2.0 Alternatives Including the Proposed Action

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The decision to be supported by this NMD EIS is whether to deploy a land-based NMD system, to include a selection of sites from among the alternatives studied in this EIS. Information related to these decisions is described in this chapter under the NMD deployment concept, the No-action Alternative, and the NMD element deployment alternative site locations.

The Preferred Alternative would be deployment of an NMD system at one GBI site with up to 100 silos. If this alternative is selected, the preferred site location for the GBI and BMC2 would be Fort Greely, Alaska. Under this configuration, the XBR would be at Eareckson Air Station (AS) (Shemya Island), Alaska. Under the Preferred Alternative, the NMD system would make use of the existing Early Warning Radars upgraded for NMD and the existing satellite detection systems that would be in place at the time of deployment. Since the IFICS Data Terminals locations have not been identified, no preferred location has been selected. Table 2-1 provides an overview of the site locations for the Preferred Alternative analyzed in this EIS.

Table 2-1: NMD Deployment Preferred Alternative

GBI	BMC2	IFICS Data Terminal	XBR	UEWR	Space-Based Detection System
Preferred Alternative—1 GBI Site with up to 100 Silos					
Fort Greely, Alaska	Fort Greely, Alaska	Not Identified	Eareckson AS, Alaska	Beale AFB, California Cape Cod AFS, Massachusetts Clear AFS, Alaska	Defense Support Program/Space-Based Infrared System Satellites

2.1 NMD OBJECTIVES

The primary mission is defense of the United States against a limited strategic ballistic missile attack. The means to accomplish the NMD mission are as follows:

- Deploy an NMD system that meets the ballistic missile threat at the time of a deployment decision
- Detect and track the launch of enemy ballistic missiles

- Continue tracking of ballistic missiles using ground-based radars
- Engage and destroy the ballistic missile warhead by force of impact above the earth's atmosphere

2.2 NMD DEPLOYMENT CONCEPT

This section provides a general description of the NMD deployment concept, the primary and secondary support elements required for operation, personnel requirements, and operational activities for each element.

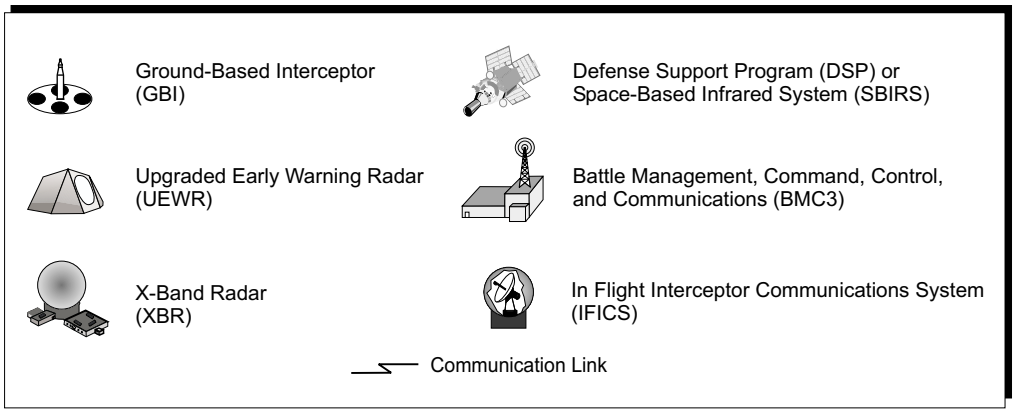
The NMD system would consist of five elements: GBIs; BMC3, which includes the BMC2, communication lines, and IFICS Data Terminal as subelements; XBRs; UEWR; and a satellite detection system (Defense Support Program satellites/SBIRS). All elements would work together to respond to a ballistic missile attack directed against the United States (figure 2.2-1). The NMD system would require deployment of the GBI, BMC2, IFICS Data Terminal, and fiber optic cable line. The NMD system would use the existing operational space-based detection system and UEWRs (table 2.2-1).

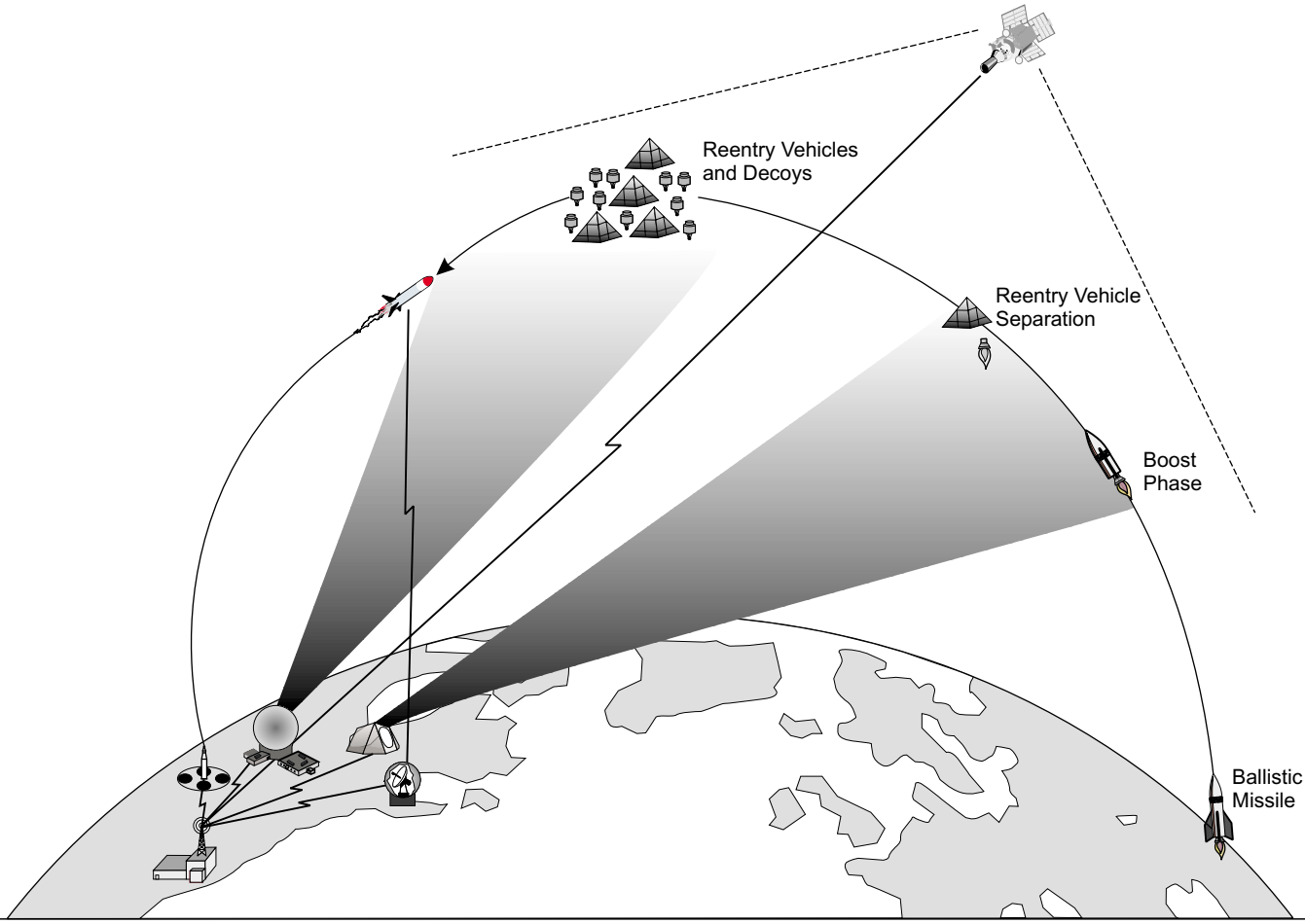
Table 2.2-1: NMD Deployment Element Requirements

NMD Element	NMD Element Requirement
Ground-Based Interceptor	1 site with up to 100 silos in Alaska or North Dakota; or 1 site with up to 100 silos in Alaska and 1 site with up to 100 silos in North Dakota
Battle Management, Command and Control	1 site with Ground-Based Interceptor
In-Flight Interceptor Communications System Data Terminal	Approximately 14 sites
X-Band Radar	1 site
Upgraded Early Warning Radar	Up to 5 sites using existing systems
Defense Support Program/Space-Based Infrared System	Space-based detection system

2.2.1 GROUND-BASED INTERCEPTORS

The GBI is the "weapon" of the NMD system. Its mission is to intercept incoming ballistic missile warheads outside the earth's atmosphere (exoatmospheric) and destroy them by force of the impact. No explosives or nuclear warheads would be used. During flight, the GBI is sent information from the NMD BMC2 to update the location of the incoming ballistic missile, enabling the GBI onboard sensor system to





EXPLANATION

Land

Water

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

The NMD Concept of Operations

Figure 2.2-1

identify and home-in on the target. The GBI element would include the interceptor and associated launch and support equipment, silos, facilities, and personnel. The GBI missile has two main components: an exoatmospheric kill vehicle and a solid propellant booster.

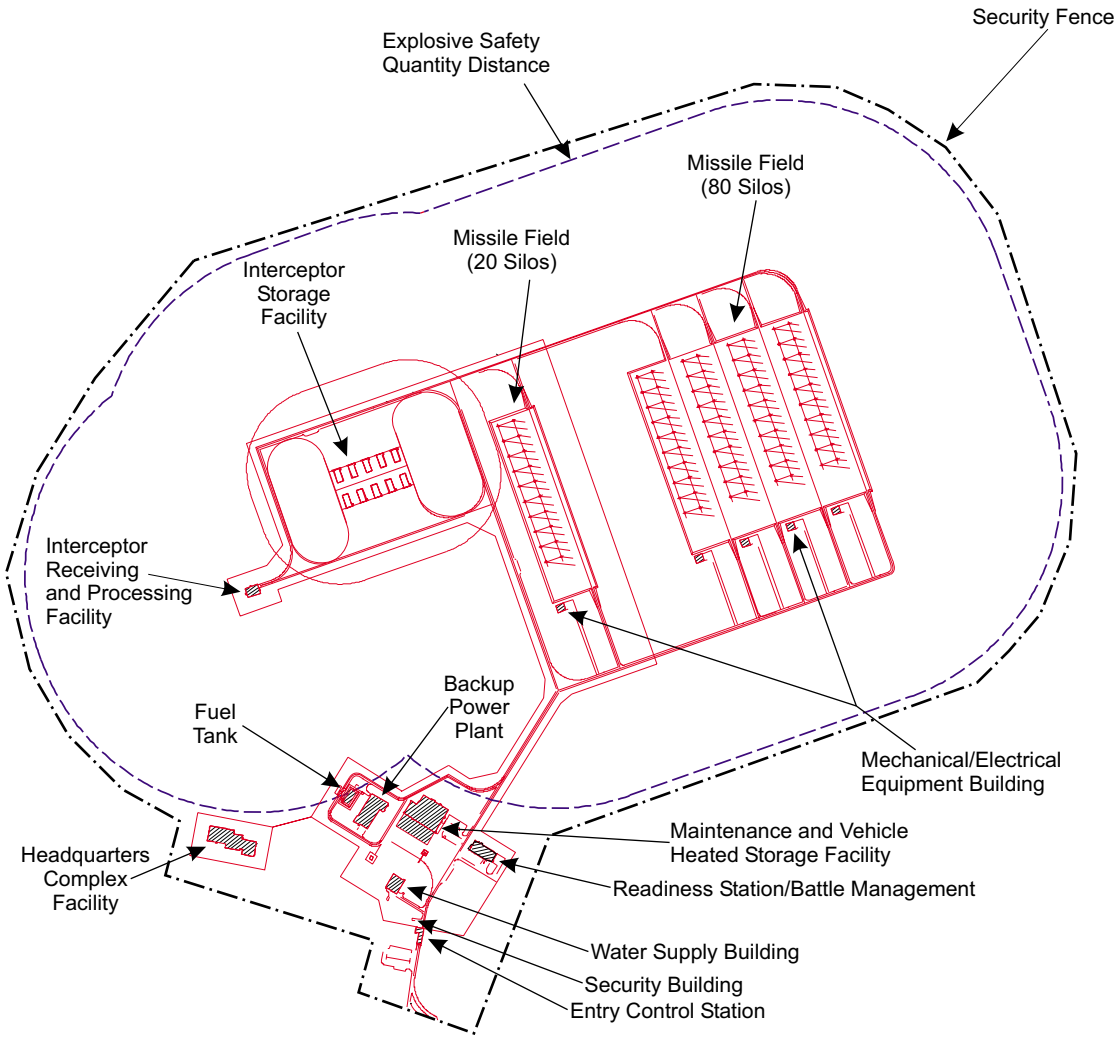
2.2.1.1 Ground-Based Interceptor Facility Design

Under the Proposed Action, up to 100 silos would be constructed at the GBI deployment site in either Alaska or North Dakota or up to 100 silos at one site in Alaska and up to 100 silos at one site in North Dakota. The GBI site would contain launch stations (silos), an Interceptor Receiving and Processing Facility, an Interceptor Storage Facility, and additional support facilities. Figure 2.2.1-1 and table 2.2.1-1 provide an overview of the GBI facilities. Because final designs of the GBI have not yet been completed, the final deployment facility requirements may change.

2.2.1.2 Operational Concept

The interceptor would remain in the underground launch silo until launch (figure 2.2.1-2). Launches would occur only in defense of the United States from a ballistic missile attack. There would be no flight testing of the missiles at the NMD deployment site. The GBI would be contained within a canister before shipment to the deployment site. The technical status of each missile would be monitored and required maintenance conducted onsite and/or at the contractor's offsite integration facility. Interceptors within the sealed canister in storage would be used to replace missiles requiring repair or selectively removed for reliability testing. Reliability testing would consist of removing the missile and inspecting for readiness. When the GBI site becomes fully operational, the total site-related employment would be 250 to 360 direct jobs. These jobs would consist of military and contractor support maintenance personnel. Operations at the GBI site would consist of maintenance of facilities, equipment, and missiles to ensure operational readiness of the system.

The GBI would consist of a multi-stage solid propellant booster and a non-nuclear exoatmospheric kill vehicle that would destroy an incoming warhead by force of impact. Each interceptor missile would contain between 12,700 and 19,278 kilograms (28,000 and 42,500 pounds) of class 1.1 or 1.3 propellant. The liquid propellants in the exoatmospheric kill vehicle, used for kill vehicle control, are expected to weigh approximately 9 to 14 kilograms (20 to 30 pounds). These liquid propellants would consist of monomethylhydrazine and nitrogen tetroxide. No storage or fueling of the liquid propellant would occur at the deployment site.



EXPLANATION

— — Explosive Safety Quantity Distance

—·— Security Fence

Ground-Based Interceptor, Conceptual Facility Layout

NORTH

Scale

0 656 1,312 Feet

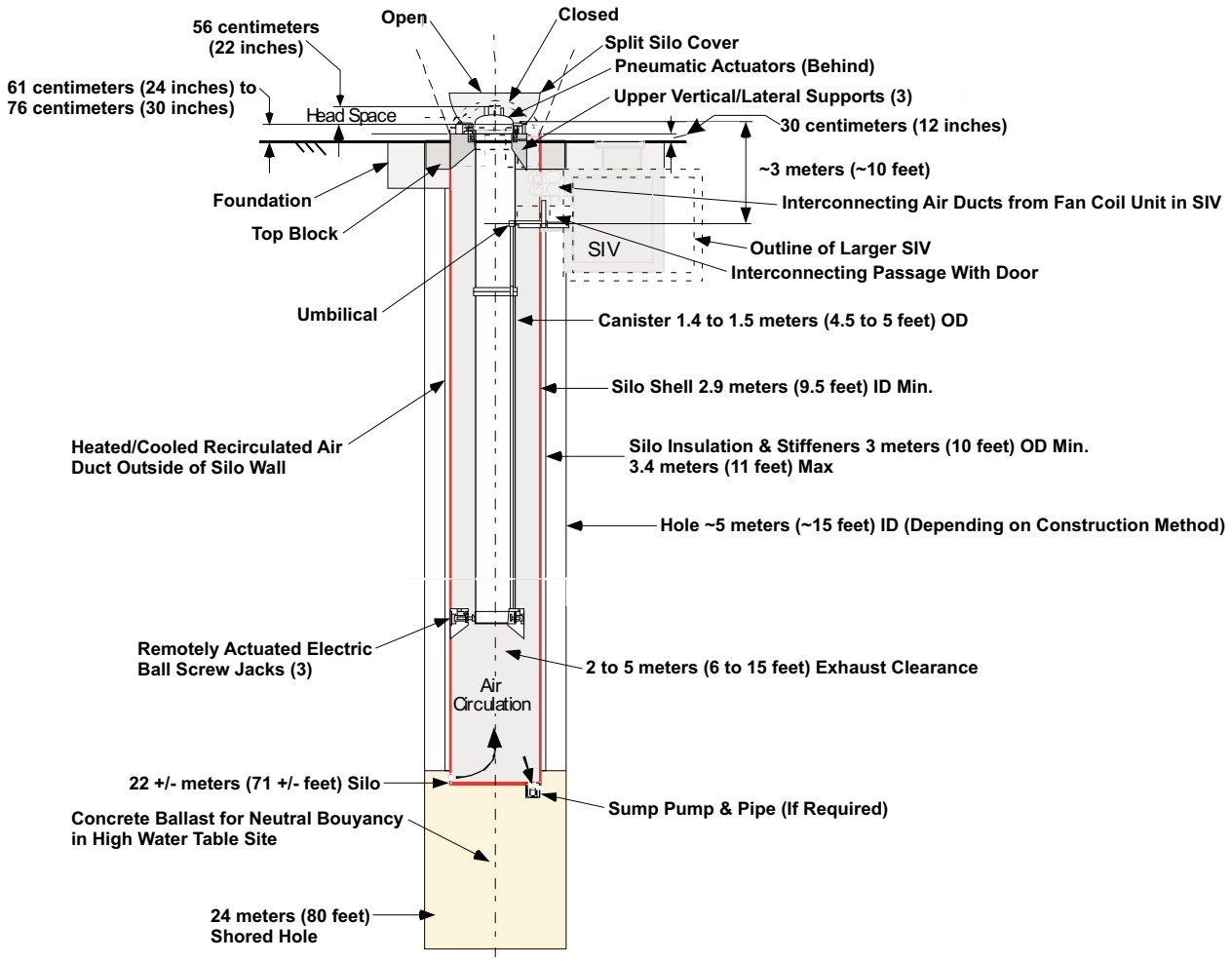
0 200 400 Meters

Figure 2.2.1-1

Table 2.2.1–1: Ground-Based Interceptor Facility Requirements

Facility	Facility Requirements[1]	Facility Activities
Missile Field	100 silos with interface vault; silos would be up to 479 meters (1,570 feet) from inhabited buildings and up to 171 meters (560 feet) from any other interceptor support facility	Ground-Based Interceptor launch area
Interceptor Receiving and Processing Facility	1,003 square meters (10,800 square feet); would be up to 479-meter (1,570-foot) explosive safety zone to inhabited facilities; up to 171-meter (560-foot) safety zone to storage facilities and silos	Missile receiving and checkout area; liquid propellant fuel leak handling area
Interceptor Storage Facilities	10 structures, 2,787 square meters (30,000 square feet) total; would be up to 479-meter (1,570-foot) explosive safety zone to inhabited facilities; up to 171-meter (560-foot) safety zone to storage facilities and silos	Provide storage for Ground-Based Interceptor in canister for extended periods
Readiness Station	2,323 square meters (25,000 square feet)	Operational center for Ground-Based Interceptor complex
Security Building	1,161 square meters (12,500 square feet)	Site security
Administration and Maintenance Facility	4,970 square meters (53,500 square feet)	Houses Ground-Based Interceptor maintenance and support functions
Mechanical/Electric Equipment Building	5 structures at 1,115 square meters (12,000 square feet) each	Maintenance facility
Entry Control Station	279 square meters (3,000 square feet)	Security entry point
Power Facility	4,180 square meters (45,000 square-feet)	Provides site electrical power
Headquarters Facility	1,486 square meters (16,000 square feet)	Site administration
Fuel Unloading Facility	46 square meters (500 square feet)	Fuel unloading
Water Supply Building	1,022 square meters (11,000 square feet)	Provides site water supply

[1] Facility size is approximate.



EXPLANATION

OD = Outside Diameter
ID = Inside Diameter
SIV = Silo Interface Vault

Ground-Based Interceptor Silo, Conceptual Layout

Not to Scale

Figure 2.2.1-2

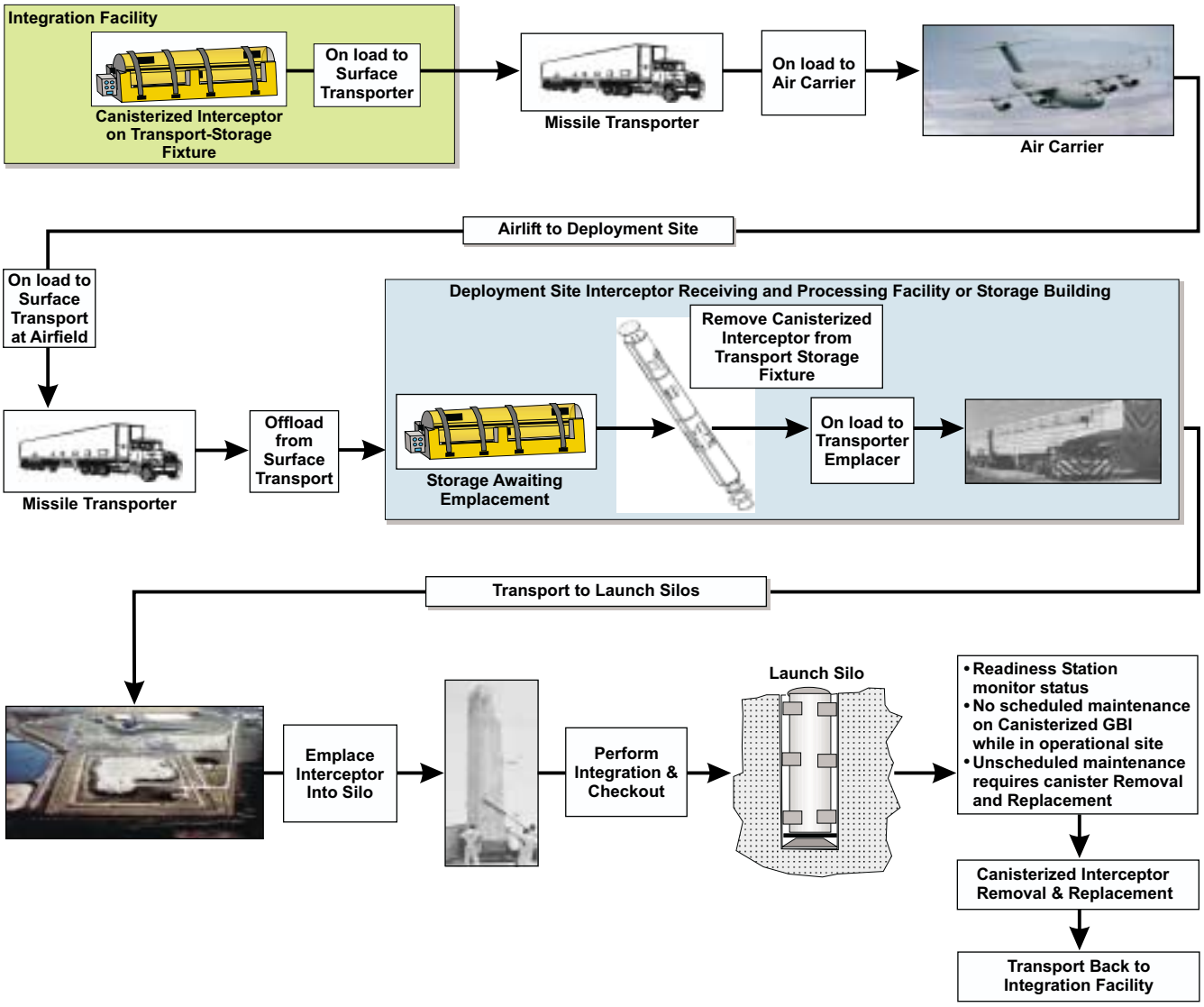
The entire GBI (solid propellant boosters and fueled exoatmospheric kill vehicle) would be integrated and loaded, ready for use, into a canister at the integration facility before shipment to the deployment site. This canister is a proven approach being used on the Trident and Peacekeeper programs. The canister would be shipped to the site in a specially designed container/transporter using commercial carriers or government transportation. The mode of transportation would be by aircraft, truck, or both, depending on the site selected. After the initial deployment flights of 50 for the 100 canisters, approximately 20 airlift operations (10 flights to deployment base and 10 return flights) could be expected per year as part of routine maintenance. A monitoring system would be installed on the canisters to provide timely and accurate notification on leakage. All shipping would be conducted in accordance with U.S. Department of Transportation regulations.

Once at the deployment site, the canister and GBI would be inspected at the Interceptor Receiving and Processing Facility for potential damage that may have occurred during shipment. Once the GBI is verified as operational within the canister, it will be transported to the silos using a transporter emplacer. Using the same procedures employed in Minuteman missile removal and emplacement, the canisterized interceptor would be inserted into and removed from the silo using the transporter emplacer. Figure 2.2.1-3 provides an overview of the transportation and deployment operations for the GBI. During operations, up to 10 canisterized interceptors would be stored in the Interceptor Storage Facilities for use as replacements. At all times there would be a system monitoring the liquid propellants on the GBI for potential leaks. Any leaks detected would be remediated quickly.

The GBI would depend on existing site infrastructure support if available, at the location selected. Once deployed, the GBI system would be essentially a dormant system. The GBI would use minimum dedicated utilities for environmental control of the silos, GBI storage, and activities associated with readiness. Power to the site would be by a combination of DOD and commercial offsite power facilities. Emergency power would be supplied by a backup battery system and onsite backup generators.

Hazardous Materials and Hazardous Waste/Wastewater Discharge

Hazardous materials that may be associated with the GBI site activation and deployment activities include protective coatings, lubricants and oils, motor and generator fuels, cleaning agents (isopropyl alcohol), backup power batteries, adhesives, and sealants. These materials would be used in periodic inspection and preventative maintenance to interceptor support systems, such as power supplies, environmental control systems communication systems, and security systems. If maintenance is required on the GBI itself, it would be returned to the manufacturer.



EXPLANATION

GBI = Ground-Based Interceptor

Ground-Based Interceptor Deployment Concept

Figure 2.2.1-3

Monomethylhydrazine and nitrogen tetroxide liquid propellants would be used in the GBI exoatmospheric kill vehicle. These materials would be contained within the kill vehicle and would not be released at the deployment site except in the unlikely event that a system leak occurred. A fully trained hazardous materials response team would be onsite to respond to such an event.

Water discharge would be associated with storm water runoff from the impervious surfaces built as part of the GBI site. Storm water runoff and wastewater discharge would be evaluated and appropriate treatment systems installed as required in accordance with local, state, and Federal requirements.

Safety Systems

Specific safety plans would be developed to ensure that each operation is in compliance with applicable regulations. Overall safety measures would be developed by the facility user to ensure the general public and site personnel would be provided an acceptable level of safety. Provided below are the main safety requirements that would be in place for the GBI site.

Fire Protection System. Fire protection, alarm, and fire suppression systems would be provided to all GBI facilities as appropriate.

Security. Security requirements are an integral component of program safety. Security measures would be incorporated within the project design and operational procedures. Elements of site security would include a perimeter security fence, clear zone, security lighting, security standby power, intrusion detection system, and security patrol roads. The security fence would be approximately 3 meters (10 feet) high. The clear zone on the inner side of the fence would contain remotely operated lights and cameras. On either side of the security fence, the surrounding vegetation would be cleared up to 46 meters (150 feet).

Quantity-Distance Criteria. Explosive Safety Quantity-Distance (ESQD) criteria are used to establish safe distances from explosive hazard areas to nonrelated facilities and roadways. These criteria are established by the DOD. For analysis purposes for this EIS, the ESQD for the GBI silos, the Interceptor Receiving, and Processing Facility and Interceptor Storage Facility was based on a 479-meter (1,570-foot) ESQD from inhabited buildings (see figure 2.2.1-1). However, once the GBI design testing is complete, the required ESQD in accordance with DOD criteria may be less than the 479-meter (1,570 foot) distance.

Launch Safety. To ensure an accidental launch of a GBI does not occur, the system would have a human in control at all times in addition to software and hardware safety systems. Additionally, stringent DOD

operating procedures, which prevent launch by any one person, would be followed.

2.2.2 BATTLE MANAGEMENT, COMMAND AND CONTROL

The BMC2, a subelement of the BMC3, is the "brains" of the NMD system. It supplies the means to plan, select, and adjust missions and courses of action. In the event of a launch against the United States, the NMD system would be controlled through the BMC2. The BMC2 subelement provides the extensive decision support systems, battle management displays, and situation awareness information. Surveillance satellites and ground radars locate targets and communicate tracking information to battle managers, who process the information and communicate target assignments to interceptors.

2.2.2.1 Battle Management, Command and Control Facility Design

The site location BMC2 subelement would be located with the GBI element. The primary facilities required for the BMC2 would occupy approximately 743 square meters (8,000 square feet) and would require electrical power from the base or the GBI site.

2.2.2.2 Operational Concept

The BMC2 operations would consist mostly of battle management functions associated with the NMD system and would act as the centralized point for readiness, monitoring, and maintenance. BMC2 provides the user system status displays, threat displays, predictive planning displays, and weapons control data to support NMD command and control decisionmaking and execution of these commands at the site level.

The Command-Level BMC2 site would be integrated into the Cheyenne Mountain Operations Center with connectivity to other BMC2 sites at one or more Service Component Centers (e.g., Air Force, Army, and Navy) and one site location deployed near the NMD main support base. BMC2 sites are planned to be operational 24 hours a day, and each node would require a total of approximately 30 personnel.

Hazardous Materials and Hazardous Waste/Wastewater Discharge

The primary facilities associated with BMC2 would be administrative in nature and would not use or generate any hazardous materials or waste except that associated with the operation of the electrical generator and backup batteries.

2.2.3 IN-FLIGHT INTERCEPTOR COMMUNICATIONS SYSTEM

The IFICS Data Terminal is a subelement of the BMC3 element and would be geographically distributed ground stations that provide communications links between the in-flight GBI and the BMC2.

Approximately 14 individual IFICS Data Terminal sites would be required to support the NMD system. Two IFICS Data Terminals are required per region to meet NMD reliability requirements. Four or more IFICS Data Terminals could be located at the GBI site to meet reliability and communication requirements. The location of the IFICS Data Terminal is based upon analysis of the regions from which a hostile ballistic missile could be launched against the United States.

2.2.3.1 In-Flight Interceptor Communications System Facility Data Terminal Design

An IFICS Data Terminal would be approximately 7 meters (20 feet) tall and would consist of a radio transmitter/receiver enclosed in an inflatable radome adjacent to the equipment shelters. The facilities required for an IFICS Data Terminal site are provided in figure 2.2.3-1 and table 2.2.3-1. An IFICS Data Terminal facility would require an area of 2 hectares (6 acres) or up to 7 hectares (17 acres) if two terminals are required at one site. Because final design of the IFICS Data Terminal has not yet been completed, the final deployment facility requirements may change.

Table 2.2.3–1: In-Flight Interceptor Communications System Facility Requirements

Facility	Facility Requirements[(1)]	Facility Activities
IFICS Data Terminal Building	7-meter (20-foot) tall structure, total 186 square meters (2,000 square feet). Includes radome, equipment room, mechanical room with one 175-kilovolt generator with fuel tank.	Transmitter/receiver to in-flight Ground-Based Interceptors. Electronic equipment, provide backup electrical power, heating, and air conditioning
Vestibule	9 square meters (100 square feet)	Entry, restrooms
Perimeter Security and Surveillance	2.4-meter (8-foot) security fence with intrusion detection system	Provides site security

(1) Facility size is approximate.

2.2.3.2 Operational Concept

The IFICS Data Terminal is a radio transmitter that would not transmit except when a GBI would be launched to intercept an incoming ballistic missile warhead. Power to an IFICS Data Terminal site would be by commercial offsite power with emergency power being supplied by a backup battery system and onsite backup electrical generators; however,

In-Flight Interceptor Communications System, Conceptual Facility Layout

Figure 2.2.3-1

if required for remote sites without commercial power, the onsite electrical generators would operate full-time.

Hazardous Materials and Hazardous Waste/Wastewater Discharge

Other than the diesel fuel and occasional maintenance of the diesel powered electrical generator and associated backup batteries, no hazardous materials or waste 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. If maintenance is required, a new tube would be brought onsite and the replaced tube sent back to the manufacturer for repair. Depending on the site selected for deployment, either portable toilets or a sanitary discharge system may be required.

Safety Systems

Specific safety plans would be developed to ensure that each operation is in compliance with applicable regulations. Overall safety measures would be developed by the facility user to ensure the general public and temporary site maintenance personnel would be provided an acceptable level of safety.

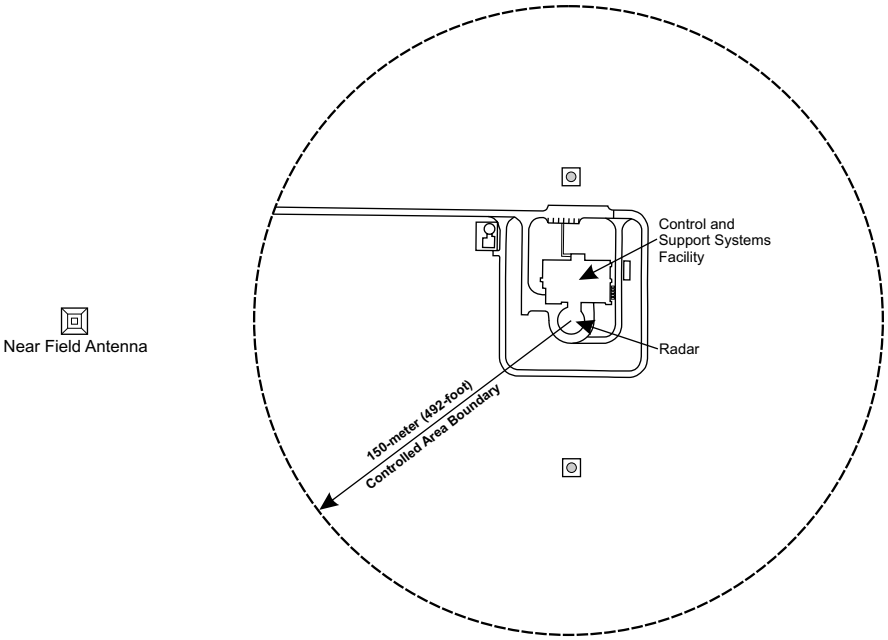
Security. Security requirements are an integral component of project safety. Elements of site security would include a perimeter security fence, clear zone, security lighting, security standby power, intrusion detection system, and security patrol roads. The security fence would be approximately 2.4 meters (8 feet) high. On either side of the security fence, the surrounding vegetation would be cleared to 15 meters (50 feet). Additional vegetation clearance may be required depending on line-of-sight requirements at each site.

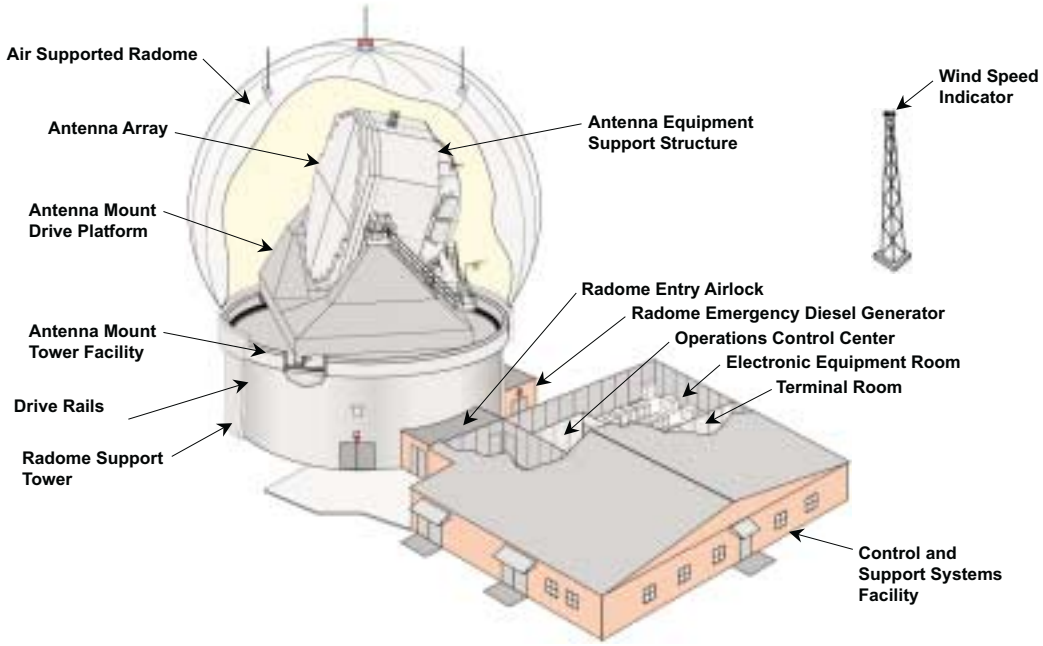
2.2.4 X-BAND RADARS

The XBRs would be ground-based, multi-function radars. For NMD, they would perform tracking, discrimination, and kill assessments of incoming ballistic missile warheads. XBRs use high frequency and advanced radar signal processing technology to improve target resolution, which permits the radar to discriminate against threats. The XBR would provide data from earlier phases of an intercontinental ballistic missile's trajectory and real-time in-flight tracking data to the BMC2.

2.2.4.1 X-Band Radar Facility Design

The XBR site would include a radar on an antenna mount inner tower facility and associated support facilities, and a 150-meter (492-foot) controlled area boundary. These requirements would encompass an area of approximately 7 hectares (17 acres). The primary facilities required for the XBR site are provided in table 2.2.4-1 and figure 2.2.4-1.





EXPLANATION

Wind Speed Indicator

150-meter (492-foot) Controlled Area Boundary

X-Band Radar, Conceptual Facility Layout

Scale

0 148 296 Feet

0 46 91 Meters

Figure 2.2.4-1

dp_xbr_001

Because final design of the XBR has not yet been completed, the final deployment facility requirements may change.

Table 2.2.4–1: X-Band Radar Facility Requirements

Facility	Facility Requirements[1]	Facility Activities
Radar	27-meter (90-foot) diameter antenna mount track tower; a 34-meter (110-foot) base diameter radome	Radar operations
Control and Support System Facility	5,574 square meters (60,000 square feet)	Provides operational control of radar and security
Near Field Antenna	18 meters (60 feet) tall; 4 to 5 meters (14 to 18 feet) square	Support radar test and calibration
Wind Speed Indicator Towers	Two 24-meter (80-foot) towers; 0.3-meter (1-foot) diameter; guy wires	Windspeed indicators for radome pressurization system

[1] Facility size is approximate.

2.2.4.2 Operational Concept

The XBR would be radiating during a ballistic missile threat, testing, exercises, training, or when supporting collateral missions such as tracking space debris or a Space Shuttle mission. When the XBR site becomes fully operational, the total site-related employment would be approximately 70 direct jobs (30 military and 40 contractors) depending on the site selected. Power to the site would be by commercial offsite power plants, if available, with emergency power being supplied by onsite backup electrical generators. If local and emergency power are not available, then onsite generators would be required for primary power. To maintain radar operating temperature, approximately 26,498 liters (7,000 gallons) of cooling water would be required. This cooling water would be in a closed looped system and consist of a 50/50 mixture of antifreeze (propylene glycol or ethylene glycol) and water, which would be replaced as required.

The XBR transmit/receive radiation pattern would be a narrow beam with most of the energy being contained within the main beam. Lesser amounts of energy could be emitted in the form of grating or side lobes in the area around the main beam. Each main beam would consist of a series of electromagnetic pulses. The main beam would be able to operate in 360 degrees. At no time would the beam be directed toward the ground.

Hazardous Materials and Hazardous Waste/Wastewater Discharge

Hazardous materials that may be expected to be associated with the XBR site activation and deployment activities include paints, lubricants and

oils, solvents, ethylene or propylene glycol, and fuel/backup batteries associated with power generation. Storm water runoff and wastewater discharge would be evaluated and appropriate treatment systems installed as required in accordance with local, state, and Federal requirements.

Safety Systems

Specific safety plans would be developed to ensure that each operation is in compliance with applicable regulations. Overall safety regulations would be developed by the facility user to ensure the general public and site personnel would be provided the required level of safety. The main safety requirements for the XBR site are provided below.

Fire Protection System. Fire protection, alarm, and fire suppression systems would be provided to the entire XBR complex.

Security. Security requirements are an integral component of project safety. Security measures would be incorporated within the project design and operational procedures. Elements of site security would include a perimeter security fence, clear zone, security lighting, security standby power, intrusion detection system, and security patrol roads. On either side of the security fence, the surrounding vegetation would be cleared up to 46 meters (150 feet).

Electromagnetic Radiation Safety Distances. Electromagnetic radiation (EMR) safety zone distance considerations are driven by concern for personnel, equipment, and environmental exposure to EMR. Positive actions would be taken in the operation of the XBR to ensure exposure levels are in accordance with safety guidelines. These controls would consist of the following:

- Ground level exposure to the main beam EMR would be eliminated by establishing a minimum beam elevation. This would eliminate hazardous EMR at ground level.
- Computer software programs would be used to ensure power densities would be in accordance with prescribed safety standards.
- The XBR would be sited or operational mitigations implemented so as not to interfere with sensitive electronic equipment, on-ground electroexplosive devices, or ordnance storage.

Airspace Requirements

Airspace around the XBR would be noted on aeronautical charts as a high energy radiation area to inform pilots of potential electromagnetic interference hazards to certain aircraft. This airspace would be approximately 6.7 kilometers (4.2 miles) around the radar unit.

2.2.5 UPGRADED EARLY WARNING RADAR

As part of the NMD system, there would be a requirement to upgrade the existing early warning radars at Clear AFS, Alaska, Beale AFB, California, Cape Cod AFS, Massachusetts, and other potential locations to be determined. These early warning radars, also referred to as "PAVE PAWS", are phased-array surveillance radars and are currently used to detect, track, and provide early warning of sea-launched ballistic missiles. They are also used to track satellites and space debris. Hardware and software modifications are planned for these existing radars in conjunction with the NMD system. A detailed description of the proposed changes and the potential environmental impacts was addressed in a Supplement to the NMD Deployment Draft EIS. The supplement was circulated for public and agency review. The final analysis for the upgraded Early Warning Radar has been incorporated into this Final EIS as Appendix H—UEWR Analysis. The Air Force is in the process of preparing an EIS to address modernization, maintenance, and sustainment of operations of the Early Warning Radars.

In addition, some of the existing early warning radars are not protected against high altitude electromagnetic pulse. The exact requirements for the radars have not been developed but could include shielding the radar equipment and modernizing power plants and internal electronic components of the radars. It is likely that power plant modernization would include replacing the existing facility with a more efficient, cleaner burning power plant. Once specific details of the modifications are defined, separate site-specific analysis, as required, would be performed.

2.2.6 EARLY WARNING SATELLITES

Existing Defense Support Program satellites provide the U.S. early-warning satellite capability. The satellites are comparatively simple, inertially fixed, geosynchronous earth orbit satellites with an unalterable scan pattern. For the NMD program, the Defense Support Program satellites would acquire and track ballistic missiles throughout their trajectory. The information from the satellites would be provided to the BMC2 subelement. SBIRS would replace the Defense Support Program satellites sometime in the next decade. NMD would use whichever system is in place when a deployment decision is made and can use a combination of the two if the transition is still in progress.

2.2.7 SPACE-BASED INFRARED SYSTEM

SBIRS would be an additional system that future NMD systems would utilize. SBIRS is currently being developed by the Air Force independently of NMD as part of the early warning satellite system upgrade, which would replace the Defense Support Program satellites. For the NMD program, the SBIRS constellation of sensor satellites would

acquire and track ballistic missiles throughout their trajectory. This information would provide the earliest possible trajectory estimate to the BMC2 subelement. See section 1.6.1 regarding environmental documentation prepared for this system.

2.2.8 NMD TESTING, TRAINING, AND EXERCISE CAPABILITY

For the NMD program, a Test, Training, and Exercise Capability would be implemented. This program would replicate the operational capability of the NMD system and would provide for system element integration and system personnel training for operation of the NMD system. This capability would require hardware (i.e., computers) and software to support the system testing and training. The Test, Training, and Exercise Capability would be located within the proposed GBI and XBR facilities required for NMD and within existing operational and test facilities and command centers that would support NMD. No modification to these facilities would be required except for the addition of computer and other simulation equipment. Some initial existing sites proposed for this training would include Cheyenne Mountain AFS and the Joint National Test Facility in Colorado; the Software Integration Facility, Huntsville, Alabama; Meck Island on Kwajalein Atoll; and within the proposed UEWR sites.

2.2.9 NMD SUPPORT FACILITIES/INFRASTRUCTURE

2.2.9.1 NMD Element Support Infrastructure

Depending on the deployment area selected, GBI, XBR, and BMC2 elements may require additional support infrastructure. Support facilities could include steam and heating plant, water supply, power generation, fuel storage area, sewage treatment, lodging and dining, readiness station, recreation, warehouse, vehicle storage and maintenance, fire station, and hazardous materials/waste storage. If the NMD element is located at or adjacent to an existing military installation with a support infrastructure in place, minor new support facilities could be required. If the NMD element is located at a remote location, then new support facilities for personnel and element operation would be required. Details about the support facilities are discussed under the potential element deployment sites. Personnel requirements to operate the support base could range from 50 to 150 depending on the facility requirements.

2.2.9.2 Fiber Optic Cable Line (Communication Lines)

To provide a communication link between the NMD system elements, fiber optic cable line would be required on both land and water. Some of the fiber optic lines currently exist and are in operation as part of the nationwide commercial telecommunication network. The new cable installation on land, whether installed below the surface or on the surface, will be per regional telecommunication specifications because

commercial providers would be installing and providing the NMD telecommunication service. For underwater ocean installations, the fiber optic cable line would be buried at a depth of 1 meter (3 feet) or more for ocean depths up to 1,372 meters (4,500 feet) to avoid interference with fishing equipment and activities. For ocean depths greater than 1,372 meters (4,500 feet), cable burial would not be necessary. The underwater installation would be performed by a commercial fiber optic cable line installation company per regional guidelines.

2.2.10 BASIC CONSTRUCTION REQUIREMENTS

For NMD, basic construction principles and off-site manufacturing would be used to reduce the effects of construction operations. Depending on the size of construction activities for a site, construction equipment laydown and staging areas would be established. During construction, this area would be fenced and used for the contractors' village, with temporary mobile offices, equipment storage, maintenance facilities, parking, and other construction needs.

General construction contractors requirements for the NMD construction period are provided in detail under each element site location description.

2.2.11 DECOMMISSIONING AND DISPOSAL

The NMD system is anticipated to be an active system that would remain in the DOD inventory for as long as there is a potential threat. However, the system may go through periodic improvements that may require decommissioning and disposal of obsolete elements or components. Upon reaching the conclusion of its effective service life, the element or component would be withdrawn from military service, decommissioned, and disposed. Some components could be evaluated for continued use by other U.S. Government agencies (for example, U.S. Customs, National Aeronautics and Space Administration), or as candidates for Foreign Military Sales. Various adaptive reuses could be analyzed and implemented if appropriate. If no appropriate requirements are identified, the NMD elements or components would be demilitarized and disposed of as excess to the needs of the Government. Demilitarization is the act of destroying a system's offensive and defensive capabilities to prevent the equipment from being used for its intended military purpose. Disposal is the process of redistributing, transferring, donating, selling, abandoning, destroying, or any other disposition of the property. Decommissioning of the site could also include removal of all structures and infrastructure and site restoration, as required.

Demilitarization of the components of the NMD system would be performed in accordance with DOD Directive 4160.21-M, *Defense Reutilization and Disposal*; DOD Directive 4160.21-M-1, *Defense*

Demilitarization Manual; procedures developed by the Command(s) responsible for managing the NMD system elements and associated equipment; and applicable state and local procedures.

Key items that could be demilitarized include explosives, propellants and propellant fillers, toxic materials, incendiary or smoke content, other military design features, and any features determined to be hazardous to the general public. In order to ensure freedom from explosive, toxic, incendiary, smoke, or design hazards, the process would be undertaken as economically as practicable and in accordance with existing environmental standards and safety and operational regulations.

The actual demilitarization and disposal of the components of the NMD system may be accomplished by a Government depot or contractor. The Command(s) responsible for managing each NMD element would initiate the demilitarization and disposal process. For the NMD program, a Pollution Prevention Plan is being prepared identifying all hazardous materials in the NMD system. A copy of this Pollution Prevention Plan would be provided to the depot or contractor performing the demilitarization and disposal. It would be the responsibility of the depot or contractor to identify, remove, segregate, package, and document all hazardous materials in the item. In the case of a depot, disposal of hazardous materials would be through Government channels as described below. When a contractor is utilized, hazardous material disposal would be processed through commercial channels in compliance with all Federal, state, and local laws.

When a depot performs the demilitarization and disposal functions, disposal of hazardous and nonhazardous materials (with the exception of any radioactive materials) would be through a Defense Reutilization and Marketing Office. The Defense Reutilization and Marketing Office would physically accept and process all property that falls within the Defense Reutilization and Marketing Office area of responsibility. The Defense Reutilization and Marketing Office would be responsible for disposing of hazardous materials in accordance with Federal, state, and local laws, utilizing best management practices.

Transportation of NMD system components to demilitarization and disposal locations from military units, training, and maintenance locations would be by commercial ground transportation in accordance with U.S. Department of Transportation, state, and local transportation and safety regulations and procedures. Transportation for some demilitarization and disposal could be performed by military aircraft in accordance with U.S. Department of Transportation and U.S. Air Force regulations and procedures, and/or by U.S. Navy, commercial, or U.S. Army ships in accordance with U.S. Department of Transportation and applicable regulations and procedures.

2.3 NO-ACTION ALTERNATIVE

The No-action Alternative is not to deploy the NMD system. If the deployment decision made is not to deploy, the NMD program would use the time to continue to enhance the existing technologies of the various system elements. The NMD program would also have the option to add new elements if and as they are developed.

Since the SBIRS Program requirements are independent of NMD, they would continue even if the decision is not to deploy the NMD system. Separate environmental documentation has been prepared by the Air Force for this program (see section 1.6.1).

For the potential sites being considered for NMD deployment, the No-action Alternative would be a continuation of activities currently occurring or planned at those locations. At the time a subsequent deployment decision is made, each site would be reviewed to determine if site conditions still permit deployment of the NMD elements.

2.4 PROPOSED ACTION

The Proposed Action is to deploy and operate an NMD system. Figure 2.4-1 provides an overview of the potential deployment locations of the NMD elements under the Proposed Action. NMD element deployment could make use of the existing SRMSC anti-ballistic missile site in North Dakota or selected military installations in Alaska. As system elements and threats continue to evolve, potential locations for system elements may change to meet system requirements; however, all sites will receive an appropriate environmental analysis.

Provided below are the NMD element deployment locations being considered for the NMD system for the Proposed Action. Under the Proposed Action, the United States Government would select the required elements from the locations described below. As noted in section 2.0, the Preferred Alternative would be for the GBI and BMC2 to be located at Fort Greely, Alaska and the XBR at Eareckson AS, Alaska. The NMD system would make use of the existing Early Warning Radars. A description of the potential UEWR locations for the Proposed Action is provided in appendix H.

2.4.1 GROUND-BASED INTERCEPTOR DEPLOYMENT ALTERNATIVES

For the NMD system, one GBI element deployment location in Alaska or North Dakota or one GBI site in both Alaska and North Dakota would be selected from the sites listed below.

Ground-Based Interceptor (GBI)

- Clear AFS, Alaska
- Fort Greely, Alaska
- Yukon Training Area (Fort Wainwright)/Eielson AFB, Alaska
- Grand Forks AFB, North Dakota
- Stanley R. Mickelsen Safeguard Complex, North Dakota
  - Missile Site Radar (MSR)

Battle Management, Command and Control (BMC2)

- Clear AFS, Alaska
- Fort Greely, Alaska
- Yukon Training Area (Fort Wainwright)/Eielson AFB, Alaska
- Grand Forks AFB, North Dakota
- Stanley R. Mickelsen Safeguard Complex, North Dakota
  - Missile Site Radar (MSR)

X-Band Radar (XBR)

- Eareckson AS, Alaska
- Stanley R. Mickelsen Safeguard Complex, North Dakota
  - Cavalier AFS
  - Missile Site Radar (MSR)
  - Remote Sprint Launch Site (RSL) 1
  - Remote Sprint Launch Site (RSL) 2
  - Remote Sprint Launch Site (RSL) 4

In-Flight Interceptor Communications System (IFICS)*

- Alaska
- North Dakota

Upgraded Early Warning Radar (UEWR)**

- Clear AFS, Alaska
- Beale AFB, California
- Cape Cod AFS, Massachusetts

EXPLANATION

*Note: Identification of potential IFICS locations is still in progress. Locations depicted are those regions under consideration. Other regions may be identified depending on system requirements.

**Note: Identification of other potential locations outside of the United States is still in progress.

Not to Scale

NORTH

NMD Element Deployment Options

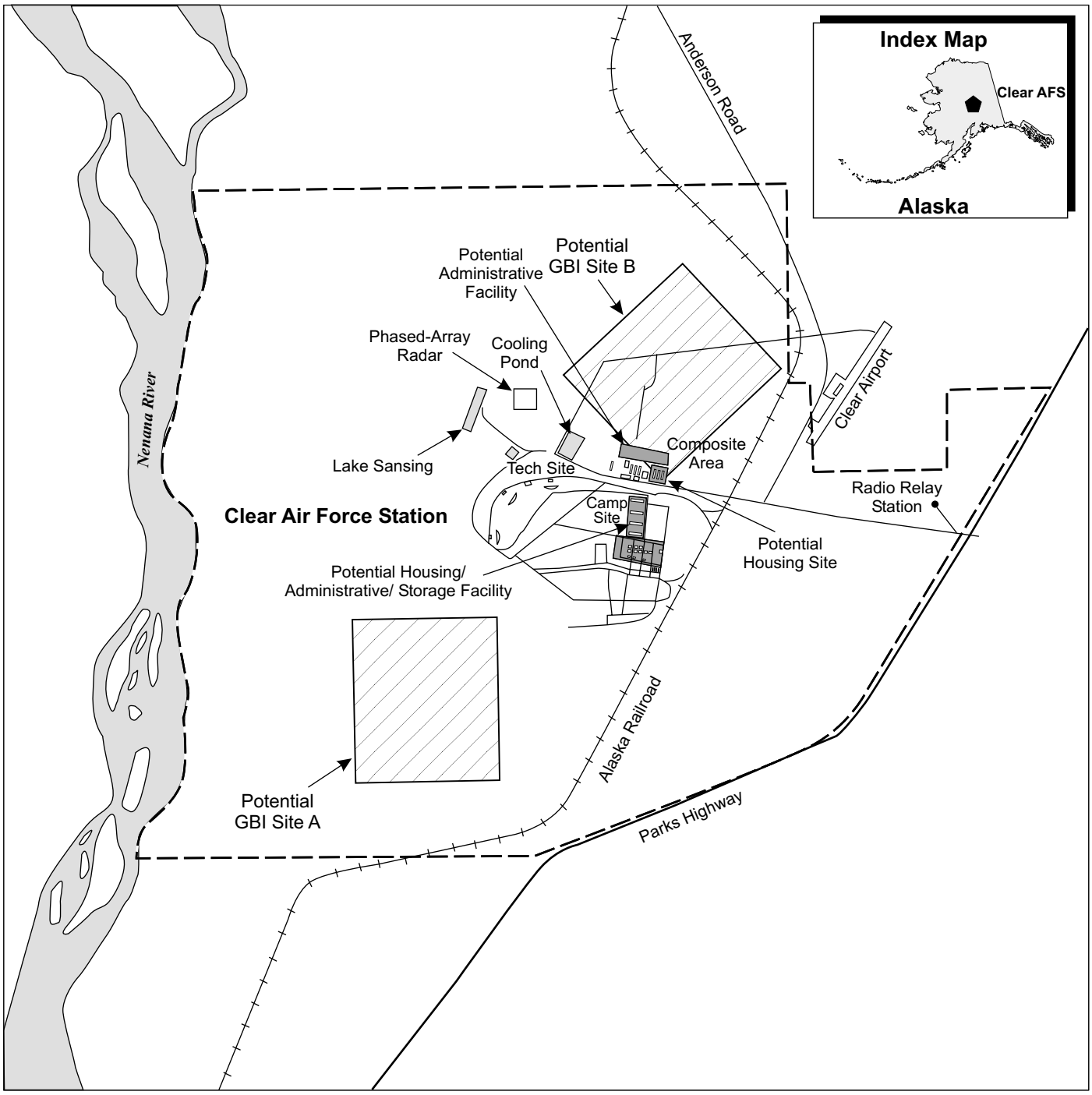
Figure 2.4-1

2.4.1.1 Clear AFS, Alaska

At Clear AFS, there are two potential locations for GBI deployment. Alternative A would be in the southern part of the installation, and Alternative B would be in the northeast corner (figure 2.4.1-1). GBI deployment would require the construction of new silos and support facilities (table 2.4.1-1). Given the amount of construction required, most of the proposed alternative deployment sites would be disturbed during construction activities. In addition, a new access road and utility corridors to either proposed site would need to be constructed.

Table 2.4.1–1: NMD System Facility Requirements, Ground-Based Interceptor, Clear AFS, Alaska

New Facilities	Existing Facilities Requiring Modifications (Building Number)
Launch Silos	870—Open Storage
Interceptor Receiving and Processing Facility	1, 3, 4, 26, 29, 35, 37, 40, 41, 42, 43, 48, 50, 51, 62, 65, 66, 79, 80, 82, 93, 720—Buildings and adjacent area known as Construction Camp
Interceptor Storage Facilities	
Headquarters Facility	
Silo Interface Vault	
Mechanical/Electrical Equipment Building	251—Fire Station
Administration and Maintenance Facility	100, 150, 196, 200-204, 209, 250, 280
Backup Power Generation with Fuel Storage	
Security (Fencing, Lighting, Monitoring Equipment)	
Equipment/Vehicle Storage Facilities	
Helicopter Pad	
Sewage Treatment (Septic Field)	
Housing/Dormitory/Dining	
Steam Plant	
Substation	
Readiness Station	
Security Building	
Warehouse	
Entry Control Station	
Roads/Utility Extensions/Water Wells	
Community Center	
Fuel Unloading Facility	
Water Supply Facility	



EXPLANATION

- Roads
- Water Area
- Ground-Based Interceptor Potential Site
- Potential Support Facilities
- Installation Boundary
- Railroads

NORTH

0 2,500 5,000 Feet

0 762 1,524 Meters

Potential Ground-Based Interceptor, Clear Air Force Station

Alaska

Figure 2.4.1-1

dp_clas_gbi_001_replacement

Construction Requirements

Once a deployment decision is made, construction activities at Clear AFS would take approximately 5 years, with the main construction effort occurring during the first 3 years. Construction would include both the GBI and BMC2. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 400, with a maximum of 600 during peak construction activities.

Approximately 243 hectares (600 acres) of undisturbed land would be graded during construction activities at Clear AFS to include the GBI silo field and related support facilities.

Operational Requirements

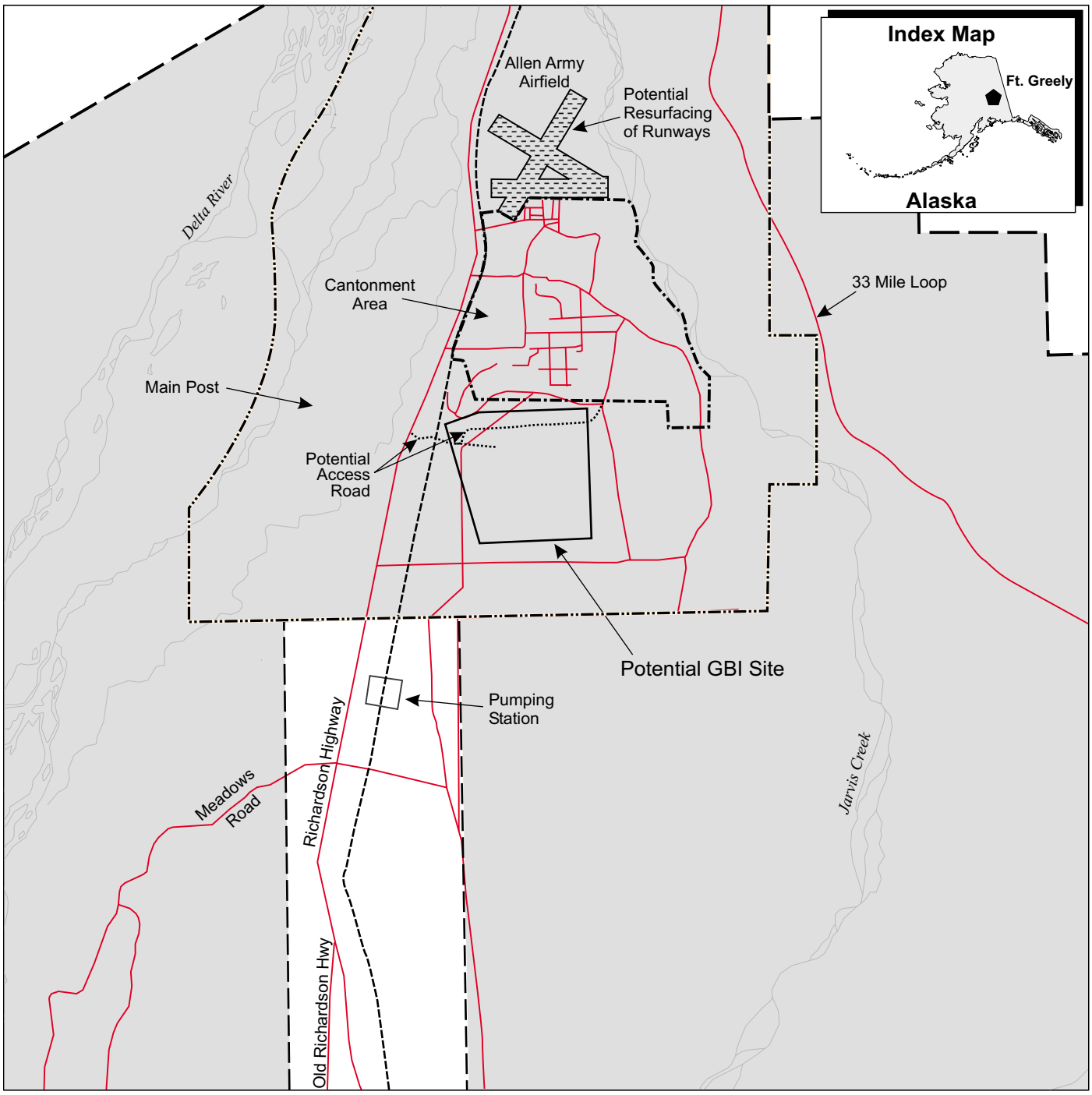
When the GBI site at Clear AFS becomes fully operational, the total site-related employment would be approximately 115 military and 90 contractor positions associated with the GBI element plus an additional 50 direct jobs associated with NMD base support functions. These jobs would include site maintenance and operations support, fire, and security personnel.

2.4.1.2 Fort Greely, Alaska

At Fort Greely, the potential location for the GBI element would be just south of the main base cantonment (figure 2.4.1-2). Table 2.4.1-2 provides an overview of the GBI facility requirements for Fort Greely. At the time of NMD deployment, there would be ample existing lodging and dining, morale, welfare, recreation, public works, and security facilities at Fort Greely to support the NMD mission. The existing dirt roads to the GBI site would need to be upgraded along with the installation of new utilities. In addition, several new roads may be constructed to the GBI site. If a decision is made to use the runway to receive GBI shipments, the runway would also need to be upgraded. The upgrade would include removing the existing pavement, reconstructing the base material, and installing new pavement to support heavy cargo aircraft. Additional upgrades could include new runway lights, instrument approach equipment, approach lights, and expanded apron areas.

Construction Requirements

Once a deployment decision is made, construction activities would take approximately 5 years, with the main construction effort occurring during the first 3 years. Construction would include both the GBI and BMC2. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 400, with a maximum of 650 during peak construction



EXPLANATION

- Fort Greely
- Ground-Based Interceptor Potential Site
- Runways
- Potential Access Roads
- Roads
- Rivers
- Installation Boundary
- Trans-Alaska Pipeline
- Main Post Boundary
- Cantonment Area Boundary

Scale 1:80,000

0 3,334 6,667 Feet

0 1,016 2,032 Meters

NORTH

dp_jarvis_gbi_001

Potential Ground-Based Interceptor, Fort Greely

Alaska

Figure 2.4.1-2

activities. This site would require additional construction personnel compared to other deployment sites to support runway reconstruction.

Table 2.4.1–2: NMD System Facility Requirements, Ground-Based Interceptor, Fort Greely, Alaska

New Facilities	Existing Facilities Requiring Modifications (Building Number)
Launch Silos	100—Hangar
Interceptor Receiving and Processing Facility	508, T-509, 601, 608, 612, 670—Warehouse/Storage and adjacent areas
Interceptor Storage Facilities	659-663, 702, 705-714, 804-806, 808-810, 812-814, 816-818, 825-827, 829-831, 833-835, 850-852, 854-856, 862-864, 875-877, 887-889, 895, 896, 910-946, 950-955—Housing
Headquarters Facility	
Silo Interface Vault	
Mechanical/Electrical Equipment Building	
Administration and Maintenance Facility	504—Fire Station
Backup Power Generation with Fuel Storage	605, 615, 626—Motor Pool
Security (Fencing, Lighting, Monitoring Equipment)	503, 630, 654, 655, 658, 853—Administration
Sewage Treatment (Septic Field)	Runway—remove and reconstruct
Steam Plant	101, 103, 106, 160, 162, 318-320, 338-341, 346, 347-354, 361, 609, 610, 628, 629, 635, 650-653, 656, 675, 701, 725, 801, 802, 820-822, 824, 845, 847
Substation	
Readiness Station	
Security Building	
Entry Control Station	
Roads/Utility Extensions/Water Wells	
Fuel Unloading Facility	
Water Supply Facility	

Approximately 243 hectares (600 acres) of undisturbed and previously disturbed land would be graded during construction activities at Fort Greely for the GBI silo field and associated support facilities.

Operational Requirements

When the GBI site becomes fully operational, the total site-related employment would be approximately 115 military and 95 contract positions associated with the GBI element plus an additional 150 direct jobs associated with NMD base support functions. Because there is a smaller number of base support personnel at Fort Greely, deployment would require more personnel than at other deployment locations. These jobs would include site maintenance and operations support, and security personnel.

2.4.1.3 Yukon Training Area (Fort Wainwright)/Eielson AFB

At the Yukon Training Area, the potential location for the GBI element would be just east of Eielson AFB at the Winter Camp Site (figure 2.4.1-3). The Yukon Training Area is a portion of Fort Wainwright located generally east of Eielson AFB. The Winter Camp Site is within the Yukon Training Area. Deployment at this site would require use of existing facilities on Eielson AFB and new silos, and the construction of new support facilities on both the Yukon Training Area and Eielson AFB (table 2.4.1-3). The existing dirt road (Manchu Trail) to the proposed site from Eielson AFB would have to be widened and upgraded to support transport of the GBI. The new utilities required to the site would be installed along the existing road during the road upgrade. Given the amount of construction required, most of the area within the potential deployment site would be disturbed during construction activities.

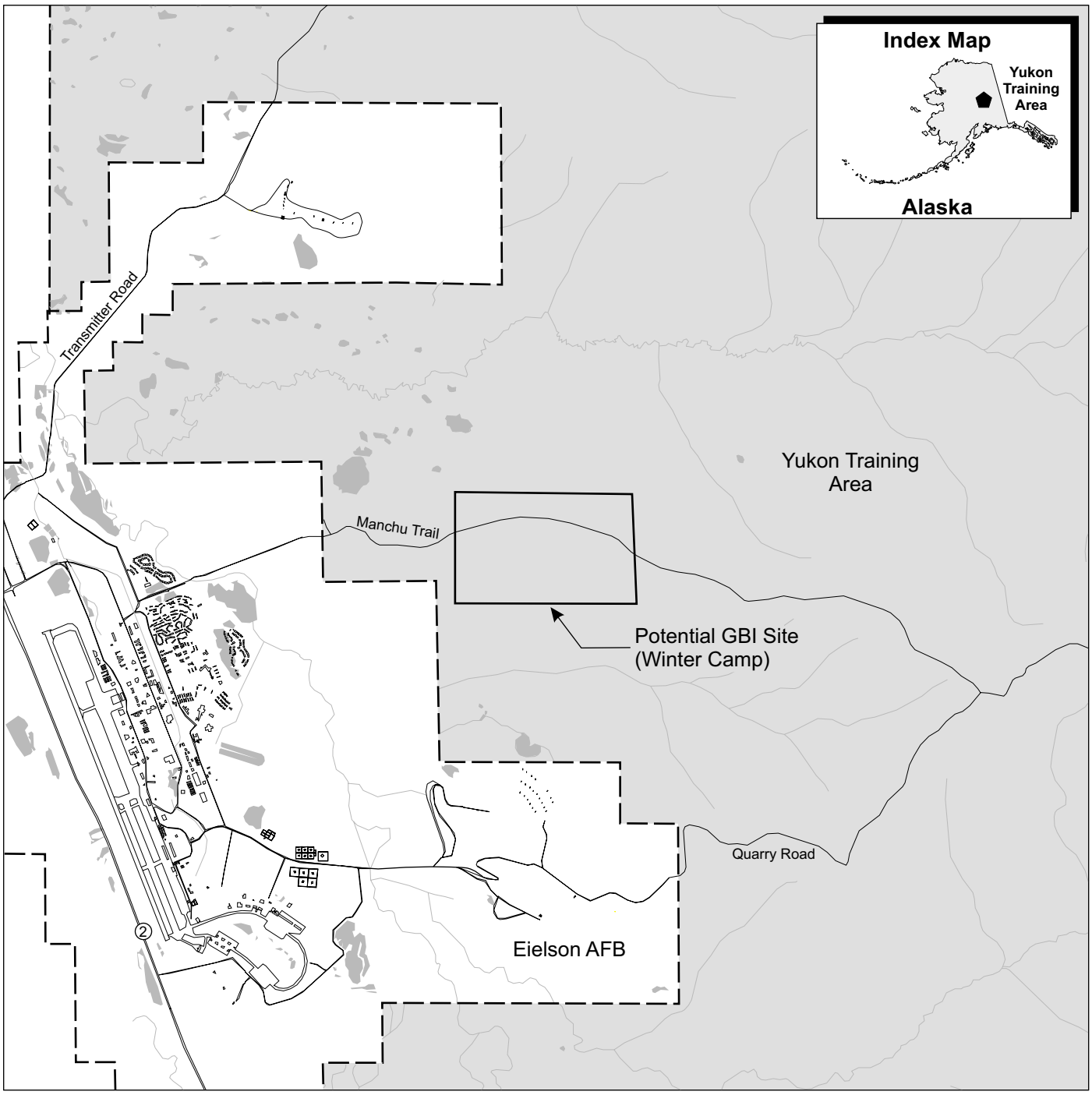
Construction Requirements

Once a deployment decision is made, construction activities would take approximately 5 years, with the main construction effort occurring during the first 3 years. Construction would include both the GBI and BMC2. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 400, with a maximum of 600 during peak construction activities.

Approximately 243 hectares (600 acres) of undisturbed and previously disturbed land would be graded during construction activities at the Yukon Training Area for the GBI silo field and associated support facilities.

Operational Requirements

When the GBI site becomes fully operational, the total site-related employment would be approximately 115 military and 90 contractor positions associated with the GBI element plus an additional 50 direct jobs associated with NMD base support functions. These jobs would include site maintenance and operations support, fire, and security personnel.



EXPLANATION

- Eielson AFB
- Yukon Training Area
- Ground-Based Interceptor Potential Site
- Roads
- Streams
- Installation Boundary
- Water Area

Scale 1:80,000

0 3,334 6,667 Feet

0 1,016 2,032 Meters

NORTH

Potential Ground-Based Interceptor, Yukon Training Area (Fort Wainwright)/ Eielson AFB

Alaska

Figure 2.4.1-3

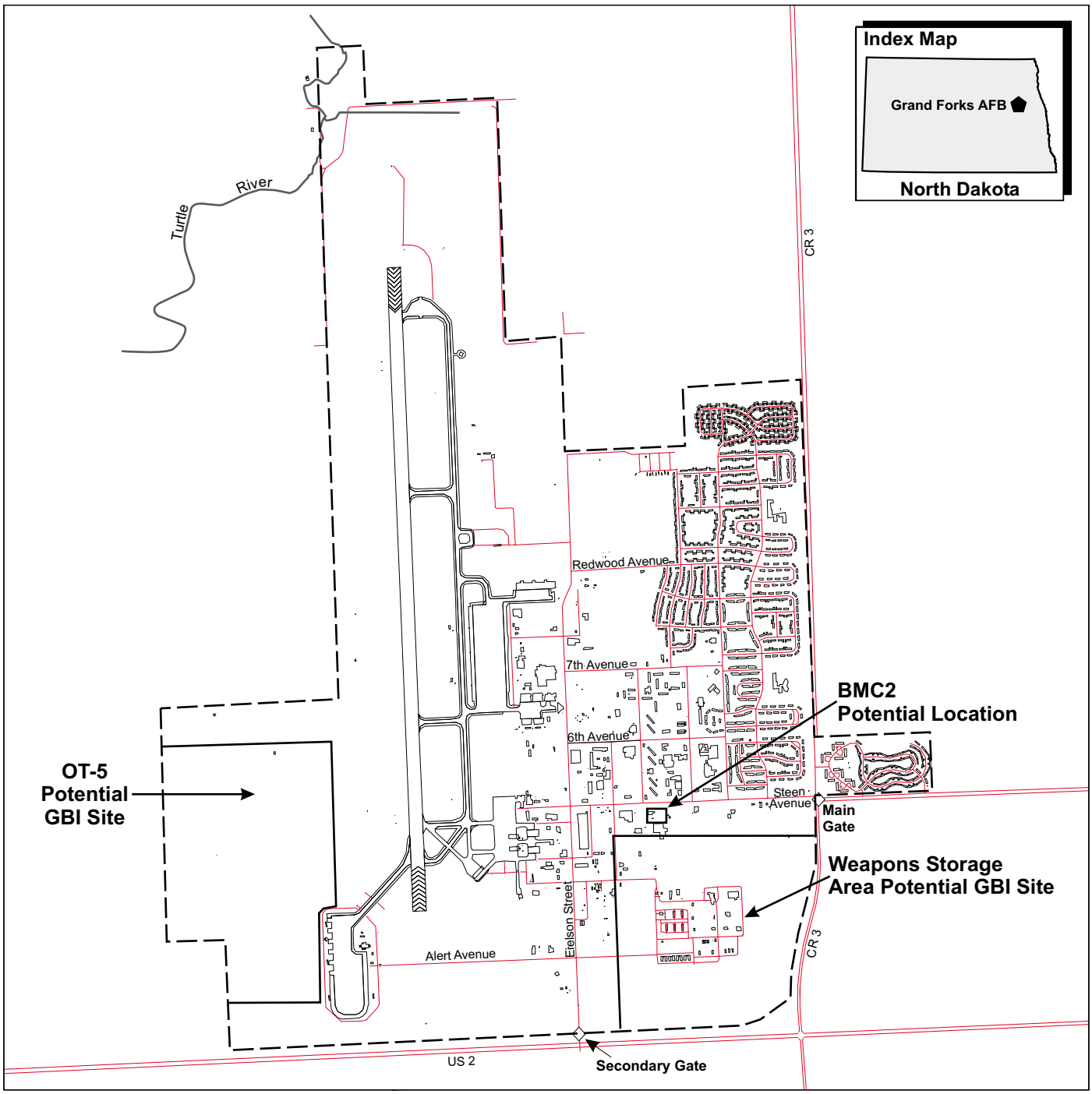
dp_wincamp_gbi_001

Table 2.4.1–3: NMD System Facility Requirements, Ground-Based Interceptor, Yukon Training Area/Eielson AFB, Alaska

New Facilities	Existing Facilities Requiring Modifications (Building Number)
Launch Silos	2171—Shop Space
Interceptor Receiving and Processing Facility	3425—Warehouse
Interceptor Storage Facilities	4280—Warehouse
Headquarters Facility	1206—Fire Station
Silo Interface Vault	
Mechanical/Electrical Equipment Building	Camping Area
Administration and Maintenance Facility	
Backup Power Generation with Fuel Storage	
Security (Fencing, Lighting, Monitoring Equipment)	
Readiness Station	
Sewage Treatment (Septic Tanks)	
Substation	
Steam Plant	
Security Building	
Entry Control Station	
Roads/Utility Extensions/Water Wells	
Fuel Unloading Facility	
Water Supply Facility	

2.4.1.4 Grand Forks AFB, North Dakota

At Grand Forks AFB, there are two potential locations for the GBI element: the Weapons Storage Area and the Ordnance Training Site 5 (OT-5) (figure 2.4.1-4). Table 2.4.1-4 provides an overview of the facility requirements for each potential GBI location at Grand Forks AFB. The Weapons Storage Area site is in the southeast corner of the base and the OT-5 area in the southwest corner of the base. The facilities required for all options would be the same except for the locations of GBI silos. In addition, there is the potential to use a combination of both sites, if required. At the time of NMD deployment, there would be ample existing lodging and dining, morale, welfare, recreation, public works, and security facilities to support the NMD mission without any new facilities or building modifications.



EXPLANATION

- Installation Boundary
- Ground Based Interceptor Potential Site
- Gate

OT-5 = Ordnance Training Site 5
CR = County Road
US = U.S. Highway

Scale 1:40,000

NORTH

0 1,667 3,333 Feet

0 508 1,016 Meters

Potential Ground-Based Interceptor and BMC2 Locations, Grand Forks Air Force Base

North Dakota

Figure 2.4.1-4

Table 2.4.1–4: NMD System Facility Requirements, Ground-Based Interceptor, Grand Forks AFB, North Dakota

New Facilities	Existing Facilities Requiring Modifications (Building Number)
Launch Silos	739, 740, 741, 742, and 743—Interceptor Storage Facility
Interceptor Receiving and Processing Facility	312 and 313—Training Facilities
Interceptor Storage Facilities	318—Warehouse
Headquarters Facility	204, 223, 225, 306, 402, 606, 714, 722, 743-750, 803
Silo Interface Vault	
Mechanical/Electrical Equipment Building	
Administration and Maintenance Facility	
Backup Power Generation with Fuel Storage	
Security (Fencing, Lighting, Monitoring Equipment)	
Readiness Station	
Entry Control Stations	
Security Building	
Roads/Utility Extensions	
Fuel Unloading Facility	
Water Supply Facility	
Fire Station	
Generator Building	

Construction Requirements

Once a deployment decision is made, construction activities at Grand Forks AFB would take approximately 5 years, with the main construction effort occurring during the first 3 years. Construction would include both the GBI and BMC2. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 250, with a maximum of 500 during peak construction activities.

For the OT-5 and Weapons Storage Area alternatives, approximately 162 hectares (400 acres) of previously disturbed land would be graded during construction activities at Grand Forks AFB.

Operational Requirements

When the GBI site at Grand Forks AFB becomes fully operational, the total site-related employment would be approximately 115 military and 90 contractor positions associated with the GBI element plus an additional 50 direct jobs associated with NMD base support functions.

These jobs would include site maintenance and operations support, fire, and security personnel.

2.4.1.5 SRMSC Missile Site Radar, North Dakota

GBI element deployment at the Missile Site Radar would require new silos and the construction of new support facilities. Figure 2.4.1-5 shows the proposed construction of new facilities at the Missile Site Radar. Given the amount of construction and demolition required, most of the site would be disturbed during construction activities. For the GBI element and support functions, the facilities listed in table 2.4.1-5 would be required at the site.

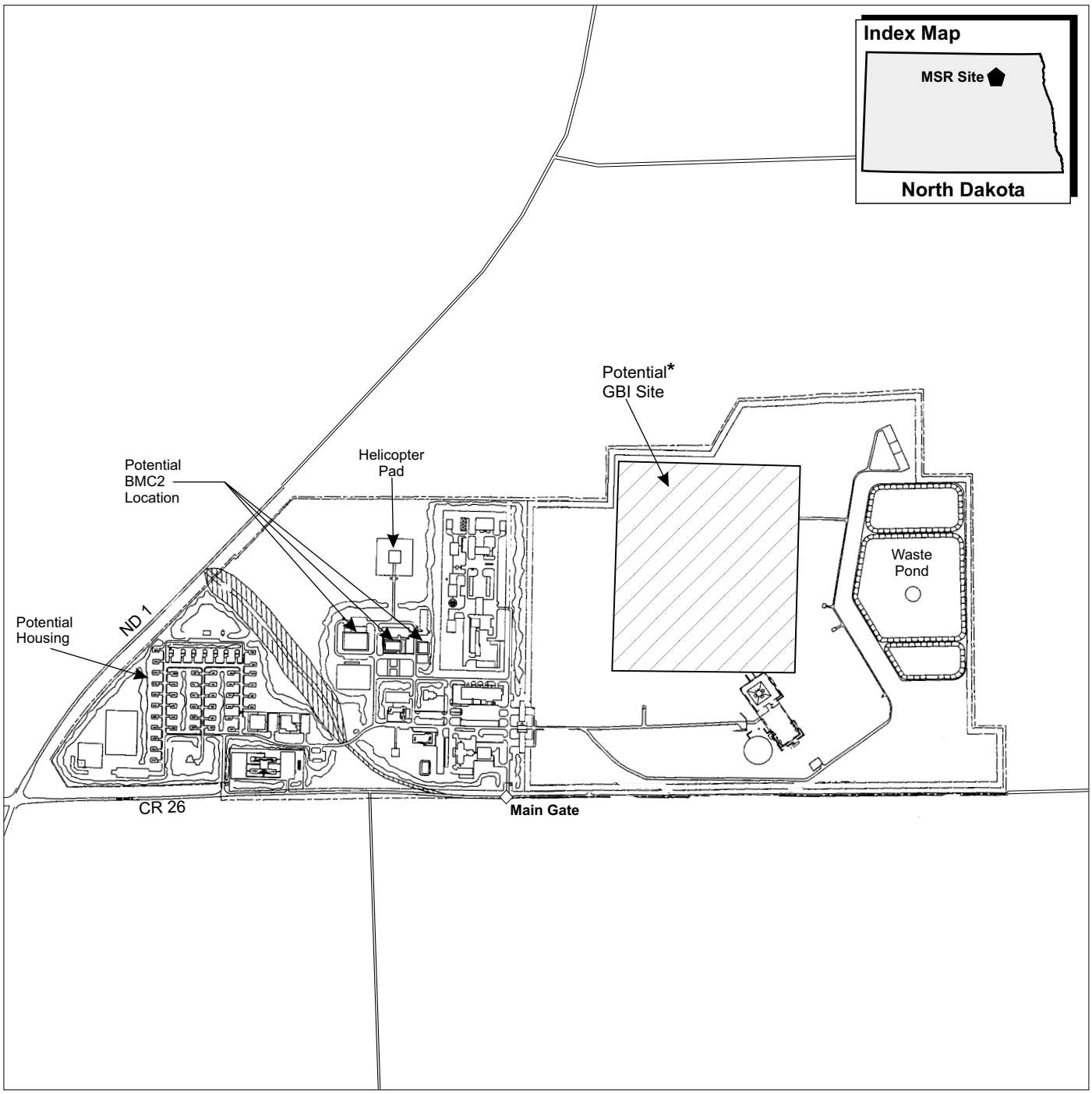
Construction Requirements

Once a deployment decision is made, construction activities would take approximately 5 years, with the main construction effort occurring during the first 3 years. Construction would include the GBI and BMC2. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 350, with a maximum of 625 during peak construction activities. This site requires additional construction personnel compared to the other deployment locations to support the additional facility requirements.

Approximately 170 hectares (420 acres) of previously disturbed land would be graded during construction activities. This area includes the GBI site for the silos and the surrounding area of the installation for support facilities.

Operational Requirements

When the GBI site becomes fully operational, the total site-related employment would be approximately 115 military and 95 contractor positions associated with the GBI element plus an additional 150 direct jobs associated with NMD base support functions. Because there are no current base support personnel at the Missile Site Radar, deployment would require more personnel than at other deployment locations. These jobs would include site maintenance and operations support, fire, and security personnel.



EXPLANATION

Ground-Based Interceptor Potential Site

◇ Gate

CR = County Road
ND = North Dakota Highway

Installation Boundary

*Note: Depicts potential silo location. The entire Missile Site Radar facility would likely be modified for required GBI support facilities.

Scale
0 633 1,266 Feet
0 193 386 Meters
NORTH

Potential Ground-Based Interceptor and BMC2 Locations, Missile Site Radar

North Dakota

Figure 2.4.1-5

dp_msr_gbi_002

Table 2.4.1–5: NMD System Facility Requirements, Ground-Based Interceptor, Missile Site Radar, North Dakota

New Facilities	Existing Facilities Requiring Modifications (Building Number)
Launch Silos	346—Gym
Interceptor Receiving and Processing Facility	350—Community Center
Interceptor Storage Facility	340—Chapel
Headquarters Facility	301—Base Administration/Construction Headquarters
Silo Interface Vault	304—Construction Lab/Training Classroom
Mechanical/Electrical Equipment Building	385—Domestic Waste Stabilization Pond
Administration and Maintenance Facility	902—Sewage Pumping
Backup Power Generation with Fuel Storage	Storage/Warehouse Facility
Security (Fencing, Lighting, Monitoring Equipment)	
Munitions Igloos	
Hazardous Materials/Hazardous Waste Storage	
Equipment/Vehicle Storage Facilities	
Helicopter Pad	
Steam Plant	
Security Building	
Readiness Station	
Warehouse	
Housing	
Medical Clinic	
Vehicle Fueling Facility	
Water Quality Lab	
Fire and Public Works Facility	
Vehicle Parking Garage	
Roads/utility extensions	
Entry Control Station	

2.4.2 BMC2 DEPLOYMENT ALTERNATIVES

For the NMD system, only one BMC2 execution level element deployment location would be required from the sites listed below. As part of the NMD system, a Headquarters Complex would be located along with the GBI site. In addition, a Command Level and Service Component Command Center BMC2 nodes would be required for the NMD program. The Command Level BMC2 node would be located at Cheyenne Mountain AFS in Colorado and would consist of placing computer and communication equipment within existing rooms and may include some minor interior modifications. The Service Component Command BMC2 node could be located at both Peterson AFB, Colorado, and Vandenberg AFB, California. At Peterson AFB an annex would be connected to a headquarters facility. For Vandenberg AFB, computer and communication equipment would be installed in an existing room within Building 10577, which may require interior modifications. The BMC2 would be an administrative-type facility.

2.4.2.1 Clear AFS, Alaska

The BMC2 subelement would be located at this site if the GBI element is also constructed at Clear AFS. The BMC2 subelement would occupy an existing building or newly constructed facility and would require backup electrical power from the base or GBI site. If a new facility is required, it would be located within the potential GBI deployment area for Clear AFS. Overall construction requirements are discussed under the GBI element for this site.

Operational Requirements

When the BMC2 subelement becomes fully operational, the total site-related employment would be approximately 30 personnel.

2.4.2.2 Fort Greely, Alaska

The BMC2 subelement would be located at this site if the GBI element is also constructed at Fort Greely. The BMC2 subelement would occupy an existing building or a newly constructed facility and would require backup electrical power from the base or GBI site. If a new facility is required, it would be located within the potential GBI deployment area for Fort Greely. Overall construction requirements are discussed under the GBI element for this site.

Operational Requirements

Operational, personnel, and infrastructure requirements for the BMC2 subelement at this site would be the same as described for Clear AFS.

2.4.2.3 Yukon Training Area (Fort Wainwright)/Eielson AFB, Alaska

The BMC2 subelement would be located at this site if the GBI element is also constructed at the Yukon Training Area. The BMC2 subelement would occupy an existing building on Eielson AFB or a newly constructed facility and would require backup electrical power from the base or GBI site. If a new facility is required, it would be located within the potential GBI deployment area for the Yukon Training Area. Overall construction requirements are discussed under the GBI element for this site.

Operational Requirements

Operational, personnel, and infrastructure requirements for the BMC2 subelement at this site would be the same as described for Clear AFS.

2.4.2.4 Grand Forks AFB, North Dakota

The BMC2 subelement would be located at this site if the GBI element is also constructed at Grand Forks AFB. The BMC2 would be a newly constructed facility on the northern boundary of the NMD controlled area adjacent to Steen Avenue (see figure 2.4.1-4) or would utilize an existing structure, if available. The BMC2 facility would require backup electrical power from the base or GBI site. Overall construction requirements are discussed under the GBI element for this site.

Operational Requirements

Operational, personnel, and infrastructure requirements for the BMC2 subelement at this site would be the same as described for Clear AFS.

2.4.2.5 SRMSC Missile Site Radar, North Dakota

The BMC2 subelement would be located at this site if the GBI element is also constructed at the Missile Site Radar facility. This would require construction of a new BMC2 facility (see figure 2.4.1-5). The general construction requirements are discussed under the GBI element for this site. This facility would require backup electrical power from the base or GBI site.

Operational Requirements

Operational, personnel, and infrastructure requirements for the BMC2 subelement at this site would be the same as described for Clear AFS.

2.4.3 IN-FLIGHT INTERCEPTOR COMMUNICATIONS SYSTEM DEPLOYMENT ALTERNATIVES

For the NMD system, approximately 14 IFICS Data Terminal sites could be required. An IFICS Data Terminal site would encompass an area of approximately 2 hectares (6 acres) and up to 7 hectares (17 acres) for

two IFICS Data Terminals and require minimal construction activities. In addition, some vegetation may need to be removed around the facility to meet line-of-sight requirements. The operational requirements for the IFICS Data Terminal are still being identified. As such, the specific locations where the IFICS Data Terminal could be deployed have not yet been determined. Regions under study include Alaska and North Dakota. In addition, as the operational requirements are refined, other regions may be identified. It is anticipated that DOD installations would be used to deploy IFICS Data Terminals because of the security and maintenance infrastructure they could provide. However, if no DOD installations are within the potential performance region required for an IFICS Data Terminal to operate, then other land would be investigated. Once specific candidate sites are identified, separate site specific environmental analysis, as required, would be performed.

2.4.4 X-BAND RADAR DEPLOYMENT ALTERNATIVES

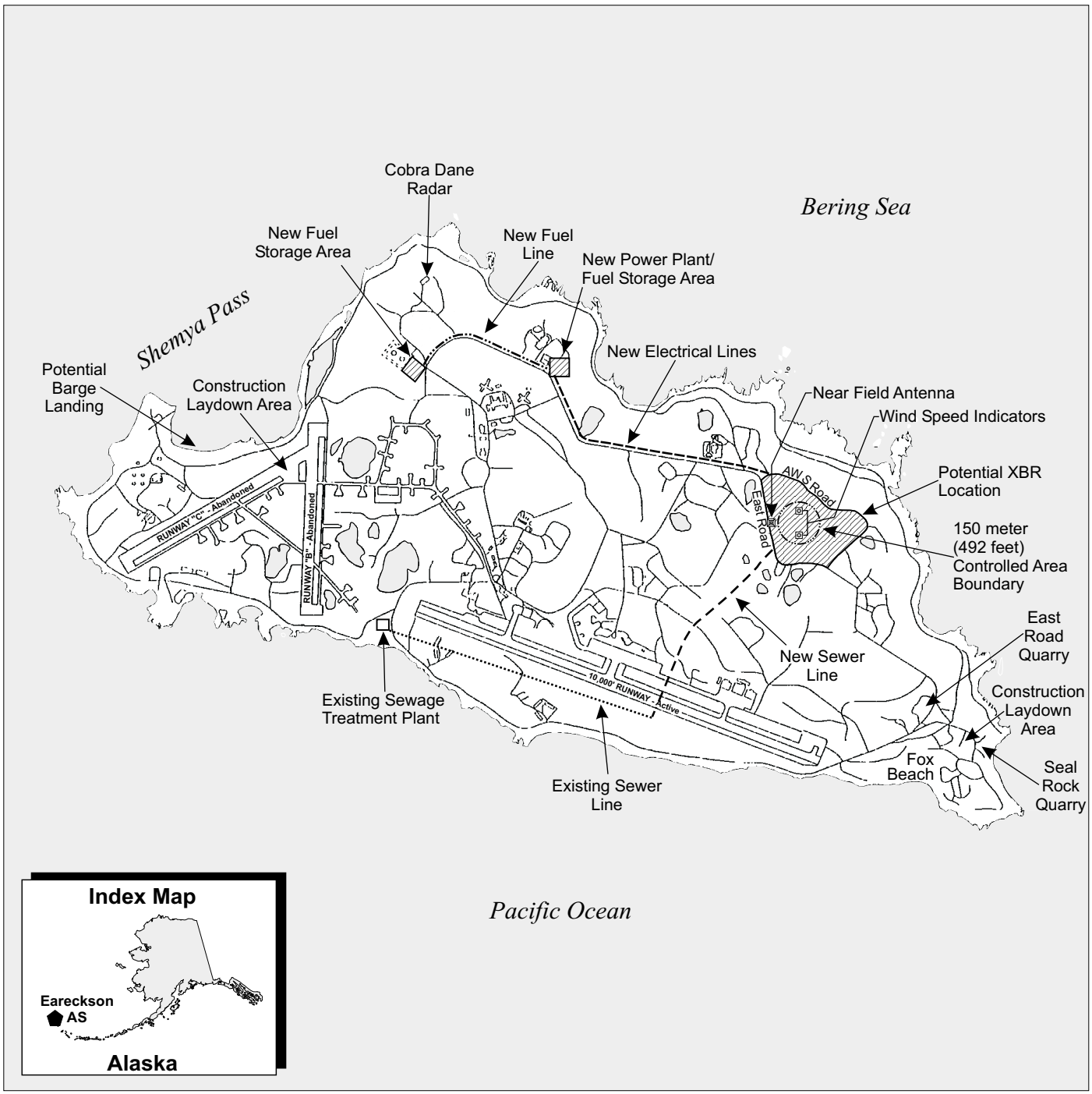
For the NMD system, an XBR element deployment location would be selected from the locations below. As part of the general construction requirements for the XBR, two temporary equipment storage facilities would be required during radar assembly. These facilities would be located next to the XBR during construction and removed once construction is complete.

2.4.4.1 Eareckson AS (Shemya Island), Alaska

The XBR would be constructed on the northeast part of the island between East Road and AWS Road. The new power plant would be located next to the existing power plant, and the new fuel storage areas would be adjacent to the existing storage area and the power plant. Table 2.4.4-1 shows the new support facilities and existing facilities required for an XBR at Eareckson AS. Some of the existing structures may require interior modifications. Figure 2.4.4-1 shows the basic facility layout. Existing water and sanitary sewer systems on the island would be utilized; however, new sewer lines would be required to the existing treatment plant. In addition, other utility lines (i.e., electrical) would be required but would follow existing utility corridors.

Construction Requirements

Once a deployment decision is made, construction activities would take approximately 3 years, with the main construction effort occurring during the first 2 years. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 230. Construction equipment and supplies would be shipped or airlifted to the island. Construction debris would be removed from the island by the construction contractor or incinerated. Construction would require limited blasting for fill



EXPLANATION

- Roads
- Land Area
- Water Area
- Potential XBR Location
- Controlled Area Boundary
- New Fuel Line
- New Electrical Lines
- New Sewer Line
- Existing Sewer Line
- Wind Speed Indicator
- Near Field Antenna

NORTH

Scale

0 1,738 3,475 Feet

0 530 1,059 Meters

Potential X-Band Radar Location, Eareckson Air Station

Alaska

Figure 2.4.4-1

material at Seal Rock Quarry on the southeast end of the island. In addition, up to two barges per year during construction may be beached to unload equipment and materials. This would require some dredging and moving of soils on the beach. Construction personnel would be housed in the existing Air Force facilities.

Table 2.4.4–1: X-Band Radar Facility Requirements, Eareckson AS, Alaska

New Facilities	Existing Facilities Requiring Modification (Building Number)
Radar Support Tower	617—Chapel
Control and Support Facility	616—Heavy Vehicle Maintenance
Power Generation Plant	600—Administration, Security, Lodging, Dining
Near Field Antenna	601-Gym
Wind Speed Indicator Towers	3050—Storage/Warehouse
Fuel Storage Area	490—Fire Station
Fire Water Storage	598—Construction Contractor Billeting
Fire Pump Buildings	3049—Power Plant
Perimeter Security and Surveillance	3062 (Demolition)
Power, Sewer, Water, and Fiber Optic Cable Lines	3063 (Demolition)
	211-213 (Demolition)
Vehicle Parking [(1)]	502, 521, 611, 700, 701, 753, 751, 1001

[(1)] Attached to Building 600

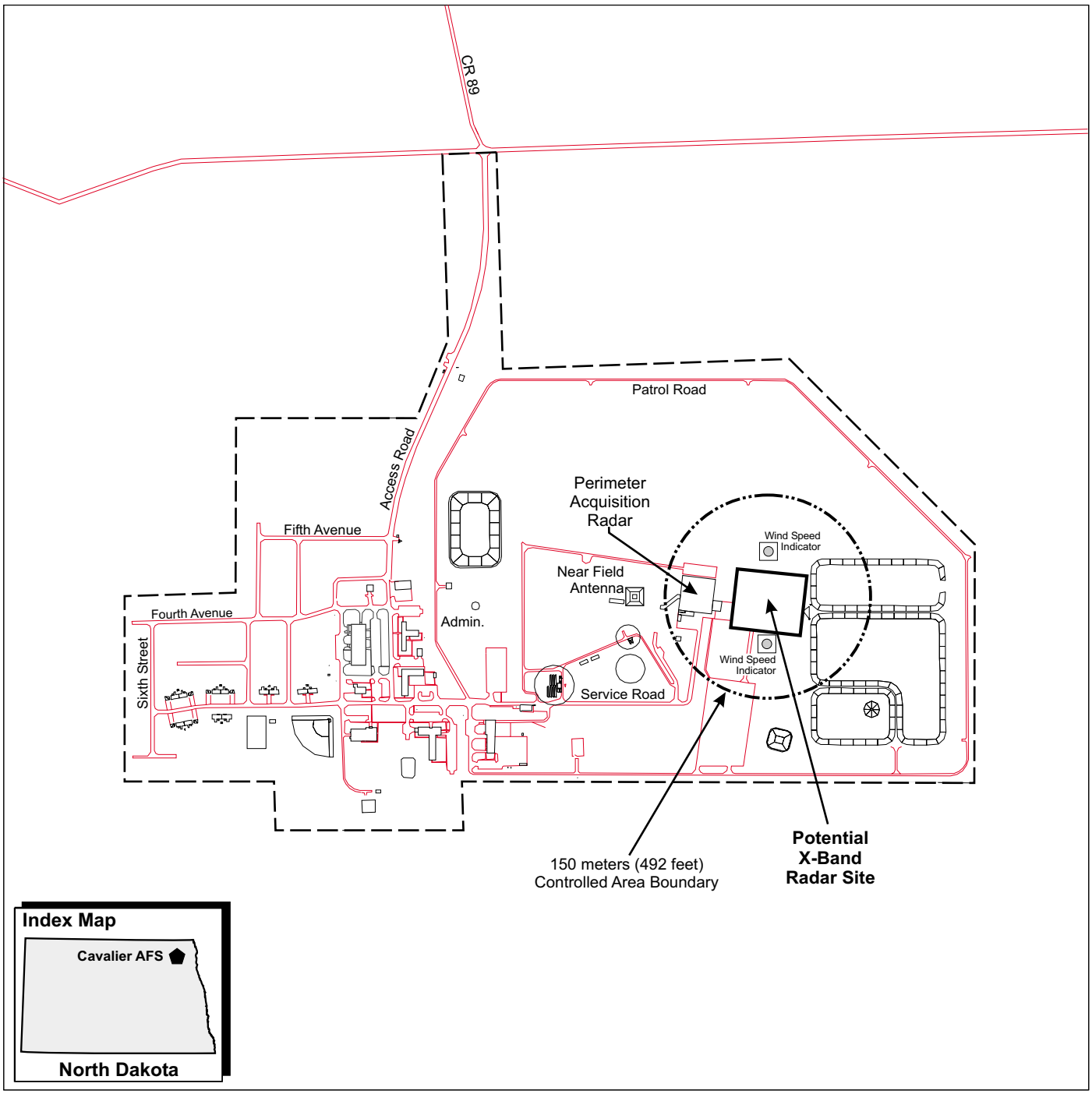
Approximately 12 hectares (30 acres) of land would be graded during construction activities. Any soil removal during construction on Eareckson AS would require analytical laboratory testing to ensure the soils are not contaminated.

Operational Requirements

When the XBR becomes fully operational, the total operations-related employment would be 70 personnel. In addition, another 35 personnel would be required to operate base support functions. All personnel would reside on-base. Fuel and other supplies would be brought to the island by barge or by air.

2.4.4.2 Cavalier AFS, North Dakota

The XBR would be located adjacent to the existing Perimeter Acquisition Radar Building, which would need to be demolished to allow for XBR operation (figure 2.4.4-2). The existing onsite infrastructure and support facilities should be adequate to meet facility requirements; however, there may be the need for a newly constructed power plant next to the XBR. The existing roads at the site may need improvement to handle the weight of the radar base during movement of the system for



EXPLANATION

- Controlled Area Boundary
- Installation Boundary
- Wind Speed Indicator
- Near Field Antenna
- CR = County Road

NORTH

Scale 1:11,000

0 459 917 Feet

0 140 280 Meters

Potential X-Band Radar Location, Cavalier Air Force Station

North Dakota

Figure 2.4.4-2

construction. No provisions for storm water detention would be made at this site.

Construction Requirements

Once a deployment decision is made, construction activities would take approximately 3 years, with the main construction effort occurring during the first 2 years. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 230. Approximately 1 hectare (3 acres) of previously disturbed land would be graded during construction activities. A maximum of 4 hectares (10 acres) at the site could be used for construction laydown.

Operational Requirements

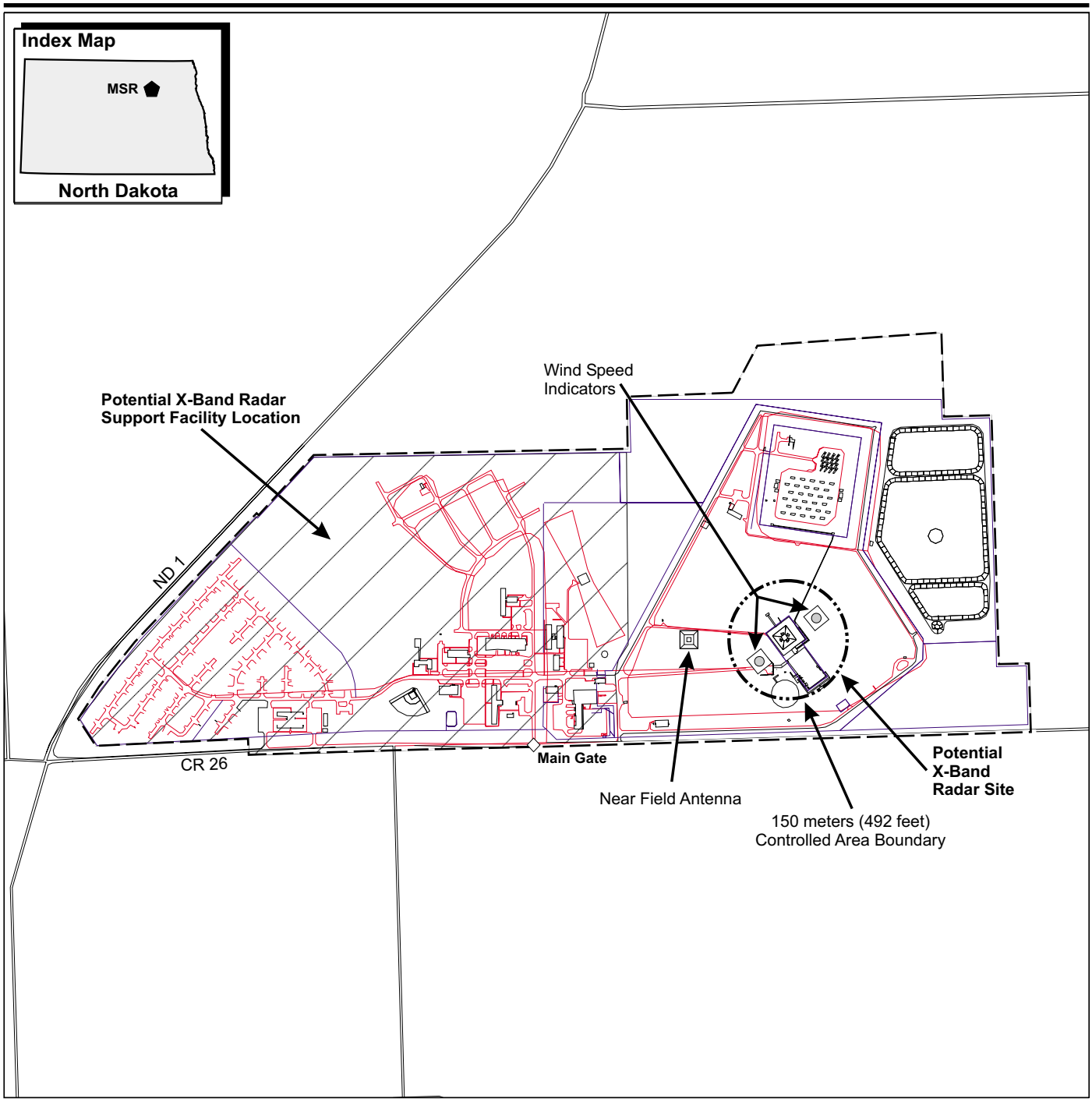
When the XBR becomes fully operational, the total operations-related employment would be 70 personnel. In addition, another 35 personnel would be required to operate base support functions.

2.4.4.3 SRMSC Missile Site Radar, North Dakota

The XBR would be located in the same location as the existing radar, requiring demolition of this facility. The XBR at this location would require the construction of support facilities as identified in table 2.4.4-2. In addition, most other facilities at this location would require demolition or modification. Figure 2.4.4-3 shows the basic facility layout. No provisions for storm water detention would be made at this site.

Table 2.4.4–2: X-Band Radar Facility Requirements, Missile Site Radar, North Dakota

New Facility Requirements	
Radar Support Tower	Parking Garages
Control and Maintenance Facility	Steam
Power Generation Plant	Warehouse
Near Field Antenna	Fire Station/Water Supply Facility/Fire Pump Building
Wind Speed Indicator Towers	Vehicle Storage and Maintenance
Fuel Storage Area	Vehicle Fueling
Perimeter Security and Surveillance	Instrument Flight Rules Helipad
Dining Facility	Hazardous Materials Storage Facility
Security	
Housing	
Utility Substation	



EXPLANATION

- Support Facility Location
- Installation Boundary
- Controlled Area Boundary
- Gate
- Wind Speed Indicator
- Near Field Antenna

CR = County Road
ND = North Dakota Highway

Scale 1:15,000
0 625 1,250 Feet
0 191 381 Meters
NORTH

Potential X-Band Radar Location, Missile Site Radar

North Dakota

Figure 2.4.4-3

Construction Requirements

Once a deployment decision is made, construction activities would take approximately 3 years, with the main construction effort occurring during the first 2 years. Most of the ground-disturbing activities would occur during the first 24 months. Construction and site activation personnel requirements would average 230.

Up to 20 hectares (50 acres) of previously disturbed land could be graded during construction activities at this site.

Operational Requirements

When the XBR becomes fully operational, the total operations-related employment would be 70 personnel. In addition, another 35 personnel would be required to operate base support functions.

2.4.4.4 SRMSC Remote Sprint Launch Site 1, North Dakota

The XBR would be totally contained within this existing site (figure 2.4.4-4). To deploy the radar unit, the existing missile silos and security building would require demolition. The abandoned launch control complex would remain, and the sewage lagoon would be enlarged and reactivated. The existing site access road would remain to service the site and would require no modification except resurfacing. A new water line would be located along the alignment from the county road adjacent to the site to the water treatment plant. The new facilities that would be required at this site are similar to those for the Missile Site Radar (see table 2.4.4-2). No provisions for storm water detention would be made at this site.

Construction Requirements

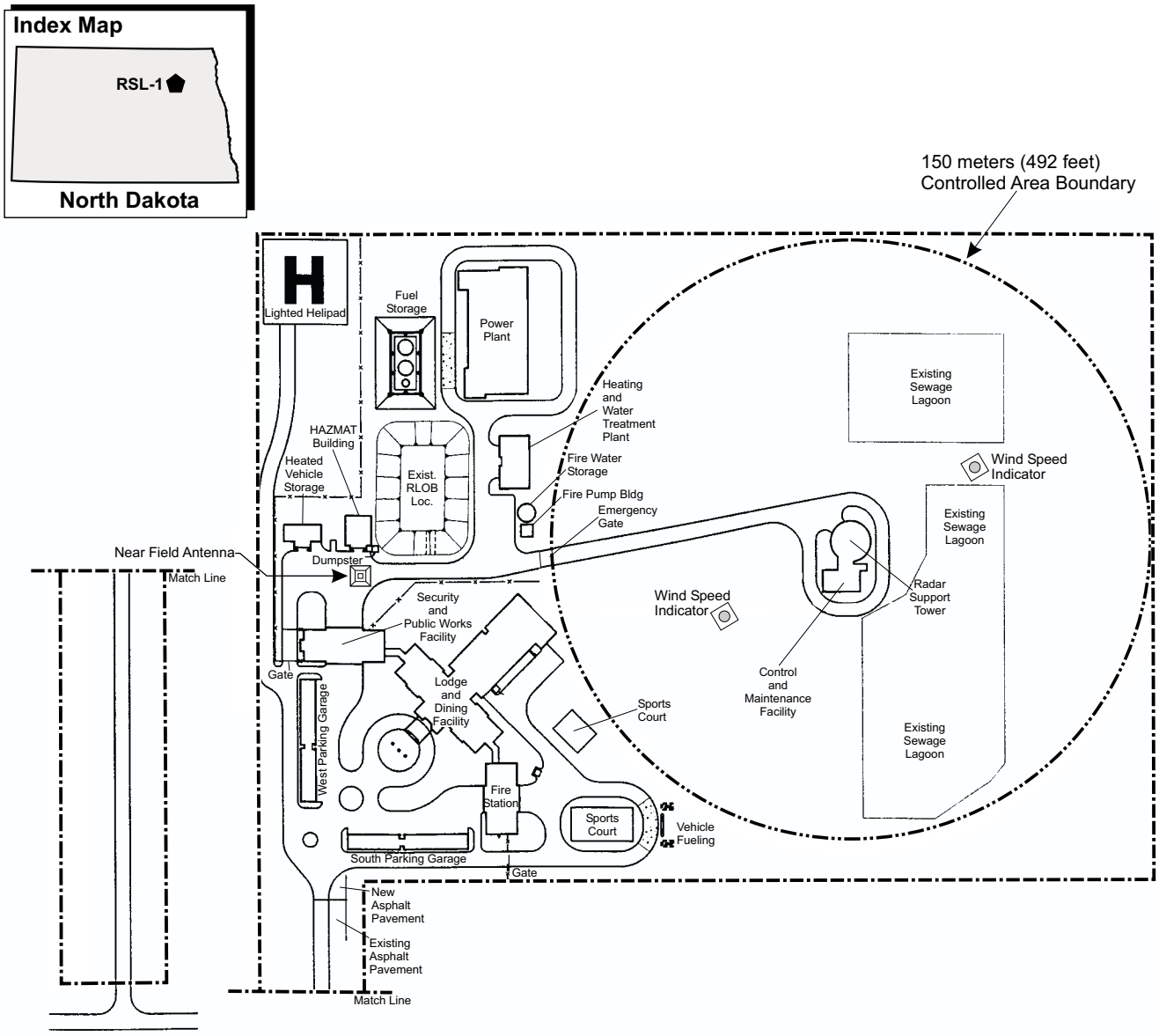
Most of the area contained within this 17-hectare (41-acre) site would be disturbed during construction activities, with ground-disturbing activities taking approximately 24 months. Construction and site activation personnel requirements would average 230.

Operational Requirements

When the XBR becomes fully operational, the total operations-related employment would be 70 personnel. In addition, another 35 personnel would be required to operate base support functions.

2.4.4.5 SRMSC Remote Sprint Launch Site 2, North Dakota

The XBR would be totally contained within this existing site (figure 2.4.4-5). To deploy the radar unit, all facilities at the site would require demolition except for the sewage lagoon, which would be enlarged and



EXPLANATION

- Controlled Area Boundary
- Wind Speed Indicator
- Near Field Antenna

RLOB = Remote Launch Operations Building

NORTH

Scale

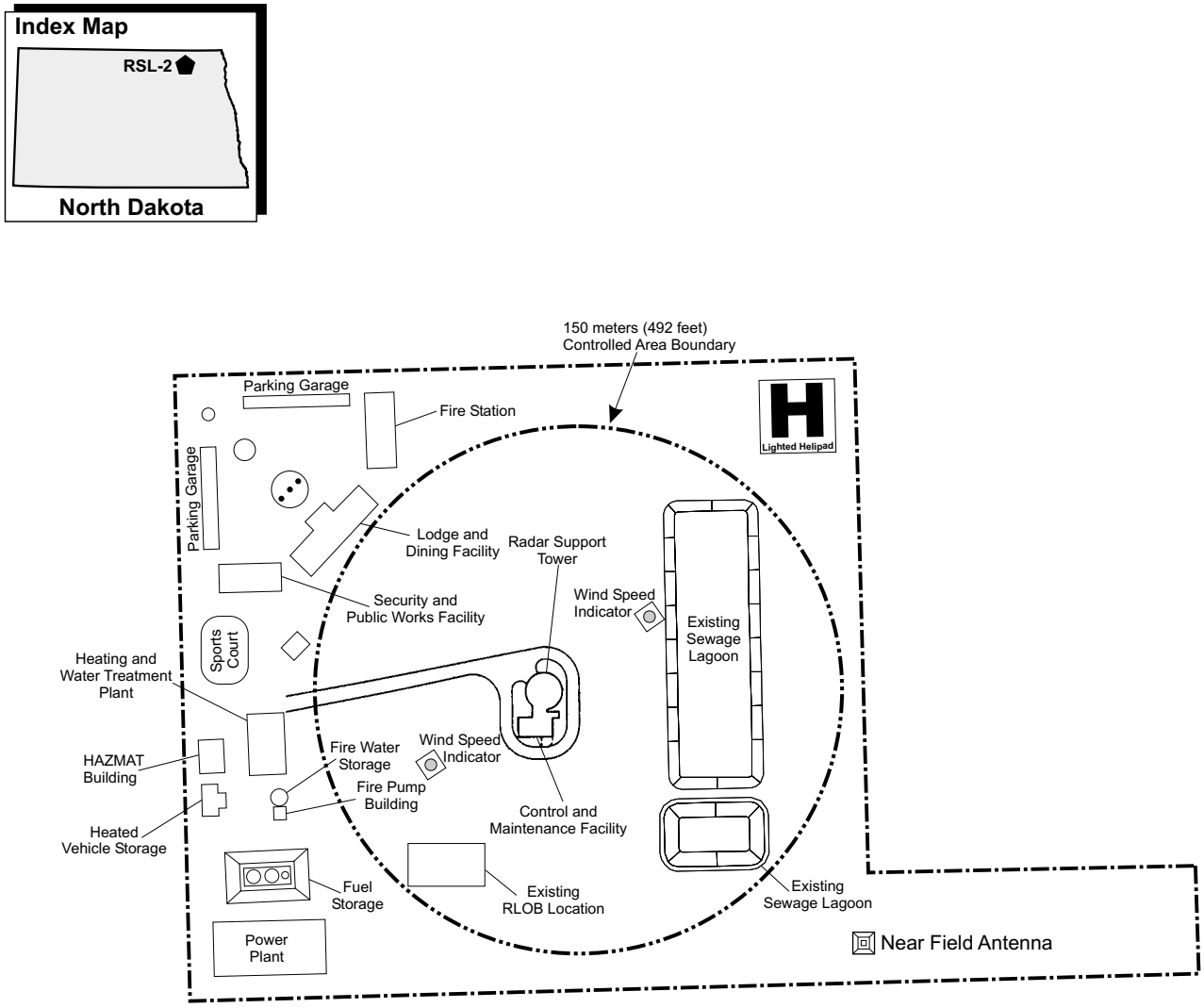
0 140 279 Feet

0 43 85 Meters

Potential X-Band Radar Location, Remote Sprint Launch Site 1

North Dakota

Figure 2.4.4-4



EXPLANATION

- Controlled Area Boundary
- Wind Speed Indicator
- Near Field Antenna

RLOB = Remote Launch Operations Building

Scale 1:4,000

0 167 333 Feet

0 51 101 Meters

NORTH

Potential X-Band Radar Location, Remote Sprint Launch Site 2

North Dakota

Figure 2.4.4-5

dp_rsl2_xbr_001

reactivated. The existing site access road would remain to service the site and would require no modification except resurfacing. Water to the site would be obtained from the local water provider near the site. The new facilities that would be required at this site are similar to those for the Missile Site Radar (see table 2.4.4-2). No provisions for storm water detention would be made at this site.

Construction Requirements

Most of the area contained within this 15-hectare (36-acre) site would be disturbed during construction activities, with ground-disturbing activities taking approximately 24 months. Construction and site activation personnel requirements would average 230.

Operational Requirements

When the XBR becomes fully operational, the total operations-related employment would be 70 personnel. In addition, another 35 personnel would be required to operate base support functions.

2.4.4.6 SRMSC Remote Sprint Launch Site 4, North Dakota

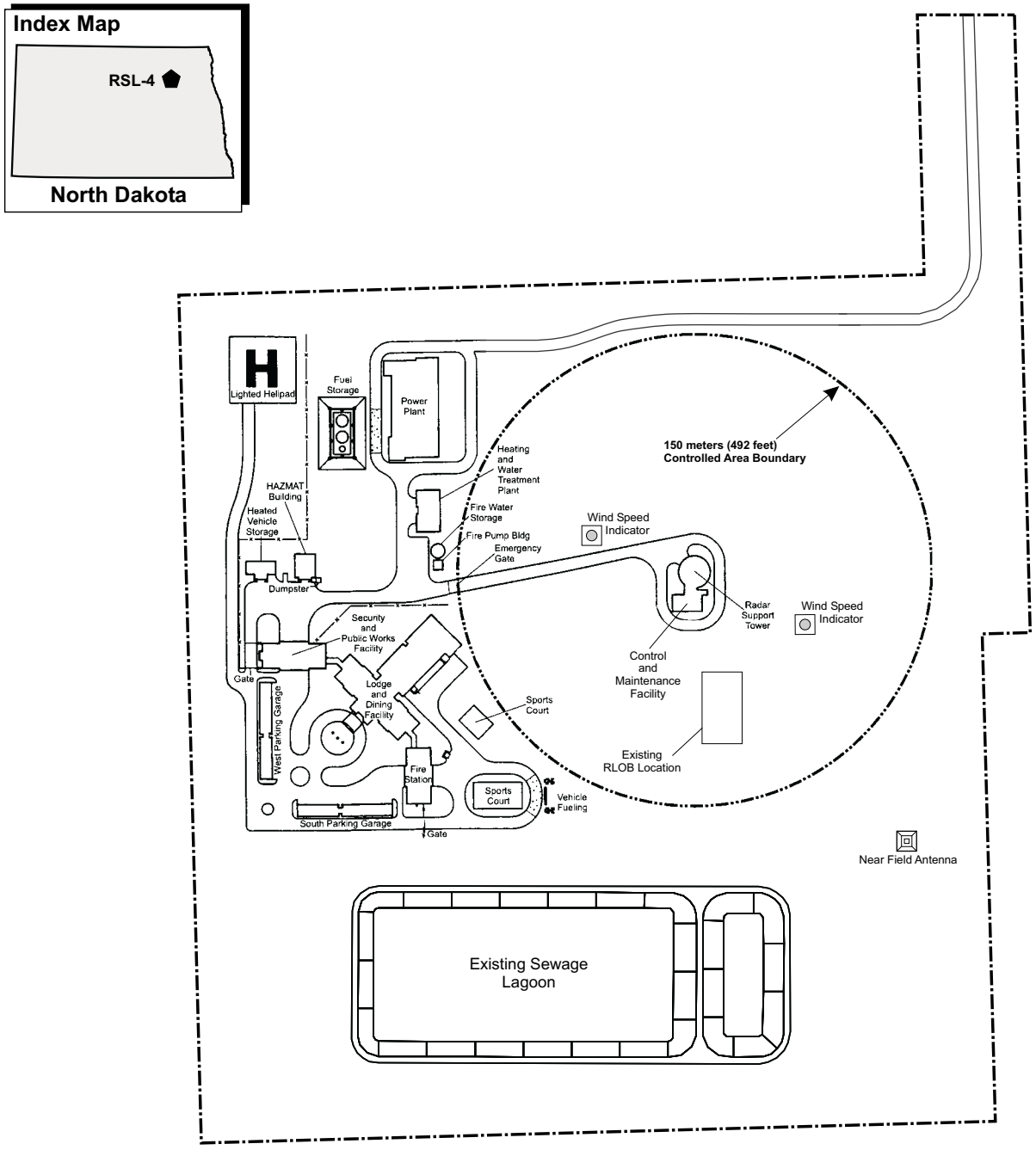
The XBR would be totally contained within this existing site (figure 2.4.4-6). To deploy the radar unit, all facilities at the site would require demolition except for the sewage lagoon, which would be enlarged and reactivated. The existing site access road would remain to service the site and would require no modification except resurfacing. Water to the site would be obtained from the local water provider near the site. The new facilities that would be required at this site are similar to those for the Missile Site Radar (see table 2.4.4-2). No provisions for storm water detention would be made at this site.

Construction Requirements

Most of the area contained within this 20-hectare (50-acre) site would be disturbed during construction activities, with ground-disturbing activities taking approximately 24 months. Construction and site activation personnel requirements would average 230.

Operational Requirements

When the XBR becomes fully operational, the total operations-related employment would be 70 personnel. In addition, another 35 personnel would be required to operate base support functions.



EXPLANATION

- Controlled Area Boundary
- Wind Speed Indicator
- Near Field Antenna

RLOB = Remote Launch Operations Building

NORTH

Scale

0 180 360 Feet

0 55 110 Meters

Potential X-Band Radar Location, Remote Sprint Launch Site 4

North Dakota

Figure 2.4.4-6

2.4.5 NMD SUPPORT FACILITIES AND INFRASTRUCTURE

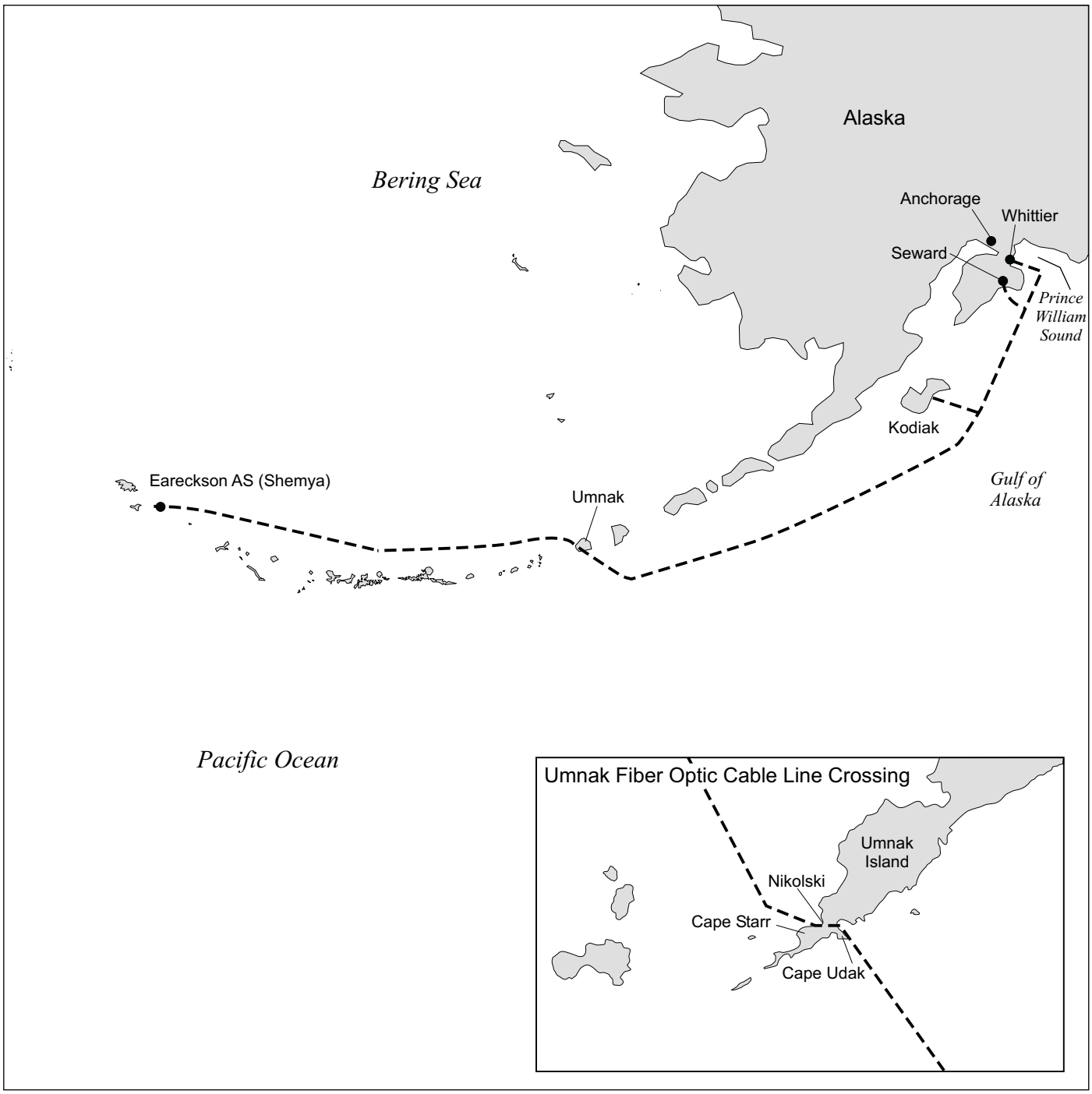
2.4.5.1 Fiber Optic Cable Line—Alaska

To provide a communication link between the elements that could be located in Alaska, new fiber optic cable line would be required for some elements in certain locations. For proposed Interior Alaska sites (i.e., Clear AFS, Fort Greely, Eielson AFB, and the Yukon Training Area), new fiber optic cable line would be connected to existing cable. This would require connections from the main line to the NMD element on that installation. In addition, some longer redundant lines may be needed to meet NMD reliability requirements. It is expected that the new fiber optic cable lines would utilize existing utility or road corridors when possible.

For proposed NMD elements in the Aleutian Islands, new fiber optic cable line would include a cable from Whittier or Seward to Eareckson AS (Shemya Island), Alaska. The cable would be laid during the summer months and would take approximately 30 to 90 days to install after a 30- to 90-day sea floor survey. In addition to this proposed route, a second redundant fiber optic cable line may be needed to meet NMD reliability requirements. The second route could be north of the Aleutian Islands or connect to existing fiber optic cable lines in the central Pacific or northwestern United States. Installation methods for this second route would be similar to those described for the Whittier or Seward to Eareckson AS route described below.

The fiber optic cable line to Eareckson AS from Whittier or Seward would be approximately 3,592 kilometers (2,232 miles) long (figure 2.4.5-1). This cable would primarily be placed underwater. The fiber optic cable line would be buried at a depth of 1 meter (3 feet) or more for depths up to 1,372 meters (4,500 feet) to avoid interference with fishing equipment and activities. For depths greater than 1,372 meters (4,500 feet), cable burial would not be necessary. The cable laying would be similar to any commercial fiber optic cable line operation (figure 2.4.5-2).

The cable route to Eareckson AS would start in Whittier or Seward using a pre-installed conduit. From the terminal building to the shoreline, the cable would be placed alongside an existing commercial fiber optic cable. From the shore, the cable would be placed in the ocean until making a landing on the Island of Kodiak north of the town of Monashka Bay. This would require crossing 457 meters (1,500 feet) of beach/land before reaching the existing utility corridors. From Kodiak, the cable would again be placed in the ocean until the Island of Umnak, where the cable would transition from the south side to the north side of the Aleutian Islands. The cable routed across the island would be along an existing dirt track. A terminal structure of 18 square meters (196 square feet) would be constructed on the island to which the cables would connect. This facility would include an electrical generator, batteries, and a diesel fuel



EXPLANATION

- Land Area
- Water Area
- Fiber Optic Cable Line

Scale 1:17,000,000

0 134 268 Miles

0 216 431 Kilometers

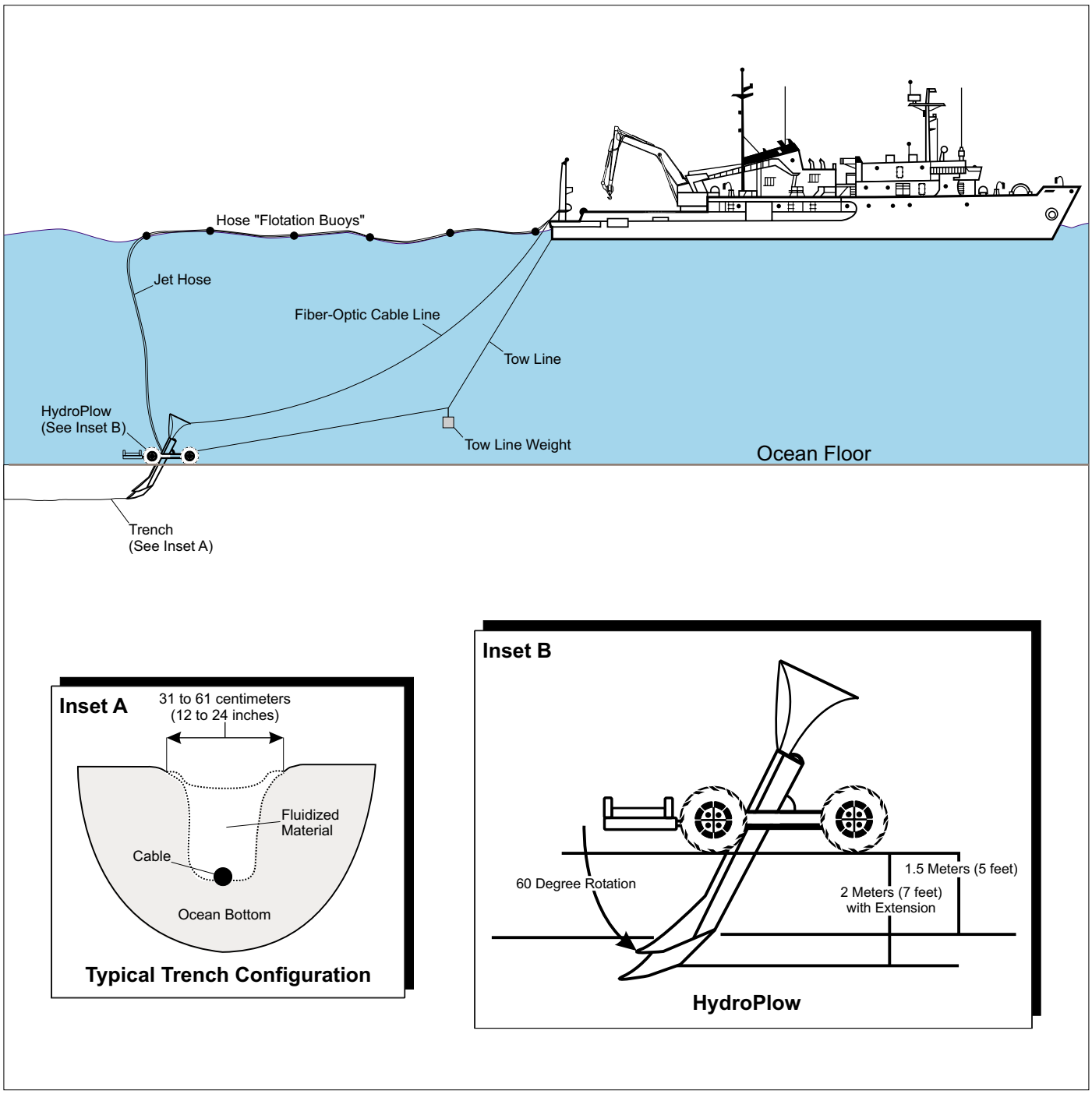
NORTH

dp_ak_fiber_001

Whittier or Seward to Eareckson Air Station Fiber Optic Cable Line Alignment

Alaska

Figure 2.4.5-1



EXPLANATION

For underwater depths of 1,371.6 meters (4,500 feet) or less.

Ocean Fiber Optic Cable Line Laying Concept

Alaska

Figure 2.4.5-2

Not to Scale

tank. From Umnak, the cable would then be laid to the Island of Shemya and would make landfall near the southeast end of the island (Fox Beach). Once on the island, the fiber optic cable line would follow existing utility corridors. Because the final ocean and land routes have not been completely surveyed for anomalies that may interfere with the cable, the final route may change.

2.4.5.2 Fiber Optic Cable Line—North Dakota

To provide a communication link between the elements, fiber optic cable line would be required if NMD elements are placed in the North Dakota region. To the extent possible, existing fiber optic cable line would be used. The new fiber optic cable line would be two separate cables with a minimum separation distance of 3 meters (10 feet). The cable would need to be from 2 to 3 meters (6 to 10 feet) below the surface because of ground freeze. No specific fiber optic cable line route has been sited for the potential North Dakota elements at this time. To the extent possible, fiber optic cable line would be located within existing roads, railway, and utility rights-of-way, with the cable being laid on both sides of the roadway, railway, and utility corridors to meet the required 3-meter (10-foot) separation distance. Placement would not affect local surface traffic except where the cable crosses an existing road network.

2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The following section briefly describes the methodology used to determine alternative potential deployment sites for NMD system elements. It also provides an overview of how certain sites were eliminated from further consideration.

Alaska

To fully satisfy NMD performance requirements, systems engineers determined that the GBI and XBR must be located within designated performance regions in Alaska. Alternative potential deployment locations were identified through the application of exclusionary criteria to DOD lands within these performance regions.

Ground-Based Interceptor. The performance region for the GBI was located in the northern half of Alaska. Within this area, 54 DOD-controlled lands were identified. These locations were evaluated against the following exclusionary criteria: special use lands, required parcel size for GBI deployment of up to 100 silos (243 hectares [600 acres]), sufficient usable land within the identified parcel, and availability of sufficient transportation modes to the location. Based on the application of these criteria, the only suitable locations were Clear AFS, Fort Greely, and the Yukon Training Area/Eielson AFB. The EIS analyzes several

potential sites at these locations. Because the other locations did not meet the exclusionary criteria, they were not addressed in this EIS.

Two potential GBI sites were initially identified at Fort Greely. However, one site (Area 5) was subsequently eliminated from further consideration because it was prone to seasonal flooding from Jarvis Creek. Four potential GBI sites were initially identified at the Yukon Training Area/Eielson AFB. Of these, three were subsequently eliminated from further consideration as follows: Engineer Hill offered poor prospects for construction, and facility layout would conflict with the mission of nearby Air Force Technical Application Center facilities. Bravo Battery and Charlie Battery offered poor road access, and existing site contamination would require a full construction season to remediate before any NMD GBI element construction.

X-Band Radar. The performance region for the XBR was determined to be the western end of the Aleutian Islands starting from Kiska Island. Within this area three DOD-controlled lands were identified. These locations were evaluated against exclusionary criteria tailored to the XBR, which included the four criteria used for GBI (with parcel size adjusted to 11 hectares [28 acres]), plus line of site and an EMR safety zone. Shemya Island was the only location that satisfied the line of sight criterion. Attu Research Site and Alaid Island Annex, the other two DOD-controlled lands within the performance region, did not pass this criterion and were excluded from further consideration on that basis. In an effort to expand the number of potential alternatives, the NMD program then considered the other, non-DOD, lands in the western Aleutians; however, none were determined to be feasible alternatives. The islands of Kiska, Buldir, Agattu, and the non-DOD owned portions of Attu are all designated as elements within the Alaska Maritime Wildlife Refuge and a designated wilderness area. In addition, because of its known volcanic activity, Kiska could not be considered suitable for a seismically sensitive, high-cost, system-critical NMD asset such as an XBR. In the case of the other islands, some mountaintops might provide the XBR clear line of sight. However, after considering these islands' wilderness designation as well as lack of infrastructure (roads, ports, power, quarters, personnel support services, communications, etc.) the NMD program determined that none could provide a superior alternative to Shemya Island, with its existing infrastructure and ongoing military mission. For this reason, the program opted not to pursue the legal actions needed to redesignate portions of one or more of these islands to permit their use for construction and operations of the XBR. For these reasons, Kiska, Buldir, Agattu, and Attu are classified as alternatives considered but not carried forward.

North Dakota

Sites in North Dakota were selected based on their location within the 1972 Anti-Ballistic Missile Treaty deployment area. Under the Treaty,

the main NMD elements (GBI and XBR) would have to be located within a 150-kilometer (93-mile) radius area centered around the former Minuteman field near Grand Forks AFB. DOD lands within this area were evaluated against the same siting criteria as noted for the Alaska sites. Within this area 199 DOD controlled locations were identified.

Ground-Based Interceptor. Of the 199 DOD sites identified within the region, only Grand Forks AFB had sufficient acreage to accommodate the GBI facilities. However, the Missile Site Radar, which only has 170 hectares (420 acres), was determined as being an acceptable site given its existing safety easements for adjacent properties.

X-Band Radar. Of the 199 DOD sites identified within the region, only Cavalier AFS, the Missile Site Radar, and Remote Sprint Launch Sites 1, 2 and 4 met all of the siting criteria. The other sites within the region were eliminated because of land size or line of sight criteria.

2.6 OTHER FUTURE ACTIONS IN THE REGIONS OF PROGRAM ACTIVITIES

This section provides an overview of other actions in the region or each alternative that could potentially contribute to cumulative impacts in conjunction with NMD deployment. In addition to the NMD program, other future proposed projects anticipated to occur during the same period as the NMD construction and operation were reviewed. Proposed projects considered as reasonably foreseeable were based on a review of installation and regional land use plans and discussions with installation and regional planners. Listed below are the projects that are being considered for cumulative impacts within this EIS. Existing activities are captured within the affected environment section of this EIS and the No-action Alternative.

Alaska

Clear AFS

- Construct Solid-State Phased Array Radar—expected completion date summer 2000

Eareckson AS

- Review of existing documentation shows that there are currently no major projects that may contribute to cumulative impacts in the timeframe of NMD construction. There may be some minor repairs and alterations to existing facilities.

Eielson AFB

- Construct Consolidated Munitions Facility in 1999

- Repair KC-135 Parking Ramp in 2000
- Repair Runway in 2000
- Construct Weapons and Release System Shop in 2001
- Construct Transportation Heavy Maintenance Facility in 2001
- Construct Phase 2 of Supply Complex in 2001
- Construct Vehicle Munitions Heated Parking in 2001
- Construct HAZWASTE Collection Facility in 2001
- Construct All-Weather Family Wellness Center in 2001
- Construct Aircraft Support Equipment Facility in 2002
- Construct Fuel Operations Facility in 2002
- Add/alter All-Weather Fitness Center in 2002
- Construct Munitions Storage/Inspection Facility in 2003
- Construct Munitions Assembly Facility in 2003
- Construct Fabrication Flight Consolidation Facility in 2003
- Add Security Lighting, Aircraft Parking Apron in 2003
- Construct Joint Deployment Processing Facility in 2003

Fort Greely

- Construct new power line from Richardson highway to the Alascom Microwave Site
- Potential public reuse of closed base cantonment area to include industrial, commercial, and institutional uses. Potential for a correctional facility.

Yukon Training Area

- Construct minor roads and extend power lines in various portions of the maneuver area
- Construct one new urban training site in several potential locations in the maneuver area
- Clear and expand Mock Airfield in the Stuart Creek Impact Area

North Dakota

Cavalier AFS

- Construct an addition to the Fitness Center in 2001
- Construct new parking lot and road in 2001
- Upgrade Community Center in 2002
- Construct four housing units in 2002

- Construct new Base Civil Engineering Self Help Center in 2003
- Demolish Buildings 705, 706, and 736 in 2002
- Construct new water treatment building in 2000
- Construct new unaccompanied enlisted personnel housing/unaccompanied officer personnel housing in 2003
- Construct new supply warehouse in 2000
- Potential dismantlement or destruction of Perimeter Acquisition Radar

Grand Forks AFB

- Construct new Commissary near the front gate in 2002
- Construct new Squadron Operations Facility near the flight line in 2005 (projected)
- Construct Extended Flightline Parking Ramp in 2002 (projected)
- Continue restoration of the city of Grand Forks from flood damage until 2002
- Continue restoration efforts of Devils Lake flooding

SRMSC Missile Site Radar

- Potential dismantlement or destruction of existing site facilities

SRMSC Remote Sprint Launch Site 1

- Potential dismantlement or destruction of existing site facilities

SRMSC Remote Sprint Launch Site 2

- Potential dismantlement or destruction of existing site facilities

SRMSC Remote Sprint Launch Site 4

- Potential dismantlement or destruction of existing site facilities

2.7 COMPARISON OF ENVIRONMENTAL IMPACTS

A summary comparison of the environmental impacts for the alternatives, along with their potential mitigation, for each resource affected over the study period is presented in tables 2.7-1 through 2.7-7. Impacts to the environment are described briefly in the summary and discussed in detail in chapter 4.0. The potential impacts of the No-action Alternative provide the baseline in which to compare the potential environmental consequences of NMD deployment and operation.

Table 2.7-1: Summary of Environmental Impacts for the No-action Alternative

Resource Category	ALASKA SITES					NORTH DAKOTA SITES			
	Clear AFS	**Eareckson AS**	**Eielson AFB**	**Fort Greely**	**Yukon Training Area**	**Cavalier AFS**	**Grand Forks AFB**	**Missile Site Radar**	**Remote Sprint Launch Sites 1, 2, and 4**
Air Quality	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status	No change to the region's current attainment status
Airspace	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use	No change in airspace status or use
Biological Resources	No impacts to biological resources from continued operations	No impacts to biological resources from continued operations	Minimal impacts to wildlife and threatened and endangered species from aircraft activities. Plans are in place to minimize impacts	Minimal impacts to vegetation, wildlife, and threatened and endangered species from training activities. Plans are in place to minimize impacts	Minimal impacts to vegetation, wildlife, and threatened and endangered species from training activities. Plans are in place to minimize impacts	No impacts to biological resources from continued operations	No impacts to biological resources from continued operations	No impacts to biological resources from continued operations	No impacts to biological resources from continued operations
Cultural Resources	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations	No impacts, resources would continue to be managed in accordance with cultural resource regulations
Geology and Soils	No impact	No impact	No impact	Potential for short-term and cumulative impact to soil and permafrost from training activities **Mitigation:** Reduce soil and permafrost impacts through best management practices	Potential for short-term and cumulative impact to soil and permafrost from training activities **Mitigation:** Reduce soil and permafrost impacts through best management practices	No impact	No impact	No impact	No impact
Hazardous Materials and Hazardous Waste Management	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites	Continued use of hazardous materials and generation of hazardous waste in accordance with appropriate regulations. Continued remediation of hazardous waste sites

Table 2.7-1: Summary of Environmental Impacts for the No-action Alternative (Continued)

Resource Category	ALASKA SITES					NORTH DAKOTA SITES			
	Clear AFS	Eareckson AS	Eielson AFB	Fort Greely	Yukon Training Area	Cavalier AFS	Grand Forks AFB	Missile Site Radar	Remote Sprint Launch Sites 1, 2, and 4
Health and Safety	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact
Land Use and Aesthetics	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Incompatible residential land uses are within runway clear zone	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses	Current base activities are compatible with regional and local planning/zoning and surrounding on and off-base land uses
Noise	No impact	No impact	Residential area of Moose Creek is within day-night level 65 decibels A-weighted noise contour from aircraft noise	No impact	No impact	No impact	No impact	No impact	No impact
Socioeconomics	Base operations would continue to provide economic benefits	No impact	Base operations would continue to provide economic benefits	Economic impact from loss of jobs associated with base realignment	Base operations would continue to provide economic benefits	Base operations would continue to provide economic benefits	Base operations would continue to provide economic benefits	No activities occur at this site; therefore, there are no economic benefits	No activities occur at these sites; therefore, there are no economic benefits
Transportation	No change to current level of service on roadways	No impact	No change to current level of service on roadways	No change to current level of service on roadways	No change to current level of service on roadways	No change to current level of service on roadways	No change to current level of service on roadways	No change to current level of service on roadways	No change to current level of service on roadways
Utilities	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand	Utility systems are adequate to handle demand
Water Resources	No change to water resources in the region	No change to water resources in the region	No change to water resources in the region	Potential for impacts to water resources from military training activities **Mitigation:** Use existing management practices and storm water plans to reduce potential water impacts	Potential for impacts to water resources from military training activities **Mitigation:** Use existing management practices and storm water plans to reduce potential water impacts	No change to water resources in the region	No change to water resources in the region	No change to water resources in the region	No change to water resources in the region

Table 2.7-1: Summary of Environmental Impacts for the No-action Alternative (Continued)

Resource Category	ALASKA SITES					NORTH DAKOTA SITES			
	Clear AFS	Eareckson AS	Eielson AFB	Fort Greely	Yukon Training Area	Cavalier AFS	Grand Forks AFB	Missile Site Radar	Remote Sprint Launch Sites 1, 2, and 4
Environmental Justice	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected
Subsistence	No impact to subsistence uses in and around Clear AFS	Restricted access on the island precludes subsistence use	No impact to subsistence use in and around Eielson AFB	No impact to subsistence uses in and around Fort Greely	No impact to subsistence use in and around the Yukon Training Area	Not applicable to North Dakota	Not applicable to North Dakota	Not applicable to North Dakota	Not applicable to North Dakota

Table 2.7-2: Summary of Environmental Impacts for Deployment of the Ground-Based Interceptor

Resource Category	ALASKA SITES			NORTH DAKOTA SITES	
	Clear AFS	Fort Greely	Yukon Training Area/Eielson AFB	Grand Forks AFB	Missile Site Radar
Air Quality	Increase in air emissions from construction and operation would not affect the region's current attainment status. Will not affect Denali National Park visibility	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status
Airspace	No impact	No impact	No impact	No impact	No impact
Biological Resources	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists to impact between 2.7 hectares (6.6 acres) and 55 hectares (135 acres) of wetlands depending on location selected **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. No wetlands would be impacted	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists to impact 46 hectares (113 acres) of low-value wetlands **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists to impact 5 hectares (12 acres) of wetlands from OT-5 deployment alternative **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists for sedimentation to impact Roaring Nancy Creek which is a wetland **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process
Cultural Resources	No adverse effects	No adverse effects	Potential effect on archaeological site and possible historic structure **Mitigation:** Consult with the State Historic Preservation Officer to minimize adverse effects. Mitigation could include recovery of data from archaeological site and recordation of possible historic structure	No impact	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation
Geology and Soils	Minor increase in soil erosion would be localized to the construction site. Potential for deployment to affect some permafrost areas. Site design would minimize impacts by avoidance if possible **Mitigation:** Avoid permafrost areas as much as possible. Conduct detailed permafrost studies of potential deployment site. Design facilities to minimize impacts to permafrost	Minor increase in soil erosion would be localized to the construction site. Minimal impact to permafrost	Short-term impacts from soil erosion during construction. Long-term impacts to permafrost at the deployment site which could result in subsidence, increase erosion, and gully formation **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques. Avoid permafrost areas as much as possible. Conduct detailed permafrost studies of potential deployment site. Design facilities to minimize impacts to permafrost	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques

Table 2.7-2: Summary of Environmental Impacts for Deployment of the Ground-Based Interceptor (Continued)

Resource Category	ALASKA SITES			NORTH DAKOTA SITES	
	Clear AFS	**Fort Greely**	**Yukon Training Area/Eielson AFB**	**Grand Forks AFB**	**Missile Site Radar**
Hazardous Materials and Hazardous Waste Management	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations
Health and Safety	Minimal increase in health and safety risks. Potential for a GBI mishap during handling is unlikely. In the event of an unlikely accidental liquid propellant leak hazardous gases could exceed base boundary under the Alternative B Site affecting up to 122 hectares (302 acres); however, no occupied structures exist within this area. No off-base areas impacted under Alternative A Site **Mitigation:** Update mutual aid agreements with local fire departments to include additional hazards associated with GBI deployment	Minimal increase in health and safety risks. Potential for a GBI mishap during handling is unlikely. In the event of an unlikely accidental liquid propellant leak hazardous gases could exceed base boundary affecting up to 14 hectares (35 acres); however, no occupied structures exist within this area. GBI Deployment would require revision to area fire protection status **Mitigation:** Change fire protection status from Full to Critical. Update mutual aid agreements with local fire departments to include additional hazards associated with GBI deployment	Minimal increase in health and safety risks. Potential for a GBI mishap during handling is unlikely. In the event of an unlikely accidental liquid propellant leak hazardous gases would not exceed base boundary. GBI Deployment would require revision to area fire protection status **Mitigation:** Change fire protection status from Full to Critical. Update mutual aid agreements with local fire departments to include additional hazards associated with GBI deployment	Minimal increase in health and safety risks. Potential for a GBI mishap during handling is unlikely. In the event of an unlikely accidental liquid propellant leak hazardous gases could exceed base boundary affecting up to 107 hectares (264 acres) for weapon storage alternative (area includes three commercial structures, two churches, and one residential unit) and 306 hectares (757 acres) for OT-5 alternative (area includes one residential unit) **Mitigation:** Update mutual aid agreements with local fire departments to include additional hazards associated with GBI deployment	Minimal increase in health and safety risks. Potential for a GBI mishap during handling is unlikely. In the event of an unlikely accidental liquid propellant leak hazardous gases could exceed base boundary affecting up to 225 hectares (557 acres); this area includes one commercial structure and an unoccupied farm building. In addition, the explosive safety quantity distances associated with the GBI facilities exceed the base boundary which includes open agricultural lands **Mitigation:** Update mutual aid agreements with local fire departments to include additional hazards associated with GBI deployment. Review existing safety lease agreements for the site and determine if any modifications or addition would be required
Land Use and Aesthetics	Deployment of the GBI would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the GBI would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the GBI would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the GBI would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the GBI would be compatible with regional and local planning/zoning. Explosive safety quantity distances would exceed base boundary but would be compatible with the agricultural uses of the land **Mitigation:** To ensure future land use compatibility, review existing lease agreements for the site and determine if any modifications or addition would be required to ensure no structures would be built within the explosive safety quantity distances

Table 2.7-2: Summary of Environmental Impacts for Deployment of the Ground-Based Interceptor (Continued)

Resource Category	ALASKA SITES			NORTH DAKOTA SITES	
	Clear AFS	Fort Greely	Yukon Training Area/Eielson AFB	Grand Forks AFB	Missile Site Radar
Noise	No impact	No impact	No impact	Potential for short-term construction related noise disturbance to 2 churches and 1 residential unit from Weapon Storage Area alternative and 1 residential unit from the OT-5 alternative; however, no long-term impacts	Potential for short-term construction related noise disturbance to 2 residential units; however, no long-term impacts
Socioeconomics	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. The economic benefit would help reduce the adverse economic impact as a result of base realignment at Fort Greely. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services
Transportation	Level of service on the George Parks Highway would change from B to C as a result of temporary construction related impacts. The level of service would change back to B after construction	Change in level of service from B to C in Delta Junction at intersection of state highways 2 and 4 as a result of potential long-term cumulative operational impacts	Level of service on the Richardson Highway would change from A to B as a result of temporary cumulative construction related impacts. The level of service would change back to A after construction	No change to level of service on roadways	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction
Utilities	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment
Water Resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources
Environmental Justice	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected
Subsistence	Decrease in the amount of land available for subsistence uses; however, the area is not a main subsistence use area in region due to limited access to the base	Decrease in the amount of land available for subsistence uses; however, the area is not a main subsistence use area in region	Decrease in the amount of land available for subsistence uses; however, the area is not a main subsistence use area in region	Not applicable to North Dakota	Not applicable to North Dakota

Table 2.7-3: Summary of Environmental Impacts for Deployment of the Battle Management Command and Control

Resource Category	ALASKA SITES			NORTH DAKOTA SITES	
	Clear AFS	Fort Greely	Yukon Training Area/ Eielson AFB	Grand Forks AFB	Missile Site Radar
Air Quality	Increase in air emissions from construction and operation would not affect the region's current attainment status. Will not affect Denali National Park visibility	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status
Airspace	No impact	No impact	No impact	No impact	No impact
Biological Resources	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists to impact wetlands **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. No wetlands would be impacted	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists to impact low-value wetlands **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. No wetlands would be impacted	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species. The potential exists for sedimentation to impact Roaring Nancy Creek which is a wetland **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process
Cultural Resources	No adverse effects	No adverse effects	Potential effect on archaeological site **Mitigation:** Consult with the State Historic Preservation Officer to minimize adverse effects. Mitigation could include recovery of data from archaeological site	No impact	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation
Geology and Soils	Minor increase in soil erosion would be localized to the construction site. Potential for deployment to affect some permafrost areas. Site design would minimize impacts by avoidance if possible **Mitigation:** Avoid permafrost areas as much as possible. Conduct detailed permafrost studies of potential deployment site. Design facilities to minimize impacts to permafrost	Minor increase in soil erosion would be localized to the construction site. Potential for deployment to affect some permafrost areas. Site design would minimize impacts by avoidance if possible **Mitigation:** Avoid permafrost areas as much as possible. Conduct detailed permafrost studies of potential deployment site. Design facilities to minimize impacts to permafrost	Short-term impacts from soil erosion during construction. Long-term impacts to permafrost at the deployment site which could result in subsidence, increase erosion, and gully formation **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques. Avoid permafrost areas as much as possible. Conduct detailed permafrost studies of potential deployment site. Design facilities to minimize impacts to permafrost	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques

Table 2.7-3: Summary of Environmental Impacts for Deployment of the Battle Management Command and Control (Continued)

Resource Category	ALASKA SITES			NORTH DAKOTA SITES	
	Clear AFS	Fort Greely	Yukon Training Area/ Eielson AFB	Grand Forks AFB	Missile Site Radar
Hazardous Materials and Hazardous Waste Management	No impact	No impact	No impact	No impact	No impact
Health and Safety	No impact	No impact	No impact	No impact	No impact
Land Use and Aesthetics	Deployment of the BMC2 would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the BMC2 would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the BMC2 would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the BMC2 would be compatible with regional and local planning/zoning and surrounding on and off-base land uses	Deployment of the BMC2 would be compatible with regional and local planning/zoning and surrounding on and off-base land uses
Noise	No impact	No impact	No impact	No impact	No impact
Socioeconomics	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. The economic benefit would help reduce the adverse economic impact as a result of base realignment at Fort Greely. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services
Transportation	Level of service on the George Parks Highway would change from B to C as a result of temporary construction related impacts. The level of service would change back to B after construction.	Change in level of service from B to C in Delta Junction at intersection of state highways 2 and 4 as a result of potential long-term cumulative operational impacts	Level of service on the Richardson Highway would change from A to B as a result of temporary cumulative construction related impacts. The level of service would change back to A after construction	No change to level of service on roadways	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction
Utilities	No impact	No impact	No impact	No impact	No impact
Water Resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources
Environmental Justice	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected
Subsistence	Decrease in the amount of land available for subsistence uses; however, the area is not a main subsistence use area in region due to limited access to the base	Decrease in the amount of land available for subsistence uses; however, the area is not a main subsistence use area in region	Decrease in the amount of land available for subsistence uses; however, the area is not a main subsistence use area in region	Not applicable to North Dakota	Not applicable to North Dakota

Table 2.7-4: Summary of Environmental Impacts for Deployment of the In-Flight Interceptor Communications System (IFICS) Data Terminal

Resource Category	Potential Environmental Impact
Air Quality	Increase in air emissions from construction and operation would be minimal. Operations emissions associated with electrical generator would not be expected to change air quality in deployment region
Airspace	Deployment would not require any change in airspace use in the deployment region
Biological Resources	Minimal impacts expected from the construction and operation of an IFICS Data Terminal site to vegetation, wildlife, threatened or endangered species, and wetlands. Sensitive biological areas would be avoided during the siting process. Annual test of system would not impact wildlife
Cultural Resources	Potential for construction to impact archaeological resources; however, sensitive cultural resource areas would be avoided during the siting process, if possible. Overall, no adverse impacts are expected
Geology and Soils	Minimal impacts expected from the construction and operation of an IFICS Data Terminal site. Construction related impacts would be short-term
Hazardous Materials and Hazardous Waste Management	Minimal use of hazardous materials and generation of hazardous waste at the deployment site. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations
Health and Safety	During normal NMD operations, the IFICS Data Terminal would not transmit except during annual testing of the equipment. It is expected that a power/calibration test of the transmitter would occur once a year. During this test, electromagnetic radiation would be generated by the IFICS Data Terminal. Electromagnetic radiation levels would not exceed personnel exposure limits during the annual test at the site
Land Use and Aesthetics	This element would affect approximately 7 hectares (17 acres) of land. Due to this project only affecting such a small portion of land it should not drastically affect the land use regardless of where it is located. The NMD program would comply with all applicable Federal and state land use laws. The significance of visual impacts from a deployment site would depend on the sensitivity of the affected views, as well as visual dominance of facilities. Impacts could occur if the facilities were within views of medium to high sensitivity public use areas and travel routes. However, it is anticipated that the IFICS Data Terminal would be located on a DOD installation with similar facilities and limited public access resulting in no visual impacts
Noise	Minimal noise impacts expected from operation of electrical generator inside of a shelter
Socioeconomics	There would be a minimal security personnel force associated with deployment of an IFICS Data Terminal. In addition, construction of the site would create minimal construction related jobs. There would be no impact to local or regional socioeconomic resources
Transportation	There may be a minimal security personnel force associated with deployment of an IFICS Data Terminal; therefore, there would be minimal impact to local or regional transportation resources
Utilities	There may be a minimal site security force associated with operation of the IFICS Data Terminal. The site would require a small amount of electricity to operate. The site may have water connections or use bottled water for the security personnel. Overall, there would be no impact to utilities
Water Resources	Minimal impacts expected from the construction and operation of an IFICS Data Terminal site. Construction related impacts would be short-term
Environmental Justice	No adverse human health and environmental impacts would be expected from construction and operation of the IFICS Data Terminal. No environmental justice concerns have been identified
Subsistence	Given the small area required for deployment it is not expected that construction or operation would affect subsistence resources in the State of Alaska if the IFICS Data Terminal were deployed in this state

Table 2.7-5: Summary of Environmental Impacts for Deployment of the X-Band Radar

Resource Category	ALASKA SITE	NORTH DAKOTA SITES				
	Eareckson AS	**Cavalier AFS**	**Missile Site Radar**	**Remote Sprint Launch Site 1**	**Remote Sprint Launch Site 2**	**Remote Sprint Launch Site 4**
Air Quality	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status	Increase in air emissions from construction and operation would not affect the region's current attainment status
Airspace	Establishment of a high energy radiation area warning on aeronautical charts would not pose any flight restriction requirements; therefore, there would be no impacts to airspace	Establishment of a high energy radiation area warning on aeronautical charts would not pose any flight restriction requirements; therefore, there would be no impacts to airspace	Establishment of a high energy radiation area warning on aeronautical charts would not pose any flight restriction requirements; therefore, there would be no impacts to airspace	Establishment of a high energy radiation area warning on aeronautical charts would not pose any flight restriction requirements; therefore, there would be no impacts to airspace	Establishment of a high energy radiation area warning on aeronautical charts would not pose any flight restriction requirements; therefore, there would be no impacts to airspace	Establishment of a high energy radiation area warning on aeronautical charts would not pose any flight restriction requirements; therefore, there would be no impacts to airspace
Biological Resources	No impacts from electromagnetic radiation. Approximately 12 hectares (30 acres) of wetlands impacted **Mitigation:** Develop mitigation measures to minimize impacts to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species from construction or electromagnetic radiation. No wetlands would be impacted **Mitigation:** Clear vegetation within 15 meters (49 feet) of radar to reduce likelihood of wildlife using the area	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species from construction or electromagnetic radiation. The potential exists for sedimentation to impact Roaring Nancy Creek which is a wetland **Mitigation:** Clear vegetation within 15 meters (49 feet) of radar to reduce likelihood of wildlife using the area. Develop mitigation measures to wetlands through the consultation and permitting process	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species from construction or electromagnetic radiation. No wetlands would be impacted **Mitigation:** Clear vegetation within 15 meters (49 feet) of radar to reduce likelihood of wildlife using the area	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species from construction or electromagnetic radiation. No wetlands would be impacted **Mitigation:** Clear vegetation within 15 meters (49 feet) of radar to reduce likelihood of wildlife using the area	Minimal impacts are expected to vegetation, wildlife, and threatened or endangered species from construction or electromagnetic radiation. No wetlands would be impacted **Mitigation:** Clear vegetation within 15 meters (49 feet) of radar to reduce likelihood of wildlife using the area
Cultural Resources	No adverse effects	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation	Adverse impact to historic structures has been mitigated through completed Historic American Engineering Record documentation
Geology and Soils	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques	Short-term impacts from soil erosion during construction **Mitigation:** Minimize soil erosion by implementation of standard erosion control techniques

Table 2.7-5: Summary of Environmental Impacts for Deployment of the X-Band Radar (Continued)

Resource Category	ALASKA SITE Eareckson AS	NORTH DAKOTA SITES Cavalier AFS	Missile Site Radar	Remote Sprint Launch Site 1	Remote Sprint Launch Site 2	Remote Sprint Launch Site 4
Hazardous Materials and Hazardous Waste Management	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations	Increase in hazardous materials use and hazardous waste generation. All hazardous material and waste handled in accordance with appropriate regulations. Storage tanks would be subject to all appropriate regulations
Health and Safety	No risk to human health from electromagnetic radiation. Potential risk to aircraft airborne systems and fly-by-wire aircraft minimized through establishment of a high energy radiation area warning on aeronautical charts	No risk to human health from electromagnetic radiation. Potential risk to aircraft airborne systems and fly-by-wire aircraft minimized through establishment of a high energy radiation area warning on aeronautical charts	No risk to human health from electromagnetic radiation. Potential risk to aircraft airborne systems and fly-by-wire aircraft minimized through establishment of a high energy radiation area warning on aeronautical charts	No risk to human health from electromagnetic radiation. Potential risk to aircraft airborne systems and fly-by-wire aircraft minimized through establishment of a high energy radiation area warning on aeronautical charts	No risk to human health from electromagnetic radiation. Potential risk to aircraft airborne systems and fly-by-wire aircraft minimized through establishment of a high energy radiation area warning on aeronautical charts	No risk to human health from electromagnetic radiation. Potential risk to aircraft airborne systems and fly-by-wire aircraft minimized through establishment of a high energy radiation area warning on aeronautical charts
Land Use and Aesthetics	Deployment of the XBR would be compatible with regional and local planning/zoning and surrounding on and off-base land uses. Deployment would be consistent with the Alaska Coastal Management Program	Deployment of the XBR would be compatible with regional and local planning/zoning	Deployment of the XBR would be compatible with regional and local planning/zoning	Deployment of the XBR would be compatible with regional and local planning/zoning	Deployment of the XBR would be compatible with regional and local planning/zoning	Deployment of the XBR would be compatible with regional and local planning/zoning
Noise	No impact	No impact	Potential for short-term construction related noise disturbance to 2 residential units; however, no long-term impacts	No impact	No impact	No impact
Socioeconomics	Eareckson AS is a military installation on an island with no surrounding support services. No socioeconomic impacts would occur	Construction direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services. Operation of the XBR would replace the current Air Force mission resulting in no net change to the regional economy	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services	Construction and operations direct and indirect employment and materials expenditures would provide economic benefit to surrounding communities' retail sales and tax base. No impact on public services

Table 2.7-5: Summary of Environmental Impacts for Deployment of the X-Band Radar (Continued)

Resource Category	ALASKA SITE	NORTH DAKOTA SITES				
	Eareckson AS	Cavalier AFS	Missile Site Radar	Remote Sprint Launch Site 1	Remote Sprint Launch Site 2	Remote Sprint Launch Site 4
Transportation	No impact	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction	Level of service on North Dakota highways 1 and 5 within Langdon would change from A to B as a result of cumulative temporary construction related impacts. Level of service would change back to A after construction
Utilities	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment	Current utility systems have adequate capacity to support deployment
Water Resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources	Minor potential for short-term increase in sediment in surface water during construction. Appropriate permits and storm water plans would be implemented to minimize impacts to water resources
Environmental Justice	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected	No low-income or minority populations would be disproportionately affected
Subsistence	Restricted access on the island precludes subsistence use	Not applicable to North Dakota	Not applicable to North Dakota	Not applicable to North Dakota	Not applicable to North Dakota	Not applicable to North Dakota

Table 2.7-6: Summary of Environmental Impacts for Deployment of the Fiber Optic Cable Line

Resource Category	Alaska	North Dakota
Air Quality	No impact	No impact
Airspace	No impact	No impact
Biological Resources	Short-term impact to invertebrates and fishes, no long-term impacts expected. Short-term disturbance of terrestrial animals and/or aquatic organisms and terrestrial and/or aquatic habitat, no long-term impacts expected. No direct adverse short or long-term impacts expected to marine mammals or birds. No expected consequences on threatened or endangered species **Mitigation:** Time construction activities to avoid nesting and breeding periods in the terrestrial environment. Use silt fences to minimize soil erosion impacts to streams (spawning habitat) on land crossings or avoid spawning season. Direct bore fiber optic lines under streams where possible. Avoid Steller sea lion rookeries or haul out areas by 5.6 kilometers (3 nautical miles)	Short-term impacts could occur to vegetation, wildlife, and threatened or endangered species. The potential exists for short-term impacts to wetlands along existing road and utility corridors **Mitigation:** Develop mitigation measures to wetlands through the consultation and permitting process. Avoid construction during nesting season.
Cultural Resources	Additional studies required to determine if historic properties may be affected **Mitigation:** Consult with the State Historic Preservation Officer to determine the requirement for additional studies	Additional studies required to determine if historic properties may be affected **Mitigation:** Consult with the State Historic Preservation Officer to determine the requirement for additional studies
Geology and Soils	Short-term disturbance to ocean floor and ground soils, no long-term impacts expected	Short-term disturbance to soils, no long-term impacts expected
Hazardous Materials and Hazardous Waste Management	No impact	No impact
Health and Safety	No impact	No impact
Land Use and Aesthetics	No impact	No impact
Noise	No impact	No impact
Socioeconomics	No impacts. See subsistence resources for potential impacts to fishermen	No impact
Transportation	No impact	No impact
Utilities	No impact	No impact
Water Resources	Short-term increase in sedimentation and degradation of ocean water quality, no long-term impacts expected	Short-term increase in sedimentation and degradation of surface water quality near fiber optic cable line, no long-term impacts expected
Environmental Justice	No impact	No impact
Subsistence	Short-term potential to displace subsistence resources resulting in diminished activities. Short-term change in fishermen's fishing activities **Mitigation:** Hold meetings in the affected communities to minimize impacts to harvesting time and harvesting areas	Not applicable

Table 2.7-7: Summary of Environmental Impacts for the Upgraded Early Warning Radars

Resource Category	ALASKA SITE Clear AFS	CALIFORNIA SITE Beale AFB	MASSACHUSETTS SITE Cape Cod AFS
Cultural Resources	**No-action Alternative**: No adverse effects **Proposed Action**: No adverse effects	**No-action Alternative**: No adverse effects **Proposed Action**: No adverse effects	**No-action Alternative**: No adverse effects **Proposed Action**: No adverse effects
Health and Safety	**No-action Alternative**: Public radio frequency exposure levels would be below recommended exposure limits. No adverse effects from long-term exposure **Proposed Action**: Public radio frequency exposure levels would be below recommended exposure limits. No adverse effects from long-term exposure	**No-action Alternative**: Public radio frequency exposure levels would be below recommended exposure limits. No adverse effects from long-term exposure **Proposed Action**: Public radio frequency exposure levels would be below recommended exposure limits. No adverse effects from long-term exposure	**No-action Alternative**: Public radio frequency exposure levels would be below recommended exposure limits. No adverse effects from long-term exposure **Proposed Action**: Public radio frequency exposure levels would be below recommended exposure limits. No adverse effects from long-term exposure

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