anticipated that it would only be in the Sound during transiting.</td>
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<td>Richard Jones</td>
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<td>General Holley, the program manager for GMD, is primary decision maker. General Kadish, the Director of the MDA, reserves the right to make the decision as well. He will be consulted and will be issuing the ROD. As we go through, we are doing the cost analyses and mission operation effectiveness. These will first be presented to Colonel Smith, the X-Band Program Manager, who will in turn go to the GMD program manager with a recommendation on siting. They will in turn go to General Kadish, who will issue the ROD on the GMD ETR.</td>
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<tr>
<td></td>
<td>P-O-0073-3</td>
<td>Program</td>
<td></td>
<td>The need could arise to use high power to track satellites while in port. However, the angle of the beam would be at 10 degrees to avoid anything the FAA requires for aircraft protection.</td>
</tr>
<tr>
<td></td>
<td>P-O-0073-4</td>
<td>Airspace Use</td>
<td>4.8.2</td>
<td>See P-E-0236-4</td>
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<td></td>
<td>P-O-0073-5</td>
<td>Airspace Use</td>
<td>4.8.2</td>
<td>See P-E-0236-4</td>
</tr>
<tr>
<td>Michelle Trautman</td>
<td>P-O-0074-1</td>
<td>EIS Process</td>
<td></td>
<td>A agency coordination meeting with local, Federal, and State agencies was held at the Naval Station Everett in October 2002.</td>
</tr>
<tr>
<td></td>
<td>P-O-0074-2</td>
<td>EIS Process</td>
<td></td>
<td>See P-E-0208-1</td>
</tr>
<tr>
<td>Annie Lyman</td>
<td>P-O-0075-1</td>
<td>Program</td>
<td></td>
<td>As the schedule stands, it is anticipated that six trips per year would be performed. There could be more as the schedule evolves.</td>
</tr>
<tr>
<td></td>
<td>P-O-0075-2</td>
<td>Program</td>
<td></td>
<td>The cost of testing operations are being considered and analyzed. The 3,028,329 liters (800,000 gallons) of fuel would be broken up into multiple tanks. In the event of a collision, a smaller amount of fuel would be at risk of being spilled. The same restriction currently observed by other vessels would be observed during the fueling of the SBX.</td>
</tr>
</tbody>
</table>
Ken Taylor  | P-O-0076-1  | Safety and Health  | 2.1.4.2  | As indicated in section 2.1.4.2, the SBX can exceed the 300 V/m average power threshold at 12 kilometers (7.5 miles). The average power threshold is based upon reducing the time of exposure of aircraft avionics to high intensity radiated field environments in order to preclude shortening the life of the aircraft avionics. The concern is not interference, but a reduction in life of the aircraft avionics. Additional on the potential effects of EMR on communications-electronics, including aircraft avionics, is provided as appendix G of the EIS. Mitigation measures such as the redundant software that would help minimize potential interference to aircraft systems are discussed in section 2.1.4 as well as in appendix G.

Elizabeth Marshall  | P-O-0077-1  | Safety and Health  | 2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2  | Sections 2.1.4, 2.1.8, 4.3.5.2.5, 4.6.5.2, and 4.8.5.2 of the EIS indicate the SBX operating and mooring areas and general operational effects. A large body of evidence was used in determining the current IEEE human exposure and measurement practices standards (IEEE C95.1-1999 and IEEE C95.3-1999) on which the EIS EMR analysis is based. The IEEE standards afford the public protection and have safety factors built in. Through the use of software controls, constraints placed on the SBX operating area, and coordination with local, state, and federal agencies, potential interference levels would be below the IEEE standards. The odds that communication-electronics equipment could be affected by the SBX because of high power effects are negligible, (roughly 1/10 of a second per day). New information on the potential effects of electromagnetic radiation on human health and communications-electronics has been added as appendix G of the EIS.

Marianne Edain  | P-O-0078-1  | EIS Process  |  | See P-E-0346-1

P-O-0078-2  | EIS Process  | See P-E-0250-2

P-O-0078-3  | EIS Process  | See P-E-0242-1

Stephanie Allen  | P-O-0079-1  | Program  |  | See P-E-0018-5
<table>
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</thead>
<tbody>
<tr>
<td>Mary Jane Anderson</td>
<td>P-O-0080-1</td>
<td>Program</td>
<td></td>
<td>The vessel portion of the SBX would consist of a commercially manufactured platform and is anticipated to be unchanged. The design of the dome itself is close to completion and is also not expected to change.</td>
</tr>
<tr>
<td></td>
<td>P-O-0080-2</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0222-1</td>
</tr>
<tr>
<td>Michelle Kermonade</td>
<td>P-O-0081-1</td>
<td>Safety and Health</td>
<td>2.1.4.2, Appendix G</td>
<td>SBX emission patterns, power levels, separation distances and calculated power densities are discussed in section 2.1.4.2 and in appendix G of the EIS. For the fully populated radar at a distance of 150 meters (492 feet) and for the 65 percent populated radar at a distance of 85 meters (279 feet) the power density was calculated to be 2.5mW/cm². Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time and two separate, redundant radio frequency radiation hazard safety software controls, similar to controls effectively used on the large XBR at Kwajalein Island in the RMI, would monitor all emission energy levels at locations around the radar and would not allow a full power beam to come in contact with any personnel, on the SBX platform or on land.</td>
</tr>
<tr>
<td></td>
<td>P-O-0081-2</td>
<td>Safety and Health</td>
<td>2.1.4, 2.3.1.8</td>
<td>Sections 2.1.4 and 2.3.1.8 discuss the SBX basing and test activities. The SBX would not enter most of the proposed PSB port facilities after leaving its assembly point in the Gulf of Mexico, and in the case of PSB Naval Station Everett while USS Abraham Lincoln is in port. In this case, the SBX would moor or anchor offshore between GMD test missions for a total of approximately 3 months per year. While in port or moored/anchored offshore, operation of the XBR would include system testing, calibration, and tracking of satellites. Radar emissions would occur in 15- to 20-minute periods totaling approximately 1 hour per day as indicated in section 2.1.4.6.</td>
</tr>
<tr>
<td></td>
<td>P-O-0081-3</td>
<td>Safety and Health</td>
<td>2.1.4, Appendix G</td>
<td>As indicated in section 2.1.4, the redundant RF radiation hazard safety software controls proposed for the SBX radar are similar to controls effectively used on the GBR-P at Kwajalein Island in the RMI. The radar has been operational for 5+ years. Additional information on the potential effects of non-ionizing radiation on human health has been added as appendix G of the EIS.</td>
</tr>
<tr>
<td></td>
<td>P-O-0081-4</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0208-3</td>
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<tr>
<td></td>
<td>P-O-0081-5</td>
<td>EIS Process</td>
<td></td>
<td>A multi-disciplinary team of experts coordinated with State and Federal agencies, concerning health and safety issues and concerns about the proposed project.</td>
</tr>
<tr>
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<td>P-O-0081-6</td>
<td>Hazardous Materials</td>
<td></td>
<td>See</td>
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<tr>
<td>Michelle Kermoade</td>
<td>P-O-0081-7</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0008-1</td>
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<tr>
<td>Doris Olivers</td>
<td>P-O-0082-1</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
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<tr>
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<td>P-O-0082-2</td>
<td>Safety and Health</td>
<td>Appendix G</td>
<td>See P-O-0077-2</td>
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<td></td>
<td>P-O-0082-3</td>
<td>Transportation</td>
<td>4.8.6.2</td>
<td>See P-E-0318-5</td>
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<tr>
<td></td>
<td>P-O-0082-4</td>
<td>Program</td>
<td></td>
<td>The SBX is not double hull. However, fuel tanks are located on the inboard side of the pontoons so are less vulnerable to external impact.</td>
</tr>
<tr>
<td></td>
<td>P-O-0082-5</td>
<td>Air Quality</td>
<td>4.8.1</td>
<td>See P-E-0025-1</td>
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<td></td>
<td>P-O-0082-6</td>
<td>Noise</td>
<td>4.8</td>
<td>See P-E-0208-2</td>
</tr>
<tr>
<td>Vernon Huffman</td>
<td>P-O-0083-1</td>
<td>Program</td>
<td></td>
<td>At this stage, the SBX is set up as a testing system and not hooked into a system that could respond to national tasking. In the event of a false alarm, the generators would be turned off and no radiating would occur. Other entities would have to be tracking in order for the system to be activated.</td>
</tr>
<tr>
<td>Karen Pauley</td>
<td>P-O-0084-1</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0026-4</td>
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<tr>
<td>Tim Reisenauer</td>
<td>P-O-0085-1</td>
<td>Safety and Health</td>
<td>2.1.4.2</td>
<td>See P-O-0057-1</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Appendix G</td>
<td></td>
</tr>
<tr>
<td>George Newland</td>
<td>P-O-0086-1</td>
<td>EIS Process</td>
<td>2.1.4</td>
<td>See P-E-0338-1</td>
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<tr>
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<td>P-O-0086-2</td>
<td>Safety and Health</td>
<td>2.1.8</td>
<td>See P-E-0340-1</td>
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<td>4.3.5.2.5</td>
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<td>4.6.5.2</td>
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<td>4.8.5.2</td>
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<td>P-O-0086-3</td>
<td>Program</td>
<td></td>
<td>Criteria for location is based on operational and support requirements as well as potential environmental impacts, cost, and other considerations.</td>
</tr>
<tr>
<td>Sean Edwards</td>
<td>P-O-0087-1</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0017-1</td>
</tr>
<tr>
<td></td>
<td>P-O-0087-2</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
</tr>
</tbody>
</table>
An appendix has been added to the document providing a brief discussion of potential listed species (terrestrial and marine) that may be found in the areas affected by the Proposed Action. As stated on page 4-242, the SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts to biological resources are anticipated. As stated on page 4-241, no significant long-term impacts to species such as the fish and whales in the area are anticipated.

<table>
<thead>
<tr>
<th>Name</th>
<th>Comment #</th>
<th>Resource</th>
<th>EIS Section</th>
<th>Response Text</th>
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</thead>
<tbody>
<tr>
<td>Sean Edwards</td>
<td>P-O-0087-3</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>An appendix has been added to the document providing a brief discussion of potential listed species (terrestrial and marine) that may be found in the areas affected by the Proposed Action. As stated on page 4-242, the SBX vessel would incorporate marine pollution control devices such as keeping decks clear of debris, cleaning spills and residues, and engaging in spill and pollution prevention practices in compliance with the UNDS provisions of the Clean Water Act. No significant long-term adverse impacts to biological resources are anticipated. As stated on page 4-241, no significant long-term impacts to species such as the fish and whales in the area are anticipated.</td>
</tr>
<tr>
<td>David Gladstone</td>
<td>P-O-0088-1</td>
<td>Policy</td>
<td>See P-E-0032-3</td>
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<td>P-O-0088-2</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>See P-O-0087-3</td>
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<td>2.1.4</td>
<td>See P-E-0340-1</td>
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<td>2.1.8</td>
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<td>4.3.5.2.5</td>
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<td>4.6.5.2</td>
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<td>4.8.5.2</td>
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<td>P-O-0088-4</td>
<td>Visual Aesthetics</td>
<td>4.8.9</td>
<td>See P-E-0017-1</td>
</tr>
<tr>
<td>Deborah Wright</td>
<td>P-O-0089-1</td>
<td>EIS Process</td>
<td>See P-E-0242-1</td>
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</tr>
<tr>
<td>John Flowers</td>
<td>P-O-0090-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
<td></td>
</tr>
<tr>
<td>Marion Skalley</td>
<td>P-O-0091-1</td>
<td>EIS Process</td>
<td>See P-E-0290-1</td>
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<tr>
<td>Melinda Gladstone</td>
<td>P-O-0092-1</td>
<td>Program</td>
<td>See P-E-0006-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-O-0092-2</td>
<td>EIS Process</td>
<td>Copies of public notices are not provided to individuals. Thank you for your comment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P-O-0092-3</td>
<td>EIS Process</td>
<td>The oil industry builds platforms like the platform proposed for the SBX due to their stability, providing a large working area that can lift several thousand tons, and seaworthy. It turned out that the oil industry has created a market for these semisubmersible, mobile, offshore platforms, and there was on on the market that was available.</td>
<td></td>
</tr>
<tr>
<td>Valerie Steel</td>
<td>P-O-0093-1</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0230-7</td>
</tr>
<tr>
<td></td>
<td>P-O-0093-2</td>
<td>Air Quality</td>
<td>4.8.1</td>
<td>The radar beam is not known to affect airborne particles.</td>
</tr>
<tr>
<td>Name</td>
<td>Comment #</td>
<td>Resource</td>
<td>EIS Section</td>
<td>Response Text</td>
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<tr>
<td>Valerie Steel</td>
<td>P-O-0093-3</td>
<td>Biological Resources</td>
<td>4.8.3</td>
<td>Comment noted. However, the radar beam would be in motion, making it extremely unlikely that a bird would be in the intense area of the beam and would remain there for any considerable length of time. The power density is also not expected to exceed levels that could impact birds.</td>
</tr>
<tr>
<td>Olemara Peters</td>
<td>P-O-0094-1</td>
<td>EIS Process</td>
<td>4.8.1</td>
<td>See P-O-0093-2</td>
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<td>P-O-0094-2</td>
<td>Safety and Health</td>
<td>4.6.5.2 Appendix G</td>
<td>See P-E-0250-2</td>
<td>As indicated in section 4.6.5.2 and appendix G of the EIS, the health effects criteria for DoD and civilian personnel used in the EIS analysis are based on the 1999 IEEE MPELs (IEEE C95.1, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, 16 April 1999). The FCC regulations are primarily based on the 1986 National Council on Radiation Protection Report, but also incorporate portions the 1991 IEEE standard.</td>
</tr>
<tr>
<td>Bob Jackson</td>
<td>P-O-0095-1</td>
<td>Safety and Health</td>
<td>2.1.4.2 Appendix G</td>
<td>See P-O-0057-1</td>
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<tr>
<td>P-O-0095-2</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0013-2</td>
<td></td>
</tr>
<tr>
<td>Bill Hawkins</td>
<td>P-O-0096-1</td>
<td>Safety and Health</td>
<td>Appendix G</td>
<td>As indicated in appendix G, the main beam and side lobes of the SBX could illuminate EEDs on the ground in the presence/shipping phase. However, the potential radiation hazard would exist only 10 meters (33 feet), in front of the radar, which would be limited to the deck of the SBX. Therefore, EEDs on the ground, including those associated with airbags in vehicles, would not be affected.</td>
</tr>
<tr>
<td>P-O-0096-2</td>
<td>Safety and Health</td>
<td>2.1.4 2.1.8 4.3.5.2.5 4.6.5.2 4.8.5.2</td>
<td>See P-E-0340-1</td>
<td></td>
</tr>
<tr>
<td>P-O-0096-3</td>
<td>Noise</td>
<td>4.8</td>
<td>See P-E-0208-2</td>
<td></td>
</tr>
</tbody>
</table>
The SBX would basically be self contained; when in port, however, a utility hook up would be required. This "shore power" requirement would be typical of other ships that currently utilize Piers Alpha and Bravo (section 4.8.7.2), thus posing no unusual demands upon current infrastructure.

Potential construction of a new 900- to 1,500-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse could be required for utilization as the PSB, and any new facilities being constructed would require utilities installation. Average daily utility demands for the maximum of 25 personnel would be at typical levels, and any new or refurbished facilities would be required to accommodate the increase in demand.

Based on five tests per year, the SBX would be at its PSB for 7 months per year. The GMD ETR testing activities would likely occur over a period of approximately 10 years following a decision to proceed.

Sea-based provides mobility to be able to position the radar in the optimum location for each different test.

<table>
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<tr>
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<tbody>
<tr>
<td>Bill Hawkins</td>
<td>P-O-0096-4</td>
<td>Utilities</td>
<td>4.8.8.2</td>
<td>The SBX would basically be self contained; when in port, however, a utility hook up would be required. This &quot;shore power&quot; requirement would be typical of other ships that currently utilize Piers Alpha and Bravo (section 4.8.7.2), thus posing no unusual demands upon current infrastructure. Potential construction of a new 900- to 1,500-square-meter (3,000- to 5,000-square-foot) environmentally controlled warehouse could be required for utilization as the PSB, and any new facilities being constructed would require utilities installation. Average daily utility demands for the maximum of 25 personnel would be at typical levels, and any new or refurbished facilities would be required to accommodate the increase in demand.</td>
</tr>
<tr>
<td>Maury Trautman</td>
<td>P-O-0097-1</td>
<td>Socioeconomics</td>
<td>4.8.6</td>
<td>See P-E-0026-4</td>
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<tr>
<td>Maury Trautman</td>
<td>P-O-0097-2</td>
<td>Program</td>
<td>4.8.1.2</td>
<td>See P-E-0028-3</td>
</tr>
<tr>
<td>Maury Trautman</td>
<td>P-O-0097-3</td>
<td>Program</td>
<td></td>
<td>The proposed SBX operating procedures are in section 2.3.1.8. Current plans call for the SBX to be potentially docked at Naval Station Everett when USS Abraham Lincoln is in port, at either Pier A or B.</td>
</tr>
<tr>
<td>Mike Papa</td>
<td>P-O-0098-1</td>
<td>Program</td>
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<td>See P-O-0097-2</td>
</tr>
<tr>
<td>Mike Papa</td>
<td>P-O-0098-2</td>
<td>Program</td>
<td></td>
<td>It is anticipated that the distance required by the Navy would be the same as required by the SBX.</td>
</tr>
<tr>
<td>Jean Burger</td>
<td>P-O-0099-1</td>
<td>Noise</td>
<td>4.8</td>
<td>See P-E-0028-2</td>
</tr>
<tr>
<td>Jean Burger</td>
<td>P-O-0099-2</td>
<td>Air Quality</td>
<td>4.8.1.2</td>
<td>See P-E-0025-1</td>
</tr>
<tr>
<td>Jean Burger</td>
<td>P-O-0099-3</td>
<td>Program</td>
<td></td>
<td>Based on five tests per year, the SBX would be at its PSB for 7 months per year. The GMD ETR testing activities would likely occur over a period of approximately 10 years following a decision to proceed.</td>
</tr>
<tr>
<td>Julian Dewell</td>
<td>P-O-0100-1</td>
<td>Program</td>
<td></td>
<td>See P-O-0097-2</td>
</tr>
<tr>
<td>Julian Dewell</td>
<td>P-O-0100-2</td>
<td>EIS Process</td>
<td></td>
<td>The GMD ETR EIS addresses testing of the SBX, it does not address any additional defensive operational capabilities specifically. In the event of locating the SBX at a permanent PSB, additional analysis would be required.</td>
</tr>
<tr>
<td>Julian Dewell</td>
<td>P-O-0100-3</td>
<td>Program</td>
<td></td>
<td>Sea-based provides mobility to be able to position the radar in the optimum location for each different test.</td>
</tr>
<tr>
<td>Desmond Skubi</td>
<td>P-O-0101-1</td>
<td>Policy</td>
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<td>See P-E-0026-1</td>
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Table 8.1.4-2: Responses to Oral Comments (Continued)

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<th>Response Text</th>
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<td>Desmond Skubi</td>
<td>P-O-0101-2</td>
<td>Program</td>
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<td>Alternative locations for the SBX PSB include Pearl Harbor, Hawaii; RTS; NBVC Port Hueneme, California; Port Adak, Alaska; and Port of Valdez, Alaska. The decision is based on mission effectiveness, availability of testing on maintenance, ability to get out to the operation area, cost effectiveness, maintenance support, infrastructure, transportation, homes and schools to support the crew, facilities, and security infrastructure. At this time, no one site has been selected nor will it be until the ROD has been issued.</td>
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Ground-Based Midcourse Defense (GMD)
Extended Test Range (ETR)

Final Environmental Impact Statement

Volume 3 of 3: Chapter 9-Appendices

July 2003

U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, Alabama 35807-3801
Ground-Based Midcourse Defense (GMD)
Extended Test Range (ETR)
Final Environmental Impact Statement

Volume 3 of 3

July 2003

Missile Defense Agency
a. Lead Agency: Missile Defense Organization

b. Preparing Agency: U.S. Army Space and Missile Defense Command

c. Cooperating Agencies: Federal Aviation Administration, Office of the Associate Administrator for Commercial Space Transportation

d. Proposed Action: Provide operationally realistic testing for GMD ETR.

e. Affected Jurisdictions: Kodiak Launch Complex, Kodiak Island Borough, Alaska; Vandenberg Air Force Base (AFB), Santa Barbara County, California; Reagan Test Site, United States Army Kwajalein Atoll; Pacific Missile Range Facility, Barking Sands, Kauai, Hawaii; Eareckson Air Station, Shemya Island, Alaska; Midway Atoll; King Salmon, Bristol Bay Borough, Alaska; Cordova, Valdez-Cordova Census Area, Alaska; Pillar Mountain, Kodiak Island Borough, Alaska; Pashagshak Point, Kodiak Island Borough, Alaska; Homer, Kenai Peninsula Borough, Alaska; Adak, Adak Island, Alaska; Pillar Point, San Mateo County, California; Wake Island, Oceania Atoll; Bremerton, Kitsap County, Washington; Pearl Harbor, Honolulu County, Hawaii; Port Hueneme/San Nicolas Island, Ventura County, California; Naval Station Everett, Snohomish County, Washington; Valdez, Valdez-Cordova Census Area, Alaska; Beale Air Force Base, Yuba County, California; Clear Air Force Station, Denali Borough, Alaska

f. Inquiries on this document may be directed to: U.S. Army Space and Missile Defense Command, ATTN: SMDC-EN-V (Ms. Julia Elliott), 106 Wynn Drive, Huntsville, AL 35805, by e-mail at gmdetreis@smdc.army.mil, or by phone at 1-800-823-8823.

g. Designation: Final Environmental Impact Statement

h. Distribution/Availability: DISTRIBUTION A. Approved for public release; distribution is unlimited.

i. Abstract: The Missile Defense Agency is proposing to develop the capability to conduct more realistic interceptor flight tests in support of GMD. The extension of the existing GMD test range would increase the realism of GMD testing by using multiple engagement scenarios, trajectories, geometries, distances, and speeds of target and interceptors that closely resemble those in which an operational system would be required to provide an effective defense. Extended range testing would include pre-launch activities, launch of targets and Ground-Based Interceptors from a number of widely separated locations, and missile intercepts over the Pacific Ocean. Target missiles would be launched from Vandenberg AFB, Kodiak Launch Complex, Pacific Missile Range Facility, Reagan Test Site (RTS), or from mobile platforms in the western Pacific Ocean. Interceptor missiles would be launched from Vandenberg AFB, Kodiak Launch Complex, or RTS. Dual target and interceptor missile launches would occur in some scenarios. Existing, modified, or new launch facilities and infrastructure would support these launch activities at the various locations.

Missile acquisition and tracking would be provided by existing test range sensors, ship-borne sensors, a Sea-Based Test X-Band Radar, and a mobile sensor (TPS-X) positioned at Vandenberg AFB, Kodiak Launch Complex, or RTS; and existing/upgraded radars at Beale AFB, California, Clear Air Force Station, and Eareckson Air Station, Alaska. In-Flight Interceptor Communications Data Terminals would be constructed near the proposed Ground-Based Interceptor launch sites. Commercial satellite communications terminals would be constructed at launch locations that do not have fiber optic communications links.
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9.0 CONSULTATION COMMENTS AND RESPONSES
9.0 CONSULTATION COMMENTS AND RESPONSES

This section includes consultation and coordination letters with various state and federal agencies. Agency coordination has been accomplished through meetings with various agencies and through distribution of the Coordinating Draft EIS and the Draft EIS. Comments were requested on both the Coordinating Draft and the Draft EIS, although not all agencies provided comments.
March 15, 2002

Michon Washington
Federal Aviation Administration
Suite 331/AST-100
800 Independence Avenue S.W.
Washington, DC 20591

Dear Ms. Washington:

Subject: Kodiak Launch Facility
Environmental Monitoring Plan

In your letter of March 5, 2002, you requested that the Division of Governmental Coordination respond to three questions related to continued monitoring at the Kodiak Launch Facility, operated by the Alaska Aerospace Development Corporation. The following conclusions reflect my own observations; they do not reflect a consolidated State response.

On March 10, 2002 I attended a briefing that Sal Cuccarese of the Environment and Natural Resources Institute organized to review the results of the monitoring from the first five launches. After listening to the presentation and agency comments, I believe there are benefits that can be derived from a continuation of a good monitoring program. According to the Alaska Department of Environmental Conservation (DEC), Air and Water Quality (AWQ), the data collected thus far is not trendable and therefore of little use, except to come to an extrapolated decision that no environmental effects will be impacted at the Narrow Cape. The monitoring plan needs to be revised to obtain a sufficient data set.

The benefits of the monitoring program would be enhanced, however, if the existing program is modified to make it more effective. For example, some monitoring could be conducted periodically rather than immediately prior to and following a specific launch. At a minimum we should continue monitoring water quality and sediments, macro-invertebrates, and marine mammals. Procedures for monitoring bird use appear to need modification if the monitoring results are to be useful. I defer to each agency’s expertise to identify the appropriate parameters to be monitored and the appropriate methodologies to conduct the monitoring.

DEC AWQ suggests the following changes to the Kodiak Launch Complex monitoring plan:
1. Alkalinity should be monitored quarterly (in first two weeks of each calendar quarter). Alkalinity will show a trendable change in water quality whereas a pH reading is a function of the buffering capacity of the water sample.

2. Perchlorates should be monitored quarterly (in first two weeks of each calendar quarter).

Your letter referenced the State's review of the Quick Reaction Launch Vehicles that was found consistent with no additional monitoring. No monitoring was required because it was part of the project description. We also noted in that letter that a state individual permit for nondomestic wastewater (0125-DB001) was being issued to the AADC for the disposal of ground water and rainwater that collects in the flame trench. The ground water near the leach field will be monitored for pH, perchlorates, and aluminum. Due to technical difficulties this permit was not issued to AADC and is undergoing additional review at this time.

The State established its initial monitoring requirements in its review of the U.S. Army Space and Missile Defense project. That review included the following monitoring requirements:

1. The U.S. Army Space and Missile Defense Command (SMDC) shall participate in monitoring the effects of its launches on land and water quality. In addition to pH, dissolved oxygen, alkalinity, conductivity, and temperature monitoring included in the Alaska Aerospace Development Corporation (AADC) Environmental Monitoring Plan, monitoring must include pre and post-launch conditions of perchlorates and total aluminum (EPA SM 3120 B, 18th Edition). In addition to the three streams identified in the AADC monitoring plan, monitoring areas must include Twin Lakes. Weather conditions (i.e., speed and direction of wind, precipitation, and humidity) at the time the launch must be included in the report.

2. Monitoring results must be submitted to DGC, Anchorage Office, DEC, Wastewater Permitting Division, DFG, Habitat and Restoration Division, Region II and KIB Community Development Department. At the end of 6 launches, SMDC shall prepare a report summarizing the monitoring results. DGC, DEC, DFG, and KIB (as noted above) shall review the results and determine the need for changes in the monitoring schedule.

Thank you for the opportunity to comment in advance of your decisions related to monitoring at the Kodiak Launch Facility. If you have any questions about this response, please contact me at (907) 269-7473 or email maureen_mccrea@gov.state.ak.us.

Sincerely,

/s/

Maureen McCrea
Project Review Coordinator

cc: via e-mail
Stefanie Ludwig, DNR/SHPO, Anchorage
Wayne Dollezal, DFG/DHR, Anchorage
Bob Scholze, KIB, Kodiak
Pat Ladner, AADC
Kerry Howard, DGC, Juneau
Karee Gaskill, DNR/DOL, Anchorage
Alan Kukla, DEC, Anchorage
Senator Alan Austerman, District C, Kodiak
J. Clifford Stone, Juneau
Mrs. Julia Hudson-Elliot  
U.S. Army Space and Missile Defense Command  
106 Wynn Drive  
Huntsville, AL 35805

Dear Mrs. Hudson-Elliot:

We have reviewed the proposal for Phase II of the Ground-Based Midcourse Defense (GMD) system. We offer the following scoping-level comments at this time.

Our comments are focused on the proposed construction of new facilities and the operations from new and existing facilities that are based out of Kodiak, Alaska, although the project encompasses a much larger geographic area. The proposed action on Kodiak as described in your April, 2002, Fact Sheet and derived from a conversation with Leroy Phillips of the Army Corps of Engineers (Corps) includes construction to develop a dual ground based interceptor with two new silos, a battle control and command center, installation of communication facilities, construction of additional test missile launch capabilities, an upgrade of existing facilities, and the utilities, equipment, and other infra-structure required to support these operations.

The proposed alternatives for the GMD extended range testing include a No-action and three other alternatives. Alternative 1 includes numerous actions for new construction (described below) near an existing launch facility on Kodiak Island. Alternative 2 includes new construction and modification of existing target launch pads and support facilities at the Kodiak Launch Facility. Alternative 3 includes all the actions for development at Kodiak described in Alternative 1 and new construction and modifications at Vandenberg Air Force Base.

As yet we have received very little information on the location, size, and specific descriptions of the actions on Kodiak, thus it is difficult for us to provide detailed information on fish, wildlife, wetlands, and other habitats that could be impacted by the project. This information should include locations and alternative locations to construct new facilities and the infra-structure (i.e., new and upgraded roads, utilities) to support these facilities. Information on potential construction camps, location and size of material site(s), and temporary fill areas should also be included in your project descriptions and environmental analysis. In addition, information on the operations (i.e., launches) proposed to occur within the facilities and the how they may affect fish and wildlife resources should also be analyzed in your environmental documentation.
An overview prepared by the Missile Defense Agency that we received from the Corps and titled “Ground Based Midcourse Defense,” includes a map of the Narrow Cape area depicting locations of proposed facilities that include the dual launch ground based interceptor silos, a second target launch pad, and an integration and processing facility. However, this map only represents one alternative for developments located near the Kodiak Launch Facility. The Environmental Impact Statement should include all practicable or feasible alternatives specific to development on Kodiak, including alternative site locations. Sites with existing infrastructure, fill, or development should be considered to minimize or prevent impacts to biological resources within undeveloped areas. Based on previous surveys (ENRI 1995) a mosaic of vegetation types including wetlands, streams, and lakes occur where the new developments are proposed at Narrow Cape.

Bald eagles have been documented nesting in the vicinity of Narrow Cape and their nests may occur within the footprint or near the proposed facilities. Bald eagles in Alaska are protected under the Bald and Golden Eagle Protection Act (Act). All parties working in the vicinity of bald eagles are responsible for avoiding the taking, "at any time in any manner (of) any bald eagle... or any part, nest or egg thereof" (16 U.S.C. 668a). "Taking" is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 U.S.C. 668a).

While the Fish and Wildlife Service can recommend distances which should eliminate the take of eagles as defined by the Act, final accountability lies with the landowner or party responsible for the action. If an action results in the abandonment of a nest or death of eaglets, the party responsible could be subject to criminal or civil penalties under the Act.

Alcetian and arctic terns and many other bird species may also nest within or adjacent to the proposed development. The development will require vegetation clearing, excavation, and fill placement which could all result in the destruction of bird nests, a violation of the Migratory Bird Treaty Act (16 U.S.C. 703). The destruction of active bird nests (i.e., those with eggs or young) can best be avoided by placing the development in an area where nesting does not occur, or if that is not feasible, by avoiding construction activities when the birds are nesting (April 15 - July 15).

In order to determine location of bird nests within the project area, bird and bald eagle nest inventories will need to be conducted within the footprint and adjacent to any proposed development for all of the alternatives specific to Kodiak. This information will help avoid potential violations of the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act by placing the development away from important nesting areas and help determine the need for a timing window. We are willing to assist with designing and/or conducting these inventories.

Any projects that are Federally funded or require a Federal permit are subject to consultation under section 7 of the Endangered Species Act. To initiate this process, the agency proposing the action first needs to request a species list from the Fish and Wildlife Service. If you need more information regarding this process please contact Charla Sterne at (907) 271-2781.
As noted above, in order to assess potential fish and wildlife habitat losses and impacts within the proposed alternatives, further resource information is required. This information is necessary in order to adequately describe the affected environment, predict environmental consequences as required by the National Environmental Policy Act, and appropriately plan a project with minimal environmental impacts.

In particular, the following elements should be identified and fully addressed in your environmental document:

1. Conduct a thorough evaluation of alternatives pursuant to the Clean Water Act Section 404(b)(1) Guidelines.
2. Conduct wetland delineations within the footprint of the proposed alternatives.
3. Identify the direct, indirect, and cumulative impacts of each alternative to fish, wildlife, and wetland resources. The scope of this assessment should include impacts related to habitat losses, construction activities, and long-term operation of the facilities (i.e., launches).

As project plans become more complete, we may identify additional resource concerns and recommend measures to avoid and minimize resource impacts. For wetlands impacts that cannot be avoided or minimized, we will recommend compensatory mitigation. For further coordination please contact Marcia Heer at (907) 271-2440.

Sincerely,

[Signature]

[Name]
Field Supervisor

cc: Corps (L. Phillips),
ADFG-Anchorage (W. Doczal)
ADFG-Kodiak (J. McCallough)
NMFS (J. Hanson)

References

U.S. Army Space & Missile Defense Command
Attn: Julia Hudson-Elliott
106 Wynn Dr.
Huntsville, AL

Dear Ms. Hudson-Elliott,

The National Park Service has reviewed the Notice of Intent published by the U.S. Army Space and Missile Defense Command regarding Preparation of the Ground-Based Midcourse Defense Extended Test Range Environmental impact Statement (March 28, 2002; Vol. 67, No. 60, PP 14919-14920). This Federal Register announcement (NOI) initiates an environmental impact analysis process for the proposed enhancement of test facilities, including Ronald Reagan Ballistic Missile Test Site at Kwajalein Atoll, the Pacific Missile Range Facility in Hawaii, Vandenberg Air Force Base in California, and Kodiak Launch Complex in Alaska.

Area of Possible Effect of Proposed Action - The proposed action involves enhancing current test capabilities, including additional missile launch sites at Kodiak Launch Complex in Alaska and Vandenberg Air Force Base in southern California. The missile launches and ancillary actions have potential for impacting natural soundscapes in any national park, national monument, or other unit of the National Park System in proximity to the tests.

Possible Environmental Effects - Potential sources of noise could include any aircraft participating in the tests, the missile launches themselves, and target destruction via missile ordinance. The resulting sounds could adversely impact natural processes in units of the National Park System, and disrupt experiences of many diverse people who expect to hear natural sounds or enjoy the solitude that is to be provided in parks. In part, these areas have been created to provide for solitude and protect resources and values including natural soundscapes.

Concerns Relating to the Scope of Analysis - Given the potential for adverse impacts as a consequence of this type of activity, the National Park Service (NPS) has concerns about how much and to what extent the proposed tests would occur in relative proximity to existing national parks and monuments such as Kenai Fjords National Park or Channel Islands National Park. The forthcoming Draft EIS (and any scoping or public information materials) should clearly disclose the location of all units of the National Park System which may be affected, as well as indicate the frequency and duration of the missile launches, the number of launches per unit time, the duration of the program with respect to each such unit, as well as altitudes and locations (with respect to prevailing winds) where these activities may occur.

May 20, 2002
Range of Alternatives - We note, with appreciation, that recently in other areas the U.S. Air Force has been very receptive about eliminating, reducing, or mitigating the impacts of routine flights and training exercises over national park areas, and is presently working proactively with our National Soundscape Program Center.

We feel that mutually beneficial results of such cooperation could be realized through consultations regarding the subject action being proposed. If not already included, we request consideration of an alternative that provides sufficient horizontal buffers between all noise-producing activities proposed and areas of the national parks and monuments in closest proximity. We are available to provide additional information to facilitate alternative development, identification of appropriate mitigations, and other aspects of the forthcoming environmental impact analysis effort.

Summary

Recognizing the propensity for the U.S. Army Space and Missile Defense Command to enhance this program, NPS sees no indication in the NOI that testing over national parks is intrinsic to the test systems' effectiveness or other critical parameters. The Draft EIS should identify and analyze a reasonable range of alternatives (and rationales for them), including an alternative that does not adversely impact units of the National Park System. However, if there is later deemed to be no prudent and practical alternative to directly or indirectly impacting units of the National Park System, it is requested that numbers, frequencies, and durations of launches, tests, and other activities relative to all units be minimized as much as possible, and that other reasonable measures to minimize environmental harm be identified and analyzed.

For further information regarding our comments and concerns, please contact the following individuals, as well as include them in your EIS mailing list: Sarah Creachbaum (970) 267-2117, National Soundscape Program Center, 1201 Oakridge Dr., Ste. 200, Ft. Collins CO 80525; Bruce Greenwood (907) 257-2645, Alaska Regional Office, 2525 Gambell St., Anchorage AK 99503; and Judith Rocchio (510) 817-1431, Pacific Great Basin Support Office, 1111 Jackson St., Ste. 700, Oakland CA 94607.

Sincerely,

John J. Reynolds

cc:
REO
OEPC
WASO-EQD
Mr. Robert Arnberger, Regional Director  
U.S. Department of the Interior  
National Park Service  
AK Area Field Office  
2525 Gambell Street, Room 107  
Anchorage, AK 99503-2892

Dear Mr. Arnberger:

In compliance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality regulations implementing NEPA, the U.S. Army Space and Missile Defense Command, on behalf of the Missile Defense Agency (MDA), is preparing the Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) Environmental Impact Statement (EIS). MDA proposes to develop the capability to conduct more realistic interceptor flight tests in support of GMD by extending the existing GMD test range. This extension would increase the realism of GMD testing by providing an area in which to conduct multiple engagement scenarios using trajectories, geometries, distances, and speed of targets and interceptors that more closely resemble those in which an operational system would be required to provide an effective defense.

The Proposed Action would include pre-launch activities, target and ground-based interceptor (GBI) missile launches from a number of widely separated locations, and missile intercepts over the Pacific Ocean. Target missile would be launched from Vandenberg Air Force Base (AFB), CA; Kodiak Launch Complex (KLC), Kodiak, AK; Pacific Missile Range Facility (PMRF), Kauai, HI; Ronald Reagan Ballistic Missile Defense Test Site (RTS), U.S. Army Kwajalein Atoll; or from mobile platforms in the western Pacific Ocean. GBI missiles would be launched from Vandenberg AFB, KLC, or RTS. Dual target and interceptor missile launches would occur in some scenarios.

Missile acquisition and tracking would be provided by existing ship-borne sensors, a new sea-based X-Band radar, and land-based sensors in the Pacific region; a mobile sensor positioned at KLC, PMRF, RTS, or Vandenberg AFB; the prototype X-Band radar at RTS; and existing/upgraded radars at Beale AFB, CA, and Clear Air Force Station and Eareckson Air Station, AK. In-Flight Interceptor Communication System Data Terminals (IDTs) would be constructed near the proposed GBI launch sites and in the mid-Pacific region. Commercial Satellite Communications terminals would be constructed at launch locations that do not have fiber optic communications links and in the mid-Pacific region.
The EIS considers the long-term conservation and protection of the coral reef ecosystem and related marine resources and species of the Northwestern Hawaiian Islands as required by Executive Order 13196, Final Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve. The EIS also investigates the potential for adverse impact to Essential Fish Habitat in accordance with the Magnuson-Stevens Fishery Conservation and Management Act.

This Coordinating Draft EIS is being distributed to various agencies, including your office, for review and comment prior to preparing the Draft EIS for public review. It is our desire to ensure that any concern you might have about our efforts to identify natural resources and assess potential impacts is fully addressed.

Please review this information and provide comments by December 5, 2002 to Deputy Commanding General, U.S. Army Space and Missile Defense Command, Attention: SMDC-EN-V (Ms. Sharon Mitchell), P.O. Box 1500, Huntsville, AL 35807-3801 or by data facsimile 256-955-5074 or e-mail sharon.mitchell@smdc.army.mil. If you have any questions or comments, please contact Ms. Mitchell at 256-955-4392.

Enclosure:
As stated
Similar letters were sent to the following agencies:

ALASKA

Mr. Greg Ballogh, U.S. Fish and Wildlife Service, Anchorage Ecological Services Office, 605 W 4th Ave Rm G62, Anchorage AK 99501

Mr. Chuck Bell, State Conservationist, U.S. Department of Agriculture, Natural Resource Conservation Service, Alaska State Office, 949 East 36th Ave Ste 400, Anchorage AK 99508-4302

Ms. Judith E. Bittner, State Historic Preservation Officer, Alaska Department of Natural Resources, Office of History and Archaeology, Division of Parks and Outdoor Recreation, 550 West 7th Ave Ste 1310, Anchorage AK 99501

Ms. Michele Brown, Commissioner, Alaska Department of Environmental Conservation, 401 Willoughby Ave Ste 105, Juneau AK 99801-1795

Ms. Michelle Davis, Alaska Regional Coordinator, Native American Fish and Wildlife Society, 707 A St, Anchorage AK 99501

Mr. Samuel Demientieff, Fairbanks Agency, Bureau of Indian Affairs, Federal Building & Courthouse, 101 12th Ave Box 16, Fairbanks AK 99701

Mr. Clarence Goward, FAA Anchorage, 222 West 7th Ave Box 14, Anchorage AK 99513

Ms. Jeanne L. Hanson, Field Office Supervisor for Habitat Conservation, U.S. Department of Commerce, National Marine Fisheries Service, 222 West Seventh Ave No 43, Anchorage AK 99513-7577

Mr. Kevin Harun, Executive Director, Alaska Center for the Environment, 806 G St Ste 100, Anchorage AK 99501

Mr. Jeff Hughes, Alaska Department of Fish and Game, Division of Wildlife Conservation, Region 2, 333 Raspberry Rd, Anchorage AK 99518-1599

Mr. Albert Kahklen, Field Representative, Bureau of Indian Affairs, 3601 C Street, Suite 1100, Anchorage AK 99503

Mr. Ronald G. King, Chief, Alaska Department of Environmental Conservation, Division of Air and Water Quality, Air Quality Improvement Section, 610 University Ave, Fairbanks AK 99709-3643

Mr. William D. McGee, Regional Environmental Supervisor, Alaska Department of Environmental Conservation, 610 University Ave, Fairbanks AK 99501

Mr. Ervin McIntosh, Field Supervisor, U.S. Department of the Interior, U.S. Fish and Wildlife Service, Ecological Service/Fairbanks, 101-12th Ave, Fairbanks AK 99701-6267

Ms. Maureen McCrae, Alaska Office of Management and Budget, Division of Governmental Coordination, Project Review Coordinator, 550 W 7th Avenue Ste 1660, Juneau AK 99501

Ms. Cynthia Navarrette, Alaska Native Health Board, 3700 Woodland Drive Ste 500, Anchorage AK 99517

Mr. Alvin G. Ott, Regional Supervisor, Alaska Department of Fish and Game, Region III, Habitat Protection Division, 1300 College Rd, Fairbanks AK 99701-1599

Mr. Steven Pennoyer, Regional Administrator, U.S. Department of Commerce, National Marine Fisheries Service, Alaska Regional Office, 709 West 9th, Juneau AK 99802-1668
Mr. Curt Wilson, U.S. Bureau of Land Management, 222 West 7th Ave, Anchorage AK 99513
Mr. Everett Robinson Wilson, U.S. Department of the Interior, U.S. Fish and Wildlife Service, Aleutian Ecological Services, Region 7, 1101 East Tudor Rd, Anchorage AK 99503

CALIFORNIA

California Regional Water, Quality Control Board, Central Coast Region, 81 Higuera St Ste 200, San Luis Obispo CA 93401-5427
Mr. Rodney McInnis, Acting Regional Administrator, Department of Fish and Game, California Coastal Commission, National Marine Fisheries Service Director, Southwest Region, 501 West Ocean Boulevard, Suite 4200, Long Beach CA 90802-4213
Mr. Jim Raives, Federal Consistency Coordinator, California Coastal Commission, 45 Fremont St Ste 200, San Francisco CA 94105-2219
Santa Barbara County Air Pollution Control District, 26 Castilian Drive, Goleta CA 93117

HAWAII

Mr. Gilbert Coloma-Agaran, SHPO, Department of Land and Natural Resources, Kakuhihewa Bldg Rm 555, 601 Kamokila Blvd, Kapolei, HI 96707
Mr. Charles Karnella, NOAA, 1601 Kapiolani Blvd Suite 1110, Honolulu HI 96814-4700
Mr. Curtis Martin, Hazard Evaluation and Emergency Response Office, 919 Ala Moana Blvd Rm 201, Honolulu HI 96814
Ms. Barbara Maxfield, U.S. Fish and Wildlife Service, 300 Ala Moana Blvd Rm 3-122, Honolulu HI 96850
Mr. Mike Molina, U.S. Fish and Wildlife Service, 300 Ala Moana Blvd Rm 3108, Honolulu HI 96580
Mr. Ben Nakamiyo, Federal Aviation Administration, 300 Ala Moana Blvd Ste 7-128, Honolulu HI 96850-4953
Mr. John Naughton, National Marine Fisheries Service, Pacific Islands Office, 1601 Kapiolani Blvd Ste 1110, Honolulu HI 96814-4700
Mr. Francis Oishi, Hawaii DLNR, 1151 Punchbowl St Rm 330, Honolulu HI 96813
Mr. Howard Park, Federal Aviation Administration, 760 Worcester Ave, Honolulu HI 96818-5125
Ms. Debbie Saito, Federal Aviation Administration, Honolulu Control Facility, 760 Worcester Ave, Honolulu HI 96818

REPUBLIC OF THE MARSHALL ISLANDS

Mr. John Bungitak, General Manager, Republic of the Marshall Islands Environmental Protection Authority, P.O. Box 1322, Majuro Atoll, Republic of the Marshall Islands 96960
Mr. Lenest Lanki, Secretary to the RMI Minister of Internal Affairs/Historic Preservation Officer, P.O. Box 1454, Majuro Atoll, Republic of the Marshall Islands MH 96960-1454
WASHINGTON

Mr. Terry Barton, Environmental Affairs, Naval Station Everett
2000 West Marine View Drive, Everett WA 98207-5001
Mr. Robert Donnelly, NWR/NMFS, 7600 Sand Point Way, Seattle WA 98115
Ms. Ann Kenny, Department of Ecology, NW Regional Office, 3190 160th Ave SE,
Bellevue WA 98008-5452
Mr. John Miller, Environmental Affairs, Naval Station Everett, 2000 West Marine View
Drive, Everett WA 98207-5001
Mr. Michael Motta, Environmental Affairs, Naval Station Everett, 2000 West Marine
View Drive, Everett WA 98207-5001
December 2, 2002

Deputy Commanding General
Attention: SMDC-EN-V (Ms. Sharon Mitchell)
P. O. Box 1500
Huntsville, AL 35807-3801

RE: Ground-Based Midcourse Defense Extended Test Range Draft EIS

Dear Ms Mitchell:

The Santa Barbara County Air Pollution Control District (APCD) appreciates the opportunity to provide comments on the Draft Environmental Impact Statement (DEIS) for the above referenced project.

1. Page 4-144, Section 4.5.1.3.1: the text states that the "(c)onstruction of GBI silos and associated facilities at Vandenberg AFB is analyzed in the ABV EA and determined to cause no significant air quality impacts to the regional air." As the APCD did not receive a copy of the Alternate Boost Vehicle Verification Test EA, we suggest that the subject analysis be included in this document.

2. Page 4-143, Section 4.5.1.3.3, Table 4.5.1-2: As Santa Barbara County is classified as a non-attainment area for the federal and state one-hour ozone standards, exhaust emissions of nitrogen oxides and hydrocarbons from construction equipment should be included in this table.

3. Please be aware that APCD permits may be required for activities and equipment enumerated in the DEIS – e.g., application of architectural coatings and generators which are used more than 200 hours annually. As this DEIS does not satisfy California Environmental Quality Act (CEQA) Guideline requirements, the APCD will need to prepare CEQA documentation necessary to support any of its permitting actions.

Please call me at 961-8812 or contact me by e-mail tanr@sbcapcd.org, if you have questions.

Sincerely,

Ron Tan
Technology and Environmental Assessment Division

cc: TEA Chron File
December 20, 2002

Steve Davis
Colonel, U.S. Army
Director, Site Activation World Wide
Department of Defense
Missile Defense Agency
Ground-Based Midcourse Defense
Joint Program Office
P. O. Box 1500
Huntsville, Alabama 35807-3801

Dear Colonel Davis:

In early November, various offices of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) received copies of the November 4, 2002, Coordinating Draft Environmental Impact Statement for the Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) (EIS). Ms. Sharon Mitchell, Chairman, GMD ETR EIS Team, is the designated point of contact for comments that NOAA Fisheries has regarding this action.

As the action analyzed in the EIS is multi-faceted and ranges across multiple NOAA Fisheries regions, one set of comprehensive NOAA comments cannot be issued by December 27, 2002. We understand that this is a coordinating draft, with the anticipated draft due to be issued in late January 2003. To assist the Missile Defense Agency (MDA) in the NEPA process, I will provide a complete list of NOAA offices/programs which will be involved in reviewing and commenting on the draft EIS.

Additionally, it appears that there are a variety of actions originating from the MDA that are related. For instance, NOAA has been involved in preliminary discussions with entities responsible for the ground-based test X-ban radar system which is proposed to be deployed and tested at the Pacific Missile Range Facility, Kauai. Similarly, NOAA has reviewed the environmental assessment (EA) for the Theater High Altitude Air Defense (THAAD) and is in the process of reviewing an EA for the Long Range Air Launch target System (LRALT). Also, NOAA Fisheries had reviewed the July 2000 Final EIS "National Missile Defense Deployment" prepared by the Ballistic Missile Defense Organization; describing a land-based missile defense system consisting of ground-based interceptors, X-band radar, upgraded early warning systems, satellite detection systems, and battle management, command, control and communications elements; to be located in various locations including Alaska, California, North Dakota, and Massachusetts.

To best serve the MDA on this and other actions and ensure that all actions receive appropriate and thorough review under our statutory authorities, NOAA will need a comprehensive description of related actions proposed for our regions. It would be helpful if the MDA would
provide NOAA with an understanding of the context of these projects in the anti-missile defense program.

We look forward to working with representatives of the MDA on these and future ongoing projects. If there are questions, or if the MDA would like to provide further information, please contact Steve Kokkinakis of my staff at (202) 482-3639; U.S. Department of Commerce, NOAA/Strategic Planning, Rm 6121, 14th and Constitution, NW, Washington D.C., 20230.

Sincerely,

James P. Burgess
NEPA Coordinator

cc:
James Balsiger, NMFS, Juneau, AK
Brad Smith, NMFS, Juneau, AK
Jeanne Hanson, NMFS, Anchorage, AK
Rodney McInnis, NMFS, Long Beach, CA
Charles Karnella, NMFS, Honolulu, HI
Margaret Akamine Dupree, Honolulu, HI
John Naughton, NMFS, Honolulu, HI
Robert Lohn, NMFS, Seattle, WA
Robert Donnelly, NMFS, Seattle, WA
Donna Wieting, NMFS, PR2, Silver Spring, MD
Phil Williams, NMFS, PR, Silver Spring, MD
Dan Basta, NOS, National Marine Sanctuaries Program, Silver Spring, MD
Carol Bernthal, Olympic Coast NMS, Port Angeles, WA
Chris Mobley, Channel Islands NMS, Santa Barbara, CA
Allen Tom, Regional Director, NMS, Kihei, HI
Robert Smith, NWHI Coral Reef Ecosystem Reserve
Naomi McIntosh, Hawaiian Islands Humpback Whale NMS, Honolulu, HI
December 26, 2002

File No.: 3130-R Army

SUBJECT: Ground-Based Midcourse Defense, Extended Test Range
Kodiak Launch Complex, AK
Review of Coordinating Draft EIS

Ms. Sharon Mitchell, Chairman
U. S. Army Space and Missile Defense Command
P. O. Box 1500
Huntsville, Alabama 35807-3801

Dear Ms. Mitchell:

We have reviewed the Ground-Based Defense (GMD) Extended Test Range (ETR) Coordinating Draft Environmental Impact Statement (EIS), (November 4, 2002). Based on our records, two of the proposed Barge Landing Points are near reported prehistoric sites.

- Barge Landing Point #1: near KOD-66 (Narrow Cape Vicinity, Koniag house pits and refuse).
- Barge Landing Point #2: no reported prehistoric sites, however area may not have been previously archaeologically surveyed.
- Barge Landing Point #3: near KOD-67 (Pasagashak Bay I, Koniag house pits and shell midden).

Our office recommends that all three Barge Landing Points be archaeologically surveyed to determine if the reported archaeological sites are indeed present or if there are previously unreported sites within the area of potential effect (APE). Any archaeological sites within the APE should be evaluated for eligibility for inclusion to the National Register of Historic Places.

The EIS states that the Kodiak Launch Complex was investigated by Office of History and Archaeology (OHA) archaeologists in 1994. While it is true that OHA archaeologists surveyed portions of the Launch Complex at that time, it is not clear if the currently proposed construction may be impacting areas that were not previously surveyed. Additional survey of this area may be needed.

Please contact Stefanie Ludwig at 269-8720 if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer
JEB:sl1
Colonel Steve Davis  
Department of Defense Missile Defense Agency  
Ground-Based Midcourse Defense Joint Program Office  
Huntsville, AL  35807-3801

Dear Colonel Davis:


The proposed action is the construction and operation of additional launch and test facilities in the Pacific Region in order to conduct more realistic interceptor flight tests in support of GMD development. Under the No Action Alternative, the GMD Extended Test Range would not be established and the Sea Based Test X-Band Radar (SBX) would not be developed. However, GMD testing would continue at the existing launch areas, including the Kodiak Launch Complex (KLC) as it does now. Three alternatives propose new Ground-Based Interceptor (GBI) missile launch site construction with new and existing test components at KLC or Vandenberg Air Force Base (AFB), California or both, and development of the SBX Radar with possible home ports in Valdez or Adak, Alaska.

Based on the information provided, it appears that the proposed activities may affect the listed Steller sea lions, Hawaiian monk seals, sea turtles, and other species. Because of this, MDA will likely need to consult with NOAA Fisheries (and Fish and Wildlife Service for species listed under their jurisdiction). Additional comments are provided regarding potential impacts on habitats and marine resources in the vicinity of the KLC. Monitoring needs are addressed as well.

Please refer any questions with respect to Alaska’s resources to Mr. Brad Smith or LT Mark Boland in our NOAA Fisheries Anchorage office at (907) 271-5006. For questions regarding activities affecting Pacific Islands resources, please contact Margaret Akamine in our Pacific Islands Area Office at (808) 973-2935.

Sincerely,

James P. Burgess, III  
NEPA Coordinator
NOAA Comments on Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) Draft Environmental Impact Statement (DEIS)

General Comments
The draft Environmental Impact Statement (DEIS) includes alternatives that would launch up to five (5) missiles annually from the existing Kodiak Launch Complex (KLC), and would construct new facilities at or near KLC such as launch pads, silos, and barge docks. Several authorizing entities exist for the KLC, including the Federal Aviation Administration, the Alaska Aerospace Development Corporation (AADC), and the various launch entities, which are often Federal agencies (e.g. the US Air Force, Department of the Army, Missile Defense Agency). This DEIS should contain a discussion of the cumulative effects of activities and the responsibilities of these parties concerning the KLC and the environmental impacts of the facility and launches. For instance, efforts to monitor certain environmental and physical conditions are ongoing near Narrow Cape, as well as operational conditions agreed to by the vendor, AADC.

The DEIS should clarify what environmental monitoring is to be done during these additional launches, what the objectives are, who is funding it or responsible for it, what existing agreements or operational constraints require, and which, if any, are inconsistent with the proposed project. For instance, the Ugak Island Steller sea lion haulout was monitored during earlier launches to understand the effect of launches on the behavior of these endangered species. No conclusive results were obtained and, while launch noise may not be injurious to these animals, periodic monitoring remains appropriate and necessary. We recommend the DEIS indicate that this monitoring would occur for the first two launches that coincide with periods when the Ugak Island haul out is occupied.

Additionally, we recommend continuing a water quality monitoring program in the streams and lakes around the KLC launch facility. Sampling should include testing for the potentially hazardous materials emitted from the missiles plus standard water chemistry parameters (e.g., pH, dissolved oxygen, temperature, and conductivity). This sampling program should also include a non-impacted control site outside the area of influence of missile emissions.

Specific Comments
The DEIS references Best Management Practices (BMP) and Standard Operating Procedures (SOP) but does not include a description of these. We recommend you include a section describing the BMPs and SOPs.

The proposed configuration of the EKV presently uses liquid propellants that would be very hazardous to local fish and wildlife if lost due to vehicle failure in the early phase of a launch. Please explain why solid propellants cannot be used here.

The Narrow Cape area is a prominent point of land and a popular viewing area for wildlife, especially gray whales during spring migrations. The DEIS notes that access will be restricted during certain activities associated with this project. However, Table ES-2 does not include the Resource Category “Recreation” or “Wildlife Viewing.” The DEIS should include an expanded
assessment of impacts to this use.

ES1.4 Proposed Action. Please explain the need for construction of launch silos at the KLF, and why existing launch complex configuration is not suitable for launching of either the target or interceptor vehicles. The DEIS should also present more detail on the design of any barge or dock facilities to be constructed on Kodiak Island.

Please explain whether the flight corridor depicted in Figure 4.1.7-2 or Figure 4.1.7-3 is correct; or are multiple corridors proposed?

Impacts to Marine Species
This document contains little information regarding protected marine species and their habitats. We request the Missile Defense Agency (MDA) provide full information regarding the potential effects of these activities on protected species and their habitats. Based on the limited information provided in the DEIS, it appears that the activities may affect the listed Steller sea lions, Hawaiian monk seals, sea turtles, and other species. Because of this, MDA will need to consult with NOAA Fisheries (and Fish and Wildlife Service for species listed under their jurisdiction). MDA should provide additional information on the effects of the various activities on listed species that would be applied to an Endangered Species Act (ESA) section 7 consultation. Without this information, NOAA cannot provide MDA with substantive comments regarding the proposed actions.

In addition, other marine mammals may be affected by launch, debris recovery, or other activities. It seems marine mammals will be disturbed during target missile launches (such as on page 4-29 to 4-30) and debris recovery (such as on page 4-176). Such disturbance would constitute a "take" by harassment. MDA should seek a Marine Mammal Protection Act authorization to exempt such take of marine mammals, and in the case of listed marine mammals (e.g., Steller sea lion) a formal consultation as well.

There is no discussion on the impacts of x-band radar to animals that remain at the water surface for extended periods. The DEIS states on page 4-215, "It is highly unlikely that an individual would be on or substantially above the surface of the water for a significant amount of time within the main beam or side lobe areas during the 3 to 6 hours per week that the SBX would be operating." Further biological information is needed to support this position.

TPS-X Radar will be used at PMRF but there is no discussion of potential impacts to protected species in the PMRF area (page 4-148).

The U.S. Navy acknowledges "that acoustic emissions from various products and activities could be interacting with marine mammals' hearing" (page 4-286). We would like further discussion on the potential or expected harassment.

Construction activities at Midway, Northwestern Hawaiian Islands need further discussion. NOAA Fisheries guidelines recommend remaining 150 feet from Hawaiian monk seals (not 100 ft as stated on page 4-113). However, it may be necessary to increase this distance depending on
construction activities (noise levels, etc.). More information regarding the construction activities is necessary in order to assess the potential for impacts to protected species and their habitats.

Appendix B of the DEIS lists the laws that were considered by MDA, but the list simply describes the various laws. It does not state MDA's intentions on how they will proceed with an ESA consultation and/or Essential Fish Habitat consultation per the Magnuson-Stevens Fishery Conservation and Management Act, and whether they will seek an MMPA authorization.
March 20, 2003

Ms. Julia Elliot
SMDC-EN-V
U.S. Army Space and Missile Defense Command
166 Wynn Drive
Huntsville, Alabama 35805

Dear Ms. Elliot:

SUBJECT:  Ground-based Midcourse Defense, Extended Test Range
State I.D. No. AK 0302-03AA
DEIS NEPA Response

The Division of Governmental Coordination received the Draft Environmental Impact Statement (DEIS) for the Ground-based Midcourse Defense, Extended Test Range. The Missile Defense Agency (MDA) prepared this document to satisfy the requirements of the National Environmental Policy Act (NEPA). The Alaska Departments of Environmental Conservation, Fish and Game and Natural Resources have reviewed the DEIS document in accordance with NEPA and with an awareness of future requirements for executing decisions that would involve State of Alaska authorizations and consistency with Alaska's Coastal Management Program.

We offer the following comments:
Kodiak Launch Complex Barge Landing Sites (KLC). Section 4.1.8.2.1, Operation, Pre-Launch Activities, discusses the use of barge landing sites. The Alaska Department of Fish and Game (ADF&G) notes that there are differences in potential effects at the three sites that are not addressed in the DEIS. Barge landing site number 2, the ADF&G’s preferred alternative, is not in proximity to an anadromous fish stream. Barge landing site number 1 is in close proximity to ADF&G anadromous fish stream 259-30-10060 which supports pink salmon. Barge landing site number 3 is in close proximity to ADF&G anadromous fish stream 259-30-10060. In addition, boaters use the area around barge landing site 3 for launching and mooring, and the beach is used for recreational purposes.

Public access to the area continues to be a primary public concern. The DEIS states that restrictions and closures can be expected both during construction and during operations. During the meetings
that GMD personnel held with State and federal agency staff, staff learned that closures and security restrictions during operations are anticipated to be about the same as is going on now with launches. The only anticipated change relates to the greater frequency of the launches so the frequency of closures will increase. To clarify exactly what the effects might be, it would be useful to include specific closure and restriction information related to the approximate number of hours per launch day and number of launch days per month or season, types of restrictions and closures, and areas to be closed. Including this information in the DEIS would address and may alleviate local concerns surrounding this issue. It also would be useful to address construction closure schedules and areas.

The DEIS notes on page 3-13 that there are no paleontological resources identified in any of the upland areas of the Kodiak Launch Complex. However, there are numerous paleontological resources in the area -- Fossil Beach derives its name from those resources and rock outcroppings on both sides of the beach contain a variety of fossil remains. Rock outcropping from the ridge that the new missile silos will be excavated into and built upon likewise contains fossils.

Two typographical errors in the DEIS should be corrected.

- Section 3.1.1.1 describes the location of the highest concentration of launch emissions on a mountaintop to the east of the KLC. The mountains are not 3 miles to the east of the KLC.
- Section 3.1.2.2 describes the location of the Kodiak airport as being northeast of the KLC; in fact, it is north and slightly to the west of the KLC.

The DEIS does not dwell on authorizations that would be needed for anticipated activities. As noted on page IV-67, GMD would submit a coastal project questionnaire and consistency determination prior to any construction activities. The questionnaire will help identify any necessary authorizations. As advisory information for future authorizations:

- There are no state legislatively designated special areas (i.e., state game refuges, sanctuaries, or critical habitat areas) over which ADF&G exerts Title 16 special areas permitting authority near the project site.
- A Fish Habitat Permit issued by ADF&G, Habitat and Restoration Division, would be required for any project related activities that are to be conducted below the ordinary high water level of a specified anadromous fish stream or that may affect the free, unhindered movement of any species of fish.
- The Alaska Department of Environmental Conservation requires information that will come later in the process to determine if any wastewater permits are needed.
- Extracting potable water from ground water or surface water sources would require an authorization from the Alaska Department of Natural Resources.
- Docking or mooring the floating X-band radar on state tidelands for more than 14 days would require either a permit or lease from the. In issuing the permit or lease, the Alaska Department of Natural Resources will consider the facilities impacts on other resources and users, including recreational boat users, commercial vessel traffic, fishing interest, visual impacts, and impacts on habitat.
Ground-based Midcourse Defense, Extended Test Range

- Changes that affect the Kodiak Launch facility that are not undertaken by the Alaska Aerospace Corporation may require approval from the Alaska Department of Natural Resources, Division of Mining, Land, and Water.

The State of Alaska appreciates your cooperation. Please contact me at 269-7473, or email maureen_mccrea@gov.state.ak.us if you have any questions.

Sincerely,

Maureen McCrea
Project Review Supervisor

Enclosures

cc: via e-mail
Wayne Dolezal, DFG
Lance Trasky, DFG
Ed Weiss, DFG
Karlee Gaskill, DNR
Mary Walter, DNR
Dick Mylius, DNR
Tim Rumfelt, DEC
Alan Kukla, DEC
Alan Wien, DEC
Pat Ladner, AADC
Leroy Phillips, COE Regulatory
David Hasley, SMDC
Cliff Stone, AK Legislature
Chris Nelson, AK
Duane Dvorak, KIB
Karol Kolehmainen, AWCRSA
Mary Siroky, DEC
U.S. Army Space and Missile Defense Command  
Attn: Ms. Sharon Mitchell  
(SMDC-EN-V) TERC  
P.O. Box 1500  
Huntsville, Alabama 35807-3801

Dear Ms. Mitchell:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the project entitled **Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR)** (CEQ #030048). Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

EPA commends the comprehensive approach taken by U.S. Army Space and Missile Defense Command to analyze the potential impacts to the environment as a result of the proposed construction, operation, and test activities associated with the proposed GMD/ETR. The DEIS is well written, and clearly lays out the issues associated with the operation of flight testing operations in the North Pacific Region. Although EPA supports your efforts to comprehensively evaluate the impacts of the proposed GMD/ETR, we have several concerns about impacts of proposed actions due to a lack of information in the DEIS.

We have rated this DEIS as EC-2, Environmental Concerns - Insufficient Information (see attached “Summary of EPA Rating System”). In particular, the DEIS lacks information on potential perchlorate contamination to soil and water.

We appreciate the opportunity to review this DEIS. If you have any questions, please call me at (202) 564-5400, or Marguerite Duffy, of my staff at (202) 564-7148.

Sincerely,

Anne Norton Miller  
Director, Office of Federal Activities

Enclosures: EPA Rating Sheet
EPA COMMENTS ON U.S. ARMY SPACE AND MISSILE
DEFENSE COMMAND
GROUND-BASED MIDCOURSE DEFENSE (GMD) EXTENDED TEST RANGE (ETR)
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

Perchlorate

Documentation of Analytical Methods

The DEIS discusses perchlorate which is used as the primary ingredient of solid rocket propellant. Salts such as ammonium perchlorate are readily soluble in water and the resultant anion, perchlorate, has increasingly been discovered in soil and water raising concerns about potential human health risks from exposure. However, recent technological improvements have better enabled sampling level detection.

The DEIS concludes that there will be no environmental contamination of perchlorate from additional launch emissions. EPA is concerned with the lack of information regarding the analytical methods used to make such determination. Using old sampling methods, levels could be between 1 and 200 ppb and not be detected. To note a few examples in the DEIS, table 4.1.14.1 and pages 4-105-106, indicate “non-detect” for perchlorate. To understand your impact analysis, critical information about the sampling technique is needed. Newer methods could yield different results. EPA has found that certain analytical methods will show false negatives (non-detect) although perchlorate levels may be as high as 200 ppb. The newer EPA method is “Method 314.0 for Perchlorate in Water,” which can be found at http://www.epa.gov/nceas. 1

This is an ion chromatograph (IC) method. If the Army is using other methods or is extending the method to other media (e.g., soil), EPA requests that the Army provide the details as to type of column used (if IC), any pre-column treatment (e.g., dilution to remove TDS), minimum reporting level (MRL) and minimum detection level (MDL). The current MRL for Method 314 is 4 ppb and MDL is 0.53 ppb. Other methods are achieving lower MRL.

Recommendation: EPA recommends that the Army provide the methodologies and analytical profiles used before finalizing the conclusions on perchlorate. This information is a critical factor in determining if additional launches will add perchlorate contamination to the surrounding ecosystem.

1 This website contains perchlorate information and also the 314.0 method as printed in the Federal Register (2000): Unregulated contaminant monitoring regulation for public water systems: analytical methods for perchlorate and acetochlor; announcement of laboratory approval and performance testing (PT) program for the analysis of perchlorate; final rule and proposed rule. FR. (March 2) 42: 11, 371-11, 385.
Sample Plan

Perchlorate is notorious for moving with seasonal changes. EPA has seen seasonal variation in sampling due to temperature (e.g., turnover of surface with bottom water in large bodies like Lake Mead). Also, hot seasons can increase evaporation and increase concentration. Therefore, we do not recommend relying on one sample to characterize a site (either negative or positive).

Recommendation: EPA requests that the Army provide transport and transformation determinants for perchlorate, as well as developing a strategy for repeated measures.

Construction

It was not clear in the document whether construction will take place at a site that has previously handled perchlorate, munitions, or other contaminants.

Recommendation: EPA recommends sampling those sites to ensure that contamination does not exist.

Tsunami

The DEIS examines the impact of a possible tsunami in the Alaska (Kodiak) area. Similar impact analyses were not conducted for the other Pacific sites. We believe that information, such as tsunami elevations on Hawaiian Flood Insurance Maps, exists. This would indicate that tsunamis are reasonably foreseeable events.

Recommendation: EPA recommends that tsunami impact analyses for the other Pacific sites be included in the FEIS.

General Comment

As written, the text on page 3-98, under the heading Installation Restoration Program, is misleading. It states that IRP sites at Vandenberg AFB are being addressed in a manner generally consistent with the CERCLA process. The Army is required to be consistent with CERCLA and the National Contingency Plan, not merely “generally consistent with.”

Recommendation: EPA recommends that you eliminate the word generally.
SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes that draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS which could reduce the environmental impacts of the action. The identified additional information, data analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.
April 15, 2003

U.S. Army Space and Missile Defense Command
Attn: SMDC-EN-V (Ms. Julia Elliott)
106 Wynn Drive
Huntsville, AL 35805

Dear Ms. Elliott:

Draft Environmental Impact Statement (DEIS)
Sea Based Test X-Band Radar (SBX)

Puget Sound Clean Air Agency has reviewed the executive summary of the SBX DEIS proposed for the Puget Sound Naval Base in Everett, Washington and has concluded that the air quality assessment is incomplete and needs to be expanded in the EIS.

To protect public health, increase clarity, and define the mitigation options available for this project, the Agency requests that the following elements be addressed in the EIS:

- a proactive dust control plan that is not reliant on “frequent rains” to minimize dust emissions during construction,
- an emission estimate of criteria and hazardous air pollutants including benzene, formaldehyde, and 1,3-butadiene,
- screening modeling to ensure that National Ambient Air Quality Standards will not be violated and the Washington State Acceptable Source Impact Levels (ASIL) will not be exceeded, and
- an evaluation of mitigation options to reduce emissions from diesel generators such as the substitution of cleaner diesel fuels (e.g., on-road and ultra-low sulfur diesel fuel, biodiesel fuel blends, and oil/water emulsion fuels); combustion modification (e.g., low NOx burners, water injection, and improving combustion aerodynamics); and post-combustion controls (e.g., selective noncatalytic reduction and selective catalytic reduction) similar to those used on stationary diesel generators.

The Agency would like to participate and comment on any future review of this project. Please send the EIS and any other correspondence to:

Thomas J. Hudson
Puget Sound Clean Air Agency
110 Union Street, Suite 500
Seattle, WA 98101

If you need any clarification of these comments, please contact Tom Hudson of my staff. He can be reached at (206) 689-4025 or e-mail to tomh@pscleanair.org. Thank you for your consideration in this matter.

Sincerely,

Dennis J. McLerran
Executive Director
30 April 2003

Pat Ladner, President and CEO
Alaska Aerospace Development Corporation
4300 B Street, Suite 101
Anchorage, AK 99503

Dear Mr. Ladner:

This responds to your request for comment on three questions raised during the ETR DEIS comment process on the Interagency Land Management Assignment (ILMA), Alaska Division of Land file 226285 (ADL 226285) issued to your agency for lands at Narrow Cape, Kodiak Island. Those questions include:

1) Whether excavations done in support of construction activities constitute unauthorized use of the subsurface estate,
2) Whether the ILMA as issued authorizes or otherwise allows for the expansion of your existing facility, and
3) Whether the ILMA provides authority for closures of the road on the site during construction and for security related reasons.

With regard to question number 1, the ILMA does not limit your right to excavate and subsequently site below surface structures. Paragraph 4 in the ILMA does limit your right to mine the site for minerals, such as gold however. With regard to question number 2, the ILMA was issued specifically to support development of an orbital launch or other aerospace related facilities at Narrow Cape, and it does not restrict you from further developing the site for these purposes. The ILMA requires that you inform ADNR of your development plans (paragraph 3 of ADL 226285) and our office prior to construction must approve the revised plans. Improvements must also be designed and located by a professional architect, engineer or surveyor (paragraph 7 of ADL 226285). Finally, with regard to question 3, the ILMA states the road may be closed for safety reasons, and this reasonably applies to safety concerns related to construction and special security situations that involve public safety, as well as launch-related operations.

Sincerely,

Mike Sullivan
Natural Resource Manager

"Develop, Conserve and Enhance Natural Resources for Present and Future Alaskans"
Mr. James P. Burgess, III  
NEPA Coordinator  
United States Department of Commerce  
National Oceanic and Atmospheric Administration  
Washington, D.C. 20230

Dear Mr. Burgess:

Thank you for your comments regarding the Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) Draft Environmental Impact Statement (DEIS).

Per our conversation with your office and the Federal Aviation Administration (FAA) on April 17, 2003, we agreed that the FAA would take the lead in the formal Section 7 consultation to be initiated under the Endangered Species Act. To meet the requirements for consultation, the FAA will prepare a Biological Assessment to address possible impacts to whales and to Steller sea lions from proposed launch activities at the Kodiak Launch Complex.

It was also agreed that the EIS would be sufficient to support the proposed rulemaking determination, and that the rulemaking process needed for National Marine Fisheries Service’s development of regulations to support a Letter of Authorization would resume.

In addition, we wish to acknowledge your May 6, 2003 letter to Vandenberg Air Force Base that determined Ground Based Interceptor launches would not result in an increase in the number of missile launches authorized to take pinnipeds by Level B harassment under Vandenberg’s Letter of Authorization.

Furthermore, the analysis in the EIS determined that no adverse impacts to marine mammals or sea turtles are anticipated for the Hawaiian Islands, Midway Island or Reagan Test Site in the Kwajalein Islands.
Responses to specific comments are enclosed. I look forward to working with your office and the National Marine Fisheries Service in Alaska to complete the consultation process.

For any questions concerning the EIS, please contact Ms. Sharon Mitchell, (256) 955-4392 or Mr. Eric Sorrells (256) 313-9575.

Sincerely,

STEVE DAVIS
Colonel, U. S. Army
Director, Site Activation World Wide
Ground-Based Midcourse Defense

Enclosure:
As stated

cc:
Ms. Michon Washington, Federal Aviation Administration, Commercial Space Transportation, 800 Independence Avenue S.W., Room 331, Washington DC 20591

Mr. Brad Smith, National Marine Fisheries Service, Protected Resources Division and Habitat Conservation Division, 222 West 7th Avenue, Box 43, Anchorage, AK 99513

Ms. Margaret Akamine, National Marine Fisheries Service, Pacific Islands Area Office, National Oceanic and Atmospheric Administration, 1601 Kapiolani Blvd., Suite 1110, Honolulu, Hawaii 96813

Mr. Pat Laddier, Alaska Aerospace Development Corporation, 4300 B Street, Suite 101, Anchorage, AK 99503
NOAA Comments, 20 March 2003

General Comments

The Draft Environmental Impact Statement (DEIS) includes alternatives that would launch up to 5 missiles annually from the existing KLC, and would construct new facilities at or near KLC such as launch pads, silos, and barge docks. Several authorizing entities exist for the KLC, including the FAA, AADC, and the various launch entities, which are often federal agencies (eg. USAF, Army, MDA). This DEIS should contain a discussion of the cumulative effects of activities and the responsibilities of these parties concerning the KLC and the environmental impacts of the facility and launches. For instance, efforts to monitor certain environmental and physical conditions are ongoing near Narrow Cape, as well as operational conditions agreed to by the vendor, AADC.

The DEIS should clarify what monitoring is to be done during these additional launches, what the objectives are, who is funding it or responsible for it, what existing agreements or operational constraints require, and which, if any, are inconsistent with the proposed project. For instance the Ugak Island Stellar sea lion haulout area was monitored during earlier launches to understand the effects of launches on the behavior of these endangered species. No conclusive results were obtained and, while launch noise may not be injurious to these animals, periodic monitoring remains appropriate and necessary. We recommend the DEIS indicate that this monitoring would occur for the first two launches that coincide with periods when the Ugak Island haulout is occupied.

Per our conversation with your office and the Federal Aviation Administration (FAA) on April 17, 2003, we agreed that the FAA would take the lead in the formal Section 7 consultation to be initiated under the Endangered Species Act. To meet the requirements for consultation, the FAA will prepare a Biological Assessment to address possible impacts to whales and to Steller Sea Lions from proposed launch activities at the Kodiak Launch Complex.

It was also agreed that the EIS would be sufficient to support the proposed rulemaking determination and that the rulemaking process needed for National Marine Fisheries Service’s development of regulations to support a Letter of Authorization would resume.

Please note that the proposed MDA launches are not “additional” launches, but fall within the 9 launches analyzed and permitted under the FAA site license.
Additionally, we recommend continuing a water quality monitoring program in the streams and lakes around the KLC launch facility. Sampling should include testing for the potentially hazardous materials emitted from the missiles plus standard water chemistry parameters (e.g. pH, dissolved oxygen, temperature, and conductivity). This sampling program should also include a non-impacted control site outside the area of influence of missile emissions.

AADC will continue to coordinate with Alaska Department of Environmental Conservation regarding required water quality monitoring.

**Specific Comments**

The DEIS references Best Management Practices (BMP) and Standard Operating Procedures (SOP) but does not include a description of these. We recommend you include a section describing the BMPs and SOPs.

*Please see enclosed list of Best Management Practices and Standard Operating Procedures.*

...EKV presently uses liquid propellants...Please explain why solid propellants cannot be used here.

*The current designs for the Exoatmospheric Kill Vehicle call for a liquid propellant in the guidance system of the missile. The boost system for the EKV uses solid propellant. The fourth stage of the Peacekeeper target missile is also designed to use a liquid propellant.*

The Narrow Cape area...Table ES-2 does not include the Resource Category “Recreation” or Wildlife Viewing.” The DEIS should include an expanded assessment of impacts to this use.

*Pages 2-63, 4-65, and 4-68, Land Use, provides a discussion of the impacts to recreational opportunities of Narrow Cape. Public access to Fossil Beach would be limited or denied for each launch day, which would result in denial of access less than 2 percent of the year.*
ES1.4...Please explain the need for construction of launch silos at the KLC, and why existing launch complex configuration is not suitable for launching of either the target or interceptor vehicles. ...more detail on the design of any barge or dock facilities to be constructed on Kodiak Island.

The purpose for the ETR testing is to duplicate real world scenarios for the deployed system. The deployed system will launch the Ground-Based Interceptor from underground silos. No barge or dock facilities are currently proposed for KLC. Barge landing sites would not involve construction.

Please explain whether the flight corridor depicted in Figure 4.1.7-2 or Figure 4.1.7-3 is correct; or are multiple corridors proposed?

Figure 4.1.7-2 shows a “representative” flight trajectory. Figure 4.1.7-3 shows the flight corridor for the westernmost proposed launch azimuth of 225 degrees. Page 4-60 states that proposed launches at KLC would utilize launch azimuths between 125 and 225 degrees, so yes multiple corridors are being proposed.

**Impacts to Marine Species**

This document contains little information regarding protected marine species and their habitats. ...MDA will need to consult with NOAA Fisheries (and Fish and Wildlife Service for species listed under their jurisdiction). ...

An appendix with descriptions of the applicable species and their habitat can be added to the EIS. Please see the response under general comments.

In addition, other marine mammals may be affected by launch, debris recovery, or other activities. It seems marine mammals will be disturbed during target missile launches (pages 4-29 to 4-30) and debris recovery (page 4-176). Such disturbance would constitute a “take” by harassment. MDA should seek a Marine Mammal Protection Act authorization to exempt such a take of marine mammals, and in the case of listed marine mammals (e.g. Steller sea lion) a formal consultation as well.

Please see the response under general comments.
There is no discussion on the impacts of X-band radar to animals that remain at the water surface for extended periods. ...Further biological information is needed to support this position.

The SBX is designed to track an incoming target missile. Its narrow beam is always moving and looking up in order to track a moving object in space. In order for tissue damage to occur, the radar’s main beam would have to rest on an animal (or human) for several minutes. Since the main beam will not come in contact with the water’s surface or remain stationary, the main beam will not come in contact with any animal at the water’s surface for any significant period of time. The only potential hazard to personnel or animals from the radar beam would be from the grating lobes that result from steering the beam. The grating lobes would be suppressed using the radar’s software for the safety of personnel on the deck of the SBX platform. Power density levels from the grating lobes at the water’s surface would be below the IEEE threshold for human exposure and at a low enough level to pose little or no chance for harm to an animal remaining at the water’s surface for extended periods of time.

Results from modeling of power density levels from the SBX, in a scenario where it is tracking multiple targets, show that the power density levels are below IEEE safety levels for human exposure in an uncontrolled environment (IEEE C95.1, IEEE Standard for Safety levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3 kHz to 300 GHz, 16 April 1999). An uncontrolled environment includes locations where there is exposure of individuals who have no knowledge or control of their exposure. Based on these results, marine species would be exposed to power density levels that are below the standard for human exposure.

TPS-X Radar will be used at PMRF but there is no discussion of potential impacts to protected species in the PMRF area (page 4-148).

Page 4-148 discusses air quality impacts. The potential for impacts to biological resources from the TPS-X Radar, including protected species, is discussed on pages 4-153 through 4-155.

The U.S. Navy acknowledges “that acoustic emissions from various products and activities could be interacting with marine mammals’ hearing” (page 4-286). We would like further discussion on the potential or expected harassment.

Additional discussion on the potential for harassment will be added to the EIS.
Construction activities at Midway...need further discussion. NOAA Fisheries guidelines recommend remaining 150 feet from Hawaiian monk seals (not 100 ft as stated on page 4-113). However it may be necessary to increase this distance depending on construction activities (noise levels, etc.). More information regarding the construction activities is necessary in order to assess the potential doer impacts to protected species and their habitats.

*The distance will be changed to 150 feet. As described in 2.1.3.1.1 and 2.1.3.5, the construction would involve less than an acre for the IDT and less than ¼ acre for the COMSATCOM.*

Appendix B ...describes the various laws. It does not state MDA’s intentions on how they will proceed with ...consultation...and whether they will seek an MMPA authorization.

*The purpose of the Appendix is to describe the various laws. Please see the response under general comments.*
Ms. Anne Norton Miller  
Director, Office of Federal Activities  
United States Environmental Protection Agency  
Office of Enforcement and Compliance Assurance  
Washington, D.C. 20460

Dear Ms. Miller:

Thank you for your March 24, 2003 comments on the Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) Draft Environmental Impact Statement (DEIS).

Responses to specific comments are enclosed. I look forward to working with your office to complete the consultation process.

For any questions concerning the EIS, please contact Ms. Sharon Mitchell, U.S. Army Space and Missile Defense Command at (256) 955-4392, or Mr. Eric Sorrells, GMD, (256) 313-9375.

Sincerely,

STEVE DAVIS  
Colonel, U. S. Army  
Director, Site Activation Worldwide  
Ground-Based Midcourse Defense

Enclosure:  
As stated
(1) Perchlorate

- **Documentation of Analytical Methods** – The University of Alaska Anchorage Environment and Natural Resources Institute (ENRI) used EPA method 314.0 for Perchlorate in Water. ENRI completed the standard quality control (QC) steps including a standard calibration curve, a spike and duplicate spike, and also determined the instrumental and method detection limits according to the EPA defined protocol. The instrumental detection limit by conductivity detection is 2 ppb and the method limit is 6 ppb. None of the samples from Kodiak contained perchlorate. As an aside, ENRI can now also do this analysis by GCMS/MS which provides a slightly lower detection limit, however all future samples will be analyzed in accord with EPA method 314.0 to assure conformity with EPA standards. Again as an aside, ENRI has developed a new method for analysis of perchlorate in fish tissue, and will be submitting a paper to the Journal of Chromatography. ENRI has also been asked to present the method to the International Conference on Ion Chromatography in September 2003 in San Diego. If you have any questions remaining about ENRI’s analysis methods or capabilities, you are encouraged to contact Dr. John Kennish, who conducted the analyses, at (907) 786-1236.

- **Sampling plan** – Water samples were collected by ENRI from 1998 to 2001 to monitor potential water quality impacts of the first six missile launches from Kodiak Launch Complex (KLC). The water samples were collected from nine different study sites within a 6-mile radius of the KLC launch site. Samples were primarily collected in the summer and late fall; samples were not collected in spring (March) because study sites were frozen. In-situ pH, dissolved oxygen, temperature, and conductivity measurements were taken after all launches and compared with results from previous baseline studies, conducted by ENRI between 1995 and 1998, in order to detect any changes in stream chemistry following rocket flight operations.

Prior to and following the fifth and sixth launches from KLC, water samples from four of the nine study sites were collected and also analyzed for ammonium perchlorate, total aluminum, and alkalinity. This was done at the request of the Alaska Department of Environmental Conservation (ADEC). The water samples for perchlorate were analyzed by ion chromatography using EPA method 314.0 for Perchlorate in Water as previously discussed. Perchlorate was not detected in any of the water samples collected for analysis.

The ENRI monitoring studies determined that water quality within a 6-mile radius of KLC was not affected by the launch of six missiles over a three year period. As background, Alaska Aerospace Development Corporation (AADC) conducted environmental monitoring of the first five launches from KLC under terms of an Environmental Monitoring Plan (EMP) that was developed as a stipulation to the
Finding of No Significant Impact rendered for the Environmental Assessment done in support of KLC construction and operation. The EMP was developed by ENRI in cooperation with interested agencies, which included the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and ADEC. The EMP’s life span was set at five launches, provided that no adverse affects were noted (in keeping with predictions in the referenced EA’s Finding of No Significant Impact) and that at least one launch of the five was of the largest class of rocket that could be flown from KLC as it was then permitted. Both conditions were met and the EMP has lapsed. However, AADC is still obligated to conduct certain environmental monitoring tasks, including monitoring of water quality, with an emphasis on perchlorate and aluminum and basic stream chemistry under terms dictated by the ADEC. As such, monitoring of interest to EPA will continue to be conducted. Water chemistry parameters will include pH, dissolved oxygen, temperature, and conductivity (in-situ) as well as total recoverable aluminum and perchlorate. The data collected during such monitoring will be sent to ADEC and summarized in an annual Environmental Monitoring and Natural Resources Management Report. This analysis will help to determine impacts, if any, of individual launches and will allow for timely mitigation.

(2) Construction – Text has been added to the EIS to address sampling for areas that may have previously handled missile propellants. None of the construction sites at KLC, Vandenberg Air Force Base (AFB), or Reagan Test Site (RTS) have been identified as propellant handling or storage areas.

(3) Tsunami – Information regarding tsunamis is not yet available for Vandenberg AFB. Modeling is underway but the results are not expected until the end of 2003. Geologic hazards are not evaluated for RTS or the Pacific Missile Range Facility, and therefore tsunami information is not included for those locations. No impacts from tsunamis to ongoing activities at those locations have been identified in previous environmental documentation.

(4) Chapter 3 – The word ‘generally’ has been removed from the Installation Restoration Program (IRP) discussion in Chapter 3.
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<tr>
<td>Charlotte Craven</td>
<td>City of Camarillo Mayor</td>
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William Cunneen
Camarillo CA

Alex Herrera
City of San Buenaventura
Ventura CA

Wayne Davey
Rockwell Scientific Company
Thousand Oaks CA

Charles Hogle
Port Hueneme CA

Jack Dodd
Camarillo CA

Timothy Johnson
Marina CA

Frank Dukat
Port Hueneme CA

Julianna Krolak
Port Hueneme CA

Norman Eagle
Oxnard CA

Tony Kurtz
Oxnard CA

MacGregor Eddy
Vandenberg Action Coalition
Salino CA

Robert Lagomarsino
Former Member of US Congress
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El Cerrito CA

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The Aerospace Corp
Los Angeles CA

Suki Ewers
Los Angeles CA

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William Lettis & Associates
Walnut Creek CA

David Faubion
Ventura Peace Coalition
Ventura CA

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Board of Supervisors, County of Ventura
Supervisor Third District
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Campbell CA

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Ventura CA

Ed Lyon
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Indio CA

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Lompoc CA

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Oxnard CA

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Oxnard CA

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Hueneme CA

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Oxnard CA

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Councilmember from City of Port Hueneme  
Port Hueneme CA

Harvey Paskowitz  
Channel Islands CA

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Lompoc CA

Lee Quaintance  
The Beacon Foundation  
Oxnard CA

Donovan Watts  
Berkeley CA

Amanda Rang  
Stanford CA

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SMC/PA  
Los Angeles AFB  
El Segundo CA

Catherine Rawson  
Colorado Springs CA

Jane Yamashita  
Los Gatos CA
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Dr David Bird
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Avian Science and Conservation Centre
Ste Anne de Bellevue Quebec

Christina Donehower
McGill University
Dept Natural Resource Sciences
Ste-Anne-de-Bellevue QC

Robert Kelly
Calgary Canada

Josee Rousseau
McGill University
Dept Natural Resource Sciences
Ste-Anne-de-Bellevue Quebec

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Denver CO

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Matthew McGuire
Cheshire CT

Gain Andrea Morresi
Fairfield CT

FLORIDA
Christina Borra
Saint Augustine FL

Cindy Brockway
Miami FL

Virginia Gibson
Key Largo FL

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Nathan Boddie
LaGrange GA

D Bowman
Athens GA

Ricky Wright
St Simons Island GA

HAWAII
William Aila
Wai’anae HI

Malu Aina
Kurtistown HI

James Albertini
Kurtistown HI

Kawika Alfiche
Hilo HI

Rosemary Alles
Kamuela HI

Dr Lee Altenberg
University of Hawaii
Info and Comp Science
Kihei HI

Todd Apo
Ko Olina Community Association
Ko Olina HI

Hattie Berg
Kilauea HI

Gary Brady
Kapa’a HI

KatRama Brooks
Kapa’a HI

Niyati Brown
Pa’auilo HI

Richard Burge
Kilauea HI

Deborah Burnham
Kapa’a HI

Lisa Carter
Honolulu HI
Michele Chavez-Pardini
Kamuela HI

Jean Flint
Kaneohe HI

Dominic Clemente
American Friends Service Committee
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Larry Ford
Captain Cook HI

Sachiko Fujita
Aria HI

D J Colbert
Kilauea HI

Lauryn Galindo
Hanalei HI

Nola Conn
Anahola HI

Kekama Galioto
Honolulu HI

Jeffery Courson
Lawai HI

Miguel Godinez
Hanalei HI

Yvette Crosby
Kilauea HI

Kathy Harter
Honolulu HI

Robert Culbertson
Hanamaulu HI

Alison Hartle
Honolulu HI

Judy Dalton
Lihue HI

Cathleen Hayes
Kilauea HI

Carroll Dana
Kalaheo HI

Karin Hazelhoff
Kamuela HI

Deborah Davis
Kileuea HI

Sanford Higginbotham
Princeville HI

David Dinner
Kilauea HI

Reagan Hooton
Kapa’a HI

Dr Frederick Dodge
Wai’anae HI

David M K Tane Inciong II
Pearl City HI

Pete Doktor
Honolulu HI

Scott Jarvis
Hanalei HI

Kima Douglas
Princeville HI

Makaala Kaaumoana
Kilauea HI

Michael Douglas
Princeville HI

Nahe Kahokualohi
Hilo HI

Eleawani Felix
Kilauea HI

GMD ETR Final EIS
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Christine Page
Iahaina HI

Marti Paskal
Hanalei HI

Walter Pomroy
Anahola HI

Richard Powers
Kailua-kona HI

Jennifer Prince
Princeville HI

Kiope Raymond
Kula HI

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Aiea HI

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Kapa’a HI

Ronald Russell
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Kapa’a HI

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Kekaha HI

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Waianae HI

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Ivona Xiezopolski
Kaneohe HI

ILLINOIS

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DeKalb IL

Miguel Checa
DeKalb IL

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Chicago IL

Mary Krane Derr
Chicago IL

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Greensboro NC
Eli Harris
Carrboro NC

OHIO
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Dane Nance
Asheboro NC
Tammy Robinson
Asheboro NC

OREGON
L M Bubala
Oregon State Penitentiary
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Central Point OR
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Lebanon OR
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Klamath Falls OR

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Wernersville PA

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City of Everett
Mayor
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Wyomissing PA

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Millerton PA

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Everett Port Commission
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Yardley PA

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Carlos Altieri
San Juan Puerto Rico

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Austin TX

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Reston VA

Linda Beeman
Clinton WA

Mark Reif
Winchester VA

Bill Belshaw
Everett Council of Neighborhoods (Chair)
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Clinton WA

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Everett WA

Victoria Adlum
Everett WA

Constance Bennet
Snohomish WA

Robin and Steve Ahmann
Marysville WA

Peter Bennett
Langley WA

Stephanie Allen
Mukilteo WA

Elizabeth B Bentler
Everett WA
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Dr Sally Goodwin
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Seattle WA
Mark Griswold
Mill Creek WA
Mary Lee Griswold
Freeland WA
Margaret Grospitch
Everett WA
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Everett WA
Robert K Hagglund
Lynnwood WA
Constance Hallgarth
Everett WA
Elizabeth Hallgarth
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Dolores M Hancock
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Langley WA
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Snohomish WA
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M Ward Hinds
Health Officer
Snohomish Health District
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Mill Creek WA
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Seattle WA  

Kimberli McCabe  
Port Gardner Bay Recovery  
Everett WA  

Heather McCartney, FAICP  
Planning Director  
City of Mukilteo  
Mukilteo WA  

John McCoy  
38th Legislative District (state representative)  
Tulalip WA  

Marie McLain  
Mukileto WA  

Lisa Mechals  
Lynnwood WA  

Glen Miller  
Everett WA  

Karen Miller  
Everett WA  

Glen Milner  
Seattle WA  

Alice Minor  
Everett WA  

Leslie and Deane Minor  
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Poulsbo WA  

Annemarie Montera  
Everett WA  

Virgil Morgan  
Morgan Aero Products  
Everett WA  

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Dale Moses  
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Everett WA  

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Everett WA  

Steve Nagel  
Everett WA  

Kevin Nasr  
Everett WA  

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Redmond WA

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Langley WA  
Ann Peterson  
Everett WA

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Langley WA

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Molly Petersons  
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Vancouver WA

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Reis  
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Kirkland WA

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Rochelle Ritchie  
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Miji Ryan  
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Coupeville WA

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Clinton WA

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Everett WA

Reg Scodeller  
Everett WA

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Port Gardner Neighborhood Association  
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Everett WA

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Port Townsend WA

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Everett WA

Russell Silva  
Everett WA

Philip Simon  
San Rafael CA

Linda Sinter  
Everett WA

Marianna C Skalley  
Everett WA

Marion Skalley  
Everett WA

Thomas Skalley  
Everett WA

Desmond Skubi  
Everett WA

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Port District of South Whidbey Island  
Freeland WA

David Sherman  
Everett WA

Chris Skolrud  
Lake Stevens WA

Andrew Skotdal  
Everett WA

Diane and Jerry Solie  
Marysville WA

Michele Somogy  
Everett WA

Stephen Somogy  
Everett WA

Madeleine Sosin  
Seattle WA

Louise Stanton-Masten  
Everett Area Chamber of Commerce  
Everett WA
Betty L Startup
Everett WA

Valerie Steel
Everett WA

Karen Stolworthy
Everett WA

Gary Stormo
Everett Parks and Recreation Board of
Commission Chairman
Everett WA

Amy J Strandell
Everett WA

Bob and Sue Strickland
Everett WA

Jeffrey and Leslie Strickland
Everett WA

H W Stuchell
Everett WA

Betty Taylor
Camano Island WA

Ken Taylor
Everett WA

Dale and Laura Temple
Everett WA

Nicole J Thompson
Everett WA

Peggy Toepel
Everett Shorelines Coalition (Co-chair)
Everett WA

Garett Tomsin
Everett WA

Peach Tomsin
Arlington WA

Roshael Tomsin
Arlington WA

Jeff Tomson
Mukilteo WA

Morrie Trautman
Everett WA

Kelli Trosvig
Everett WA

Monica Trott
Everett WA

Janis Tullis
Everett WA

Mary Suzanne Ulloa
Seattle WA

Mark Underwood
Monroe WA

John Vandalen
Everett WA

Gary A Vandalfsfeni
Everett WA

Corry Venema-Weiss
Everett WA

Dave Waggoner
Paine Field

Airport Director
Everett WA

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Everett WA

Loren Waxler
Everett WA

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Everett WA
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Everett WA

Lynda Wessman  
Everett WA

John L Wetzstein  
Everett WA

Richard Windt  
Everett WA

Donna Witte  
Everett WA

Jonathan Witte  
Everett WA

Lloyd Wold  
Everett WA

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Everett WA

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WASHINGTON DC

Perry McCorkle  
Washington DC

WISCONSIN

Peggy Choy  
Madison WI

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Rhonda Arvidson  
Prince William Sound Regional Citizens Advisory Council  
Anchorage AK

Janet Axell  
Kodiak AK

Vicky Burnham  
Anchorage AK

Terri Burrell  
Anchorage AK

Dermot Cole  
Fairbanks Daily News-Miner  
Fairbanks AK

Eugene T Denton  
Adak AK

Duane Dvorate, Acting Director  
Community Development Department  
Kodiak Island Borough  
Kodiak AK

Stacey Fritz  
Fairbanks AK

Greg Garcia  
Chigiak AK

Carolyn Heitman  
Kodiak AK

Sarah Hurst  
Anchorage AK

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<table>
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<th>Name</th>
<th>Title</th>
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<tr>
<td>Judith Johnson</td>
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<td>Dave Raney</td>
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<td>Patricia Tummons</td>
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<td>Environmental Hawaii Hilo HI</td>
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Jackie Miller  
University of Hawaii Environmental Center  
Honolulu HI

Leandra Wai  
Waianae HI

MARYLAND
Brent Hart  
AOPA  
Fredrick MD

NEW JERSEY
Peter Allan  
Gladstone NJ

NEW ZEALAND
Martini Gotjé  
Waiheke Island  
New Zealand

OREGON
Allison Tolliver  
Okland OR

VIRGINIA
Thomas Duffy  
Arlington VA

WASHINGTON
Cindy  
Snohomish WA

Aarika Copper  
Stanwood WA  
Concern Citizens Against the SBX  
Everett WA

Mary J Craig  
Everett WA

John Flowers  
Everett WA

Lorna Frey  
Everett WA

Chris Galloray  
Stanwood WA

Peter W Havens  
CEP  
Engineering Field Activity Northwest  
Poulsbo WA

Rachelle Hein  
for US Senator Patty Murray  
Everett WA

Robert Jackson  
Everett WA

David S Mann  
Seattle WA

Robert Marmaduke, PE  
The Anthae Company  
Tumwater WA

John Mohr  
Executive Director, Port of Everett  
Everett WA

Lori O’Neal  
Clinton WA

Maria Elsa L Pringle  
Marysville WA

Melba Shephard  
Everett WA

Greg E Shilling  
Everett WA
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<td>Washington Pilots Assn.</td>
<td>Bellevue WA</td>
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<td>APO</td>
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<td>Alan Taylor</td>
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APPENDIX A
RELATED ENVIRONMENTAL DOCUMENTATION

SEE SEPARATE LINKED FILE
(http://www.smdcen.us/gmdebris/)
Link active on EIS publication date.)
Table A-1 summarizes some of the most pertinent related National Environmental Policy Act documentation that has been used in the preparation of the *Ground-Based Midcourse Defense Extended Test Range Environmental Impact Statement*. These Environmental Assessments and Environmental Impact Statements have previously been prepared to support the development of the specific technologies that may be used as part of the Ground-Based Midcourse Defense System. The information and analyses contained in these National Environmental Policy Act documents were used in the development of this Environmental Impact Statement. Several of the documents have been incorporated by reference and are cited in the Environmental Impact Statement where applicable. This appendix is available in digital format at the following website: http://www.smdc.us/gmdetreis/defaultflash. This link was in operation when the *Ground-Based Midcourse Defense Extended Test Range Environmental Impact Statement* was completed, and every effort will be made to maintain the website for the duration of the Proposed Action.
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<tr>
<th>Date/Document Title</th>
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<th>Missiles Analyzed</th>
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<th>Activities Analyzed</th>
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<tr>
<td>2. Final Environmental Impact Statement for the Strategic Target System (U.S. Army Strategic Defense Command, 1992) (Web Link)</td>
<td>Kauai Test Facility, Pacific Missile Range Facility</td>
<td>Strategic Target System</td>
<td>Not applicable</td>
<td>Construction of flight support facilities and the launch of Strategic Target System vehicles</td>
</tr>
<tr>
<td>3. Kauai Test Facility (KTF) Environmental Assessment (U.S. Department of Energy, 1992) (Web Link)</td>
<td>Kauai Test Facility, not Pacific Missile Range Facility</td>
<td>Strategic Target System and Exoatmospheric Discrimination Experiment</td>
<td>FPO-14 equivalent</td>
<td>Evaluate the impact of continuing test operations at Kauai Test Facility on the environment (continuing the existing Kauai Test Facility and program; constructing new roadways, fencing, fuel handling, and launch pad facilities; and vertical and rail launch vehicles)</td>
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<tr>
<td>Date/Document Title</td>
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<tr>
<td>4. Final Ground Based Radar (GBR) Family of Radars Environmental Assessment (U.S. Army Program Executive Office, 1993) (Web Link)</td>
<td>Raytheon, Massachusetts for manufacture; White Sands Missile Range, New Mexico; Fort Bliss, New Mexico; U.S. Army Kwajalein Atoll</td>
<td>Not applicable</td>
<td>Theater Missile Defense – Ground Based Radar and Ground Based Radar–Test</td>
<td>Fabrication and testing of the Ground Based Radar to demonstrate discrimination capabilities and validation of the technology</td>
</tr>
<tr>
<td>6. Environmental Assessment (EA) for Theater Missile Defense (TMD) Ground Based Radar (GBR) Testing Program at Fort Devens, Massachusetts (U.S. Army Program Executive Office Missile Defense, 1994) (Web Link)</td>
<td>Fort Devens, Massachusetts</td>
<td>Not applicable</td>
<td>Theater Missile Defense–Ground Based Radar</td>
<td>System testing as part of demonstration/validation of the Ground-Based Radar program, full power antenna radar tests</td>
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<tr>
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<td>10. Environmental Assessment of the Kodiak Launch Complex (Federal Aviation Administration, 1996) (Web Link)</td>
<td>Kodiak Island, Alaska</td>
<td>Lockheed Martin Launch Vehicles 1 and 2, Minuteman II (modified for commercial use), Taurus, and Conestoga</td>
<td>Not applicable</td>
<td>Examine the potential for environmental impacts resulting from the proposed Kodiak Launch Complex construction and operation; the proposed Kodiak Launch Complex would support commercial rocket launches to place small satellites into orbit</td>
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<tr>
<td>Date/Document Title</td>
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### Table A-1: Related Environmental Documentation (Continued)

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<tr>
<td>13. Final Theater Ballistic Missile Targets Programmatic Environmental Assessment (U.S. Department of the Air Force, 1997) (Web Link)</td>
<td>Vandenberg Air Force Base, California</td>
<td>Lance, HERMES Target System, PATRIOT as a Target, Black Brant IX, Two-stage (or DR-2) Terrier, Terrier/Orion, Castor I, and STRYPI II, Storm, ARIES, Hera, Theater High Altitude Area Defense, PATRIOT Advanced Capability-2 and PATRIOT Advanced Capability-3, Corps Surface-to-Air Missile, Navy Standard Missile 2, Block III or IVA; and Air Force theater ballistic missile</td>
<td>Ground-based optical sensors, radar, and telemetry stations may be supplemented by ship-based or airborne sensors</td>
<td>In cooperation with Vandenberg Air Force Base, the U.S. Army Space and Missile Defense Command proposes to launch up to 30 small, solid- and liquid-propellant theater ballistic missiles and sounding rockets from mobile launchers on several launch sites on Vandenberg Air Force Base; in addition, it is proposed that larger target missiles, such as the Storm, ARIES, and Hera, be launched from a 50k rail launcher located on Space Launch Complex -5</td>
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<tr>
<td>14. Supplemental Environmental Assessment for the Proposed Public Use Program at Midway Atoll National Wildlife Refuge (U.S. Department of the Interior, Fish and Wildlife Service, 1997) (Web Link)</td>
<td>Midway Atoll National Wildlife Refuge</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Proposes that shore-based fishing, the taking of lobsters, night-diving, night-fishing, glass-bottom boating, kayaking tours, and the development of a designated trail system through a closed area of Sand Island be included in the Public Use Plan for the Refuge</td>
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<td><strong>18. Booster Verification Tests Environmental Assessment (U.S. Department of the Air Force, 1999) (Web Link)</strong></td>
<td>Vandenberg Air Force Base</td>
<td>Booster Verification Flight Vehicle</td>
<td>Not applicable</td>
<td>Two booster verification test flights; the Environmental Assessment covers all pre-flight, in-flight, and post-flight operational activities; modification of the existing Minuteman II silo at LF-21, minor modifications to the communications and launch control buildings, and installation of a temporary above-ground fiber-optic communication line connecting LF-21 to the base communication system</td>
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<tr>
<td><strong>19. Wake Island Launch Center (WILC) Supplemental Environmental Assessment (U.S. Army Space and Missile Defense Command, 1999) (Web Link)</strong></td>
<td>Wake Island</td>
<td>Liquid propellant target missile</td>
<td>Not listed</td>
<td>Minimal new site preparation, liquid propellant transfer and fueling, liquid propellant missile launches</td>
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<tr>
<td><strong>20. Final Supplemental Environmental Impact Statement for the Evolved Expendable Launch Vehicle Program (U.S. Department of the Air Force, 2000) (Web Link)</strong></td>
<td>Cape Canaveral Air Force Station, Florida; Vandenberg Air Force Base, California</td>
<td>Atlas V, Delta IV</td>
<td>Not applicable</td>
<td>To allow the addition of up to five strap-on solid rocket motors to the Atlas V lift vehicle and to allow the use of larger solid rocket motors on the Delta IV lift vehicle; both vehicles are part of the Evolved Expendable Launch Vehicle program</td>
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### Table A-1: Related Environmental Documentation (Continued)

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<td>23. Final Environmental Assessment for the North Pacific Targets Program (U.S. Army Space and Missile Defense Command, 2001) (Web Link)</td>
<td>Kodiak, Alaska; Kauai Test Facility, Pacific Missile Range Facility; Open Ocean near U.S. Army Kwajalein Atoll</td>
<td>Strategic Target System</td>
<td>Not applicable</td>
<td>The Proposed Action is to increase launch capability of the Strategic Target System in order to provide ballistic missile targets to test North American sensors, and for possible use in testing various sensors and ground-based interceptors at U.S. Army Kwajalein Atoll/Kwajalein Missile Range and various sensors and ship-based interceptors at Pacific Missile Range Facility</td>
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<td><strong>26. Final Environmental Impact Statement/Overseas Environmental Impact Statement Point Mugu Sea Range</strong> (U.S. Department of the Navy, 2002) (Web Link)</td>
<td>Naval Air Warfare Center Weapons Division Point Mugu/Naval Air Warfare Center Weapons Division Point Mugu Sea Range</td>
<td>Vandal Smaller</td>
<td>Range Radars and Telemetry</td>
<td>In addition to conducting current test and training operations at the Naval Air Warfare Center Weapons Division Point Mugu Sea Range, Naval Air Warfare Center Weapons Division Point Mugu proposes to accommodate Theater Missile Defense testing and training, accommodate an increase in current levels of training exercises, and modernize facilities to enhance the existing testing and training capabilities at Naval Air Warfare Center Weapons Division Point Mugu</td>
</tr>
<tr>
<td>Date/Document Title</td>
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<tr>
<td>27. Development and Demonstration of the Long Range Air Launch Target System Environmental Assessment (U.S. Department of Defense, 2002) (Web Link)</td>
<td>Yuma Proving Ground, Central Pacific Broad Ocean Area</td>
<td>Long Range Air Launch Target</td>
<td>Not applicable</td>
<td>Two validation tests; the Long Range Air Launch Target demonstration would test a ballistic missile target comprising a launch vehicle delivery system and a simulated re-entry vehicle</td>
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APPENDIX B
RESOURCE DESCRIPTIONS INCLUDING LAWS AND REGULATIONS CONSIDERED
APPENDIX B
RESOURCE DESCRIPTIONS INCLUDING LAWS AND REGULATIONS CONSIDERED

AIR QUALITY

Air quality in a given location is described as the concentration of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or micrograms per cubic meter (μg/m³), or in a pollution standard index. Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of a pollutant concentration is determined by comparing it to federal and state ambient air quality standards (AAQS).

The Federal Clean Air Act (42 United States Code [USC] 7401) requires the adoption of national ambient air quality standards (NAAQS) to protect the public health, safety, and welfare from known or anticipated effects of air pollution. Air quality is defined by ambient air concentrations of specific pollutants. Seven air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide: carbon monoxide, ozone, nitrogen dioxide, particulate matter equal to or less than 10 microns in size (PM-10) (also called respirable particulate and suspended particulate), fine particulate matter equal to or less than 2.5 microns in size (PM-2.5), sulfur dioxide, and lead. The EPA has established NAAQS for these pollutants, which are collectively referred to as criteria pollutants, as shown in table B-1. Alaska, Hawaii, California, and Washington have established state AAQS. Emissions of air pollutants from operations in each state are limited to the more restrictive standard (federal or state). Table B-1 compares the NAAQS and the state AAQS. The NAAQS are applicable at sites within the United States; applicability at the other project sites is discussed in the individual sections that follow.

According to EPA guidelines, an area with air quality better than the NAAQS is designated as being in attainment; areas with worse air quality are classified as nonattainment areas. A nonattainment designation is given to a region if the primary NAAQS for any criteria pollutant is exceeded at any point in the region for more than 3 days during a 3-year period. Pollutants in an area may be designated as unclassified when there is insufficient data for the EPA to determine attainment status.

The Clean Air Act Amendments of 1990 (Public Law [PL] 101-549, 104 Statute 2399) required the EPA to promulgate rules to ensure that federal actions in areas classified as nonattainment or maintenance areas conform to the appropriate state implementation plan. These rules, known together as the General Conformity Rule (40 Code of Federal Regulations [CFR] 51.850-860 and 40 CFR 93.150-160), require any federal agency responsible for an action to determine if its action conforms to pertinent guidelines and regulations. Certain actions are exempt from conformity determinations if the projected emission rates would be less than specified emission rate thresholds, known as de minimis limits.
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<td>Carbon Monoxide</td>
<td>8-hour</td>
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<td>1-hour</td>
<td>40 mg/m³ (35 ppm)</td>
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<td>Nitrogen Dioxide</td>
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<td>100 μg/m³ (0.053 ppm)</td>
<td>70 mg/m³ (0.037 ppm)</td>
<td>None</td>
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<td>1-hour</td>
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<td>470 μg/m³ (0.25 ppm)</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Ozone</td>
<td>8-hour (2)</td>
<td>None</td>
<td>None</td>
<td>470 μg/m³ (0.25 ppm)</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>235 μg/m³ (0.12 ppm)</td>
<td>100</td>
<td>180 μg/m³ (0.09 ppm)</td>
<td>None</td>
<td>None</td>
<td>Same as Primary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Same as Primary</td>
</tr>
<tr>
<td>Lead</td>
<td>30-day average</td>
<td>None</td>
<td>None</td>
<td>1.5 μg/m³</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Quarterly (1)</td>
<td>1.5 μg/m³</td>
<td>1.5 μg/m³</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>1.5 μg/m³</td>
</tr>
<tr>
<td>PM-2.5</td>
<td>Annual (3)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>15 μg/m³</td>
</tr>
<tr>
<td></td>
<td>24-hour (4)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>65 μg/m³</td>
</tr>
<tr>
<td>PM-10</td>
<td>Annual (5)</td>
<td>50 μg/m³</td>
<td>50 μg/m³</td>
<td>None</td>
<td>50 μg/m³</td>
<td>50 μg/m³</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>24-hour (5)</td>
<td>150 μg/m³</td>
<td>150 μg/m³</td>
<td>50 μg/m³</td>
<td>150 μg/m³</td>
<td>150 μg/m³</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Annual (6)</td>
<td>None</td>
<td>None</td>
<td>30 μg/m³</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>Annual (1)</td>
<td>80 μg/m³ (0.03 ppm)</td>
<td>80 μg/m³ (0.03 ppm)</td>
<td>None</td>
<td>53.3 μg/m³ (0.02 ppm)</td>
<td>80 μg/m³ (0.03 ppm)</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>365 μg/m³ (0.14 ppm)</td>
<td>365 μg/m³ (0.14 ppm)</td>
<td>105 μg/m³ (0.04 ppm)</td>
<td>262 μg/m³ (0.10 ppm)</td>
<td>365 μg/m³ (0.14 ppm)</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>3-hour</td>
<td>1300 μg/m³ (0.5 ppm)</td>
<td>1300 μg/m³ (0.5 ppm)</td>
<td>None</td>
<td>655 μg/m³ (0.25 ppm)</td>
<td>1050 μg/m³ (0.4 ppm)</td>
<td>1300 μg/m³ (0.5 ppm)</td>
</tr>
<tr>
<td>Ammonia</td>
<td>8-hour</td>
<td>2.1 mg/m³ (3.0 ppm)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Reduced Sulfur</td>
<td>30-minute</td>
<td>50 μg/m³ (0.02 ppm)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>1-hour</td>
<td>None</td>
<td>35 μg/m³ (0.025 ppm)</td>
<td>42 μg/m³ (0.03 ppm)</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Total Suspended Particles</td>
<td>Annual (7)</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>60 μg/m³</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>150 μg/m³</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>----------------------------</td>
<td>----------------------------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Sulfates</td>
<td>24-hour</td>
<td>None</td>
<td>None</td>
<td>25 μg/m³</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Visibility</td>
<td>8-hour</td>
<td>None</td>
<td>None</td>
<td>Insufficient amount to</td>
<td></td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Particles</td>
<td>(10 am to 6 pm, PST)</td>
<td>None</td>
<td>None</td>
<td>produce an extinction</td>
<td></td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>coefficient of 0.23 per</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>kilometer - visibility of 16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>kilometers (10 miles) or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>more due to particles when</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>the humidity is less than 70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Alaska Department of Environmental Conservation, Division of Air and Water Quality, 2002; State of Hawaii, Department of Health, Clean Air Branch, 2001; Ventura County Air Pollution Control District, Air Quality Planning and Evaluation Division, 2000; Washington State Department of Ecology, Air Quality Program, 1999.

(1) Calculated as the arithmetic mean
(2) Calculated as the 3-year average of the fourth highest daily maximum 8-hour ozone concentration
(3) Calculated as the 3-year average of the arithmetic means
(4) Calculated as the 98th percentile of 24-hour PM-2.5 concentration in a year (averaged over 3 years) at the population-oriented monitoring site with the highest measured values in the area.
(5) Calculated as the 99th percentile of 24-hour PM-10 concentrations in a year (averaged over 3 years).
(6) Measured as sulfur dioxide
mg/m³ = milligrams per cubic meter
μg/m³ = micrograms per cubic meter
PM-2.5 = fine particulate matter equal to or less than 2.5 microns in size
PM-10 = particulate matter equal to or less than 10 microns in size (also called respirable particulate and suspended particulate)
ppm = parts per million
PST = Pacific Standard Time
The federal laws and regulations also define a group of pollutants called hazardous air pollutants, toxic air contaminants, or air toxics. These pollutants are regulated by the National Emissions Standards for Hazardous Air Pollutants section of the Clean Air Act. Exposure to these pollutants can cause or contribute to cancer, birth defects, genetic damage, and other adverse health effects. The source and effects are generally local rather than regional. Evaluation is based on case studies, not standards for ambient concentration. Examples of air toxics include benzene, asbestos, and carbon tetrachloride.

**AIRSPACE**

**Types of Airspace**

*Controlled and Uncontrolled Airspace*

As part of the national airspace system, controlled and uncontrolled airspace is divided into six classes, dependent upon location, use, and degree of control. Figure B-1 depicts the various classes of controlled airspace. Class A airspace, which is not specifically charted, includes airspace overlying the waters within 22.2 kilometers (12 nautical miles) of the coast. Unless otherwise authorized, all aircraft must be operated under Instrument Flight Rules (IFR).

Class B airspace is generally that airspace surrounding the nation’s busiest airports in terms of IFR operations or passenger enplanements. An air traffic control clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace.

Class C airspace is generally that airspace surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Class D airspace is generally that airspace surrounding those airports that have an operational control tower. Class E airspace is controlled airspace that is not Class A, Class B, Class C, or Class D airspace. Uncontrolled airspace, or Class G airspace, has no specific definition but generally refers to airspace not otherwise designated and operations below 365.8 meters (1,200 feet) above ground level. No air traffic control service to either IFR or Visual Flight Rules (VFR) aircraft is provided other than possible traffic advisories when the air traffic control workload permits and radio communications can be established (Illman, 1993).

*Special Use Airspace*

Complementing the classes of controlled and uncontrolled airspace described above are several types of special use airspace used by the military to meet its particular needs. Special use airspace consists of that airspace wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of these activities, or both. Except for controlled firing areas, special use airspace areas are depicted on aeronautical charts. Special use airspace, except controlled firing areas, are charted on IFR or visual charts and include hours of operation, altitudes, and the controlling agency. Only the kinds of special use airspace found in the region of influence are described. These include the following:

- **Restricted Areas** contain airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Activities within these areas must be confined, because of their nature, or limitations imposed upon aircraft operations that are not a part of these activities, or both.
The Six Classes of Non-Military Airspace

**EXPLANATION**
- AGL = Above Ground Level
- FL = Flight Level
- MSL = Above Mean Sea Level

Source: U.S. Department of Transportation, 2002a
Restricted Areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles. Restricted Areas are published in the Federal Register and constitute Federal Aviation Regulation Part 73 (Aviation Supplies and Academics, Inc., 1996)

- Warning Areas are airspace that may contain hazards to non-participating aircraft in international airspace. Warning Areas are established beyond the 5.6-kilometer (3-nautical-mile) limit. Although the activities conducted within Warning Areas may be as hazardous as those in Restricted Areas, Warning Areas cannot be legally designated as Restricted Areas because they are over international waters (Aviation Supplies and Academics, Inc., 1996). By Presidential Proclamation No. 5928, dated 27 December 1988 (issued in 1989), the U.S. territorial limit was extended from 5.6 to 22.2 kilometers (3 to 12 nautical miles). Special Federal Aviation Regulation 53 establishes certain regulatory warning areas within the new (5.6- to 22.2-kilometer [3- to 12-nautical-mile]) territorial airspace to allow continuation of military activities while further regulatory requirements are determined.

Other Airspace Areas
Other types of airspace include airport advisory areas, military training routes, temporary flight restrictions areas, flight limitations and prohibitions areas, parachute jump aircraft operations areas, published VFR routes, and terminal radar service areas (Aviation Supplies and Academics, Inc., 1996).

Special Airspace Use Procedures
Other types of airspace, and special airspace use procedures used by the military to meet its particular needs, include air traffic control assigned airspace and altitude reservation (ALTRV) procedures. Both of these are described below:

- Air Traffic Control Assigned Airspace, or airspace of defined vertical and lateral limits, is assigned by air traffic control to provide air traffic segregation between specified activities being conducted within the assigned airspace and other IFR air traffic. Air Traffic Control Assigned Airspaces are usually established in conjunction with Military Operations Areas, and serve as an extension of Military Operations Area airspace to the higher altitudes required. These airspace areas support high altitude operations such as intercepts, certain flight test operations, and air refueling operations.

- ALTRV Procedures are used as authorized by the Central Altitude Reservation Function, an air traffic service facility, or appropriate Air Route Traffic Control Center, under certain circumstances, for airspace utilization under prescribed conditions. ALTRVs are classified as either moving or stationary, with the latter normally defining the fixed airspace area to be occupied as well as the specific altitude(s) and time period(s) the area will be in use. ALTRVs may encompass certain rocket and missile activities and other special operations as may be authorized by FAA approval procedures.
BIOLOGICAL RESOURCES

Native or naturalized vegetation, wildlife, and the habitats in which they occur are collectively referred to as biological resources. Existing information on plant and animal species and habitat types in the vicinity of the proposed activities was reviewed with special emphasis on the presence of any species listed as rare, threatened, or endangered by federal or state agencies to assess their sensitivity to the effects of the Proposed Action and alternatives. Biological studies consisted of literature review, field reconnaissance, agency and installation consultation, and map documentation. For the purpose of discussion, biological resources have been divided into the areas of vegetation, wildlife, threatened and endangered species, and environmentally sensitive habitats.

The Endangered Species Act of 1973 (16 USC 1531 et seq.) declares that it is the policy of Congress that all federal departments and agencies shall seek to conserve endangered species and threatened species. Further, the act directs federal agencies to use their authorities in furtherance of the purposes of the act. Under the Endangered Species Act, the Secretary of the Interior creates lists of endangered and threatened species. The term endangered species means any species which is in danger of extinction throughout all or a significant portion of its range. The act defines a threatened species as any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

A key provision of the Endangered Species Act for federal activities is Section 7 consultation. Under Section 7 of the act, every federal agency must consult with the Secretary of the Interior, U.S. Fish and Wildlife Service (USFWS), to ensure that any agency action (authorization, funding, or execution) is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species.

Through the Fish and Wildlife Coordination Act of 1958 (16 USC 661 et seq.), Congress encourages all federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote conservation of nongame fish and wildlife and their habitats. Further, the act encourages each state to develop a conservation plan.

The Fish and Wildlife Coordination Act requires a federal department or agency that proposes or authorizes the modification, control, or impoundment of the waters of any stream or body of water (greater than 4.1 hectares [10 acres]), including wetlands, to first consult with the USFWS. Any such project must make adequate provision for the conservation, maintenance, and management of wildlife resources. The act requires a federal agency to give full consideration to the recommendations of the USFWS and to any recommendations of a state agency on the wildlife aspects of a project.

The Migratory Bird Treaty Act of 1918, as amended (16 USC 703-712) protects most species of migratory birds. Specifically, the act prohibits the pursuit, hunting, taking, capture, possession, or killing of such species or their nests and eggs.
The Clean Water Act (33 USC 1251 et seq.), Section 404, regulates the dredging and filling of jurisdictional wetlands. Permits from the U.S. Army Corps of Engineers are required for conducting dredging and filling operations.

The Marine Mammal Protection Act of 1972, as amended (16 USC 1361 et seq.), gives the USFWS and National Marine Fisheries Service co-authority and outlines prohibitions for the taking of marine mammals. The act also provides for penalties for the use of fishing methods in contravention of any regulations or limitations enacted by governmental agencies to achieve the purposes of the act. A take would result from an attempt to harass, hunt, capture, or kill marine mammal. Subject to certain exceptions, the act establishes a moratorium on the taking and importation of marine mammals. Exceptions to the taking prohibition allow USFWS and National Marine Fisheries Service to authorize the incidental taking of small numbers of marine mammals in certain instances. The Marine Mammal Commission, which was established under the act, reviews laws and international conventions, studies world-wide populations, and makes recommendations of federal officials concerning marine mammals.

The Bald and Golden Eagle Protection Act (16 USC 668 et seq.) establishes penalties for the unauthorized taking, possession, selling, purchase, or transportation of bald or golden eagles, their nests, or their eggs. Any federal activity that might disturb eagles requires consultation with the USFWS for appropriate mitigation.

The National Wildlife Refuge System Administration Act of 1966 (16 USC 668dd-668ee) consolidates the authorities for categories of areas previously established that are administered by the Secretary of the Interior for the conservation of fish and wildlife, including species that are threatened with extinction. All lands, waters, and interests therein administered as wildlife refuges, etc., are designated as the National Wildlife Refuge System.

The Magnuson–Stevens Fishery Conservation and Management Act (16 USC 1801 et seq.) requires that federal agencies consult with the National Marine Fisheries Service on activities that could harm Essential Fish Habitat areas. Essential Fish Habitat refers to “those waters and substrate (sediment, hard bottom) necessary to fish for spawning, breeding, feeding or growth to maturity."

The Plant Protection Act, which became law in June 2000, consolidates all or part of 10 existing U.S. Department of Agriculture plant health laws into one. The act gives the Secretary of Agriculture the ability to prohibit or restrict the importation, exportation, and interstate movement of plants, plant products, some biological control organisms, noxious weeds, and plant pests.

Executive Order 13112, Invasive Species, orders the prevention of invasive species introduction and provides means for their control in order to minimize economic, ecological, and the human health impacts they cause.

The conservation of species and habitats of special concern at U.S. Army Kwajalein Atoll (USAKA), including threatened and endangered species, are addressed in the USAKA Environmental Standards (UES). The objective of the UES is to ensure that actions taken at USAKA are not likely to jeopardize the continued existence of these species or to result in destroying or adversely changing the habitats on which they depend.
CULTURAL RESOURCES

Cultural resources include prehistoric and historic artifacts, archaeological sites (including underwater sites), historic buildings and structures, and traditional resources (such as Native American and Native Hawaiian religious sites). Paleontological resources are fossil remains of prehistoric plant and animal species and may include bones, shells, leaves, and pollen. Cultural resources of particular concern include properties listed or eligible for inclusion in the National Register of Historic Places (National Register). Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into consideration the effects of their actions on significant cultural properties. Implementing regulations (36 CFR 800) specify a process of consultation to assist in satisfying this requirement. To be considered significant, cultural resources must meet one or more of the criteria established by the National Park Service that would make that resource eligible for inclusion in the National Register. The term “eligible for inclusion in the National Register” includes all properties that meet the National Register listing criteria which are specified in Department of Interior regulations at 36 CFR 60.4. Therefore, sites not yet evaluated may be considered potentially eligible to the National Register and, as such, are afforded the same regulatory consideration as nominated properties. In some cases, cultural resources that have been determined not eligible for the National Register may still require some level of management activity, protection, or mitigation when threatened by an undertaking. Whether prehistoric, historic, or traditional, significant cultural resources are referred to as historic properties.

Numerous laws and regulations require that possible effects to cultural resources be considered during the planning and execution of federal undertakings. These laws and regulations stipulate a process of compliance, define the responsibilities of the federal agency proposing the action, and prescribe the relationship among other involved agencies (e.g., State Historic Preservation Officer, the Advisory Council on Historic Preservation). In addition to the National Environmental Protection Act, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act ([16 USC 470 et seq.] especially Sections 106 and 110); the Archaeological Resources Protection Act of 1979 (16 USC 470aa-470mm), which prohibits the excavation or removal of items of archaeological interest from federal lands without a permit; the Antiquities Act of 1906 (16 USC 431); and the Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.), which requires that federal agencies return “Native American cultural items” to the federally recognized native groups with which they are associated, and specifies procedures to be followed if such items are discovered on federal land.

GEOLOGY AND SOILS

Geology and soils are those earth resources that may be adversely affected by the proposed action. This resource is described in terms of landforms, geology, and soil conditions as they could contribute to erosion, depletion of mineral or energy resources, and soil contamination resulting from proposed construction and launch activities. The potential for geologic hazards is also described as relative to each site’s geologic setting. A geologic hazard is a naturally occurring or man-induced geologic condition that presents a risk or a potential danger to life and property. Such hazards could include phenomena such as landslides, flooding, ground subsidence, volcanic activity, faulting, earthquakes, and tsunamis.

Although there are no regulations pertaining specifically to geology and soils in the project areas, some water quality regulations are indirectly related with respect to erosion and resultant turbidity in surface waters (National Pollutant Discharge Elimination System [NPDES] permitting.
program), avoidance of development in floodplains (Executive Order 11988, Floodplain Management), and spill response plans to ensure that groundwater is not adversely impacted.

HAZARDOUS MATERIALS AND HAZARDOUS WASTE

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (PL 96-510, 42 USC 9601, et seq.) authorizes the EPA to enforce remediation of past contamination. The law authorized federal agencies to respond to the release or imminent release of hazardous substances into the environment through emergency response procedures coordinated with state governments.

The Emergency Planning and Community Right-to-Know Act of 1986 (PL 99-499, 42 USC 11001, et seq.) as part of the Superfund Amendments and Reauthorization Act of 1986 Title III (PL 99-499, 42 USC 9611, et seq.) establishes the emergency planning efforts at state and local levels and provides the public with potential chemical hazards information.


The Hazardous Materials Transportation Act of 1975 (PL 93-633, 49 USC 1801, et seq.) gives the U.S. Department of Transportation authority to regulate shipments of hazardous substances by air, highway, or rail. These regulations, found at 49 CFR 171–180, may govern any safety aspect of transporting hazardous materials, including packing, repacking, handling, labeling, marking, placarding, and routing (other than with respect to pipelines).

The Military Munitions Rule (62 FR 6621, 40 CFR 260, et seq.) identifies when conventional and chemical military munitions become a hazardous waste under the Resource Conservation and Recovery Act, and provides safe storage and transport of such waste. It amends existing regulations regarding emergency responses involving both military and non-military munitions and hazardous waste and explosives. The rule also exempts hazardous waste generators and transporters from needing Resource Conservation and Recovery Act manifests when traveling through or close to adjacent properties under the control of the same person.

The Nuclear Regulatory Commission (PL 93-438, 42 USC 5801, et seq.) regulates radioactive materials, including depleted uranium; enforcement of this statute is conducted under 10 CFR 19, 20, 21, 30, and 40, Nuclear Regulatory Commission Standards for Protection Against Radiation. These health and safety standards were established as protection against ionizing radiation resulting from activities conducted under the licenses issued by the Nuclear Regulatory Commission. The handling, storage, establishing radiation protection programs, record keeping, transport, and disposal of radioactive materials are subject to Nuclear Regulatory Commission standards.

The Ocean Dumping Act (PL 92-532, 33 USC 1401, et seq.) is Title I of the Marine Protection, Research, and Sanctuaries Act of 1972. The Ocean Dumping Act regulates what can be dumped into the ocean in order to protect the marine environment. It restricts allowed dumping to designated locations, and strictly prohibits dumping of materials such as radioactive and biological warfare substances. The U.S. Coast Guard conducts surveillance as a regulatory measure.
The Oil Pollution Act of 1990 (PL 101-380, 33 USC 2701, et seq.) requires oil storage facilities and vessels to submit to the federal government plans detailing how they will respond to large discharges. The Oil Pollution Act also established a trust fund for cleaning up oil spills when the responsible party is incapable or unwilling to do so. The Oil Pollution Act requires the development of Area Contingency Plans to prepare and plan for oil spill response on a regional scale.

The Pollution Prevention Act of 1990 (PL 101-508, 42 USC 13101, et seq.) requires the EPA to develop standards for measuring waste reduction, serve as an information clearinghouse, and provide matching grants to state agencies to promote pollution prevention. Facilities with more than 10 employees that manufacture, import, process, or otherwise use any chemical listed in and meeting threshold requirements of Emergency Planning and Community Right-to-Know Act must file a toxic chemical source reduction and recycling report.


The Toxic Substances Control Act of 1976 (PL 94-469, 15 USC 2601, et seq.) establishes that the EPA has the authority to require the testing of new and existing chemical substances entering the environment, and, subsequently, has the authority to regulate these substances. The Toxic Substances Control Act also regulates polychlorinated biphenyls.

HEALTH AND SAFETY

29 CFR 1910 and 1926—Regulatory requirements related to the Occupational Safety and Health Act of 1970 have been codified in 29 CFR 1910, General Industry Standards, and 29 CFR 1926, Construction Industry Standards. The regulations contained in these sections specify equipment, performance, and administrative requirements necessary for compliance with federal occupational safety and health standards, and apply to all occupational (workplace) situations in the United States. Requirements specified in these regulations are monitored and enforced by the Occupational Safety and Health Administration (OSHA), which is a part of the U.S. Department of Labor.

With respect to ongoing work activities at the Proposed Action locations, the primary driver is the requirements found in 29 CFR 1910, Occupational Safety and Health Standards. These regulations address such items as electrical and mechanical safety and work procedures, sanitation requirements, life safety requirements (fire and evacuation safety, emergency preparedness, etc.), design requirements for certain types of facility equipment (such as ladders and stairs lifting devices), mandated training programs (employee Hazard Communication training, use of powered industrial equipment, etc.), and recordkeeping and program documentation requirements. For any construction or construction-related activities, additional requirements specified in 29 CFR 1926, Safety and Health Regulations for Construction, also apply.

EM 385-1-1, U.S. Army Corps of Engineers Safety and Health Requirements Manual—All work activities undertaken or managed by the U.S. Army Corps of Engineers, which can include many types of federal construction projects, must comply with the requirements of EM 385-1-1.
In many respects the requirements in this manual reflect those in 29 CFR 1910 and 1926, but also include U.S. Army Corps of Engineers-specific reporting and documentation requirements.

Range Commanders Council (RCC) Standard 321-02, Common Risk Criteria for National Test Ranges. RCC 321-02 sets requirements for minimally-acceptable risk criteria to occupational and non-occupational personnel, test facilities, and non-military assets during range operations. Methodologies for determining risk are also set forth.

RCC 319-92, Flight Termination System Commonality Standards, specifies performance requirements for flight termination systems used on various flying weapons systems.

49 CFR—Requirements pertaining to the safe shipping and transport handling of hazardous materials (which can include hazardous chemical materials, radioactive materials, and explosives) are found in the U.S. Department of Transportation Hazardous Materials Regulations and Motor Carrier Safety Regulations codified in 49 CFR 107, 171-180 and 390-397). These regulations specify all requirements that must be observed for shipment of hazardous materials over highways (truck shipment) or by air. Requirements include specific packaging requirements, material compatibility issues, requirements for permissible vehicle/shipment types, vehicle marking requirements, driver training and certification requirements, and notification requirements (as applicable).

The Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 USC 1251, et seq.) has special enforcement provisions for oil and hazardous substances. For example, the Spill Prevention Control and Countermeasure Plan covers the release of hazardous substances, as identified by EPA, which could reasonably be expected to discharge into the waters of the United States.

Marine Terminals, 29 CFR 1917, applies to employment within a marine terminal (as defined in 29 CFR 1917.2) including the loading, unloading, movement or other handling of cargo, ship's stores, or gear within the terminal or into or out of any land carrier, holding or consolidation area, and any other activity within and associated with the overall operation and functions of the terminal, such as the use and routine maintenance of facilities and equipment. Cargo transfers accomplished with the use of shore-based material handling devices are also regulated.

Safety and Health Regulations for Longshoring, 29 CFR 1918, applies to longshoring operations and related employments aboard marine vessels.

LAND USE

Land use is described as the human use of land resources for various purposes, including economic production, natural resources protection, or institutional uses. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive uses. Potential issues typically stem from encroachment of one land use or activity on another or an incompatibility between adjacent land uses that leads to encroachment.

The Coastal Barrier Resources Act of 1983 (16 USC 3501) is designed to curtail federal subsidization of development on fragile coastal barriers. The act prohibits designated federal
expenditures and financial assistance, including flood insurance, for development within the coastal barrier system.

The Coastal Zone Management Act of 1972 (16 USC 1451 et seq.) is designed to preserve and develop the resources of the coastal zone. The act seeks to do so by providing funds to states that develop and implement programs for management of land and water uses consistent with the act's standards.

Executive Order 11988, Floodplain Management (amended by Executive Order 12148, Federal Emergency Management), was designed to improve federal policy on floodplain management. The order requires federal agencies to avoid direct or indirect support of floodplain development when there is a "practicable" alternative. The order applies to acquisition, disposal, or management of federal land; undertaking, financing, or assisting construction projects; and conducting activities affecting land use, including planning, regulating, and licensing.

Executive Order 11990, Protection of Wetlands, was designed to prevent federal agencies from causing or encouraging unnecessary destruction of wetland areas.

The Farmland Protection Act of 1981 (7 USC 4201 et seq.) is designed to require federal agencies to consider alternatives to projects that would convert farmlands to nonagricultural use. The reach of the act is limited to procedures to assure that the actions of federal agencies do not cause U.S. farmland to be irreversibly converted to nonagricultural uses in cases in which other national interests do not override the importance of the protection of farmland nor otherwise outweigh the benefits of maintaining farmland resources.

The Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.) repeated a number of public land statutes and instituted a number of new programs including review of all lands managed by the Bureau of Land Management for possible designation by Congress as "wilderness," including a stipulation that the federal agency must manage the public lands so as not to impair their wilderness potential.

The Wilderness Act of 1964 (16 USC 1131-1136) provided Congressional protection of several named wilderness areas and also established a National Wilderness Preservation System for inclusion of lands within national forests, national parks, and national wilderness refuges.

NOISE

Noise is most often defined as unwanted sound. Sound levels can be easily measured, but the variability in subjective and physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "loudness" or "noisiness." Physically, sound pressure magnitude is measured and quantified in terms of a level scale in units of decibels (dB).

The human hearing system is not equally sensitive to sound at all frequencies. Because of this variability, a frequency-dependent adjustment called A-weighting has been devised so that sound may be measured in a manner similar to the way the human hearing system responds. The abbreviation for A-weighted sound level, dBA, is often used for expressing the units of the sound level quantities. Typical A-weighted noise levels measured for various sources are
provided in table B-2. When sound levels are read and recorded at distinct intervals over a period of time, they indicate the statistical distribution of the overall sound level in a community during the measurement period. The most common parameter derived from such measurements is the energy equivalent sound level ($L_{eq}$). $L_{eq}$ is a single-number noise descriptor that represents the average sound level in a real environment where the actual noise level varies with time.

### B-2: Noise Levels of Common Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Noise Level (in A-weighted decibels)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air raid siren</td>
<td>120</td>
<td>At 15.2 meters (50 feet) (threshold of pain)</td>
</tr>
<tr>
<td>Rock concert</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>Airplane, 747</td>
<td>102.5</td>
<td>At 304.8 meters (1,000 feet)</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>96</td>
<td>At 3.0 meters (10 feet)</td>
</tr>
<tr>
<td>Power lawn mower</td>
<td>96</td>
<td>At 0.9 meters (3 feet)</td>
</tr>
<tr>
<td>Football game</td>
<td>88</td>
<td>Crowd size: 65,000</td>
</tr>
<tr>
<td>Freight train at full speed</td>
<td>88 to 85</td>
<td>At 9 meters (30 feet)</td>
</tr>
<tr>
<td>Portable hair dryer</td>
<td>86 to 77</td>
<td>At 0.3 meters (1 foot)</td>
</tr>
<tr>
<td>Vacuum cleaner</td>
<td>85 to 78</td>
<td>At 1.5 meters (5 feet)</td>
</tr>
<tr>
<td>Long range airplane</td>
<td>80 to 70</td>
<td>Inside</td>
</tr>
<tr>
<td>Conversation</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Typical suburban background</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Bird calls</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Quiet urban nighttime</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Quiet suburban nighttime</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Library</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Bedroom at night</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Audiometric (hearing testing booth)</td>
<td>10</td>
<td>Threshold of hearing without hearing loss</td>
</tr>
</tbody>
</table>

Source: Cowan, 1994

While the A-weighted scale is often used to quantify the sound level of an individual event and is related to subjective response, psychoacousticians (scientists specializing in the effects of noise on people) have determined that the degree of annoyance response and other effects depend on a number of factors. Some of the factors identified by researchers that affect our perception and cause us to categorize a sound as an annoyance or “noise” are magnitude of the event sound level in relation to the background (i.e., ambient) sound level, duration of the sound event, frequency of occurrence of events, and time of day at which events occur.

Several methods have been devised to relate noise exposure over time to community response. The EPA has developed the Day-Night Average Sound Level ($L_{dn}$) as the rating method to describe long-term annoyance from environmental noise. $L_{dn}$ is similar to a 24-hour $L_{eq}$ A-weighted, but with a 10 dB penalty for nighttime (10:00 p.m. to 7:00 a.m.) sound levels to account for the increased annoyance that is generally felt during normal sleep hours. The U.S. Air Force also uses $L_{dn}$ for evaluating community noise impact.
The Community Noise Equivalent Level (CNEL) has been adopted by the State of California for environmental noise monitoring purposes. CNEL is also similar to the A-weighted $L_{eq}$, but includes a penalty of 5 dB during evening hours (7:00 p.m. to 10:00 p.m.), while nighttime hours (10:00 p.m. to 7:00 a.m.) are penalized by 10 dB. For outdoor noise, the $L_{dn}$ noise descriptor is usually 0.5 to 1 dB less than CNEL in a given environment.

CNEL and $L_{dn}$ values can be useful in comparing noise environments and indicating the potential degree of adverse noise impact. However, averaging the noise event levels over a 24-hour period tends to obscure the periodically high noise levels of individual events and their possible adverse effects. These metrics have limitations in their usefulness, and the use of other noise metrics may be necessary to assess noise impact. In recognition of this limitation of the $L_{dn}$ and CNEL metrics, the EPA uses single-event noise impact analyses for sources with a high noise level and short duration.

The maximum sound level ($L_{max}$) is a noise descriptor that can be used for high-noise sources of short duration, such as space vehicle launches. The $L_{max}$ is the greatest sound level that occurs during a noise event. The term “peak” defines peak sound over an instantaneous time frame for a particular frequency.

**Regulatory Framework**

Federal and state governments have established noise regulations and guidelines for the purpose of protecting citizens from potential hearing damage and various other adverse physiological, psychological, and social effects associated with noise. The federal government preempts the state on control of noise emissions from aircraft, helicopters, railroads, and interstate highways.

The following are federal regulations and guidelines. The state regulations and guidelines are discussed under each facility according to its jurisdiction.

The Noise Control Act (PL 92-574, 42 USC 4901, et seq.) directs all federal agencies, to the fullest extent within their authority, to carry out programs within their control in a manner that promotes an environment free from noise that jeopardizes the health or welfare of any American. The act requires a federal department or agency engaged in any activity resulting in the emission of noise to comply with federal, state, interstate, and local requirements respecting control and abatement of environmental noise. OSHA has established noise limits for workers. For an 8-hour work day, people should not be exposed to a continuous noise level greater than 90 dBA. In addition, personnel should not be exposed to noise levels higher than 115 dBA for periods longer than 15 minutes. For the general public, the EPA recommends a 24-hour average noise level not to exceed 70 dBA. Typical noise exposure levels are shown in table B-3.

The Department of Defense Noise–Land Use Compatibility Guidelines state that sensitive land use, such as residential areas, are incompatible with annual $L_{dn}$ greater than 65 dBA. Table B-4 shows typical land use zones for noise and their accompanying day-night noise levels.

The California Division of Aeronautics has set noise standards governing airports that operate under a valid permit issued by the Division. These regulations control the noise in communities
in the vicinity of airports. For persons residing in the vicinity of an airport, state noise standards establish a CNEL of 65 dB as an acceptable level of noise to a reasonable person.

### Table B-3: Permissible Noise Exposures*

<table>
<thead>
<tr>
<th>Duration (hours per day)</th>
<th>Sound level (dBA) Slow Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>3</td>
<td>97</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>1 to 1.5</td>
<td>102</td>
</tr>
<tr>
<td>1</td>
<td>105</td>
</tr>
<tr>
<td>0.5</td>
<td>110</td>
</tr>
<tr>
<td>0.25 or less</td>
<td>115</td>
</tr>
</tbody>
</table>

*Source: 29 CFR 1910.95, table G-16

*Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level

### Table B-4: Definition of Land Use Zones for Noise

<table>
<thead>
<tr>
<th>Noise Zone</th>
<th>Compatibility with Noise Sensitive Land Uses</th>
<th>Percent of Population Highly Annoyed</th>
<th>C-Weighted Annual Average Day-Night Sound Level (L_{dn})</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Acceptable</td>
<td>Less than 15%</td>
<td>Less than 62 dB</td>
</tr>
<tr>
<td>II</td>
<td>Normally Unacceptable</td>
<td>15–39%</td>
<td>62–70 dB</td>
</tr>
<tr>
<td>III</td>
<td>Unacceptable</td>
<td>More than 39%</td>
<td>More than 70 dB</td>
</tr>
</tbody>
</table>

*Source: U.S. Army Regulation 200-1

### Noise Sources

The major operational noise source is missile launch noise. Three distinct noise events are associated with launch and ascent of a launch vehicle: on-pad missile noise, in-flight missile noise, and sonic boom.

On-pad missile noise occurs when engines are firing but the vehicle is still on the pad. Deflectors or an exhaust tunnel usually turns the missile exhaust horizontally. Noise is highly directional, with maximum levels in lobes that are at about 45 degrees from the main direction of the deflected exhaust. Noise levels at the vehicle and within the launch complex are high. Because the sound source is at or near ground level, propagation from the missile to off-site locations grazes along the ground and tends to experience significant attenuation over distance. On-pad noise levels are typically much lower than in-flight noise levels because sound propagates in close proximity to the ground and undergoes significant attenuation when the vehicle is on or near the pad.
In-flight missile noise occurs when the vehicle is in the air, clear of the launch pad, and the engine exhaust plume is in line with the vehicle. In the early part of the flight, when the vehicle’s motion is primarily vertical, noise contours are circular. The sound source is also well above the ground and therefore experiences less attenuation as it propagates to large distances. The shapes of the contours for launch vehicle ascent are approximately circular, particularly for the higher levels near the center. The outer contours tend to be somewhat distorted. They can be stretched out in the launch direction or broadened across the launch direction, depending on specific details of the launch. Because the contours are approximately circular, it is often adequate to summarize noise by giving the sound levels at a few distances from the launch site. On-pad noise contours are much smaller than in-flight contours. Because in-flight noise is greater than on-pad noise, analysis in this study has concentrated on in-flight noise.

The major source of missile noise is from mixing of the exhaust flow with the atmosphere, combustion noise in the combustion chamber, shock waves and turbulence in the exhaust flow, and occasional combustion noise from the post-burning of fuel-rich combustion products in the atmosphere. The emitted acoustic power from a missile engine and the frequency spectrum of the noise can be calculated from the number of engines, their size and thrust, and their flow characteristics. Normally, the largest portion of the total acoustic energy is contained in the low-frequency end of the spectrum (1 to 100 hertz). Noise measurements conducted during a Titan IIID launch indicated that the maximum sound pressure levels occurred at around 20 to 50 hertz (U.S. Air Force, 1991).

To evaluate the potential noise impact associated with launch and ascent, it is necessary to consider not only the overall sound level but also the frequency spectrum and the duration of exposure. High noise levels can cause annoyance and hearing damage. As previously discussed, OSHA has established noise limits to protect workers at their work places. According to these standards, no worker shall be exposed to noise levels higher than 115 dBA. The exposure level of 115 dBA is limited to 15 minutes or less during an 8-hour work shift (U.S. Department of the Air Force, 1998a). The OSHA standards are the maximum allowable noise levels for the personnel in the vicinity of the launch pad. Off site, concerns for noise are community annoyance, damage to fragile structures, and adverse effects on animals.

Another noise characteristic of launch vehicles is that they reach supersonic (faster than the speed of sound) speeds and will generate sonic booms. A sonic boom, the shock wave resulting from the displacement of air in supersonic flight, differs from other sounds in that it is impulsive and very brief (less than 1 second for aircraft; up to several seconds for launch vehicles). Sonic booms are generally described by their peak overpressure in pounds per square foot.

Sonic booms can vary from inconsequential to severe, depending on the physical aspects of the launch vehicle, the trajectory of the launch, and weather conditions at the time of launch. Physical features of the launch vehicle that influence the occurrence and intensity of sonic booms include the vehicle’s overall length and width, the length of each stage, and the shape of the nose cone. Trajectory criteria that affect sonic booms include the time from launch, the angle of the flight path from the horizontal, velocity of the launch vehicle, altitude of launch vehicle, range from the launch site, and the position at which stage separation occurs (U.S. Department of the Air Force, 1998b).

The initial shock wave propagates along a path that grazes the Earth’s surface due to the angle of the vehicle and refraction of the lower atmosphere. As the vehicle pitches over, the direction...
of propagation of the shock wave becomes more perpendicular to the earth’s surface. These
direct and grazing shock waves can intersect to create a focused sonic boom. The focused
sonic boom is typically narrow, about 1.6 kilometers (1 mile) of intense focus, followed by a

SOCIOECONOMICS

Socioeconomics is defined as the basic attributes and resources associated with the human
environment, in particular population and economic activity. Socioeconomic resources consist
of several primary elements including population, employment, and income. Other aspects
often described may include housing and employment characteristics, and an overview of the
local economy.

TRANSPORTATION

The purpose of the transportation section is to address the ground, aviation, and ocean
transport systems within an organized framework and their use within a region of influence
defined for each location.

Ground Transportation

Ground transportation refers to the movement of vehicles through a road and highway network.
Roadway operating or pavement conditions and the adequacy of the existing and future
roadway system to accommodate vehicular movements are typically described in terms of the
volume-to-capacity ratio. This ratio is a comparison of the average daily traffic volume to the
capacity of the roadway. The volume-to-capacity ratio corresponds to a Level of Service rating,
ranging from free-flowing traffic conditions (Level of Service A) for a volume-to-capacity of
usually less than 30 percent, to forced flow, congested conditions (Level of Service F) for a
volume-to-capacity of usually 100 percent or greater (i.e., roadways operating at or beyond
design capacity).

Aviation Transportation

Aviation transportation refers to the movement of aircraft through airspace. The control of
airspace used by air traffic varies from very highly controlled to uncontrolled areas. Examples of
highly controlled air traffic situations are flight in the vicinity of airports, where aircraft are in
critical phases of flight (take-off and landing), flight under IFR, and flight on the high or low
altitude route structure (airways). Less controlled situations include flight under VFR or flight
outside of U.S. controlled airspace (e.g., flight over international waters off the coast of
California, Hawaii, or Alaska).

Ocean Transportation

Ocean traffic is the transportation of commercial, private, or military vessels at sea, including
submarines. Ocean traffic flow in congested waters, especially near coastlines, is controlled by
the use of directional shipping lanes for large vessels (cargo, container ships, and tankers).
Traffic flow controls are also implemented to ensure that harbors and ports-of-entry remain as
uncongested as possible. There is less control on ocean traffic involving recreational boating,
sport fishing, commercial fishing, and activity by naval vessels. In most cases, the factors that
govern shipping or boating traffic include the following: adequate depth of water; weather
conditions (primarily affecting recreational vessels); the availability of fish of recreational or
commercial value; and water temperature (higher water temperatures will increase recreational boat traffic and diving activities).

UTILITIES
The purpose of the utilities section is to address the existing rate of consumption, generation, and distribution of utilities (i.e., energy, water, wastewater, and solid waste/construction debris). The analysis of these issues is conducted within a region of influence defined for each location.

Energy
Energy refers to the power that is produced by a central electrical power plant or, in some cases, by individual power generators. The power would be utilized for both construction and operational activities on different sites (i.e., Ronald Reagan Ballistic Missile Defense Test Site at Kwajalein Atoll, Pacific Missile Range Facility in Hawaii, and Vandenberg AFB in California). The current capabilities and capacities of each system are evaluated.

Water
Water refers to the system that produces water and the network that distributes that water. This water system is usually controlled, managed, and distributed by an entity (i.e., utility purveyor). In the absence of a water system, individualized water wells or a series of wells meet the demand for water. The water system is identified by potable, or drinkable, freshwater and nonpotable water used for other activities such as construction, operations, irrigation, and more. In some cases the non-potable system is saltwater. The water system is composed of a source that produces the water and the treatment systems that cleanse and purify it, making it available for use. The water available to public must meet certain standards (i.e., EPA standards). For instance, new facility upgrades that include adding potable water sources (e.g., wells, surface water intakes, or other drinkable water sources) must comply with the “new source” provisions recently amended to the Safe Drinking Water Act of 1974 (42 USC 300f et seq.).

More specifically, all new systems, or systems utilizing a new source of supply, that begin operation after 22 January 2004 are required to demonstrate compliance with the Maximum Contaminant Levels (MCLs) within a State-specified (or primacy agency-specified) time frame. These regulations require that States or primacy agencies establish initial sampling frequencies to ensure on-going compliance for inorganic (40 CFR 141.23(c)(9)), volatile organic (40 CFR 141.24(f)(22)), and synthetic organic (40 CFR 141.24(h)(20)) MCLs.

Potable water systems must also properly document any new drinking water sources for use by the appropriate Safe Drinking Water Act primacy agency (e.g., EPA Regional office or State Department of Environmental Quality office), as these new drinking water sources may require operating and/or withdrawal permits or other licensing requirements.

The current capabilities and capacities of these systems are analyzed.

Wastewater
There are different methods of treating wastewater that is produced by a development. Wastewater can be collected in a central system and then directed to a treatment plant where it can be treated and then discharged. In many instances, the wastewater is further treated and
reclaimed for use as nonpotable water. In the absence of a central system, septic systems collect and treat water either individually (individual households) or collectively (within a community). The current capabilities and capacities of these systems are analyzed.

**Solid Waste Disposal**

Solid waste disposal includes the collection, handling, and disposal of waste. Designated landfills within an area or region are the final destinations where solid waste is transported for processing. Solid waste is usually first processed to separate out recyclable products. Solid waste disposal also includes practices such as open burning, incineration, septage disposal, and burial in open or excavated trenches. Current systems of solid waste collection and disposal and their capabilities and capacities are evaluated.

**VISUAL AND AESTHETIC RESOURCES**

The significance of visual effects is very subjective and depends upon the degree of alteration, the scenic quality of the area disturbed, the sensitivity of the viewers, and the existing goals and policies of jurisdictions in which the project is located. The degree of alteration refers to the height and depth of maximum cut and fill areas and the introduction of urban elements into an existing natural environment or a substantial increase of structural elements into an already urban environment, while acknowledging any unique topographical formation or natural landmark. Sensitive viewers are those who utilize the outdoor environment or value a scenic viewpoint to enhance their daily activity and are typically residents or recreation users. Changes in the existing landscape where there are no identified scenic values or sensitive viewers are considered less than significant. It is also possible to acknowledge a visual change, as possibly adverse, but not significant, because either viewers are not sensitive or the surrounding scenic quality is not high.

In an effort to determine the existing visual quality of each of the SBX locations, the following method was derived from Agricultural Handbook Number 701, *Landscape Aesthetics: A Handbook for Scenery Management* (U.S. Department of Agriculture, Forest Service, 1995). The handbook outlines ways to measure individual aspects of visual resources and then rate the scenic value class of each of the locations. The following criteria were used to determine the scenic value class for the potential SBX locations: Scenic Attractiveness, Viewer Concern, and Distance Zones.

**Scenic Attractiveness**

Scenic attractiveness is the measure of scenic quality based on human perceptions of inherent beauty of the forms, colors, textures, and visual composition of an individual landscape. It assists in determining landscapes that are important for scenic beauty, based on commonly held perceptions of the beauty of landform, vegetation pattern, composition, surface water attributes, land use patterns, and cultural features.

Class A: Distinctive—Areas where land forms, vegetation patterns, water characteristics, and cultural features combine to provide outstanding or unique visual quality. These areas have strong, positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.
Class B:  **Typical**—Areas where the land forms, vegetation patterns, water characteristics, and cultural features combine to provide ordinary or common scenic quality. These areas have generally positive but typical attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

Class C:  **Indistinctive**—Areas where the landform, vegetation patterns, water characteristics, and cultural land use have low visual quality. These landscapes have weak or missing attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance. (U.S. Department of Agriculture, Forest Service, 1995)

**Distance Zones**

A principal indicator of scenic importance based on the distance an area can be seen by observers, and the degree of visible detail within that zone.

**Foreground:** 0 to 0.8 kilometers (0 to 0.5 miles)

The foreground distance zone is where the individual details of specific objects are important and easily distinguished. Details are most significant within the immediate foreground, (0 to 300 feet).

**Mid-ground:** 0.8 to 6.4 kilometers (0.5 to 4 miles)

The mid-ground zone where most object characteristics are distinguishable, but their details are weak and they tend to merge into larger patterns. When landscapes are viewed in this zone they are seen in broader context. Human alteration may contrast strongly with the larger patterns and make some mid-ground landscapes more sensitive than the foreground.

**Background:** 6.4 kilometers (4 miles) to the horizon

The background is the distant landscape where objects are not normally discernible unless they are especially large and standing alone. Details are generally not visible and colors are lighter. (U.S. Department of Agriculture, Forest Service, 1995)

**Viewer Concern**

Viewer concern can be defined as the level of scenic importance based on expressed human concern for the scenic quality of land areas viewed. Concern levels for this document were determined due to attitudes of the viewers at each of the locations. Generally the public was classified as having a “High” (Level 1) level of concern while military personnel and contractors were determined to have a “Low” (Level 3) level of concern.

**Level 1:** Areas seen from primary and secondary use areas where the number of viewers and concern for scenic quality is normally high.

**Level 2:** Areas also seen from primary and secondary use areas; however, the level of concern among the viewers is moderate or low.
Level 3: Areas seen from low-use primary areas or moderate- to low-use secondary areas and the level of concern among the viewers is low. (U.S. Department of Agriculture, Forest Service, 1995)

**Scenic Value Class**

The scenic value class of a landscape is determined by combining the levels of scenic attractiveness with the distance zones and concern levels of landscape visibility. They are a product of the inventory process is used for analysis and planning purposes. Table B-5 is used to determine the scenic value class for an individual landscape.

### Table B-5: Scenic Classes

<table>
<thead>
<tr>
<th>Scenic Attractiveness</th>
<th>Distance Zones and Concern Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FG1</td>
</tr>
<tr>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Agriculture, Forest Service, 1995

Scenic Attractiveness
- A – Distinctive, B – Typical, C – Indistinctive

Distance zone and Concern Level
- FG1 – Foreground with a high level of concern
- MG1 – Mid-ground with a high level of concern
- BG1 – Background with a high level of sensitivity
- FG2 – Foreground with a moderate level of sensitivity
- MG2 – Mid-ground with a moderate level of sensitivity
- BG2 – Background with a moderate level of sensitivity
- FG3 – Foreground with a low level of sensitivity
- MG3 – Mid-ground with a low level of sensitivity
- BG3 – Background with a low level of sensitivity

Scenic Class
- 1-2: High public value.
- 3-5: Moderate public value.
- 6-7: Low public value.

**Scenic Integrity**

The scenic integrity of an area can be used to determine the level of modification to an area. Scenic Integrity is a measure of the degree to which a landscape is visually perceived to be “complete.” Although scenic integrity may or may not be used to determine the scenic value of a viewshed, it should be noted that the scenic integrity greatly affects the current scenic value.

Very High: Landscapes where the valued landscape is intact with only insignificant if any deviation or disturbance.

High: Landscapes where the valued landscape appears intact. Deviations may occur but must repeat the form, line, color, texture, and pattern found in the landscape character so completely that they are not evident.

Moderate: Landscapes where the valued landscape appears slightly altered. Noticeable deviations must be visually subordinate to the landscape character being viewed.
Low: Landscapes where the valued landscape character appears moderately altered. Deviations begin to dominate the valued landscape character but still borrow valued attributes such as size, shape, and pattern of natural openings, vegetative changes, or architecture.

Very Low: Landscapes where the valued landscape character appears heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from attributes such as size, shape, and pattern of natural openings, vegetative changes, or architecture.

Unacceptably Low: Landscapes where the valued landscape appears extremely altered. Deviations are extremely dominant and borrow little from the landscape character. Landscapes at this level require rehabilitation. (U.S. Department of Agriculture, Forest Service, 1995)

WATER RESOURCES
Potentially affected water resources include freshwater surface and groundwater resources and marine waters in the region of influence described in the next section. Potential changes in the availability of water supplies as a result of project water use requirements also are addressed. As required by Executive Order 11988, Floodplain Management, potential effects to floodplains were considered; however, none of the proposed facilities in any of the action alternatives would be constructed in a floodplain and further analysis of such issues is not warranted. Potentially affected wetland resources are described under Biological Resources.

Water quality and the consumption and diversion of water are regulated by a number of federal and state agencies. The EPA has the primary authority for implementing and enforcing the Clean Water Act (33 USC 1251 et seq.) (after 1977, the Clean Water Act became the common name of the 1972 Federal Water Pollution Control Act). The EPA, along with state agencies to which the EPA has delegated some of its authority, issues permits under the Clean Water Act to maintain and restore the quality of our nation’s water resources. The Clean Water Act requires permits for activities that result in the discharge of pollutants to water resources or the placement of fill material in waters of the United States.

Stormwater Pollution Prevention Plans are typically prepared and permitted under the National Pollutant Discharge Elimination System to ensure construction activities do not lead to unacceptable levels of erosion and water pollution. The Safe Drinking Water Act of 1974 (42 USC 300f et seq.), and its 1986 and 1996 amendments, provides the EPA with the authority to regulate the quality of the nation’s drinking water supplies, including surface water and groundwater sources. The EPA has delegated some of its authority for enforcement to all of the states, with the exception of Wyoming and the District of Columbia. The appropriation of water, including diversions, consumption of potable water, and other uses are usually regulated by the same state agencies that regulate water quality.

The state agency with water quality and water rights permitting authority related to this project in Alaska is the Alaska Department of Environmental Conservation. This state agency issues water quality standards that must be at least as stringent as the national standards developed by the EPA. The water quality standards of Alaska are extensive, and cover a wide variety of water
contaminants or other physical characteristics of water, such as turbidity, temperature, dissolved oxygen, pH, total dissolved solids, and heavy metals.

The California State Water Resources Control Board and its local Central Coast Regional Water Quality Control Board also have the authority to help regulate water quality at Vandenberg AFB.

ENVIRONMENTAL JUSTICE

Examination of Minority and Low Income populations is warranted through the adoption of a 1994 directive designed specifically to examine impacts to such things as human health of minority populations, low-income populations, and Indian tribes and is commonly known as Environmental Justice. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 CFR 7629 [1994]) requires each federal agency to achieve environmental justice by addressing "disproportionately high and adverse human health and environmental effects on minority and low-income populations." The demographics of the affected area should be examined to determine whether minority populations, low-income populations, or Indian tribes are present in the area impacted by the Proposed Action. If so, a determination must be made whether the implementation/development of the proposed project may cause disproportionately high and adverse human health or environmental effects on the minority populations or low-income populations present.

The Council on Environmental Quality defined "minority" to consist of the following groups: Black/African American, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, and Hispanic populations (regardless of race). Additionally, for the purposes of this analysis, “minority” also includes all other non-white racial categories within the census such as "Some other race" and "Two or more races." The Interagency Federal Working Group on Environmental Justice guidance states that a "minority population" may be present in an area if the minority population percentage in the area of interest is "meaningfully greater" than the minority population in the general population.

Council on Environmental Quality defined "low-income populations" as those identified with the annual statistical poverty thresholds from the Bureau of the Census. The accepted rationale in determining what constitutes a low-income population is similar to minority populations, in that when the low-income population percentage within the area of interest is "meaningfully greater" than the low-income population in the general population, the community in question is considered to be low-income.

EXECUTIVE ORDER 12114

Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, represents the U.S. Government's exclusive and complete determination of the procedural and other actions to be taken by federal agencies to further the purpose of the National Environmental Policy Act, with respect to the environment outside the United States, its territories, and possessions. This Executive Order enables responsible officials of federal agencies to be informed of pertinent environmental considerations and to take such considerations into account, with other pertinent considerations of national policy in making decisions regarding proposed actions. Although based on independent authority, this Order furthers the purpose of the National Environmental Policy Act and the Marine Protection Research and Sanctuaries Act of 1972 (33 USC 1401 et seq.; 16 USC 1431 et seq.) and the Deepwater Port Act of 1974, as amended (33 USC 1501-1524), consistent with the foreign policy and national security policy of the United States.
APPENDIX C
MISSILE LAUNCH SAFETY AND EMERGENCY RESPONSE
APPENDIX C

MISSILE LAUNCH SAFETY AND EMERGENCY RESPONSE

This appendix discusses in general terms the potential health and safety hazards associated with missile launch operations. The information herein focuses on the nature and control of the potential hazards and public risks associated with pre-launch, launch, and emergency response.

The information in this appendix is derived from numerous sources, including Final Launch Site Safety Assessment (Federal Aviation Administration, 2002) for the 30th Space Wing/Vandenberg Air Force Base; Standard 321-02, Common Risk Criteria for National Test Ranges, Subtitle: Inert Debris (Range Commanders Council, Range Safety Group, 2002); The Hazard Analysis of Commercial Space Transportation (Federal Aviation Administration, 1997); Casualty Areas from Impacting Inert Debris for People in the Open, Final Report (Department of the Air Force, 30th and 45th Space Wing, 1995); AFR 127-1, Eastern and Western Range Safety Policies and Procedures (Department of the Air Force, 1997); and Theater Missile Defense Extended Test Range, Supplement to the Draft Environmental Impact Statement (U.S. Army Space and Strategic Defense Command, 1994).

While range safety is location, facility and mission-dependent, the Department of Defense has established standards and protocols to eliminate or acceptably minimize potential health and safety risks/hazards.

Safety regulations are directed at preventing the occurrence of potentially hazardous accidents and minimizing or mitigating the consequences of hazardous events. This is accomplished by employing system safety concepts and risk assessment methodology to identify and resolve prospective safety hazards.

Ground Safety

Procedures have been established to handle and store all materials (propellants, etc.) which may be a hazard, control and monitor electromagnetic emissions, and govern transportation of materials to and from a facility. Storage of propellants and explosives is controlled by quantity–distance criteria. Failure modes and effects analyses are prepared when necessary for all potentially hazardous activities and devices.

Accidents occurring before launch can result in on-pad explosions, potential destruction of the vehicle, damage to facilities within range of the blast wave, and dispersion of debris in the vicinity of the pad. The types of accidents depend upon the nature of the propellants. An accident in handling storable hypergolic propellants could produce a toxic cloud, likely to move as a plume and disperse beyond the boundaries of the facility. The risk to the public would then depend upon the concentration of population in the path of this toxic plume and on the ability to evacuate or protect the population at risk until the cloud is dispersed. It is obviously advantageous if the winds generally blow away from populated areas. There are also specific
safety requirements and risks associated with ground support equipment. The design and use of this equipment must incorporate safety considerations.

The Range Safety Control process is predicated on risk avoidance, minimization of accident impacts, and protection of population centers. Risk values related to missile launch activities are categorized in two ways: probability of vehicle failure, including all possible failure modes that could lead to debris impact events, and their probabilities and consequence estimation. The casualty estimation used is generally one of two types: the probability of casualty, defined as the probability of one or more persons sustaining an injury, or the expected number of casualties, defined as the number of persons expected to sustain an injury as a result of at least one object impact in a specific area.

Protection of life and property, on- and off-range, is the prime concern of Range/Mission Safety personnel.

Range safety is accomplished by establishing:

- Requirements and procedures for storage and handling of propellants, explosives, radioactive materials and toxics
- Performance and reliability requirements for flight termination systems on the vehicle
- A real-time tracking and control system at the range
- Mission abort, vehicle destruct, or flight termination criteria that are sufficient to provide the necessary protection to people both on and outside the boundaries of the launch facility

Health and safety risks/hazards associated with pre-launch and launch activities are generally broken down into:

- Ground safety—handling of propellants, ordnance, noise, hazardous operations, toxics, etc.
- Flight analysis—vehicle trajectory, mission, etc.
- Flight termination systems
- Ground operations and flight operations

Launch Planning
Minimization of the probability of terminating a “good” flight and simultaneous minimization of the potential of risk due to malfunctioning missile is accomplished through careful mission planning, preparation, and approval before launch. Planning is in two parts:

- Mission definition such that land overflights or other higher risk aspects of launch are avoided and/or minimized
- Development of data that support the real-time decision and implementation of active control and destruct activities
Hazard potential exists because of the large quantities of liquid and/or solid propellants and they could be unintentionally released in case of a launch accident. This potential hazard decreases with time into the flight because the quantities of on-board propellants decrease as they are consumed and the vehicle/missile moves away from both the launch site and nearby populated areas.

**Federal Aviation Administration Clearance Procedures**

Aeronautical information is distributed through the Airmen’s Information System and the Notice to Airmen (NOTAM) System.

The Airmen’s Information System consists of civil aeronautical charts and publications, such as airport/facility directories, published and distributed by the Federal Aviation Administration, National Aeronautical Charting Office. The aeronautical charts and the airport/facility directories contain more permanent data and are the main sources to notify airmen of changes in or to the National Airspace System.

The NOTAM System is a telecommunication system designed to distribute unanticipated or temporary changes in the National Airspace System, or until aeronautical charts and other publications can be amended. This information is distributed in the Notice to Airmen Publication. The Notice to Airmen Publication is divided into four parts: (1) NOTAMs expected to be in effect on the date of publication, (2) revisions to Minimum En Route Instrument Flight Rules Altitudes and Changeover Points, (3) international—flight prohibitions, potential hostile situations, foreign notices, and oceanic airspace notices, (4) special notices and graphics such as military training areas, large scale sporting events, air shows, and airport specific information – Special Traffic Management Programs. Notices in Sections 1 and 2 are submitted through the National Flight Data Center, ATA-110. Notices in sections 3 and 4 are submitted and processed through Air Traffic Publications, ATA-10. Air Traffic Publications, ATA-10 issues the Notice to Airmen Publication every 28 days.

The Coast Guard District is responsible for developing and issuing Local Notices to Mariners. Local Notices to Mariners are developed from information received from Coast Guard field units, the General Public, U.S. Army Corps of Engineers, U.S. Merchant Fleet, National Oceanic and Atmospheric Administration, National Ocean Service, and other sources, concerning the establishment of, changes to, and deficiencies in aids to navigation and any other information pertaining to the safety of the waterways within each Coast Guard District. This information includes: reports of channel conditions, obstructions, hazards to navigation, dangers, anchorages, restricted areas, regattas, information on bridges such as proposed construction or modification, the establishment or removal of drill rigs and vessels, and similar items.

The actual implementation of operational plans under launch conditions ultimately determines the actual risk exposure levels on and off site. Integral to the analysis are the constraints posed by the following:

- Launch area/range geometry and siting
- Nominal flight trajectories/profiles
- Launch/release points
- Impact limit lines, whether based on risk to population/facilities or balanced risk criteria
- Flight termination system and destruct criteria
- Wind/weather restrictions
- Instrumentation for ground tracking and sensing onboard the vehicle
- Essential support personnel requirements

The range safety group (or its equivalent) typically reviews and approves launch plans, imposes and implements destruct lines and other safeguards, such as NOTAMS, Air Space Danger Area Notifications, and radio-frequency monitoring.

The launch (normal and failure) scenarios are modeled, and possible system failure modes are superimposed against the proposed nominal flight plan. The hazard to third parties is dependent on the vehicle configuration, flight path, launch location, weather, and many other factors.

A blast danger area around the missile on the launch pad and a launch danger area (a circle centered on the pad with tangents extended along the launch trajectory) are prescribed for each missile depending on its type, configuration, amount of propellant and their toxicity, trinitrotoluene (TNT) equivalents, explosive fragment velocities anticipated in case of an accident, typical weather conditions, and plume models of the launch area.

Typical mission approval documentation submitted to the range: Flight Plan approval and Flight Termination reports.

Each launch is evaluated based on:

- Range user data submission requirements from the hazard analysis viewpoint
- Launch vehicle analyses to determine all significant failure modes and their corresponding probability of occurrence
- The vehicle trajectory, under significant failure mode conditions, which is analyzed to derive the impact of probability density functions for intact, structurally failed and destructed options
- The vehicle casualty area based on anticipated (modeled) conditions at the time of impact
- Computed casualty expectations given the specific launch and mission profile, population data near the range and along the ground track. Shelters may be provided or evacuation procedures adopted, in addition to restricting the airspace along the launch corridor and notifying the air and shipping communities (NOTAM) to avoid and/or minimize risks
- An Accident Risk Assessment Report prepared to identify hazards of concern, causes, controls, and verification procedures for implementing such controls
Risk Models and Safety Criteria Used at National Ranges

The Range Safety Group, Range Commanders Council has reviewed a number of the computer models used at national ranges.

The evaluation of launch associated hazards is based on range destruct criteria designed to minimize risk exposure to on- and off-range population and facilities. Computer models are used to simulate missions for optimization and approval or run in real time for range safety control officers to minimize flight performance.

Launch risk exposure to the public is primarily controlled in real time by the range safety personnel rather than the range users.

Range safety reports, safety analysis reports, and other such probabilistic hazard analyses must be prepared by range users for mission approval at most national ranges whenever a new launch vehicle configuration, an unusually hazardous payload, or a trajectory with land overflight is involved.

Range safety guidelines minimize post-launch risks to the public by imposing a number of restrictions: e.g., no land overflight corridors are selected if it is possible to have launches and flight paths over water. However, for land-locked launches, strict overflight criteria restrict both land and airspace corridors to on-range and extended range areas. There are no intentional off-range land impacts permitted for any normally jettisoned booster and sustainer castings, and sufficient safety margins are provided within the destruct corridor to avoid impacts on population centers by accidentally or intentionally generated debris.

Models run sequentially or in parallel are designed to compute risks based on estimating both the probabilities and consequences of launch failures as a function of time into the mission. Databases include data on mission profile, launch vehicle specifics, local weather conditions, and the surrounding population distribution. Given a mission profile, the risks would vary in time and space. Therefore, a launch trajectory optimization is performed by the range for each proposed launch, subject to risk minimization and mission objectives constraints. The debris impact probabilities and lethality are then estimated for each launch considering the geographic setting, normal jettisons, failure debris, and demographic data to define destruct lines to confine and/or minimize potential public risk of casualty or property damage.

A circular or an elliptical footprint dispersion model is used to analyze vacuum and wind-modified instantaneous impact points from both normal stages jettisoned during launch and launch debris (failure or destruct). The debris dispersal estimates generally assume bivariate Gaussian dispersion distributions. Risk contours are estimated as impact probabilities or casualties expected per unit area centered on the instantaneous impact points (nominal impact points) or on a specific site (land, community or range) of interest. All these models are similar in approach, but quite site-specific in the use of databases, which depend on range location and on the geographic area and associated population distribution at risk. The models may be run either as simulation to assist in analyzing and selecting launch options, or can be run in real time, to monitor launch operations.
The Launch Risk Analysis program calculates relative risks to population centers on the flight corridor ground-track. Real-time debris footprint display is based on computed and wind-corrected trajectory and Launch Risk Analysis impact patterns moving with the tracked vehicle and their position relative to the fixed, prescribed destruct and impact limit lines. If the failed vehicle encroaches upon these lines, a destruct decision must be made or withheld according to clearly formulated destruct criteria.

**Launch Hazards**

Generally, the on-board destruct system is not activated early in flight (during the first 10 seconds or so) until the failed vehicle clears the range. This protects range personnel and facilities from a command explosion. Failures during the very early portion of launch and ascent can be divided into two categories: propulsion and guidance/control. Lighting, wind, and other meteorological hazards (e.g., temperature inversions) must be considered before launch countdown. Propulsion failures produce a loss of thrust and the inability of the vehicle to ascend. Depending on its altitude and speed when thrust ceases, the vehicle can fall back intact or break up under aerodynamic stresses. If the vehicle falls back, the consequences are similar to those of an explosion on the ground.

The exception is when intact solid rocket motors impact the ground at a velocity exceeding approximately 91 meters (300 feet) per second. In that case, the explosive yield may be significantly increased. If there are liquid fuels (hydrogen-oxygen), there is also potential for a large explosion, much higher overpressures, and more damage to structures at the launch facility. It could also create higher overpressures off the facility that could break windows and possibly do minor structural damage to residential and commercial buildings.

Solid rocket motor failures can be due to a burn-through of the motor casing or damage or burn-through of the motor nozzle. In a motor burn-through there is a loss of chamber pressure and an opening is created in the side of the case, frequently resulting in structural breakup. The nozzle burn-through may affect both the magnitude and the direction of thrust. There is no way to halt the burning of a solid rocket once initiated. Hence, a solid rocket motor failure almost inevitably puts the entire launch vehicle and mission at risk.

The purpose of the Range Safety Control system is to destroy, halt, or neutralize the thrust of an errant vehicle before its debris can be dispersed off-range and become capable of causing damage or loss of life. Without a flight termination system, the debris could land on a population center and, depending upon the type of debris (inert or burning propellant), cause considerable damage. The destruct system generally is activated either on command or spontaneously at or soon after the time of failure. In-flight destruction limits vehicle debris dispersion and enables dispersion of propellants, thus reducing the possibility of secondary explosions upon ground impact. The destruct systems on vehicles having cryogenics are designed to minimize the mixing of the propellants, i.e., holes are opened on the opposite ends of the fuel tanks. Solid rocket destruct systems usually consist of linear shaped charges running along the length of the rocket, which open up the side of the casing like a clam shell, causing an abrupt loss of pressure and thrust. They may, however, produce many pieces of debris in the form of burning chunks of propellant and fragments of the motor casing and engines.

In addition to complete loss of control, three other early flight guidance and control failures have been observed with launch vehicles over the life span of the space program: failure to pitch
over, pitching over but flying in the wrong direction (i.e., failure to roll before the pitchover maneuver), and having the wrong trajectory programmed into the guidance computer. The likelihood of these circumstances depends upon the type of guidance and control used during the early portion of flight. The types are open or closed loop (i.e., no feedback corrections) and programmer or guidance controlled. In the case of vehicles that use programming and open-loop guidance during the first portion of flight, failure to roll and pitch is possible, although relatively unlikely, based on historical flight data. If the vehicle fails to pitch over, it rises vertically until it is destroyed. As it gains altitude, the destruct debris can spread over an increasingly larger area. Consequently, most ranges watch for the pitchover, and if it does not occur before a specified time, they destroy the vehicle before its debris pattern can pose significant risk to structures and people outside the launch facility or the region anticipated to be a hazard zone, where restrictions on airspace and ship traffic apply. Failure to halt the vehicle within this time can produce a significant risk to those not associated with launch operations.

Of greatest concern to Range Safety Control during the steep ascent phase is the capability of the vehicle to wander off course immediately following a malfunction. The Range Safety Control system must be able to respond before debris becomes a hazard. Consequently, the design of the destruct lines must take into consideration: (1) the delay between decision and destruct; (2) the highest rate that the vehicle can move its instantaneous impact point toward a protected area; (3) the effect of the winds; and (4) the contribution of any explosion to the scatter of debris.

The potential for damage to ground sites from a launch vehicle generally decreases with time into flight since fuel is consumed as the vehicle gains altitude. If it breaks up or is destroyed at a higher altitude, the liquid fuels are more likely to be dispersed and lead to lower concentrations on the ground. In addition, if there are solid propellants, they would have been partially consumed during the flight period before the failure and would continue to burn in free fall after the breakup.

Very early in flight, when the vehicle is still close to the ground, there is less opportunity for debris to be scattered. The debris fall within a footprint is affected by the range of ballistic coefficients of the pieces, the wind speed and direction, velocity contributions due to explosion and random lift.

Debris that is very dense and has a high ballistic coefficient (b) is not as affected by drag and will tend to land closer to the vacuum instantaneous impact point. High ballistic coefficients can be associated with pumps, other compact metal equipment, etc. Panels or pieces of motor and rocket skin offer a high drag relative to their mass (a low ballistic coefficient) and consequently slow down much more rapidly in the atmosphere. After slowing down they tend to fall and drift with the wind. A piece of debris with a very low ballistic coefficient (b=1) is shown to stop its forward flight almost immediately and drift to impact in the direction of the wind. Pieces having intermediate value ballistic coefficients show a combination of effects and fall along a centerline. From a lethality standpoint, the pieces having a higher ballistic coefficient impact at a higher velocity and can cause more damage (depending upon their size).

The boundaries of the debris dispersion footprint are not precise but rather represent a contour which contains, for example, 95 percent of the debris. Thus, when considering the hazard to structures or people on the ground, one must consider the hazard area for debris impacts in the terms of a dynamic pattern.
For all launches, the boosters, sustainers, and other expendable equipment are always jettisoned and fall back to the Earth. Therefore, in planning a mission, care must be taken to keep these objects from impacting on land, offshore oil platforms, aircraft, and shipping lanes. The impact locations are normally quite predictable, so risks can be avoided or minimized.

Failure modes and associated probability of failure are required if other than a normal launch is addressed. Estimates for failure mode probabilities are typically based upon knowledge of a vehicle’s critical systems and expert assessment of their reliability combined with historical data, when available. Launch vehicle data used may include propellants, explosive/fuel chemical properties, fragmentation characteristics, mass, shape, ballistic coefficients, flight dynamics, flight termination system, guidance and control, stage burn times and separation characteristics, and lethality of debris, as represented by lethal area.

The regions or areas exposed to launch operations or accident hazards must be identified. These may be subdivided into smaller sections, critical locations of people or buildings that are specified for subsequent risk calculations. All risk analyses require estimates of the probabilities of debris/fragments from failed vehicle impacting within hazardous distances of personnel or structures in the region. The probability of an impact for a public area requires consideration of all failure chains which could endanger it and always implies a flight termination system failure.

It is important to determine what occurs after vehicle failure fragmentation leading to ground impact. The number of fragments, their sizes and shapes would ultimately define the hazard and casualty area for a given vehicle or fragment impact. Debris pieces are characterized by their size, mass, area, and ballistic coefficient to determine if they survive re-entry and their terminal velocity at ground impact.

**Flight Corridors**

Vehicle performance is determined at all ranges by visual observation (early in the flight) and by real-time telemetry measurements of vehicle status as a backup to the computed (wind-corrected) behavior of the instantaneous impact point. The actual location of the missile is less important than the where it and/or its debris will land in case of normal launch operation, accidental failure, abort or destruct. Therefore, when tracking a missile, velocity data must be obtained either directly or by differentiating successive measures of position. Radar trackers measure vehicle position in terms of azimuths, elevation and range relative to the tracker, expressed in a launch-pad centered reference coordinate system.

Early in the flight, visual observation and telemetry may be the only means of determining whether there is a malfunction or whether the vehicle maintains correct altitude. Vehicle position and velocity data and the predicted instantaneous impact point(s) are displayed in real time in the Launch Control Center.

Early in the flight the (predicted) instantaneous impact point advances slowly. As the vehicle altitude, velocity, and acceleration increase, the instantaneous impact point change rate also increases from zero to several miles per second. It is the advancing instantaneous impact point that the Range Safety Officer usually observes during a launch. Prior to launch a map with lines indicates the limits of excursion, which, when exceeded, would dictate a command signal to terminate flight.
Destruct Lines
Destruct lines are deliberately offset from land or populated areas to accommodate:

- Vehicle performance characteristics and wind effects
- The correction for using a vacuum instead of a drag-corrected impact point
- The scatter of vehicle debris
- The inaccuracies and safety-related tolerances of the vehicle tracking and monitoring system
- The time delays between the instantaneous impact point impingement on a destruct line and the time at which flight termination actually takes place (i.e., human decision time lag)

By proper selection of destruct lines, debris can be prevented from impacting on or near inhabited areas.

Debris Impact Areas
Debris consists of missile fragments that may land upon structures or populated areas. Fragments may include burning propellants which could explode or burn, thus posing additional hazards (explosion or fire).

Vehicle altitude increases rapidly with time into flight, roughly reaching 37 kilometers (20 nautical miles) in the first 2 minutes of flight. Furthermore, the location of the launch site and the direction of the launch are usually selected so the vehicle moves away from population centers. Thus, the “separation” distance between the vehicle and the potentially vulnerable communities/populations, in case of vehicle accident, increases with time. As time elapses from liftoff, the quantity of propellants remaining on board decreases very rapidly. Note that the total remaining propellant weight decreases by about 50 percent within 2 minutes from liftoff. Also the explosive potential (or TNT yield) of a given quantity of propellant may change as time elapses from liftoff.

Generally, the hazard from propellant explosion decreases rapidly with time into flight, except for the first 10 to 25 seconds. Activation of the flight termination system is likely to further reduce such explosion hazards by dispersing the propellant. Typically, the flight termination system is not activated during the first 8-12 seconds (depending on the missile, mission and site/facility) in order to avoid damage to the pad facilities.

When a vehicle is in flight at significant altitude, the debris will land over a much larger area. Distribution of debris impacts is dependent upon the forces acting on the fragments. Initially, the velocity vector of the vehicle is of primary importance, and this contribution is affected by the velocity vectors resulting from the turns, tumbling and/or explosions. Thereafter, the effects of the atmosphere on the fragments during free fall (which depend on wind and fragment size, shape, and mass) become important.
Furthermore, impacting launch vehicle fragments can be divided into four categories:

- Inert pieces of vehicle structure
- Pieces of solid propellant (some of which may burn up during free fall)
- Vehicle structures which contain propellant (solid or liquid) that may continue to burn after landing (but are non-explosive). They may pose the risk of starting secondary fires at the impact points.
- Fragments which contain propellant and which can explode upon impact (if their velocity is greater than roughly 91 meters [300 feet] per second)

The casualty area of an impacting fragment is the area about the fragment impact point within which a person would become a casualty. Casualties may result from a direct hit, from a bouncing fragment, from a collapsing structure resulting from an impact on a building or other shelter, from the overpressure pulse created by an explosive fragment, from a fire or toxic cloud produced by the fragment or some combination thereof. The hazard area is increased if a fragment has any significant horizontal velocity component at impact which could result in bouncing or other horizontal motion near ground level.

Casualty area is also affected by the sheltering of people by structures. Structures may be divided into classes (for occupational purposes) depending on the degree of protection they afford.

**Emergency Response**

Each launch facility has an Emergency Response Plan that defines the initial response requirements and procedures to be implemented in the event that flight system malfunction and/or flight termination occurs during flight activities associated with Ground-Based Midcourse Defense Extended Test Range activities. The following paragraphs present a general description of the emergency response process.

It is the policy of each launch facility to immediately respond in the event of an emergency during any missile flight operation. Initial response to any areas impacted by flight hardware shall be to secure and render safe the area for follow-on recovery and restoration activities. All areas affected by ground impact of flight hardware shall be cleared of all recoverable debris and environmentally restored. The recovery of launch hardware shall be accomplished in a manner consistent with each launch location’s requirements as set forth in applicable environmental documentation and conditions specified by the appropriate land owner.

In the event of a flight termination or malfunction, Flight Safety would immediately determine the projected impact area(s) for all debris and flight hardware. The Emergency Response Coordinator would be notified, and the Emergency Response Plan would be initiated.

An initial assessment team would be immediately dispatched to the predicted impact area(s) to assess the situation.
Key elements of information to be obtained by the initial assessment team include:

- Exact impact location(s)
- Extent and condition of impact location(s)
- Personnel injuries
- Indications of fires and/or hazardous materials releases
- Extent of property damage

Results would be reported back to the Emergency Response Coordinator as expeditiously as possible. Based on this assessment, the Emergency Response Coordinator would call up and dispatch to the impact site(s) the appropriate elements of a contingency team.

The Contingency Team would be designated by the Emergency Response Coordinator and would consist of those elements determined to be required, based on the initial assessment. Elements that may be included on the Contingency Team may include, depending on the situation, communications, logistics, public affairs, staff judge advocate, security, health and safety, Explosive Ordnance Disposal, recovery, fire safety, and civilian agency personnel.

The initial priorities for the Contingency Team are the following:

- Emergency rescue and/or emergency medical treatment
- Establish site security
- Contain, control, and extinguish fires
- Confine hazardous materials

All elements of the Contingency Team would be under the control of an On Scene Incident Coordinator, designated by the Emergency Response Coordinator. The On Scene Incident Coordinator would retain on-scene control of all initial response elements until initial response operations are complete and recovery and site restoration activities commence.

The highest priorities during any emergency response operation are the rescue of injured or trapped personnel and the control of any fires produced by a launch or impact event. Rescue of injured and trapped personnel is of the highest priority. Responsibility for emergency rescue is shared among all initial response personnel but most especially by the first-on-scene security personnel and the fire response units (military or civilian). Rescues should be attempted using appropriate safety equipment and protective clothing (i.e., respirators, protective clothing, etc., as necessary). Since rescue may require entry into the impact area, care should be taken to avoid hazards associated with hazardous debris or fires. Under no circumstances shall rescue personnel unnecessarily endanger themselves during rescue activities. Rescue personnel should never require rescue by other response personnel.

Emergency response operations are complete once all impact sites have been secured, rescue operations are completed, any fires have been extinguished, and initial site reconnaissance has been performed. Recovery and site restoration activities can then be initiated. Using the results
of the initial site reconnaissance, plans would be developed for the recovery of all debris and the restoration of the site(s) to natural conditions.

Additional post-launch recovery and restoration areas may be determined by the launch operator before and throughout mission-specific operations. The recovery of launch hardware would be accomplished in a manner consistent with the launch site procedures, and requirements set forth in applicable environmental documentation and conditions specified in agreements with appropriate land owners.

The launch site operator is responsible for planning, performance, and control of launch activities. This includes:

- Using results of analysis provided by Flight Safety to determine flight hardware impact zones which fully encompass the areas designated in the analysis
- Ensuring that appropriate agreements with all affected landowners are in place and adequately address recovery requirements
- Coordinating with local civilian authorities concerning recovery requirements
- Providing recovery plans to applicable agencies/personnel in accordance with current launch site policies
- Establishing appropriate travel routes (ground/air) prior to launch activities to outline access into recovery areas
- Perform visual inspections and obtain radar data to insure expeditious recovery of the missile
- Ensure complete recovery of missile hardware

The recovery team is responsible for the recovery of all missile debris and restoration of impact areas to their natural condition. Recovery personnel would have overall responsibility for controlling recovery and restoration operations. Air units composed of helicopters and support equipment would transport recovery personnel to road-inaccessible impact sites. Air support equipment would also transport the missile components out of all land and near-shore impact sites and perform quality assurance inspections or sweeps to ensure proper recovery procedures.

Each launch location is subject to all federal and state regulations involving waste/material handling and disposal, endangered species, and historical resource preservation. Implementation of these regulations may require the assistance of civilian agencies and law enforcement authorities during recovery and restoration operations. Civilian assistance would be requested by each launch location in accordance with existing agreements.

The following is a list of personnel, equipment, transportation, and operational requirements that typically would be necessary to perform recovery activities.
Personnel

- Helicopter pilots
- Helicopter co-pilots
- Helicopter crew chief
- Explosive Ordnance Disposal personnel (2)
- Recovery personnel
- Project representative
- Owner representative (if required by controlling agent)
- Environmental representative (if required by controlling agent)

Roadblocks

Roadblocks shall be utilized to limit unauthorized access into recovery areas that include locations in the vicinity of public roadways or thoroughfares. The Recovery Team Coordinator would designate appropriate roadblock locations on roads leading into recovery areas. Roadblocks would be coordinated by the launch site security personnel, augmented as needed by local law enforcement personnel. At each roadblock positive communication would be established and maintained with the Recovery Team Coordinator and other security personnel/roadblocks. This communication would occur using either landlines (telephones), cellular telephone, or military radio systems.

Certain critical response personnel, such as ambulance/medical or fire response units, shall be permitted to pass through "active" roadblocks in the performance of their duties.

Debris Recovery

Personnel would arrive at impact site by appropriate mode. Recovery transportation vehicles would remain at nearest accessible road. Explosive Ordnance Disposal members of the recovery team would be the first on scene and would be responsible for the identification, handling, control, and rendering safe of minor detonating charges and other minor hazardous debris. Other responsibilities include:

- Providing initial impact site control to prevent exposure for recovery personnel (Security personnel would assume this role as impact zone access controls are eased.)
- Maintaining area safety and rendering safe potential explosive materials
- Conducting initial impact site assessments for the identification of debris and the determination of recovery equipment requirements
- Assisting in dismantling of launch hardware prior to recovery and transport operations

Recovery personnel would then handle the next phase of the recovery including:

- Collect small missile parts
- Dismantle larger pieces into manageable sections
Transport recovered parts by helicopter to recovery vehicles waiting at accessible roads

Environmental Restoration

Recovery operations would be coordinated with the Environmental Office at each launch site. If deemed necessary, an archaeologist and biologist would accompany Explosive Ordnance Disposal personnel during the initial site assessment to determine if cultural or sensitive biological resources are present at the impact site. These resource specialists would assist in the determination of recovery equipment requirements and recovery transport routes.

All recovery and restoration activities would be carried out in accordance with Memorandum of Agreements signed by appropriate state and federal agencies and other potentially affected organizations. Impacted areas would be restored to a natural condition in accordance with land-owners’ agreements and agency requirements.
APPENDIX D

ENGINEERING FIELD ANALYSIS OF
SEISMIC DESIGN BUILDING STANDARDS FOR
EXISTING FACILITIES AT KODIAK LAUNCH COMPLEX
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Kodiak Island is located in one of the world’s most seismically active regions, producing three of the largest magnitude earthquakes of the last 100 years, including the great Mw 9.2, 1964 Prince William Sound Earthquake. The potential for severe ground shaking at Kodiak Launch Complex (KLC) over the design life of KLC is high and has been discussed in section 3.1.5. Existing KLC facilities were designed in 1997 under seismic design guidelines as specified in the 1994 Uniform Building Code for high seismic areas. New facilities and infrastructure envisioned under the Ground-Based Midcourse Defense (GMD) Extended Test Range would conventionally be designed and constructed under the newer International Building Code. Modifications in the newer code have brought about questions of whether the standards are sufficient given the severe seismic setting. In addition, recent and on-going seismic hazard evaluation studies at the U.S. Coast Guard Loran Station, Narrow Cape, Alaska (U.S. Coast Guard Civil Engineering Unit, 2001, 2002, 2003) indicate that “the shaking hazard at Kodiak is significantly greater than was previously recognized and exceeds standards such as the Uniform Building Code that have traditionally been used as a basis for design and construction in the Kodiak area.” The Alaska Aerospace Development Corporation (AADC) would obtain and review necessary definitive information on surface faulting in the vicinity of the proposed GMD facilities. In making final siting and design determinations, AADC would incorporate all appropriate standards specified by its licensed and bonded A&E contractor. The purpose of this Appendix is to address the following questions:

1. How does the Code under which the original KLC structures were designed (LLC building, LS, IPF building and the SCAT building) compare with the current code? This issue takes into account that as time goes by the Code officials and experts in the field of seismic design gain knowledge and incorporate this knowledge into the future Building Code editions.

2. Are the existing structures constructed as originally designed? This question requires inspection of the existing structures to ensure that they were constructed as designed.

KLC is located at Narrow Cape on Kodiak Island, Alaska. The facility, per the Construction Drawings, was designed in 1997. At that time, the 1994 edition of the Uniform Building Code was in place. Per the drawings, this is the Code to which the facilities were designed. For the purpose of this study, we are assuming that this is true and that the structures are properly designed using this Code. The Frame Loading Conditions shown on the design drawings are compatible with the 1994 Uniform Building Code. To answer the first question, how does the
Code in which the structures were designed compare with the current Code, we performed calculations using the two Codes. The calculations are attached for reference.

Although the two Codes are different in the method for obtaining the design base shear, once calculated, the loads are applied in the same way to design the structure. Therefore, we can compare the design base shear values calculated with each Code and determine which code requires a stronger design. Based on the original calculations included in the Draft EIS, the Uniform Building Code, 1994 edition required approximately a 10% greater design base shear than the International Building Code, 2000 edition. However, based on comments received on the Draft EIS, a Site Class S2 (Uniform Building Code 94) and Site Class B (International Building Code 2000) should be used due to the soft sandstone under Narrow Cape. The calculations for each building were rerun using these numbers. Based on these revised calculations, the International Building Code 2000 design base shear is approximately 15% to 20% greater than the Uniform Building Code 94 design base shear. For example, at the Launch Control building this equates to an International Building Code design base shear of 0.26W and a Uniform Building Code design base shear of 0.229W (W is the Dead Load of the structure). However, when looking at the KLC design documents wind is the controlling factor, not the seismic design. Based on ASCE 7-95, which was used for the wind design at the KLC facilities, the design base shear for wind is 20 k per frame. The design base shear for seismic is calculated at 7 k per frame and thus the wind controls the design. The International Building Code 2000 design base shear for wind is calculated to be 13.4 k per frame. This is greater than the seismic base shear but less than the original wind base shear.

Another comment on the Draft EIS questioned why the buildings were not classified as structures having critical national defense functions. The proposed facilities at KLC are for test purposes. Facilities having critical national defense functions are those directly involved in national defense operations that must remain operational following a seismic event. KLC is not involved in operational aspects related to national defense and therefore it does not have critical national defense functions.

In answering the second question, are the structures constructed as designed, a professional engineer traveled to the site and inspected the structures. Original Construction Documents were compared to the actual structures in the field. Each building was inspected with special attention to the bracing system. Although some components could not be directly observed due to them being hidden by siding or wall coverings, most of the braces could be directly observed and compared to the Construction Documents. We did not find any discrepancies in the bracing construction. (ASCG Incorporated, 2002)

After reviewing all of the documents and comparing the loading requirements of each Code, we have determined that if the structures were designed and built with the latest techniques for resisting seismic forces, in accordance with the latest Building Codes, and the structures would not require any modifications. Since the design wind load is the controlling factor, and it is almost 50% greater than the design seismic load it is our opinion that the structures should be able to withstand a seismic event with a 2% probability of exceedence in 50 years without a catastrophic failure. (ASCG Incorporated, 2002)
Purpose: To determine whether the UBC 97 code or the IBC 2000 code will require more load be applied to the structures at the facility.

Method: Will calculate the total dead load factor (Design Base Shear) that each code will require and compare them.

Criteria: Will use the information on the drawings along with the maps in the codes, will use similar assumptions as original design.

Results:

Launch Control Center
IBC = .207 W
UBC = .229 W
UBC Controls

Launch Structure
IBC = .156 W
UBC = .172 W
UBC Controls

IPF
IBC = .207 W
UBC = .229 W
UBC Controls

SCAT
IBC = .207 W
UBC = .229 W
UBC Controls

UBC 94 Code Controls the Amount of Force Applied to the Structure in Every Case.
STRUCTURE SUMMARY:

- LAUNCH CONTROL CENTER
  175' x 80' x 14' E.H.
  METAL BUILDING w/ MOMENT FRAMES & X-BRACING
  4:12 ROOF SLOPE
  RW = 6
  CATEGORY II

- LAUNCH STRUCTURE
  85' x 40' x 210' HIGH
  METAL STRUCTURE w/ X-BRACING
  RW = 6
  CATEGORY II

- INTEGRATED PROCESSING FACILITY (IPF)
  100' x 71' x 50' E.H.
  METAL BUILDING w/ MOMENT FRAMES & X-BRACING
  4:12 ROOF SLOPE
  RW = 6
  CATEGORY II

- SCAT
  70' x 50' x 50' E.H.
  METAL BUILDING w/ MOMENT FRAMES & X-BRACING
  4:12 ROOF SLOPE
  RW = 6
  CATEGORY II
LAUNCH CONTROL CENTER:

UBC 94

GIVEN:
- Zone 4
- \( S_1 = 1.0 \)
- Occupancy Category II
- \( R_W = 6 \)

DESIGN PER 16.27.8.2 USE STATIC PROCEDURE (16.28)

\[ V = \frac{2IC}{R_W} W \]

- \( \varepsilon = 0.10 \) (TABLE 16-1)
- \( I = 1.25 \) (TABLE 16-K)
- \( R_W = 6 \) (TABLE 16-N)

\[ C = \frac{1.25S}{T^{2/3}} = 11.42 > 2.75 \Rightarrow USE \ 2.75 \]

- \( T = C_e (b_n)^{3/4} = 0.035 \)
- \( C_e = 1.035 \)
- \( b_n = 0 \)
- \( S = 1.0 \)

\[ V = \frac{(0.4)(1.25)(2.75)}{6} W = 0.229 W \]
LAUNCH CONTROL CENTER

IBC 2000

GIVEN:

- $S_5 = 1.75$ (maps)
- $S_1 = 0.60$ (maps)

SITE CLASS A (TABLE 16.15.11)
SEISMIC USE GROUP II

DESIGN:

- $F_a = 0.8$ (TABLE 16.15.1.2(1))
- $F_v = 0.8$ (TABLE 16.15.1.2(2))
- $S_{M5} = 0.8(1.75) = 1.4$ (16-16)
- $S_{M1} = 0.8(0.60) = 0.48$ (16-17)
- $S_{DS} = 2/3(1.4) = 0.93$ (16-18)
- $S_{D1} = 2/3(0.48) = 0.32$ (16-19)

SEISMIC DESIGN CATEGORY = D (PER TABLE 16.10.3)
USE EQUIVALENT LATERAL-FORCE PROCEDURE 16.17.4
(PER TABLE 16.10.6.3)

\[
V = \frac{C_{5} \times W}{1.4} \quad (16.34 \text{ MODIFIED FOR ASD})
\]

- $C_5 = \frac{SDS}{1.6}$

\[
C_5 = \frac{SDS}{1.6} \Rightarrow 0.194 > 0.051 \quad \text{OK USE 0.194}
\]

\[
C_{SMAX} = \frac{SD}{(1.044 \times S_5 \times T_5)} \Rightarrow 1.90
\]

- $SD = 0.93$ (16-18)
- $R = 6$ (TABLE 16.17.4)
- $T_5 = 1.25$ (16.17.1.2)

\[
C_{SMIN} = 0.104 \times S_5 \times T_5 \Rightarrow 0.051
\]

\[
V = \frac{0.194 \times W}{1.4} = 0.138W
\]

PER 16.17.2 MUST APPLY REDUNDANCY FACTOR DUE TO SDC = D

MADE $\rho = 1.5$ \quad $\Rightarrow V = 0.138W \rho = 0.207W$
LAUNCH STRUCTURE:

UBC 94

**Given:**

- Zone 4
- $S_1 = 1.0$
- Occupancy Category II

**Design:**

PER 1427.8.2 MSE STATIC PROCEDURE (1428)

\[ V = \frac{Z \cdot C}{R_w} \cdot W \]

- $Z = 1.40$ (Table 16-1)
- $C = 1.25 S \frac{5}{T^{\frac{3}{2}}} = 16.5 \geq 2.75$; use 2.75 max
- $T = C_b (h_m)^{3/4} = .020$
- $C_b = .020$
- $h_m = 0.1$
- $S = 1.0$

\[ V = \frac{(40)(1.25)(2.75)}{8} = 1.17 \text{ W} \]
LAUNCH STRUCTURE:

IBC 2000

GIVEN:

$s_0 = 1.75$

$s_1 = 0.60$

SITE CLASS A (TABLE 16/15.1.1)

SEISMIC USE GROUP II

DESIGN:

$f_a = 0.8$ (TABLE 16/15.1.26(1))

$f_v = 0.8$ (TABLE 16/15.1.26(2))

$S_{eq} = 0.175 = 1.4 \quad (16-16)$

$S_{nu} = 0.060 = 0.98 \quad (16-17)$

$S_{ds} = 2/3 (1.4) = 0.93 \quad (16-18)$

$S_{d1} = 2/3 (0.98) = 0.32 \quad (16-19)$

SEISMIC DESIGN CATEGORY "D" (TABLE 16/6.3)

USE EQUIVALENT LATERAL FORCE PROCEDURE 16/12.14

(TABLE 16/6.2.3)

$V_{as0} = \frac{C_s}{1.4} W \quad (16-34$- MODIFIED FOR ASD$)$

$C_s = \frac{S_{ds}}{S_{nu}} = \frac{0.93}{0.98} = 0.95 \quad < 2.5$  

$S_{ds} = 0.93$

$\alpha = 8$

$T_e = 1.25$

$C_{smw0} = \frac{S_{d1}}{(C_s T \alpha)} = 2.5$

$S_{d1} = 0.32$

$\alpha = 8$

$T_e = 1.25$

$C_{smw} = 0.044 \quad S_{ds} \cdot T_e = 0.051$

$V = \frac{1.145}{1.4} W = 0.810 W$

PER 16/17.2, MUST APPLY REDUNDANCY FACTOR DUE TO SDC D

$MAX \rho = 1.5$

$V = 1.104 W \rho = 1.156 W$
IPF BUILDING:

UBC '94

GIVEN:
- Zone 4
- \( S_1 = 1.0 \)
- Occupancy Category I
- \( R_W = 6 \)

DESIGN PER 1627.8.2 USE STATIC PROCEDURE (1628)

\[
V = \frac{210}{R_W} \text{ W}
\]

\[
2 = 0.10 \text{ (TABLE 16.1)}
\]

\[
S = 1.25 \text{ (TABLE 16.2)}
\]

\[
R_W = 6 \text{ (TABLE 16.3)}
\]

\[
C = \frac{1.25 \cdot 5}{T^{0.5}} \geq 11.42 \Rightarrow 2.75 \Rightarrow \text{ USE 2.75}
\]

\[
T = C (h_n)^{1/4} \approx 0.35
\]

\[
C_e = 0.35
\]

\[
h_n = 0
\]

\[
S = 1.0
\]

\[
V = \frac{(2.75)(1.25)(2.75)}{6} \text{ W} \approx 1229 \text{ W}
\]
IPF BUILDING:

IBC 2000

Given: 

\[ S_b = 1.75 \text{ (w/m}) \]
\[ S_s = 0.160 \text{ (w/m}) \]

Site Class A (Table 1617.11)

Seismic Use Group II

Design:

\[ F_v = 0.8 \text{ (Table 1617.1.26c)} \]
\[ F_s = 0.8 \text{ (Table 1617.1.26c)} \]

\[ S_{150} = 0.8(1.75) = 1.4 \text{ (16.16)} \]
\[ S_{41} = 0.8(0.160) = 0.128 \text{ (16.17)} \]
\[ S_{DS} = 2/3(1.4) = 0.93 \text{ (16.18)} \]
\[ S_{D1} = 7/8(0.16) = 0.132 \text{ (16.19)} \]

Seismic Design Category D (Table 1617.3)

Use Equivalent Lateral Force Procedure 1617.4 (Table 1616.10.3)

\[ V_{ASD} = \frac{C_b \cdot W}{1.4} \text{ (16.34) Modified for ASD} \]

\[ C_b = \frac{50S_{150}}{E} \Rightarrow \frac{50 \times 1.4}{20,000} = 0.035 \text{ (16.38)} \]

\[ I_e = 2.25 \text{ (1617.6)} \]

\[ C_{I_e} = \frac{S_{DS}}{I_e} \Rightarrow 0.93 \text{ (16.18)} \]

\[ C_{I_e} = 1.25 \text{ (1616.2)} \]

\[ \frac{C_{I_e}}{T} = 0.32 \text{ (16.38)} \]

\[ T = 0.35 \text{ (1617.4.2.1)} \]

\[ C_{I_e} = 1.044 \text{ (Table 16.37)} \]

\[ C_{I_e} = \frac{0.5}{0.051} \Rightarrow 10 \]  

\[ V = \frac{1194}{1.4} \Rightarrow 852 \text{ w} \]

PER 1617.2 MUST APPLY REDUNDANCY FACTOR DUE TO SDC = D

\[ W = 1.5 \times 138 \text{ w} = 207 \text{ w} \]
SCAT BUILDING

USE 94

GIVEN:
- Zone 4
- \( S_t = 1.0 \)
- Occurrence Category II
- \( R_w = 6.0 \)

DESIGN PER 1627.8.2 USE STATIC PROCEDURE (1624)

\[
V = \frac{\frac{2EC}{R_w} W}{s}
\]

\( s = 0.40 \) (TABLE 16-1)
\( E = 1.25 \) (TABLE 16-K)
\( R_w = 6.0 \) (TABLE 16-N)

\[
C = \frac{1.25 \times 5}{1.43} = 11.42 > 2.75 \therefore \text{USE 2.75}
\]

\[
T = C_t (h_n)^{0.4} = 0.35
\]

\[
C_t = 0.35
\]

\[
h_n = 0
\]

\[
S = 1.0
\]

\[
V = \frac{(0.4)(1.25)(2.75)}{6.0} = 0.229 W
\]
SCAT:

ISC 2000

**Given:**
- $S_0 = 1.75$ (story)
- $S_1 = 0.60$ (story)

**Site Class A** (Table 16.15.1.1)

**Seismic Use Group II**

**Design:**
- $F_a = 0.8$ (Table 16.15.1.2.1)
- $F_v = 1.3$ (Table 16.15.1.2.2)
- $S_{ms} = 0.8(1.75) = 1.4$ (16.16)
- $S_{mu} = 0.8(0.6) = 0.48$ (16-17)
- $S_{ds} = 0.9(1.4) = 1.26$ (16-18)
- $S_{d1} = 0.9(0.48) = 0.32$ (16-19)

**Seismic Design Category = D** (Per Table 16.16.3.3)

**Use Equivalent Lateral Force Procedure 16.17.4**

**$V_{abd} = \frac{C_0 W}{1.4}$$ (16-34 modified for ASD)**

- $C_0 = \frac{S_{ds}}{P_{BE}} = 0.94 < 1.0$ OK USE 0.94
- $S_{ds} = 1.43
- R = 6
- $T = 1.25$ (Table 16.16.3.2)

- $C_{s,min} = \frac{S_{d1}}{(1.4)^{1/3}} = 0.94
- S_{d1} = 0.32
- R = 6
- $T = 1.25$

- $T = 0.035$ (16.17.4.2.1)

- $C_{s,min} = 0.44$ $S_{ds} I_x = 0.051$
- $C_{s,min} = 0.051$
- $S = 0.051$
- $W_{max} P = 0.5$

- $V = 0.94 W = 0.138 W$

**Per 16.17.2 must apply redundancy factor due to SDP = D**

- $V = 0.138 W P = 0.207 W$
### Launch Control Center

**IEC 2000**

- $S_0 = 1.75$
- $S_1 = 0.60$

**Site Class B**

**Seismic Use Group E**

- Testing facility with limited amounts of hazardous material with limited times of use.

**Design**

- $F_a = 1.0$ 
  - Table 1616.1.2(1)
- $F_v = 1.0$ 
  - Table 1415.1.2(2)
- $S_m = 1.10(1.75) = 1.75$ 
  - (IEC-16)
- $S_{Dr} = 1.0(0.60) = 0.60$ 
  - (IEC-11)
- $S_{Ds} = 0.3(1.75) = 1.17$ 
  - (IEC-18)
- $S_{D1} = 0.3(0.60) = 0.40$ 
  - (IEC-19)

**Seismic Design Category = D**

- $S_{Dr} > 0.67$ 
- $S_{D1} > 0.29$

**Table 16.16.3**

- Regular structures

**Use Equivalent Lateral Force Procedure**

- (Sec. 16.17.4)

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**SUPPLEMENTAL CALCULATIONS**

D-15
## Launch Control Center

### Seismic Base Shear

- **$V = C_s W$**
  - $C_s$: Seismic Response Coefficient
  - $T = 1.25$

- **$C_s = \frac{1.17}{1.25}$**
- **$C_s = 0.936$**

- **$V = 0.36 W$**
  - $0.014 S_{0e} T_e = 0.0164 \times C_s$

- **ASD $V = \frac{V}{1.4} = 0.26 W$**
  - $T = 0.005 (14)^{3/4}$
  - $T = 0.253$

### IBC 2000

- **$V = 0.26 W > 0.229 W$**
  - $V_{ASD} (R) = \frac{0.26}{1.25} = 0.208 > C_s$

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D-16
**DESIGN LOADS**

**DESIGN WIND ASCE 7-95**
- BASIC WIND: 10 MPH
- EXPOSURE: C
- CLASSIFICATION OF BUILDING: I = 1.00

**SEISMIC LOAD** - 1994 UBC
- ZONE: 4
- FACTOR: \( z = 0.40 \)
- SITE COEFFICIENT: \( S_l = 1.0 \)
- CLASSIFICATION OF BUILDING: II

**DEAD LOAD** - 375.16 lb/ft

**USE**: 250 lb/ft for D+W

\[ R = 16, H = 9K \]

**TOTAL DEAD**: 32K (120K lb/ft) WIND

**TYPE FRAME**: 25-O.O.G.

**LIVE LOAD** - 300 lb/ft

\[ R = 12, H = 8K \]

**TOTAL LIVE**: 60K

**SNOW LOAD** - 450 lb/ft

\[ R = 19, H = 15K \]

**TOTAL SNOW**: 83K

**WIND LOAD**
- INTERNAL PRESSURE
- DIRECTIONAL 150 lb/ft
- POSITIVE PRESS
- NEGATIVE PRESS

\[ R_{wind1}, H_{wind1} \]
\[ R_{wind2}, H_{wind2} \]

**TOTAL BASE SHEAR FOR WIND**: 20K

---

**SUPPLEMENTAL CALCULATIONS**

D-17
**Design Loads**

**Seismic Loads** -

\[ V = 0.18 \text{ W} \]

**Seismic Dead Load* Included 25% Snow Load**

**IBC 2000**

\[ V = 150 \text{ MPH} \text{ Wind Speed} \]

**Exposure** C

\[ \pi = 14 \]

**Table 1609.6.2.1**

- **Interior Wall**
  \[ \frac{v}{s} = 24.7 \text{ psi} \]

- **Window Roof**
  \[ \frac{v}{s} = -22.1 \text{ psi} \]

- **Leach Roof**
  \[ \frac{v}{s} = -17.0 \text{ psi} \]

\[ 25 \text{ ft.} \text{ TRI. WIND.} \]

**Wall**

\[ P = 25(24.7) = 617.5 \text{ psi} \]

**W. Roof**

\[ P = 25(-22.1) = 550 \text{ psi} \]

**LR. Roof**

\[ P = 25(22.1) = 548 \text{ psi} \]

**Mean Value**

\[ k = 14 + \frac{18.93}{2} = 20.47 \text{ DP. 20} \]

**Table 1609.6.2.1**

**Height & Exposure Coefficients**

\[ P = 1.29(617.5) = 790 \text{ psi} \]

\[ W. Roof P = 1.29(550) = 722 \text{ psi} \]

\[ LR. Roof P = 1.29(548) = 548 \text{ psi} \]
<table>
<thead>
<tr>
<th>BASIC WIND SPEED V (mph—3-second gust)</th>
<th>LOAD DIRECTION</th>
<th>ROOF ANGLE</th>
<th>HORIZONTAL LOADS&lt;sup&gt;a&lt;/sup&gt;</th>
<th>VERTICAL LOADS</th>
<th>MAXIMUM HORIZONTAL WALL LOADS&lt;sup&gt;a&lt;/sup&gt;</th>
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<td>All angles</td>
<td>11.5</td>
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<td>20°</td>
<td>24.6</td>
<td>-11.9</td>
<td>15.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;sup&gt;c&lt;/sup&gt;</td>
<td>31.6</td>
<td>8.1</td>
<td>21.1</td>
</tr>
<tr>
<td></td>
<td>Longitudinal</td>
<td>All angles</td>
<td>22.8</td>
<td>-11.9</td>
<td>15.1</td>
</tr>
<tr>
<td>125</td>
<td>Transverse</td>
<td>20°</td>
<td>24.8</td>
<td>-12.9</td>
<td>16.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;sup&gt;c&lt;/sup&gt;</td>
<td>27.9</td>
<td>19.1</td>
<td>22.2</td>
</tr>
<tr>
<td></td>
<td>Longitudinal</td>
<td>All angles</td>
<td>24.8</td>
<td>-12.9</td>
<td>16.4</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>BASIC WIND SPEED V (mph— 3-second gust)</th>
<th>LOAD DIRECTION</th>
<th>ROOF ANGLE</th>
<th>HORIZONTAL LOADS a</th>
<th>VERTICAL LOADS</th>
<th>MAX HORIZONTAL WALL LOADS a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wall</td>
<td>Roof</td>
<td>Windward face</td>
</tr>
<tr>
<td>130</td>
<td>Transverse</td>
<td>0 to 5°</td>
<td>26.8</td>
<td>-13.8</td>
<td>-17.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20°</td>
<td>37.1</td>
<td>-25.8</td>
<td>-24.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;angle&lt;45°</td>
<td>30.1</td>
<td>-26.6</td>
<td>-24.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All angles</td>
<td>26.8</td>
<td>-13.9</td>
<td>-17.8</td>
</tr>
<tr>
<td>140</td>
<td>Transverse</td>
<td>0 to 5°</td>
<td>31.1</td>
<td>-16.1</td>
<td>-20.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20°</td>
<td>43.0</td>
<td>-21.4</td>
<td>-28.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;angle&lt;45°</td>
<td>35.0</td>
<td>-27.9</td>
<td>-27.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All angles</td>
<td>31.1</td>
<td>-16.1</td>
<td>-20.6</td>
</tr>
<tr>
<td>145</td>
<td>Transverse</td>
<td>0 to 5°</td>
<td>33.3</td>
<td>-17.3</td>
<td>-22.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20°</td>
<td>46.2</td>
<td>-19.2</td>
<td>-30.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;angle&lt;45°</td>
<td>37.5</td>
<td>-25.6</td>
<td>-29.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All angles</td>
<td>33.3</td>
<td>-17.3</td>
<td>-22.1</td>
</tr>
<tr>
<td>150</td>
<td>Transverse</td>
<td>0 to 5°</td>
<td>35.7</td>
<td>-18.5</td>
<td>-23.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20°</td>
<td>49.4</td>
<td>-20.7</td>
<td>-33.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;angle&lt;45°</td>
<td>40.1</td>
<td>-27.4</td>
<td>-31.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All angles</td>
<td>35.7</td>
<td>-18.5</td>
<td>-23.7</td>
</tr>
<tr>
<td>170</td>
<td>Transverse</td>
<td>0 to 5°</td>
<td>35.7</td>
<td>-18.5</td>
<td>-23.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20°</td>
<td>49.4</td>
<td>-20.7</td>
<td>-33.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30°&lt;angle&lt;45°</td>
<td>51.5</td>
<td>-35.2</td>
<td>-41.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All angles</td>
<td>45.8</td>
<td>-23.8</td>
<td>-30.4</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 0.3048 m, 1 degree = 0.01745 rad.

a. Pressures for roof angles between 5° and 20° and between 20° and 30° shall be interpolated from the table.
b. Pressures are the sum of the windward and leeward pressures and shall be applied to the windward elevation of the building in accordance with Figure 1609.6(3).
c. If pressure is less than 0, use 0.d. Pressures shall be applied in accordance with Figure 1609.6(1).
### TABLE 1609.8.2.1(3)

**ROOF OVERHANG COMPONENT AND CLADDING DESIGN WIND PRESSURES**

For a building with a mean roof height of 30 feet located in exposure B° (psf)

<table>
<thead>
<tr>
<th>ZONE</th>
<th>EFFECTIVE WIND AREA (sq ft)</th>
<th>BASIC WIND SPEED V (mph—3-second gust)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>-21.0</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>-20.6</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>-20.1</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>-19.8</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>-34.6</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>-27.1</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>-17.3</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>-10.0</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>-27.2</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>-27.2</td>
</tr>
<tr>
<td>4</td>
<td>50</td>
<td>-27.2</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>-27.2</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>-45.7</td>
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<tr>
<td>5</td>
<td>20</td>
<td>-40.5</td>
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<tr>
<td>5</td>
<td>50</td>
<td>-33.6</td>
</tr>
<tr>
<td>5</td>
<td>100</td>
<td>-28.4</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>-24.7</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>-24.0</td>
</tr>
<tr>
<td>6</td>
<td>50</td>
<td>-23.0</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td>-22.2</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm, 1 degree = 0.01745 rad, 1 mile per hour = 0.44 psf.

a. For effective area between those given above, the load is permitted to be interpolated; otherwise, use the load associated with the lower effective area.

### TABLE 1609.8.2.1(4)

**HEIGHT AND EXPOSURE ADJUSTMENT COEFFICIENTS**

<table>
<thead>
<tr>
<th>MEAN ROOF (foot)</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1.00</td>
<td>1.21</td>
<td>1.47</td>
</tr>
<tr>
<td>20</td>
<td>1.00</td>
<td>1.29</td>
<td>1.55</td>
</tr>
<tr>
<td>25</td>
<td>1.00</td>
<td>1.35</td>
<td>1.61</td>
</tr>
<tr>
<td>30</td>
<td>1.00</td>
<td>1.40</td>
<td>1.66</td>
</tr>
<tr>
<td>35</td>
<td>1.05</td>
<td>1.45</td>
<td>1.70</td>
</tr>
<tr>
<td>40</td>
<td>1.09</td>
<td>1.49</td>
<td>1.74</td>
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<tr>
<td>45</td>
<td>1.12</td>
<td>1.53</td>
<td>1.78</td>
</tr>
<tr>
<td>50</td>
<td>1.16</td>
<td>1.56</td>
<td>1.81</td>
</tr>
<tr>
<td>55</td>
<td>1.19</td>
<td>1.59</td>
<td>1.84</td>
</tr>
<tr>
<td>60</td>
<td>1.22</td>
<td>1.62</td>
<td>1.87</td>
</tr>
</tbody>
</table>

For SI: 1 foot = 304.8 mm.

a. All table values shall be adjusted for other exposures and heights by multiplying by the above coefficients.

---

### SUPPLEMENTAL CALCULATIONS

---
**Structural Design**

**IBC 2000**

Max Base Shear due to Wind

\[ 13.4^k \leq 20^k \text{ Original Design Wind Load} \]

**Figure 1609.6(3)**

Application of Main Windforce-Resisting System (MWFRS) Loads for Simple Diaphragm Buildings

2000 International Building Code®
APPENDIX E
POTENTIAL PERMITS, LICENSES, AND ENTITLEMENTS REQUIRED

KODIAK LAUNCH COMPLEX

**Air**—The existing Alaska Department of Environmental Conservation Air Permit under the Clean Air Act will be upgraded to include Ground-Based Midcourse Defense activities

**Cultural Resources**—As project details are further delineated, additional archaeological surveys may be required to verify the absence of sites within the area of potential effect

**Land Use**—Coastal Consistency Determination under the Alaska Coastal Management Act of 1977

**Water Resources**—Existing Alaska Department of Environmental Conservation (ADEC) National Pollutant Discharge Elimination System permit (under Section 402 of the Clean Water Act for non-point sources from construction activities) will be updated to include Ground-Based Midcourse Defense activities

**Wetlands**—Section 404 Permit under the Clean Water Act

MIDWAY

No permits, licenses, or entitlements identified

RONALD REAGAN BALLISTIC MISSILE DEFENSE TEST SITE

No permits, licenses, or entitlements identified

PACIFIC MISSILE RANGE FACILITY

No permits, licenses, or entitlements identified

VANDENBERG AIR FORCE BASE

**Biological Resources**—Section 7 (Endangered Species Act) consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service; Section 10(a) incidental take permit under the Endangered Species and Marine Mammal Protection Acts
Cultural Resources—As project details are further delineated, coordination would occur with the Environmental Planning Section and the Cultural Resources Section at Vandenberg AFB to further ensure that cultural resources would be protected.

Water Resources—Construction of the IDT would require a Construction Activities Storm Water General Permit from the California State Water Resources Control Board, or its local Central Coast Regional Water Quality Control Board. A related Stormwater Pollution Prevention Plan would also need to be prepared before the commencement of any soil-disturbing activities.

SEA-BASED TEST X-BAND RADAR

Airspace—Federal Aviation Administration initiated Notices to Airmen and Notices to Mariners when the Sea-Based Test X-Band Radar is testing.

Biological Resources—Section 7 (Endangered Species Act) consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Land Use—Coastal Consistency Determination depending on location of the Primary Support Base.

BROAD OCEAN AREA

Airspace—Federal Aviation Administration initiated Notices to Airmen and Notices to Mariners when the Sea-Based Test X-Band Radar is testing.
Ronald T. Kadish  
Lieutenant General, USAF  
Director  
Ballistic Missile Defense Organization  
7100 Defense Pentagon  
Washington D.C. 20309-7100

Dear General Kadish:

It has come to my attention that the Department of Defense Ballistic Missile Defense Organization (BMDO) will be proposing construction and operations in support of the National Missile Defense System at the Kodiak Launch Complex (KLC). I also understand that in conjunction with the proposed activities at KLC, the BMDC will be initiating an environmental review process pursuant to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) Office of the Associate Administrator for Commercial Space Transportation, the Federal agency responsible for licensing the operation of U.S. commercial launch facilities, is reviewing the license renewal process for the KLC. The license renewal process will also require NEPA review. Given the similar timing and the fact that the BMDO and FAA actions are connected, I propose that the FAA and BMDO work together to fulfill their NEPA obligations.

By way of background, the FAA issued a launch site operator license to the Alaska Aerospace Development Corporation (AADC) in September 1998 that specifies the terms and conditions under which the KLC can be operated. The AADC license is valid for a period of five years. The current license expires in September 2003 and will need to be renewed prior to that time. As part of the license renewal process and pursuant to NEPA, the FAA must make an environmental determination regarding any proposed modification to the terms of the launch site operator license. This would include any proposed addition or change to on-site facilities and operations at KLC. The FAA is advising that AADC begin the environmental portion of the license renewal process as soon as possible. We note that if the AADC license is not renewed prior to September 2003, the KLC launch site operator license will expire and no launches could occur at the facility.
NEPA emphasizes agency cooperation early in the environmental review process. Recognizing that the FAA has jurisdiction by law over the operation of the launch facility and any commercial launches proposed to take place at KLC, the FAA proposes that a cooperative environmental process is appropriate. Currently both BMDO and FAA are beginning a NEPA environmental review process for the KLC facility. The proposed actions to be evaluated under NEPA by BMDO must also be considered by the FAA during the license renewal process. It seems clear that environmental documentation to meet the needs of both agencies could be addressed in one Environmental Impact Statement (EIS) thereby reducing paperwork and delay. Therefore, the FAA requests that the BMDO designate the FAA as cooperating agency, as provided in 40 CFR § 1501.5, for an EIS to cover both proposed construction and operations in support of the National Missile Defense System test activities at the KLC as well as proposed renewal of the ADDC launch site operator license.

Specific arrangements and details pertaining to the responsibilities and regulatory requirements of each agency can be discussed and outlined in a future Memorandum of Agreement between the BMDO and the FAA. Initiating this arrangement early in the NEPA review process will help to ensure that the concerns and requirements of both agencies are thoroughly addressed.

Please feel free to contact me at (202) 267-7793 or Michon Washington from my staff at (202) 267-9305. I look forward to hearing back from you regarding the FAA request for designation as cooperating agency on the BMDO EIS and to working with you on this project.

Sincerely,

Patricia G. Smith
Associate Administrator for
Commercial Space Transportation
APPENDIX G
ELECTROMAGNETIC RADIATION
SUMMARY

The information in this appendix focuses on the nature and control of potential health and safety and interference effects associated with non-ionizing electromagnetic radiation (EMR) from the proposed Sea-Based Test X-Band (SBX) radar.

IONIZING AND NON-IONIZING RADIATION

EMR is generated during the operation of medical/diagnostic equipment, microwave ovens, cellular phones, computers, radios, televisions, radars, and similar devices. EMR is usually classified as one of two types: ionizing radiation or non-ionizing radiation. Ionizing radiation is produced by x-rays, cosmic rays, and gamma rays. Non-ionizing radiation is produced by a wide variety of equipment such as cellular phones, ham radios, and radars.

HEALTH EFFECTS AND STANDARDS

Human exposure to high levels of ionizing radiation can cause cell tissue damage. The EMR (non-ionizing radiation) that is generated by radars, microwave ovens, cellular phones, etc., is absorbed into the human body in the form of heat. This causes the temperature of the body to rise. At low intensities, the heat that is induced by EMR can be accommodated by the body’s ability to regulate its temperature through blood flow and perspiration. Thus, any effects produced would be regulated by the body in a manner similar to when the body heats up due to exercise or exposure to the sun. At high intensities, the thermoregulatory capabilities may be exceeded, which could lead to thermal distress or irreversible thermal damage similar to heat exhaustion or severe sunburn.

The Institute of Electrical and Electronics Engineers (IEEE) is considered a leading authority in computer engineering, biomedical technology, telecommunications, electric power, aerospace, and consumer electronics, with individual members in approximately 150 countries. For non-ionizing radiation, the Occupational Safety and Health Administration established a radiation protection guide (29 Code of Federal Regulations 1910.97) for normal environmental conditions and for incident electromagnetic energy of frequencies from 10 megahertz (MHz) to 100 MHz. This radiation protection guide is 10 milliwatts per square centimeter (mW/cm²), as averaged over any possible 1-hour period. Department of Defense (DoD) Instruction 6055.11, Protection of DoD Personnel from Exposure to Radiofrequency (RF) Radiation, established Permissible Exposure Levels (PELs) for controlled and uncontrolled environments and for high power microwave narrow-band and electromagnetic pulse broad-band simulator systems.

The IEEE guidelines are more stringent than the U.S. Environmental Protection Agency (EPA) guidelines, based on the shorter averaging time, and therefore are used in the SBX analysis. The IEEE standards have dual designations as American National Standards Institute standards. The Federal Communications Commission regulations are primarily based on the 1986 National Council for Radiation Protection and Measurement Report No. 86, Biological
Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields, but also incorporate portions the 1991 IEEE standard.

To protect people from exposure to levels of EMR that may be considered harmful, the IEEE has defined an extremely conservative set of standards based on the relationship between the body mass and skin area (the whole body exposure of a human baby or small child) that converts the exposure limit to a power density related to area. Hundreds of studies (321 that are referenced in the latest version of IEEE C95.1-1999) have determined that laboratory animals may be affected by specific absorption rates (the rate at which the EMR is absorbed by the body as heat) if maintained for extended periods of time. The periods of time are frequency dependent because the higher frequencies have less penetration depth than lower frequencies. The IEEE also applied a safety factor of 10 in arriving at standards for human exposure which are expressed in terms of milliwatts per square centimeters (mW/cm²). General public exposure is typically limited to one-fifth of the occupational limits. Table G-1 provides a comparison of EMR exposure from a variety of sources.

<table>
<thead>
<tr>
<th>System</th>
<th>Distance</th>
<th>Power Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microwave Oven</td>
<td>5 centimeters (2 inches)</td>
<td>5 mW/cm²</td>
</tr>
<tr>
<td>SBX</td>
<td>85 meters (278 feet)</td>
<td>5 mW/cm²</td>
</tr>
<tr>
<td>Walkie-Talkie</td>
<td>10 centimeters (4 inches)</td>
<td>2.5 mW/cm²</td>
</tr>
<tr>
<td>Cellular Phone</td>
<td>1 centimeter (0.4 inches)</td>
<td>0.6 mW/cm²</td>
</tr>
</tbody>
</table>

At X-band frequencies (8,000 MHz to 12,000 MHz), the IEEE standards for human exposure is 5.33 mW/cm² to 8 mW/cm², respectively. In order for the SBX to have an effect on human health, the beam operating at full power would have to come in contact with a person and remain on them for 7.5 minutes (8,000 MHz) and 11.25 minutes (12,000 MHz). Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any period of time. Safe distance separations and redundant RF Radiation Hazard Safety software controls would not allow a full power beam to come in contact with any personnel, on the deck of the SBX or on land. Similar software controls have been effectively used on the Ground-Based Radar Prototype (GBR-P) at Kwajalein Island in the Republic of the Marshall Islands for over 5 years.

People with pacemakers may be affected by the EMR generated by some radars. According to the Air Force Occupational Safety and Health Standard 161-9, a significant disruption of normal pacemaker function requires RF radiation signals having a primary frequency between 100 and 5,000 MHz; pulse widths greater than 10 microseconds, and electric field strengths greater than 10 mW/cm². The disruption of pacemakers via RF radiation has also been studied extensively at the Georgia Technical Research Institute and similar results have been found. The SBX is not in the same frequency band, nor would it exceed the 10 mW/cm² that are required to affect pacemakers.
INTERFERENCE EFFECTS

Communications-Electronics Equipment

The proposed SBX operates within the 8,000–12,000 MHz frequency band, commonly referred to as the X-band. RF interference is most likely to occur when two pieces of communications-electronics equipment are operated within the same frequency band (in-band-interference). Therefore, equipment whose frequencies fall within the X-band is most likely to be affected by the SBX. Some examples of X-band communications-electronics equipment include airborne weather radars, fire control radars, and bomb/navigation radars. Garage door openers are well below this frequency and would not be affected. Adjacent-band RF interference is similar to in-band RF interference. The adjacent bands for the X-band include all frequencies that are within approximately 5 percent of the operating frequency. Interference is also possible to systems that operate in harmonically-related frequency bands. Harmonic band interference refers to interference produced in harmonically related receivers or interference caused by sub-harmonically related transmitters. Harmonic frequencies include those frequencies which are integer multiples of the operating frequencies. Systems that operate in harmonically-related frequency bands include airport surface detection equipment and broadcasting satellite service. Software controls and coordination with military and commercial aircraft controllers would minimize this potential interference. Personal home satellite systems would not be affected.

Systems that operate outside of X-band and the harmonically-related frequency bands could be subject to interference (non-frequency-related) due to high power effects from the SBX. High power effects typically occur in receivers that are located close to high power transmitters and may be the result of either antenna-coupled signals or equipment case penetration. The accepted levels for high power effects are 1 mW/cm² for military equipment and 0.1 mW/cm² for civilian equipment. At power levels below these thresholds, it can be reasonably assumed that high power effects are not likely to occur. At power levels above these thresholds, it cannot be stated with certainty that high power effects will occur, only that it is possible. Under proposed SBX operating conditions, full power operation would involve tracking objects in space with the beam pointed up and constantly moving. The beam would not remain stationary for any appreciable period of time; thus the odds of interference from high power effects with any electronic equipment on the ground would be slight, 1/1000000 or 0.0001 percent of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than 1 second, should this occur.

Ground-based, airborne, and ship-based systems will be evaluated for in-band, adjacent-band, and harmonic band interference during the detailed EMR/electromagnetic interference (EMI) survey that is underway. Level 2 surveys are planned to be completed in the summer of 2003.

Electro-Explosive Devices

An electro-explosive device (EED) is defined as a device in which electrical energy is used to initiate an enclosed explosive, propellant, or pyrotechnic material. Some applications of EEDs are detonators, squibs, blasting caps, and igniters. A current sufficient to initiate the EED can be induced by exposure of the device to an electromagnetic field. The potential impacts to EEDs from emissions from the X-Band Radar (XBR) are twofold: (1) the EED could be made not to work (a phenomenon known as dudding), or (2) the EED could be inadvertently initiated. The majority of the time, an EED is either installed in its intended application with its leads attached (the presence phase) or is in the shipping/storage phase. Typical EED applications in the presence phase would include fire extinguishers, automotive airbags, a missile attached to
the wing of an aircraft, and military aircraft ejection seats. However, infrequently, EEDs are sometimes handled without the protection of a storage container (handling/loading phase). Therefore, different susceptibility criteria have been developed for each of these two distinct conditions described above. As can be seen from table G-2, EEDs in the handling/loading phase are substantially more susceptible to EMR hazards; however, main beam illumination on the ground will not occur. Based upon a grating lobe illumination on the ground from the fully populated SBX, a separation distance of 2.3 kilometers (1.4 miles) is recommended for EEDs in the handling/loading phase (table G-2). The distances for the 65 percent populated SBX are also shown in table G-2.

<table>
<thead>
<tr>
<th>Table G-2: Electromagnetic Radiation Potential Interference Distances for SBX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>65 Percent Populated</strong></td>
</tr>
<tr>
<td>kilometers (miles)</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Main beam (average field intensity) on an aircraft (air)</td>
</tr>
<tr>
<td>Main beam on an EED presence/shipping (ground and air) such as a missile mounted on an aircraft wing or an EED in a shipping container</td>
</tr>
<tr>
<td>Grating lobe on an EED handling (ground) where an EED is in an exposed position</td>
</tr>
<tr>
<td>Grating lobe on an EED presence/shipping (ground and air) such as a vehicle airbag or an EED in a shipping container</td>
</tr>
<tr>
<td>Military communications/electronics</td>
</tr>
<tr>
<td>Commercial communications/electronics</td>
</tr>
<tr>
<td>Grating or side lobe personnel hazard (exceeds Permissible Exposure Limit within)</td>
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\(^1\) Personnel Hazard distance worst case—without software controls
\(^2\) Personnel Hazard distance with software controls

It is assumed that the handling/loading of EEDs will not occur when aircraft are airborne. However, main beam illumination of in flight aircraft with EEDs (mainly military aircraft ejection seats) in the presence and shipping phases is possible. There is a potential for EED radiation interference for distances up to 7.5 kilometers (4.6 miles) in the air. Software controls on the SBX and coordination with military and commercial aircraft controllers would be used to ensure that aircraft bearing EEDs are not threatened by main beam interference. Based on the EMR/EMI survey results and coordination with the Federal Aviation Administration (FAA), the U.S. Department of Transportation, and others, the SBX operating area would be crafted in time and space so as to avoid existing airports, air routes, and airspace users. The general SBX operating area would be published on appropriate aeronautical charts to inform pilots of the potential EMI hazard to certain aircraft.

The main beam and side lobes of the SBX could also illuminate EEDs on the ground in the presence/shipping phase. However, the potential radiation hazard would exist only 10 meters (33 feet), in front of the radar, which would be limited to the deck of the SBX. Therefore, EEDs on the ground, including those associated with airbags in vehicles, would not be affected.
Two separate, redundant computer systems (similar to controls effectively used on the large XBR currently operating at Kwajalein Island in the Republic of the Marshall Islands) would monitor all emission energy levels at locations around the radar to assure safe exposure levels would be maintained. These software controls and coordination with military and commercial aircraft controllers would also minimize potential interference to systems such as airport surface detection equipment and broadcasting satellite services that operate in harmonically-related frequency bands.

Aircraft/Avionics

Another form of non-frequency related interference affects aircraft and avionics. Both the DoD and the FAA have standards for EMR interference to aircraft, which should not be exceeded. DoD uses MIL-STD-464 standards; therefore, military aircraft must be hardened or protected from EMR with a peak power threshold up to 3500 volts per meter (V/m) and 1270 V/m (average power). The SBX would not exceed these levels. Commercial aircraft must be hardened or protected from EMR levels up to 3,000 V/m (peak power) and 300 V/m (average power) as mandated by the FAA by Notice 8110.71, Guidelines for the Certification of Aircraft Flying through High Intensity Radiated Field Environments. The SBX would not exceed the 3000 V/m peak power threshold. The SBX could exceed the 300 V/m average power threshold. As shown in table G-2, the fully populated radar has a potential for interference out to a distance of 19 kilometers (11.8 miles) from the SBX. The average power threshold is based upon reducing the time of exposure of aircraft avionics (electronic equipment) to High Intensity Radiated Fields in order to preclude shortening the life of the aircraft avionics. Therefore, the concern is not interference but is a reduction in life of the aircraft avionics/electronic equipment.

Fuels

Based upon the threshold of 5,000 mW/cm² from Technical Order 31Z-10-4, the SBX does not present a radiation hazard to fuels because the SBX does not emit radiation levels that exceed 5,000 mW/cm².

SUMMARY

The proposed SBX operating conditions at a Primary Support Base would include full power operation to track objects in space. The beam would be pointed up and constantly moving along with the object. Software controls would not allow a full power beam to come in contact with any personnel on the platform or on land. Similar software controls have been proven and effectively used on the large XBR operating at Kwajalein Island in the Republic of the Marshal Islands. The disruption of pacemakers via RF radiation has been studied extensively by the Air Force and Georgia Technical Research Institute, and the SBX would not exceed the 10 mW/cm² that those agencies determined would be required to affect pacemakers.

The potential radiation hazard for EEDs on the ground would exist only 10 meters (33 feet) in front of the radar or only on the main deck of the SBX. Therefore, EEDs on the ground, including those associated with airbags in vehicles, would not be affected. Garage door openers as well would not be affected because they are well below the operating frequency of the SBX. The beam from the SBX would not remain stationary during operation for any period of time, thus the odds of interference from high power effects with any electronic equipment on the ground would be slight, 1/1000000 or 0.0001 percent of the time (roughly 1/10 of a second per day). The effects would not damage any electronic equipment and would last for less than 1 second, should this occur.
The SBX will not exceed the 3,000 V/m peak power threshold for commercial aircraft as established by the FAA. The SBX could exceed the 300 V/m average power threshold; however, the concern is not interference but a reduction in life of the aircraft avionics.

Based on the current standards and analysis described above, proposed operation of the SBX in port, with appropriate controls and coordination, would not pose a hazard to personnel or equipment.
PLANTS

Lau’ehu (*Panicum niihauense*)

Lau’ehu is a federally and state endangered grass species that was historically known to occur on Niihau and one location on Kauai. It is currently known to occur as 23 individuals scattered in the sand dunes on state-owned land near Queen’s Pond in Polihale State Park, north of the Pacific Missile Range Facility (PMRF). It has not been identified on PMRF. The primary threats to this grass are off-road vehicles, competition with alien/exotic species, and the risk of extinction due to natural events because of the small size of the population.

Critical habitat is the term used in the Endangered Species Act to define those areas of habitat that are known to be essential for an endangered or threatened species to recover and that require special management protection. A proposed rule to designate critical habitat for 76 listed plant species on the islands of Kauai and Niihau was published in the *Federal Register* in November 2000 (Federal Register, 2000b). This proposed rule included land in the northwestern end of PMRF near Polihale State Park as critical habitat for the endangered ohai and lau’ehu. In January 2002, the U.S. Fish and Wildlife Service (USFWS) proposed critical habitat for additional plant species on Kauai and Niihau, revising the total number of plants to 83, which includes additional land in the southern portion of PMRF for protection of lau’ehu. (U.S. Fish and Wildlife Service, Pacific Region, 2002a; Federal Register, 2002) The USFWS reevaluated the dune habitat on PMRF and the habitat on Navy land at Makaha Ridge and determined that these lands were not essential for the conservation of ohai or dwarf iliau. However, the USFWS has determined that land on PMRF adjacent to Polihale State Park and dune areas along the southern portion of the range contain primary constituents necessary for the recovery of lau’ehu because not enough areas exist outside of PMRF. If the Navy revises its Integrated Natural Resources Management Plan to address the maintenance and improvement and long-term conservation of the lau’ehu, the USFWS will reassess critical habitat boundaries. (Federal Register, 2003)

Ohai (*Sesbania tomentosa*)

Ohai is a federally and state endangered member of the pea family that is endemic to Hawaii. Historically this species occurred on all of the main Hawaiian Islands but currently has been identified on Necker, Nihoa, Kauai, Oahu, Molokai, Maui, and Hawaii. Foraging by deer, cattle, sheep, and pigs may have extirpated the species from other islands. Ohai has been observed in Polihale State Park, adjacent to a state-owned pond south of the park, and in the sand dunes north of PMRF.

As stated above, the USFWS reevaluated the dune habitat in the northwestern end of PMRF near Polihale State Park as critical habitat for ohai and determined that these lands were not essential for its conservation (Federal Register, 2003).
Dwarf iliau (*Wilkesia hodyi*)

The dwarf iliau, a federally and state endangered member of the daisy or sunflower family, has been observed on rocky outcrops of the cliff overlooking Makaha Valley, to the north of the tracking station on Makaha Ridge. It occurs only on Kauai at elevations ranging from about 275 to 400 meters (902 to 1,312 feet). Threats to the dwarf iliau include habitat disturbance and browsing by feral goats. Threats to its survival could also include fire and naturally occurring events, such as landslides or hurricanes.

The USFWS recently reevaluated the habitat on Navy land at Makaha Ridge and determined that these lands were not essential for the conservation of dwarf iliau (Federal Register, 2003).

Lompoc Yerba Santa (*Eriodictyon capitatum*)

The federally endangered Lompoc yerba santa is a shrub in the waterleaf family that produces lavender flowers on sticky stems that can reach heights of 3 meters (10 feet). It grows in maritime chaparral and southern bishop pine forests in western Santa Barbara County, California. (U.S. Fish and Wildlife Service, 2002c)

The USFWS excluded approximately 2,126 hectares (5,253 acres) of critical habitat for the Lompoc yerba santa and Gaviota tarplant at Vandenberg AFB because the benefits of excluding the base from being designated as critical habitat for the two plant species were more significant. This decision was based on Vandenberg’s commitment to the development and implementation of the protective measures agreed to in their revised Integrated Natural Resource Management Plan, including the establishment of Sensitive Resource Protection Areas for the plants in the areas proposed for critical habitat designation. The monitoring, survey, enhancement, and restoration activities Vandenberg AFB will undertake that will provide additional benefits to the species and, in addition, will provide encouragement to Vandenberg for ongoing positive environmental protection programs and partnerships on base that may lead to future conservation. (U.S. Fish and Wildlife Service, 2002)

Gaviota Tarplant (*Hemizonia increscens* ssp. *villosa*)

The federally and state endangered Gaviota tarplant is a gray-green annual in the sunflower family that has yellow flowers and can grow to a height of 89 centimeters (35 inches). It occurs in rare needlegrass grasslands between Point Arguello and Gaviota, California on coastal terraces and along ridgeline saddles in the Santa Ynez Mountains. (U.S. Fish and Wildlife Service, 2002)

As stated above, land on Vandenberg AFB was excluded as critical habitat for the Gaviota tarplant.

**BIRDS**

**Short-tailed Albatross (*Phoebastria albatrus*)**

The short-tailed albatross is a very large seabird that is listed as endangered both federally and by the State of Alaska. There are no breeding populations in the United States, but several individuals have been regularly observed on Midway Atoll during migration and the breeding season. Midway Atoll is the only terrestrial area within U.S. jurisdiction that is currently used by the short-tailed albatross for attempted nesting. Single nests occasionally occur on the island.
Most summer sightings in Alaska are in the Aleutian Islands, Bering Sea, and Gulf of Alaska (State of Alaska Online, 2002b). The world population is estimated to be 1,200 (U.S. Fish and Wildlife Service, 2001).

Threats to the species include destruction of breeding habitat by volcanic eruption, mud or landslides caused by monsoons, and genetic vulnerability due to low population numbers and limited breeding distribution.

**Steller’s Eider (Polysticta stelleri)**

The Steller’s eider is a diving duck that has three distinct breeding populations: two in Russia and one (a small portion, less than 5 percent) in Alaska. The Alaskan population is listed as federally threatened due to a substantial decrease in size. Most of the world’s Steller’s eiders winter along the Alaskan Peninsula, an area that includes Kodiak Island and the Aleutian Islands. The Steller’s eiders spend most of the year in shallow, nearshore marine waters (Bureau of Land Management, 2002). Rafts of the eiders were primarily observed offshore of North and South Lagoons on Kodiak and offshore of Pasagshak Bay during surveys conducted in 1997 and 1998 (Alaska Aerospace Development Corporation, 1998).

Threats to the species include predation by ravens, gulls, and foxes in breeding areas; increased shipping traffic and disturbance of feeding flocks; and contaminants in the Bering Sea that affect food availability. (Bureau of Land Management, 2002)

**Hawaiian Duck (Anas wyvilliana)**

The federally and state endangered Hawaiian duck’s range formerly included all the main islands except Lanai and Kahoolawe. The only remaining natural population occurs on the island of Kauai, but the species has been successfully reintroduced to the islands of Oahu and Hawaii. Kauai supports the main population of the Hawaiian duck. The current population is estimated to be about 2,000 on Kauai. About 90 percent of the Kauai duck population uses montane stream habitat between elevations of 305 and 1,219 meters (1,000 and 4,000 feet). Habitat near PMRF includes the Mana pond, Mana ditches and drains, and pasture land near Kekaha. Individuals have also been observed in wetland areas (drains) on PMRF. (U.S. Fish and Wildlife Service, 2001; Pacific Missile Range Facility, Barking Sands, 1998)

The Hawaiian duck uses a variety of wetland habitats, from sea level to elevations of 1,067 meters (3,500 feet). Marshes, reservoirs, taro patches, streams and river valleys, flooded grassland, coastal ponds, mountain pools, bogs and forest swamplands, drainage ditches, and wet agricultural lands are used as habitat for feeding and nesting. Nesting may occur year round, but most nesting occurs in December through May. Concealed nests are built on the ground near water. U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The primary cause for the decline of the Hawaiian duck is the loss of wetland habitat and hunting. The Hawaiian duck is also limited by degradation of wetland habitat and introduced predators such as feral pigs, rats, and dogs that eat ducklings or disturb nests. Toxic chemicals may also adversely affect the species. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)
Hawaiian (American) Coot (*Fulica americana alai*)

The federally and state endangered Hawaiian coot is a subspecies of the common American coot. It is nonmigratory and is endemic to the Hawaiian Islands. The Hawaiian coot occurs on all the main islands (Hawaii, Maui, Molokai, Oahu, Lanai, Kauai, and Niihau) except Kahoolawe. The largest concentrations occur on Maui, Oahu, and Kauai. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The preferred habitat of the Hawaiian coot includes thickly vegetated fresh and brackish marshland and ponds. On PMRF, the Hawaiian coot is limited to wetland habitat along drainage ditches and settling ponds. Nesting occurs year round. Floating nests and platforms are built from aquatic vegetation. Feeding occurs at the water surface and by diving. The Hawaiian coot rarely flies. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The primary cause of the decline of the Hawaiian coot is the loss of wetland habitat. Natural and agricultural wetlands have been converted to drier agricultural use and developed for housing, resorts, and other urbanized use. Exotic plant species that invade the wetlands compete with the more desirable species and eliminate open water areas. Introduced predators have also had a negative impact on the population. Toxic chemicals from agriculture and other human activity may also be a threat. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

Hawaiian Common Moorhen (*Gallinula chloropus sandvicensis*)

The federally and state endangered Hawaiian moorhen is a non-migratory endemic species of the Hawaiian Islands. Its range is limited to Kauai, Oahu, and possibly Maui and Molokai. The species also occurs on the playa lakes and other natural and man-made lakes and ponds on Niihau. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

Preferred habitat of the Hawaiian moorhen includes thickly vegetated freshwater ponds, marshes, reservoirs, irrigation ditches, taro patches, and wet pasture. Areas below elevations of 125 meters (400 feet) are preferred. Available habitat is used for nesting, feeding, and loafing sites. Protected habitat for the Hawaiian moorhen is present on Kauai within the Hanalei and Huleia National Wildlife Refuges and at State bird sanctuaries such as the newly developed Kawaiele Sanctuary and the Mana base pond. Both of the latter locations are near PMRF. On PMRF, the Hawaiian moorhen is limited to wetland habitat along agricultural drainage ditches and settling ponds. Individuals have been observed foraging on the Mana base pond (near the north end of PMRF). (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The primary cause of the decline of the Hawaiian moorhen is the loss of wetland habitat. Other factors include introduced predators, disease, hybridization, and toxic contaminants. The introduced common myna is an egg predator, and the black crowned night heron may also be a predator of the Hawaiian moorhen. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)
Hawaiian Black-necked Stilt (*Himantopus mexicanus knudseni*)
The federally and state endangered Hawaiian black-necked stilt is endemic to the Hawaiian Islands. It is known to occur on all of the main islands except Kahoolawe. Protected habitat for the Hawaiian black-necked stilt is present on Kauai within the Hanalei and Huleia National Wildlife Refuges and at State bird sanctuaries, such as the newly developed Kawaeiele Sanctuary and the Mana base pond. Both of the latter locations are near PMRF. Additional habitat exists on Kauai at several reservoirs and agricultural areas. On PMRF, the Hawaiian black-necked stilt is limited to wetland habitat along agricultural drainage ditches and settling ponds. Individuals have been observed foraging on the Mana base pond (near the north end of PMRF).

Hawaiian black-necked stilts use a variety of wetland habitats and move between different locations daily. The different locations are used separately for feeding, loafing, and nesting. Feeding occurs in shallow, fresh, brackish, or salt water. Loaﬁng occurs in open mudﬂats, pickleweed mats, open pasture, islands in offshore mudﬂats, and in fresh or brackish ponds. Nesting occurs on sparsely covered ground adjacent to or on islands surrounded by fresh or brackish water. Irrigation reservoirs, settling basins, ponds, marshes, taro patches, silted ancient fish ponds, and salt evaporation pans are used as nesting locations. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The primary cause of the decline of the Hawaiian black-necked stilt is the loss of wetland habitat. The stilt is also limited by degradation of wetland habitat, introduced predators, and lack of suitable nesting habitat. The species may also be adversely affected by toxic chemicals. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

Hawaiian Goose (ne ne) (*Nesochen sandvincensis*)
The federally and state endangered Hawaiian goose is endemic to the Hawaiian Islands (Hawaii, Maui) and is the Hawaiian state bird. It almost became extinct in the wild by 1951 when the population was limited to 30 birds. A small introduced population is present at Makaha Ridge of the PMRF complex. This population had at least two breeding pairs with young in 1997, and appeared to be doing well in the open areas between buildings and other structures within the Makaha Ridge facility. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The Hawaiian goose frequents scrubland, grassland, golf courses, sparsely vegetated slopes, and open lowland country. The breeding season is from November to June. It appears to prefer nesting in the same nest area. Family groups remain in the breeding grounds for approximately 1 month. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

Threats to the species include predation by introduced species such as rats, dogs, cats, mongooses, and pigs. Poor available nutrition in their habitat may contribute to low productivity. (U.S. Fish and Wildlife Service, 2003)

Hawaiian Dark-rumped Petrel (*Pterodroma phaeopygia sandwichensis*)
This federally and state endangered subspecies of the dark-rumped petrel nests only in the Hawaiian Islands and in the Galapagos Islands. The Hawaiian dark-rumped petrel breeds in
burrows in barren areas high along large rock outcrops on mountain slopes. In the Hawaiian Islands, the Hawaiian dark-rumped petrel breeds on Kauai, Maui, Lanai, Hawaii, and possibly on Molokai. Nearly the entire known population of Hawaiian dark-rumped petrels, about 900 pairs, nests in colonies on Maui in or near Haleakala National Park. The potential numbers of Hawaiian dark-rumped petrels on Kauai are low; they are not expected to occur on or near PMRF. The breeding season is from March to October. During the breeding season, they come and go between the nest site and the ocean at night. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

 Threats to the species include predation by introduced mammals, development, ocean pollution, and disturbance to their breeding grounds (U.S. Fish and Wildlife Service, 2003).

**Newell's Townsend's Shearwater (Puffinus auricularis newelli)**

The federally threatened and state endangered Newell’s Townsend’s shearwater is endemic to the Hawaiian Islands. Breeding occurs on steep, forested slopes of Kauai, which is the primary location of breeding habitat for the Newell’s shearwater. Breeding grounds are typically at elevations of 152 to 701 meters (500 to 2,300 feet). The wetter side of the island is preferred. It nests in burrows, which are used year after year, usually by the same pair. Fledging occurs in October and November. Adults and fledging chicks fly between nesting areas and the ocean at night only. These flight corridors are considered critical habitat for the Newell’s shearwater. The Newell’s shearwater is not known to nest on or near PMRF or its associated facilities such as Makaha Ridge. However, it may cross the PMRF facilities during flights from the breeding grounds in the mountains to the ocean. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The greatest threat to the Newell’s Townsend’s shearwater population is predation by the mongoose and feral dogs and cats. Feral pigs also damage nesting grounds through rooting activity. Urbanization, especially near the coast, has had an adverse impact on breeding colonies of the Newell’s shearwater because bright outdoor lights cause fledglings to become disoriented on their flights to the ocean and possibly cause temporary night blindness. Disoriented fledglings may collide with power lines and other obstacles and fall to the ground. The Barking Sands-Kekaha area, in which PMRF is located, has recorded relatively low numbers of fallen birds. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

**Western Snowy Plover (Charadrius alexandrinus nivosus)**

The federally threatened western snowy plover breeds along the Pacific coast from southern Washington State to southern Baja California, Mexico. The majority breed along the California coast. They currently occupy beaches in the Santa Barbara area from Point Conception to Point Sal, Santa Rosa Island, and San Nicolas Island (County of Santa Barbara, Department of Planning and Development, 2003). The plover nests and forages year round on the beaches and intertidal zone of San Nicolas Island. Several beaches on San Nicolas Island have been designated as critical habitat for the western snowy plover. Nesting beaches are closed during the breeding season (March through September) and are monitored weekly to determine plover usage. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002; Sacramento Fish and Wildlife Service, 2003)
The western snowy plover is commonly observed in the Vandenberg AFB area, which provides nesting and roosting habitat. The USFWS has designated critical habitat for nesting snowy plovers in 28 areas along the coasts of California, Oregon, and Washington, including the beaches of Vandenberg AFB. Vandenberg AFB is developing a management plan in coordination with USFWS for beach closures during the snowy plover nesting season (1 March through 30 September). The nesting season extends from early March through late September and may be 2 to 4 weeks earlier in southern California than in Oregon and Washington. Nests typically occur in flat, open areas. (Sacramento Fish and Wildlife Service, 2003)

Threats to the Western snowy plover include shoreline modification, recreational activities such as the use of off-road vehicles and beach combing, and loss of nesting habitat. (Sacramento Fish and Wildlife Service, 2003)

California Brown Pelican (*Pelecanus occidentalis californicus*)

The federally and state endangered California brown pelicans breed in nesting colonies on islands free of mammal predators. Nesting is restricted to Gulf of California islands, along the outer coast from Baja California to West Anacapa, and Santa Barbara islands in Southern California. The breeding season is from March to August (County of Santa Barbara, Department of Planning and Development, 2003). Non-breeding pelicans occur along the Pacific Coast from the Gulf of California northward to Washington State and southern British Columbia.

Breeding habitat occurs on San Nicolas Island and the pelicans roost along the coastline, mainly along the eastern end of the island (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002). The California brown pelican is commonly observed in the Vandenberg AFB area, which provides winter roosting. The beach at the mouth of Shuman Creek is also occasionally used by the California brown pelican (Vandenberg Air Force Base, 2003). The pelicans also roost at Point Sal. (Sacramento Fish and Wildlife Service, 2003)

Threats to the California brown pelican include the decline in their food supply due to overfishing, entanglement with hooks and fishing lines, disturbance at roosting sites, disease outbreaks, and climatic changes. (Sacramento Fish and Wildlife Service, 2003)

California Least Tern (*Sterna antillarum browni*)

The federally and state endangered California least tern is a migratory bird that is present in Southern California from April to September. It migrates further south for the winter. The least tern nests in colonies on sandy open areas, near lagoons or estuaries, where fish are available. Least terns nest from mid-April through August along the western coast from San Francisco to Baja California, Mexico. It also forages in nearshore waters. Least terns have been observed in Shuman Creek on Vandenberg AFB, which is the main water body closest to the proposed project launch sites and which offers foraging areas. (Vandenberg Air Force Base, 2003)

Threats to the California least tern include habitat loss, human disturbance, predation, and climatic events (County of Santa Barbara, Department of Planning and Development, 2003).
AMPHIBIANS

California Red-legged Frog (*Rana aurora draytoni*)

The federally threatened California red-legged frog occurs in nearly all permanent streams and ponds on Vandenberg AFB, including the San Antonio Creek and the man-made Mod III Lake located south of Building 1819 on the southern edge of San Antonio Terrace. The California red-legged frog is found in surrounding riparian areas, as well as in freshwater ponds neighboring the area and Barka Slough. The California red-legged frog is also found in riparian wetland areas in the northwestern Vandenberg AFB portion near Minuteman Beach, and shows a preference for freshwater pools and ponds associated with arroyo willow, cattails, and other thickets of emergent aquatic vegetation. (U.S. Department of the Air Force, 1997b) In March 2001, the USFWS designated 1.6 million hectares (4.1 million acres) in 28 California counties as critical habitat for the threatened California red-legged frog, but excluded Vandenberg AFB since its integrated natural resource management plan provided adequate management for the on-base population (Jumping Frog Research Institute, 2001).

Threats to the California red-legged frog include the presence of exotic species such as the bullfrog and nonnative fish, human disturbance such as alteration of critical stream habitat features and commercial exploitation, and natural events (Vandenberg Air Force Base, 1997).

REPTILES

Loggerhead Sea Turtle (*Caretta caretta*)

The federally threatened loggerhead sea turtle is a large turtle similar to the green sea turtle. It occurs in oceans throughout the world. However, it is considered a visitor to the Hawaiian Islands and does not nest in the archipelago. Since it does not nest in the State of Hawaii, the state does not list the species as threatened or endangered. (Pacific Missile Range Facility, Barking Sands, 1998) The loggerhead may possibly occur in and around the U.S. Army Kwajalein Atoll (USAKA). Loggerheads are reported as far north as Alaska, in the eastern Pacific, and as far south as Chile. Occasional sightings are reported from the coast of Washington, but most records are of juveniles off the coast of California. Southern Japan is the only known breeding area in the North Pacific. (National Oceanic and Atmospheric Administration, Office of Protected Resources, no date)

Loggerhead sea turtles have been observed in the Point Mugu Sea Range at depths up to 1,000 meters (3,280 feet). Juvenile loggerhead sea turtles are common in the Sea Range, with the frequency of sighting increasing from July through September. Adult loggerheads are rare. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002) Most sightings of loggerhead sea turtles in northern United States waters are of juveniles. There have been several sightings from the Washington coast.

Threats to the loggerhead sea turtles include exploitation, loss of habitat, fishing practices, and pollution.

Green Sea Turtle (*Chelonia mydas*)

The federally threatened and state (Hawaii) endangered green sea turtle is found world-wide in warm seas. In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska. Green sea turtles are found along the coasts of Hawaii and basks and nests on PMRF adjacent to the Nohili Ditch (Pacific Missile Range Facility, Barking Sands, 1999;
Department of the Navy, Pacific Missile Range Facility, Hawaii, 2001). Ninety percent of the Hawaiian population of the green sea turtle returns to French Frigate Shoals to breed and nest (National Oceanic and Atmospheric Administration, Channel Islands National Marine Sanctuary, 2002). A number of green sea turtles live and forage within Midway’s lagoon, but nesting has not been recorded.

Sea turtles frequently enter the lagoon and are commonly seen in the harbors at Kwajalein and Roi-Namur. Green and hawksbill sea turtles have been observed on Kwajalein, but very little sea turtle nesting activity has been documented in recent years. At least two instances of nesting have been reported on Roi-Namur in recent years. Although some sandy beaches on the lagoon side of Meck provide potential sea turtle nesting habitat, no evidence of nesting has been observed. (U.S. Army Space and Strategic Defense Command, 1995)

Green sea turtles may forage in the kelp beds off western San Nicolas Island, but there are no known sea turtle nesting beaches on the island. Green sea turtles are sighted year round in the Point Mugu Sea Range in waters less than 50 meters (164 feet) deep, with more numbers being encountered from July through September. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

The green sea turtle forages and rests where food is abundant. Benthic algae and sea grasses, their main diet, grow in shallow water where there is sufficient sunlight and substrate. Resting habitat is near foraging habitat, in submarine caves or outcroppings where there is a sandy bottom. The Hawaiian population of green sea turtles is among the few known to haul out to bask on sandy beaches. Breeding and nesting occurs mainly in the summer. Nesting takes place at night on sandy beaches where the eggs are buried in the sand above the high water mark. Most females nest more than once in a season.

Threats to the green sea turtle include overharvesting by humans, habitat loss, fishing net entanglement, boat collisions, and disease (U.S. Fish and Wildlife Service, 2003).

**Leatherback Sea Turtle (Dermochelys coriacea)**

The federally and state (Hawaii) endangered leatherback sea turtle, a highly migratory species, is more pelagic than other species of sea turtles. This sea turtle is commonly seen by fishermen in Hawaiian offshore waters, generally beyond the 183-meter (100-fathom) curve but within sight of land. Sightings often take place off the north coast of Oahu and the Kona Coast of Hawaii. North of the Hawaiian Islands, a high seas aggregation of leatherbacks is known to occur at 35 to 45 degrees north, 175 to 180 degrees west. Because the leatherback sea turtle is not known to nest in the State of Hawaii, the state does not list the species as threatened or endangered. (Pacific Missile Range Facility, Barking Sands, 1998) The leatherback may possibly occur in and around USAKA.

Leatherback sea turtles may forage in the kelp beds off western San Nicolas Island, but there are no known sea turtle nesting beaches on the island. Leatherback sea turtles have been observed in the Point Mugu Sea Range in depths up to 1,000 meters (3,280 feet). Leatherback sea turtles are commonly seen in the Sea Range during July, August, and September. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)
Threats to the leatherback sea turtles include exploitation, loss of habitat, fishing practices, and pollution.

Hawksbill Sea Turtle (*Eretmochelys imbricata*)
The hawksbill sea turtle occurs in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. Hawksbill sea turtles occur in Hawaiian coastal waters year round. The species is a solitary nester, which makes population estimates difficult. It is known to nest on the main islands, primarily on several small sand beaches on the islands of Hawaii, Maui, and Molokai. Two of the sites are at a remote location in the Hawaiian Volcanoes National Park. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998) The hawksbill sea turtle is a rare visitor to Midway Atoll (Pacific Division, Naval Facilities Engineering Command, 1994). Hawksbill sea turtles have been observed on Kwajalein, but very little sea turtle nesting activity has been documented in recent years. (U.S. Army Space and Strategic Defense Command, 1995) Occasional sightings are reported from the coast of Washington.

Threats to the hawksbill sea turtle include illegal international trade of items made from this species, beach erosion, and coastal construction (U.S. Fish and Wildlife Service, 2003).

Olive Ridley Sea Turtle (*Lepidochelys olivacea*)
The range of the olive ridley is essentially tropical. In the eastern Pacific, nesting takes place from southern Sonora, Mexico, south at least to Colombia. Non-nesting individuals occasionally are found in waters of the southwestern United States. The olive ridley has been recorded occasionally from Galapagos waters, but is essentially very rare throughout the islands of the Pacific. The olive ridley forms great nesting aggregations generally known as “arribadas.” Not all adult olive ridley adults participate in the arribadas, but the vast majority of them do. The genus is unique in that both ridley species, Kemp’s and olive, commonly, and probably typically, nest each year without intervening non-breeding seasons as shown by other sea turtle species. (Pacific Missile Range Facility, Barking Sands, 1998)

Recent investigations show that ridleys reside in oceanic habitats of the eastern Pacific Ocean during the non-reproductive portion of their life cycle. The overall distribution of the olive ridley has parallels with that of the leatherback sea turtle. Both occupy oceanic habitat, and both nest primarily on Pacific shores of the American tropics and in the Guianas, in moderate numbers in tropical West Africa, and in relatively small numbers elsewhere, being extremely rare throughout Australia and the Pacific oceanic islands. (Pacific Missile Range Facility, Barking Sands, 1998) The olive ridley may possibly occur in and around USAKA.

Olive ridley sea turtles have been observed in the Point Mugu Sea Range in waters less than 50 meters (164 feet) deep, but they are rarely encountered. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

FISH

Tidewater Goby (*Eucyclogobius newberryi*)
The endangered tidewater goby is a small fish approximately 50 millimeters (2 inches) or less in length. It is restricted to waters less than 1 meter (3 feet) deep with low salinity in the coastal wetlands of California. (U.S. Fish and Wildlife Service, 2003) San Antonio Creek, located south of Building 1819, is one of the largest streams on base. Several freshwater marshes have been
recorded along the San Antonio that, along with the creek itself and the lagoon at its mouth, support both common and rare Vandenberg species; the tidewater goby can be found there (U.S. Department of the Air Force, 1997).

Threats to the existence of the tidewater goby include loss of saltmarsh habitat from coastal development, upstream water diversions resulting in salinity changes, groundwater drafting, and cattle grazing present. (U.S. Fish and Wildlife Service, 2003)

**Unarmored Threespine Stickleback (Gasterosteus aculeatus williamsoni)**

The federally endangered unarmored threespine stickleback is a small scaleless fish that has been eliminated from most of its natural range. Adults are approximately 2.5 centimeters (1 inch) long. San Antonio Creek, one of the largest streams on Vandenberg AFB supports the unarmored threespine stickleback. Several freshwater marshes have been recorded along the San Antonio that, along with the creek itself and the lagoon at its mouth, support both common and rare Vandenberg species; the unarmored threespine stickleback can be found there. (U.S. Department of the Air Force, 1997) This may represent the northern limit for the unarmored threespine stickleback, which uses adjoining feeder streams during the wet season (Pacific Pipeline System, Inc., 1996).

Threats to the unarmored threespine stickleback include loss of water quality, predation by larger non-native fish, and destruction of habitat.

**Bull Trout (Salvelinus confluentus)**

The federally threatened bull trout (Salvelinus confluentus) occurs in the Puget Sound. Bull trout have relatively specific habitat requirements and are found primarily in colder streams (below 15°C [59°F]). (U.S. Army Corps of Engineers, Seattle District, Regulatory Branch, 2002) Spawning begins in late August and ends in November in pristine headwater areas. Adults overwinter in mainstem rivers, lakes, or reservoirs before moving into saltwater in the spring. Newly hatched anadromous bull trout spend about 2 years in fresh water before they migrate to saltwater. (Port of Everett, 2001)

Bull trout are threatened by habitat degradation and fragmentation and interaction with introduced non-native fish such as brook trout.

**Chinook salmon (Oncorhynchus tshawytscha)**

The federally threatened Chinook salmon (Oncorhynchus tshawytscha) is found in the Puget Sound. Port Gardner, the lower Snohomish River, and the Everett Marina are located in the migration corridor of the Chinook salmon. Juvenile Chinook salmon migrate through the Snohomish River estuary during spring and summer outmigrations between May and late June. Adult Chinook move through the estuary from June through September. Chinook salmon spawn and rear young in fresh water, which then migrate to marine waters. (Port of Everett, 2001)

Threats to the chinook salmon include overfishing, increased sedimentation, and decrease in water quality.
MAMMALS

Northern Right Whale (*Balaena glacialis*)
The northern right whale is approximately (56 feet) long and are mainly black. It is found in both the Atlantic and Pacific oceans. Alaskan right whales feed in the northern Pacific waters during the summer and migrate to lower latitudes to calve. They eat zooplankton. (State of Alaska Online, 2001) It is unlikely that the northern right whale would be encountered in the Point Mugu Sea Range, which stretches from offshore San Luis Obispo County to offshore Los Angeles County. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

Right whales were hunted almost to extinction. It is not known if the current population of 100 to 500 whales is increasing, decreasing, or stable. (State of Alaska Online, 2001)

Steller Sea Lion (*Eumetopias jubatus*)
The federally endangered Steller sea lion is the largest member of the “eared seal” family. Steller sea lions have external ears and rear flippers that turn forward allowing them to “walk.” The average weight of a male Steller sea lion is 566 kilograms (1,245 pounds) and length 3.2 meters (10.6 feet). Adult females are approximately half the weight of a male. Females give birth to a single pup in mid-May to July. Steller sea lions eat a wide variety of fish and invertebrates. (State of Alaska Online, 2002d)

Steller sea lions were a primary source of food for Aleutian Island inhabitants, and some are still taken for food. The primary threats to the species are from commercial fisheries, subsistence, and illegal shooting. (State of Alaska Online, 2002d)

Sei Whale (*Balaenoptera borealis*)
The federally endangered sei whale is approximately 14 to 16 meters (46 to 52 feet) long and weighs between 20 to 25 metric tons (22 to 28 tons). The sei whale is commonly found in the open ocean and not inshore or in coastal waters. It feeds on shoaling fish, squid, and plankton. The sei whale is found in every ocean and sea in the world, although most are found in temperate and sub-tropical water. (Cetacea, 2003a) Sei whales are rare in California waters. There are no estimates of stock numbers of sei whales along the western coast of the United States, or in the eastern north Pacific (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002; National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 2003).

Threats to the sei whale include take by commercial whalers, offshore drift gillnet fisheries, and ship strikes. (National Oceanic and Atmospheric Administration, National Marine Fisheries, 2003)

Blue Whale (*Balaenoptera musculus*)
The federally endangered blue whale is the largest living animal. It can reach 30 meters (100 feet) in length and weigh 90,000 kilograms (200,000 pounds). The blue whale feeds on small shrimp-like krill. It is found in all of the world’s oceans. It is rarely seen north as far as the Chukchi Sea. It winters off the eastern north Pacific from central California northward to the Gulf of Alaska. (State of Alaska Online, 2002e) The blue whale may possibly occur in and around USAKA. The blue whale is extremely rare in Hawaii. The blue whale occasionally
occurs within 5.6 kilometers (3 nautical miles) of San Nicolas Island and is common in summer beyond 5.6 kilometers (3 nautical miles) west of the island. There are about 1,600 blue whales in the Point Mugu Sea Range during summer (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002).

Historic whaling, offshore drift gillnet, and ship strikes are the main past and present threats to blue whales. (National Oceanic and Atmospheric Administration, National Marine Fisheries, 2003)

**Fin Whale (Balaenoptera physalus)**

The federally endangered fin whale is the second largest of the whales. It is approximately 24 meters (79 feet) long. The fin whale is mainly dark gray or brown. It feeds on plankton, fish, and squid. The fin whale is found in every ocean in the world but is rarely seen inshore. (Cetacea, 2003b) The fin whale was recently observed, but further than 5.6 kilometers (3 nautical miles) off the coast of San Nicolas Island. There are about 1,600 to 1,500 fin whales in the Point Mugu Sea Range during summer. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

Historic whaling, offshore drift gillnet fishing, and ship strikes are the main past and present threats to fin whales. (National Oceanic and Atmospheric Administration, National Marine Fisheries, 2003)

**Hawaiian Hoary Bat (Lasiurus cinereus semotus)**

The federally and state endangered, endemic Hawaiian hoary bat is a subspecies of the hoary bat common to temperate north and south America. It has been recorded on the islands of Kauai, Oahu, Maui, and Hawaii. It is the only native land mammal of Hawaii. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998)

The Hawaiian hoary bat roosts in trees during the day and are apparently not selective of the tree species used. It has also been reported to use rock structures for shelter. The bats are most common in regions between sea level and elevation of 1,219 meters (4,000 feet) that receive 51 to 229 centimeters (20 to 90 inches) of rain per year. The bats commonly feed on flying insects concentrated by offshore winds. (Pacific Missile Range Facility, Barking Sands, 1998)

The Hawaiian hoary bat may occur at PMRF, but it has not been documented there. It is known to occur in Polihale State Park, to the north of PMRF, where it has been observed feeding on flying insects offshore. The kiawe/koa-haole vegetation that is dominant in the area around PMRF and on Niihau may potentially provide roosting habitat for the Hawaiian hoary bat. However, the bat is not species specific in selecting roosting habitat. (Pacific Missile Range Facility, Barking Sands, 1998)

Threats to the Hawaiian hoary bat include habitat loss, pesticides, predation, and roost disturbance (U.S. Fish and Wildlife Service, 2003).
Humpback Whale (*Megaptera novaeangliae*)

The federal and state endangered migratory humpback whale has an average length of 14.5 meters (47.5 feet) long (female) and 13.5 meters (44 feet) (males). The humpback whale are dark on top and have white pigmentation on their flippers, flukes, and sides. It feeds on small schooling fish as well as on krill. (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and State of Hawaii, Office of Planning, 1997) Humpback whales occur throughout the world in coastal and open ocean areas. It is known to use the channel between Kauai and Niihau. Approximately two-thirds of the North Pacific population of humpback whales winter in Hawaii. Humpbacks are seen in the winter months in the shallower waters surrounding the Hawaiian Islands, where they congregate to mate and calve. (Pacific Missile Range Facility, Barking Sands, 1998)

The humpback whale may possibly occur in and around USAKA. Humpback whales have also been seen within 5.6 kilometers (3 nautical miles) of San Nicolas Island. Approximately 220 feeding humpback whales are located in the Point Mugu Sea Range during summer. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

Hawaiian Monk Seal (*Monachus schauinslandi*)

The major reproductive population of the federally and state endangered Hawaiian monk seal occurs in the northwest islands of the Hawaiian archipelago, including Kure Atoll, Midway Atoll, and French Frigate Shoals. However, they also are known to occur at Johnston Atoll to the southwest of the Hawaiian Island chain. The Hawaiian monk seal’s primary breeding activity and pupping take place in the Northwest Hawaiian Islands, most of which are in the Hawaiian National Wildlife Refuge. (U.S. Fish and Wildlife Service, 2003; Pacific Missile Range Facility, Barking Sands, 1998) The first Hawaiian monk seal birth observed on a Kauai beach since 1993 occurred on PMRF in 1999 on the beach adjacent to the runway (Pacific Missile Range Facility, Barking Sands, 1999). Only four other Hawaiian monk seal births had been recorded on Kauai since 1961 (Navy Office of Information, 1999). The fact that humans frequent all beaches on PMRF may generally discourage use by monk seals. Approximately 45 to 55 Hawaiian monk seals live on Midway Atoll. Eastern and Spit islands are the main pupping areas. All of Midway Atoll, except for Sand Island and its harbor, has been designated as critical habitat for the Hawaiian monk seal.

The seals prefer undisturbed, sandy beaches where they can haul out to rest, give birth, and nurse young. Vegetation behind the beaches is also used as shelter. They are known to occasionally use hard substrate benches and exposed reefs for hauling out. Hawaiian monk seals may be more sensitive to human intrusion than other seal species. The degree of human disturbance may be one of the most important factors in selection of hauling-out habitat. Monk seals forage in shallow inner reef waters around coral structures, over offshore banks, and down bank slopes. They have been observed using habitat to 40 meters (22 fathoms). (Pacific Missile Range Facility, Barking Sands, 1998)

Threats to the Hawaiian monk seal include disturbance from human activities, interaction with fisheries (competition for prey or entanglement), mobbing attacks by males on adult and immature females, and predation by sharks (U.S. Fish and Wildlife Service, 2003).
**Sperm Whale (Physeter macrocephalus)**

The federally endangered sperm whale is the largest of the toothed whales. It is dark brown to gray in color. The sperm whale feeds on squid, octopus, and fish. It is located in all oceans of the world but rarely enters semi-enclosed or shallow seas. (Cetacea, 2003c) It may possibly occur in and around USAKA. Approximately 3,740 to 5,000 sperm whales may be present in the Point Mugu Sea Range in autumn and winter (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002). Sperm whales are found year round in California waters. The sperm whale is seen in every season except winter in Washington waters.

Historic whaling, offshore drift gillnet fishing, and ship strikes are the main past and present threats to sperm whales. (National Oceanic and Atmospheric Administration, National Marine Fisheries, 2003)

**Southern Sea Otter (Enhydra lutris nereis)**

The federally threatened southern sea otter is a member of the weasel family and is related to mink and river otters. Males weigh 32 to 41 kilograms (70 to 90 pounds). Female average weights range from 18 to 27 kilograms (40 to 60 pounds). The sea otter lives in shallow water along the shores of the North Pacific. Sea otters do not usually migrate. (State of Alaska Online, 2002) Sea otters inhabit intertidal and shallow, subtidal zones and are associated with kelp bed areas. A small resident breeding colony inhabits a kelp bed near Purisima Point on Vandenberg AFB. The southern sea otter can be found throughout the year in the kelp beds at the west end of San Nicolas Island and in smaller numbers off the north side of the island. Although the translocation project of 1987 to 1990 to waters off San Nicolas Island appears to have failed, the remaining population of approximately 17 individuals has been relatively stable. (Department of the Navy, Naval Air Warfare Center Weapons Division, 2002)

Sea otters are susceptible to drowning in gill nets in Washington's fisheries, but incidental takes are rare. Shooting, boat strikes, capture and relocation efforts, oil spills, and other toxic contaminants are the main threats to the species. (National Oceanic and Atmospheric Administration, National Marine Fisheries, 2003)

**Guadalupe Fur Seals (Arctocephalus townsendi)**

The federally threatened Guadalupe fur seal breeds along the eastern coast of Guadalupe Island west of Baja California. Births occur from mid-June through July. Individuals have been observed in the southern Channel Islands, including San Nicolas Island. (National Oceanic and Atmospheric Administration, National Marine Fisheries, 2002)

The major decline in the species was from commercial hunting.
APPENDIX I

TYPICAL STANDARD OPERATING PROCEDURES AND BEST MANAGEMENT PRACTICES

Numerous Standard Operating Procedures and Best Management Practices would be implemented as part of the Proposed Action. These types of actions are typically implemented as contract requirements. The following list is not intended to be all inclusive but rather provides a summary of the Standard Operating Procedures and Best Management Practices identified in the Ground-Based Midcourse Defense (GMD) Extended Test Range (ETR) Environmental Impact Statement (EIS) for one location, the Kodiak Launch Complex (KLC). Each installation identified in the EIS has similar Standard Operating Procedures and Best Management Practices that would be implemented as part of the Proposed Action.

Air Quality

Dust suppression measures could include the following:

- Periodically watering the areas being graded
- Minimizing unnecessary traffic
- Reducing vehicle speeds near the work areas
- Wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas
- Proper tuning and preventative maintenance of construction vehicles would also serve to minimize exhaust emissions and maximize vehicle performance

Alaska Aerospace Development Corporation’s (AADC’s) approved Standard Operating Procedures include the following:

- Personal protection equipment procedures

Department of Defense (DoD) requirements include the following:

- KLC Range Safety Officer would obtain approval from the Administrator, Federal Aviation Administration
- Provision would be made for surveillance of the affected airspace
**Biological Resources**
Standard Operating Procedures could include the following:

- Spill prevention, containment, and control measures while transporting equipment and materials

Best Management Practices for soil erosion control could include the following:

- Site preparation—vegetation preservation and protection, topsoil preservation, dust control, and temporary gravel construction entrance and exit
- Surface stabilization—temporary and permanent seeding and use of mulches and fabric and gravel blankets
- Runoff control and conveyance measures—installation of diversions, dikes, grassed waterways, and temporary slope drains
- Sediment barriers—straw bale and rock barriers, sediment fences
- Sediment traps and basins
- Stream protection—temporary stream crossings and streambank stabilization
- Protection of soil and fill storage piles

U.S. Fish and Wildlife Service monitoring recommendations for KLC’s launches will be reviewed and coordinated with AADC and if agreed to, will be conducted.

Safety crews and other personnel are briefed on the survey procedures as well as harassment guidelines established by the National Marine Fisheries Service to minimize harassment. The GMD ETR program would adhere to the terms and conditions imposed on AADC by these future National Marine Fisheries Service recommendations.

Spill control procedures would be established using KLC’s approved Standard Operating Procedures, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill. The procedures could include the following:

- Impermeable ground cover
- Spill containment berms

Spill control procedures would be established in accordance with KLC’s approved Spill Prevention Control and Countermeasure Standard Operating Procedures, and spill control kits would be present at the site in the unlikely event of a fuel leak or spill.

**Geology and Soils**
Best Management Practices would be used for erosion and sediment control, including the following:

- Storm water diversions
Hazardous Materials and Hazardous Waste

The following hazardous materials management techniques may be used during the construction period to minimize (1) the amount of hazardous materials stored, (2) the threat of their accidental and unplanned release into the environment, and (3) the quantity of hazardous waste generated:

- Structures may be prefabricated by manufacturers and shipped for final assembly at the site using bolts to minimize the need for welding, painting, and other activities involving hazardous materials.
- No underground tanks exist at KLC and none would be installed as a result of this activity. Diesel fuel would be stored in aboveground storage tanks with secondary containment and inspected daily in accordance with the provisions of the KLC spill prevention, control, and countermeasures plan (as appropriate). Aboveground storage tanks may be removed after tests are complete or put in standby condition at KLC to support future activities. Fueling would follow existing procedures to minimize the potential for fuel spills.
- Bulk hazardous materials [e.g., 210-liter (55-gallon) drums of anti-freeze, hydraulic fluid, compressed welding gases] would be stored in approved containers that meet National Fire Protection Association industrial fire protection codes and required containment systems.
- Spill response materials (e.g., sorbents, drain covers, mops, brooms, shovels, drum repair materials and tools, warning signs and tapes, and personal protective equipment) would be readily available for use in the event of an unplanned release.
- Storage of hazardous materials would be in protected and controlled areas designed to comply with site-specific spill prevention, control, and countermeasures plans.
- Hazardous materials would be inspected before accepting a shipment (e.g., to validate container integrity, expiration date, etc.).
- Hazardous materials would be purchased in appropriately sized containers (e.g., if the material is used by the can, it would be purchased by the can rather than in bulk-sized containers).
- Overpurchasing of hazardous materials would be avoided.
- Hazardous material containers would be appropriately labeled.
- At the completion of the construction period, unused amounts of hazardous materials would be the responsibility of the construction contractors and would be safely removed from the site.
Onsite waste management practices would include the following:

- The containerization of waste to prevent discharges of waste or leachate
- The prevention of litter
- Controlling access by wildlife or disease vectors
- Keeping the premises free of solid waste
- The use of best available management practices for the control and prevention of runoff and erosion

Emergency response actions would be in accordance with the KLC User's Manual.

Removal and disposal of nonhazardous and hazardous waste from KLC would be done in accordance with applicable state and federal requirements.

Hazardous materials management would be performed in accordance with ongoing KLC procedures, as described in the KLC User's Manual (Alaska Aerospace Development Corporation, 2001) and the Alaska Hazardous Waste Management Regulations (Alaska Administrative Code, Title 18, Environmental Conservation, Chapter 16).

Hazardous wastes would be collected for disposal in accordance with applicable federal, State of Alaska, and DoD requirements.

Specific restoration actions would be determined on a case-by-case basis in coordination with the procedures of KLC and the Alaska Department of Environmental Conservation.

Management of hazardous materials and hazardous waste would be performed in accordance with AADC requirements, and would not significantly impact existing KLC hazardous materials and hazardous waste management procedures.

Adherence to the existing hazardous materials and waste management systems on KLC would preclude the potential accumulation of hazardous materials or waste.

**Health and Safety**

Missile launches by their very nature involve some degree of risk and it is for this reason that DoD and AADC has specific launch to assure that any potential risk to the public and government assets (launch support facilities) are minimized.

Planning and execution of target launches would be in compliance with federal, state, and local health and safety requirements and regulations, as well as DoD and KLC Safety Policy.

Public access would be restricted in accordance with the KLC’s Interagency Land Management Agreement that encourages public access except in cases where safety is concerned or protection of structures is needed.
All components and equipment will be handled and shipped in accordance with applicable military, state, and Department of Transportation regulations.

Appropriate safety measures as established by AADC would be instituted at the receiving terminals or airport, including the following:

- Specified receiving and parking areas (for transport vehicles)
- Establishment and enforcement of applicable explosive safety quantity-distances around receiving areas
- Restricting handling and transportation of missile components to specific and properly trained personnel
- Using established and permitted transportation routes from the receiving terminal or airport to KLC

All personnel associated with the Proposed Action would be properly trained in compliance with applicable health and safety procedures and guidelines.

All pre-flight hazardous operations would be conducted in accordance with applicable and routine safety regulations and operations plans.

All preparation activities would be conducted in accordance with applicable safety regulations and operations plans.

Adherence to appropriate safety regulations and operating plans would serve to maintain health risks to mission personnel within the Range Commanders’ Council acceptable levels.

The transportation of the Exoatmospheric Kill Vehicle tanks containing liquid fuels and oxidizers would be conducted in accordance with state and federal regulations (49 Code of Federal Regulations (CFR) 106-180, University of Alaska, Fairbanks [UAF] Policy 902, Bureau of Explosives Tariff No. BOE 6000-1).

All personnel associated with the handling of the tanks and installation on the Exoatmospheric Kill Vehicle would be properly trained in compliance with UAF 601 and 29 CFR 1910 procedures and guidelines.

The implementation of AADC’s safety programs and practices at KLC before and during launch activities would limit the number of personnel exposed to increased hazards and, as a result, no significant health and safety impacts are expected.

If necessary, debris recovery activities would be conducted in accordance with DoD regulations and KLC safety plans and procedures and would not be expected to effect public health and safety.

Any potentially hazardous concerns remaining after a flight or flight termination would be handled in accordance with the KLC Safety Policy and Explosive Ordnance Disposal Plan.
Disposal activities would be in accordance with KLC Explosive Ordnance Disposal Plan, NPD 600.1 Transportation Management Guidelines and applicable state and federal regulations.

Potentially hazardous operations such as fueling of the generators would be conducted in compliance with the safety standards of the Occupational Safety and Health Administration, the Kodiak Safety Plan, and applicable range operating procedures.

Work practices, worker training and engineering controls, such as ventilation, would be used to further reduce the potential of beryllium exposure.

Adherence to AADC, Federal Aviation Administration, and DoD safety procedures relative to radar operations would preclude significant impact to health and safety.

Implementation of DoD and range safety and health plans and procedures during all phases of operation would avoid or reduce the probability of potential impact to health and safety.

Land Use
The siting and use of this area would take into account explosive safety quantity-distances and applicable safety criteria preventing incompatible activities or land use conflicts.

A Coastal Project Questionnaire for GMD ETR activities would be submitted to the State of Alaska to confirm that construction activities would be consistent with the Alaskan Coastal Zone Management Program, and the Kodiak Island Borough Coastal Management Program. Submission of the Coastal Project Questionnaire would be coordinated among AADC, the U.S. Army Corps of Engineers, and the Missile Defense Agency.

Furthermore, barge beach landings would comply completely with the standards of the Alaskan Coastal Management Program.

Delivery would be conducted under routine procedures in accordance with applicable Federal Aviation Administration and Department of Transportation safety standards to minimize any possible impacts to land use.

Necessary electromagnetic radiation hazard exclusion areas would be observed in accordance with DoD and U.S. Air Force standards, and the proposed locations would not produce a land use conflict.

Delivery would be conducted under routine procedures in accordance with applicable Federal Aviation Administration, and Department of Transportation safety standards minimizing any possible impacts to land use.

Transportation
Shipping and delivery would be conducted under routine procedures in accordance with applicable Federal Aviation Administration and Department of Transportation safety standards to minimize any possible impacts to transportation.
Security procedures will be established in accordance with AADC’s Interagency Land Management Agreement for property, which permits public exclusion during times of danger and assists in protecting structures.

**Infrastructure**

As part of pre-launch and flight activities, a Launch Hazard Area would be established around the launch site in accord with the AADC Interagency Land Management Agreement has for the property, which allows public access restrictions in cases of public safety and to protect structures.

In keeping with KLC procedures, any septic systems would likely include a mounded absorption bed.

Trained personnel using only appropriately certified cranes and other materiel handling equipment would handle missile components and handling equipment in accordance with approved Standard Operating Procedures.

**Water Resources**

Water quality-related Standard Operating Procedures that apply to each of the action alternatives include the following:

- Site preparation—vegetation preservation and protection, topsoil preservation, dust control, and temporary gravel construction entrance and exit
- Surface stabilization—temporary and permanent seeding and use of mulches and fabric and gravel blankets
- Runoff control and conveyance measures—installation of diversions, dikes, grassed waterways, and temporary slope drains
- Sediment barriers—straw bale and rock barriers, sediment fences
- Sediment traps and basins
- Stream protection—temporary stream crossings and streambank stabilization
- Protection of soil and fill storage piles

Standard Operating Procedures related to the handling, disposal, recycling, and other use of hazardous materials and wastes would be followed including spill prevention, containment, and control measures while transporting equipment and materials.

Other water quality-related Standard Operating Procedures to be followed include the following:

- The use of portable toilets and waste disposal practices during construction
- Rapid response, control and cleanup activities in the event of unplanned spills or accidents
- Worker education and training programs
The KLC Natural Resources Management Plan commitments include the following:

- Such measures as collecting and disposing of sewage offsite
- Monitoring of soil conditions
- Periodic inspection by a designee of AADC to ensure erosion and sediment control structures are working properly
- Hazardous waste management measures and offsite disposal
- Post-launch monitoring and revegetation of areas around launch sites if needed
APPENDIX J
DETERMINATION OF NON-APPLICABILITY
GROUND-BASED MIDCOURSE DEFENSE EXTENDED TEST
RANGE ENVIRONMENTAL IMPACT STATEMENT,
VANDENBERG AIR FORCE BASE, CALIFORNIA
The Clean Air Act (CAA), as amended in 1990, specifies in section 176(a) that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way, or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated under section 110 of this title. Conformity is defined in section 176(c) of the CAA as conformity to the State Implementation Plan’s purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards. These activities would not:

- Cause or contribute to any new violation of any standard in any area
- Increase the frequency or severity of any existing violation of any standard in any area
- Delay timely attainment of any standard or any required interim emission reduction or other milestones in any area

Air quality in the area of Vandenberg Air Force Base (AFB) is under the jurisdiction of the Santa Barbara County Air Pollution Control District (SBCAPCD). Santa Barbara has been classified as being in serious non-attainment with respect to federal ozone standards; however, Santa Barbara is currently in the process of being redesignated by the U.S. Environmental Protection Agency (EPA) as being in attainment for the federal ozone standard. Santa Barbara is also in non-attainment with respect to California Ambient Air Quality Standards (CAAQS) for ozone and particulate matter under 10 microns in diameter (PM-10).

Potential emissions are less than the federal de minimis (minimal) levels established in 40 Code of Federal Regulations (CFR) 51.853(b)(1). Additionally, maximum daily reactive organic gases and oxides of nitrogen levels are less than 10 percent of the SBCAPCD budget planning values.

No federal de minimis levels have been established for state non-attainment areas. However, potential emissions are less than the federal de minimis level for moderate federal PM-10 non-attainment.
Introduction

The analysis below is divided into three sections. Section one describes the methodologies used to project potential mobile emissions, missile preparation, launch emissions, and In-Flight Interceptor Communication System Data Terminal (IDT) construction and operation emissions. Section two addresses the federal de minimis thresholds and it was determined that the project activity emissions would be less than the de minimis thresholds. Section three addresses regional significance and how it was determined that project activity emissions would not be regionally significant. Sections two and three must be addressed separately because the de minimis thresholds are measured in tons per year, and SBCAPCD planning values for regional significance are measured in tons per day.

Various aspects of the project are unspecified at this time. This is intentional on the part of the project planner to allow maximum flexibility in actual operations. Due to this built-in operational flexibility, realistic emissions, while lower than theoretically possible emissions, are indeterminable. Therefore, this study uses the theoretical maximums. This follows the logic that if the projected maximum emissions are (1) less than the de minimis thresholds and (2) not regionally significant, then any level of activity less than these maximums will also meet the same requirements. In order to present a conservative estimate of environmental impact, the following assumptions are used throughout all sections of the study:

- The alternatives proposed do not specify the number of personnel required to attend each launch. However, an estimated monthly build-up of personnel has been proposed for dual and single launches. Personnel required for a dual and single Peacekeeper Target launch was used throughout this analysis.
- The proposed alternatives require the capability to launch up to five missiles per year (ground-based interceptors and/or targets). No further specifics of missile types or launch times are given. Therefore, this analysis assumes the missile with the highest level of emissions (Peacekeeper Target) would be launched for all five launches.
- This analysis assumes a maximum of one dual launch and three single launches of the Peacekeeper Target in a year.
- The proposed alternatives do not specify launch site. For the purpose of this analysis it is assumed that the personnel must travel the length of the base (approximately 30 miles) to and from the launch site for a total of 60 miles per launch.
- This study assumes that 1.5 personnel would travel in each vehicle to and from the launch site.

Mobile Emissions Methodology and Calculations

Projected vehicle emission factors were calculated using previous analysis in the Programmatic Targets Environmental Assessment and the California Department of Transportation model CT-EMFAC. The model was set up to calculate emission factors in 1 mile per hour (mph) increments from 3 to 65 mph. The model’s inspection and maintenance flag was turned on since vehicle inspection and maintenance occur within the county. The proposed action is a multiyear project. Vehicle emissions factors were calculated for the year 1997, as vehicles in 1997 would generate greater emissions than vehicles in the following years due to the “phasing-
out” of older (dirtier) vehicles. It is assumed that if the project met the *de minimis* levels with the older vehicles, then it would also meet them at reduced emission levels.

A temperature of 50°F was assumed for the vehicle emission factor calculations. Emission factors were calculated for support personnel commute vehicles. Summer and winter emission factors were calculated. Emission factors for personnel commute vehicles (81.1 percent light duty automobiles and 18.9 percent light-duty trucks) were used. The first 3.59 miles of each trip would use 100 percent cold-start emissions factors and the remainder would use the 0 percent cold-start/0 percent hot start (100 percent hot stabilized) emissions factors.

For each one-way trip made by support personnel commute vehicles, the first 3.59 miles use the emission factors from the 100 percent cold start run. The remaining 26.41 miles of the support personnel commute vehicle trips use the emission factors from the 0 percent cold start/0 percent hot start (100 percent stabilized) run.

The greatest emissions would be obtained if all vehicles traveled at low speeds. Therefore, emissions factors for 10 mph are used in these calculations. Actual speeds would probably be faster, which would result in fewer emissions.

The number of vehicles per month would vary with the type of launch and the number of missiles launched. With the launching of five launch vehicles in a year, a scenario involving a dual Peacekeeper launch and three single Peacekeeper Target launches was used. The build up for a dual Peacekeeper Target would be 25 personnel the first month, 90 the second month, and 175 the third month. For a single Peacekeeper Target launch, the build-up would be 25 the first month, 75 the second month, and 150 the third month. The number of vehicles was calculated using information from the CEQA Air Quality Handbook, average vehicle ridership is 1.5.

Using these calculations, the maximum emissions for two 30-mile trips (one 60-mile round trip commute) are listed in table J-1.

**Missile Emissions**

If used as a target, the fourth stage of a Peacekeeper target would utilize a single liquid propellant and require onsite fueling. Although total vapor emissions can vary depending on the propellant transfer equipment used and how it is assembled, it is anticipated that only very small amounts (approximately 10 grams [0.4 ounce]) of vapors would be released to the atmosphere during the transfer operation.

The assumption was made that 100 percent of the missile exhaust products are released at or near ground level. In reality, only a small portion of the exhaust products would be released in the launch area. Table J-2 lists exhaust emissions for the Peacekeeper Target (the largest of the proposed targets).
Table J-1: Mobile Emissions Data and Calculations (at 50ºF)

<table>
<thead>
<tr>
<th>Vehicles</th>
<th>Carbon Monoxide</th>
<th>Volatile Organic Compounds</th>
<th>Oxides of Nitrogen</th>
<th>Particulate Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Vehicle: Cold Start (first 3.59 miles)</td>
<td>91.31 grams/mile</td>
<td>7.99 grams/mile</td>
<td>2.79 grams/mile</td>
<td>0.01 grams/mile</td>
</tr>
<tr>
<td>1 Vehicle: Hot Stabilized (after first 3.59 miles)</td>
<td>9.24 grams/mile</td>
<td>1.59 grams/mile</td>
<td>0.93 grams/mile</td>
<td>0.01 grams/mile</td>
</tr>
<tr>
<td>1 Vehicle: Total (round-trip emissions)</td>
<td>1.14 kg</td>
<td>0.141 kg</td>
<td>0.69 kg</td>
<td>0.0006 kg</td>
</tr>
<tr>
<td>17 Vehicles Total</td>
<td>19.4 kg</td>
<td>2.4 kg</td>
<td>11.7 kg</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>60 Vehicles Total</td>
<td>68.4 kg</td>
<td>8.5 kg</td>
<td>41.4 kg</td>
<td>0.036 kg</td>
</tr>
<tr>
<td>117 Vehicles Total</td>
<td>134.0 kg</td>
<td>16.5 kg</td>
<td>80.7 kg</td>
<td>0.070kg</td>
</tr>
<tr>
<td>Total Vehicle Emission: Dual Target Launch</td>
<td>221.8 kg</td>
<td>27.4 kg</td>
<td>267.6 kg</td>
<td>0.116 kg</td>
</tr>
<tr>
<td>17 Vehicles Total</td>
<td>19.4 kg</td>
<td>2.4 kg</td>
<td>11.7 kg</td>
<td>0.010 kg</td>
</tr>
<tr>
<td>50 Vehicles Total</td>
<td>57.0 kg</td>
<td>7.1 kg</td>
<td>34.5 kg</td>
<td>0.030 kg</td>
</tr>
<tr>
<td>100 Vehicles Total</td>
<td>114.0 kg</td>
<td>14.1 kg</td>
<td>69.0 kg</td>
<td>0.060 kg</td>
</tr>
<tr>
<td>Total Vehicle Emission: Single Target Launch</td>
<td>190.4 kg</td>
<td>23.6 kg</td>
<td>145.2 kg</td>
<td>0.100 kg</td>
</tr>
</tbody>
</table>

Note: kg = kilograms

Table J-2: Potential Exhaust Emissions Peacekeeper Target

<table>
<thead>
<tr>
<th>Missile</th>
<th>Aluminum Oxide metric tons (tons)</th>
<th>Chlorine metric tons (tons)</th>
<th>Carbon Monoxide metric tons (tons)</th>
<th>Carbon Dioxide metric tons (tons)</th>
<th>Nitrogen Oxide metric tons (tons)</th>
<th>Hydrogen Chloride metric tons (tons)</th>
<th>Nitrogen metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peacekeeper Target</td>
<td>15.58 (17.17)</td>
<td>0.085 (0.093)</td>
<td>9.75 (10.75)</td>
<td>0.65 (0.72)</td>
<td>0.029 (0.030)</td>
<td>7.12 (7.85)</td>
<td>3.65 (4.03)</td>
</tr>
</tbody>
</table>

IDT Emissions

Construction for an IDT site would require the disturbance of approximately 5.9 hectares (14.6 acres). Potential construction emissions were determined by using emission factors from various sources including the EPA. Conservative estimates are based on building square footage, acreage disturbed, and duration of construction, as well as general meteorological and soil information. Table J-3 lists estimated carbon monoxide, oxides of nitrogen, volatile organic compounds, oxides of sulfur, and PM-10 emissions from construction equipment, earth moving and commuting workers anticipated during 7 months of construction. Best management practices including proper tuning and preventative maintenance of construction vehicles would serve to minimize exhaust emissions and maximize vehicle performance, as well as dust suppression measures such as periodically watering the areas being graded, minimizing unnecessary traffic, reducing vehicle speeds near the work areas, and wet sweeping or otherwise removing soil and mud deposits from paved roadways and parking areas.

It is anticipated that construction and launch emissions would not occur concurrently or in the same year.
Table J-3: Potential IDT Construction Emissions

<table>
<thead>
<tr>
<th>Emissions</th>
<th>7 Months metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>0.36 (0.40)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>1.6 (1.8)</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td>0.35 (0.39)</td>
</tr>
<tr>
<td>Oxides of Sulfur</td>
<td>0.11 (0.13)</td>
</tr>
<tr>
<td>PM-10</td>
<td>4.8 (5.3)</td>
</tr>
</tbody>
</table>

Operational power for the IDT would be provided by offsite commercial power sources; however, in the event of a loss of power, a 275-kW diesel generator would be used. Along with the generator itself, there would be a 3,785-liter (1,000-gallon) aboveground storage tank for fuel. Table J-4 lists the possible emissions associated with the use of this generator. The generator is assumed to be tested weekly during non-launch periods and used during power outages for approximately 200 hours a year.

Table J-4: Potential Generator Emissions for IDT Facilities

<table>
<thead>
<tr>
<th>Emissions</th>
<th>275-kW Diesel Generator</th>
<th>De Minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxides of Nitrogen</td>
<td>0.51 (0.56)</td>
<td></td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>0.63 (0.70)</td>
<td></td>
</tr>
<tr>
<td>PM-10</td>
<td>0.02 (0.03)</td>
<td></td>
</tr>
</tbody>
</table>

De Minimis Thresholds

The de minimis thresholds are federal limits listed in the 40 CFR 51.583(b)(1). If any of the project emissions would exceed these values, a conformity determination is required. Table J-5 defines the de minimis thresholds.

As shown in table J-5, total project emissions per year would be less than the federal de minimis thresholds. Therefore the project meets the de minimis requirement for non-applicability.

Regional Significance

Regional significance is the second part of the General Conformity analysis. Even if a project would emit less than the de minimis thresholds of all pollutants, it may still produce significant amounts of pollutants based on the area in which the project is to take place. Therefore, any action which produces 10 percent or more of an area’s budgeted amount for a federally non-attainment pollutant would be considered regionally significant and must conduct a conformity determination.

Santa Barbara County has been classified as being in serious non-attainment with respect to federal ozone standards; however, Santa Barbara County is currently in the process of being redesignated by the EPA as being in attainment for the federal ozone standard. Only the pollutants requiring budgeting are ozone and ozone precursors, specifically volatile organic compounds and oxides of nitrogen. Federal regulations refer to volatile organic compounds instead of reactive organic gases. There are minor differences between the two, but for the
purposes of this study they can be considered synonymous. Ozone is not addressed because the proposed actions would not generate ozone.

Table J-5: *De Minimis* Threshold and Potential Project Emissions

<table>
<thead>
<tr>
<th>Criteria Pollutant</th>
<th>De Minimis Threshold</th>
<th>Calculated Emissions (per year)</th>
<th>IDT Construction Emissions metric tons (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatile Organic Compound</td>
<td>45.4 metric tons (50 tons) per year in federal serious non-attainment area</td>
<td>0.10 (0.11)</td>
<td>0.35 (0.39)</td>
</tr>
<tr>
<td>Oxides of Nitrogen</td>
<td>45.4 metric tons (50 tons) per year in federal serious non-attainment area</td>
<td>2.80 (3.00)</td>
<td>1.6 (1.8)</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>90.7 metric tons (100 tons) per year in all federal non-attainment areas</td>
<td>49.9 (55.0)</td>
<td>0.36 (0.40)</td>
</tr>
<tr>
<td>Sulfur Dioxide or Nitrogen Dioxide</td>
<td>90.7 metric tons (100 tons) per year in all federal non-attainment areas</td>
<td>0</td>
<td>0.11 (0.13)</td>
</tr>
<tr>
<td>PM-10</td>
<td>90.7 metric tons (100 tons) per year in federal moderate non-attainment area</td>
<td>77.9 (85.8)</td>
<td>4.8 (5.3)</td>
</tr>
<tr>
<td>Lead</td>
<td>22.7 metric tons (25 tons) per year in all federal non-attainment areas</td>
<td>&lt; 1 (&lt;1)</td>
<td>0</td>
</tr>
</tbody>
</table>

Santa Barbara County’s budget planning values are presented as maximum daily emissions. The determination of regional significance is based on the maximum amount of amount of a pollutant emitted in a single day, which would be the launching of two Peacekeeper Targets in one day. Calculations include total emissions from two Peacekeeper Targets and mobile emissions stemming from personnel commuting to the launch site. Table J-6 lists the relationship between the daily budgeted amounts and potential emissions.

Table J-6: Regional Budget and Potential Emissions for Ozone Precursors

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Daily Budget metric tons (tons)</th>
<th>10 Percent of Budget metric tons (tons)</th>
<th>Potential Emissions metric tons (tons)</th>
<th>Regionally Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxides of Nitrogen</td>
<td>37.53 (41.37)</td>
<td>3.753 (4.137)</td>
<td>0.91 (1.0)</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Organic Gas</td>
<td>10.80 (11.91)</td>
<td>1.080 (1.191)</td>
<td>0.027 (0.030)</td>
<td>No</td>
</tr>
</tbody>
</table>

Potential project emissions would not amount to 10 percent or more of SBCAPCD’s budget planning values for oxides of nitrogen or reactive organic gases. Therefore, this program would not be regionally significant.

In conclusion, the estimated emissions due to the proposed Extended Test Range would not exceed the *de minimis* thresholds and would not be regionally significant. Therefore, it should be ruled as being exempt from the requirement for a Conformity Determination due to non-applicability as defined 40 CFR 51.853(c)(1) and CFR 51.853(i).
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