4.3.4 X-BAND RADAR

The potential XBR deployment alternatives consist of the six sites listed below.

Consistent with Council on Environmental Quality regulations, the scope of the analysis presented in this EIS for the XBR deployment alternatives was defined by the range of potential environmental impacts that would result from implementation of the Proposed Action. Resources that have a potential for impacts were considered in the analysis to provide the decisionmakers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 15 resource areas. For potential deployment of the XBR all 15 resource areas were analyzed.

4.3.4.1 Air Quality

This section addresses potential environmental impacts caused by changes to the air quality environment due to the proposed construction and operation of the XBR element. Impacts considered include potential effects from ongoing or planned activities at these sites. Potential impacts were determined using the following criteria:

- Operations within attainment areas that could cause a detrimental change in attainment status of the area
- Operations within non-attainment areas that could impede or delay attainment of the NAAQS or state AAQS
- Increases in ambient air pollutant concentrations that could cause exceedances of the NAAQS or state AAQS
- Increases in air pollutant concentrations greater than 1 microgram per cubic meter (averaged over 24 hours) from new or modified major stationary sources within 10 kilometers (6 miles) of a Class I area

The proposed construction of the XBR would generate fugitive dust and exhaust emissions similar to that described in section 4.3.1.1. While section 2.2.4.1 describes the facilities in terms of a 7-hectare (17-acre) plot, the actual area that would be disturbed varies sufficiently from location to location to warrant individual presentations. Construction emissions estimates are based on a total building footprint of 9,300 square meters (100,000 square feet) at all proposed sites.

Operational emissions at the site would be limited to generator exhaust, maintenance-related emissions, and mobile emissions from operations vehicles and from privately-owned vehicles used by operations and support personnel. As noted in section 4.3.1.1, maintenance-related emissions would consist primarily of minimal levels of volatile organic compound emissions. These emissions would be included in the site's

emissions inventories, but it is not anticipated that they could have a significant impact on air quality. Maintenance-related emissions are not addressed further.

Approximately 105 personnel would be required for operation of each XBR and attendant infrastructure. This would result in a net increase in mobile emissions in the area. The extent of this increase would depend on the amount of increase in local traffic. Assuming all personnel are new, and following the assumptions outlined in section 4.3.1, mobile emissions from personnel would generate up to 43 metric tons (47 tons) of carbon monoxide annually. It is not anticipated that this level of increased mobile emissions would have an impact on any of the proposed XBR sites. As in section 4.3.1, these emissions are not included in the comparison of current and anticipated emissions. Mobile emissions for XBR sites are not addressed further.

Power generation and other potentially significant operational emissions sources are addressed individually for each proposed XBR site.

4.3.4.1.1 Alaska Installations

4.3.4.1.1.1 Eareckson AS—Air Quality

Construction

Installation of the XBR at Eareckson AS would require the disturbance of up to 12 hectares (30 acres) of land. Table 4.3.4.1-1 summarizes potential emissions from construction and operational site activation of the XBR at Eareckson AS. All construction would be conducted in accordance with appropriate regulations and permits. No exceedances of the NAAQS or state AAQS would be anticipated beyond the immediate construction area due to the Proposed Action.

Operation

The facility would be powered by a dedicated 7,500-kilowatt generator. New boilers would also be installed. It is likely that both of these would require major modifications to the current Title V Air Permit. It is also likely that they would require a PSD review. Both of these changes would require an extended period of time to finalize (a year or more each). Both of these measures (Title V Permit restrictions and PSD review) would limit the impact of the Proposed Action on air quality. Table 4.3.4.1-2 compares the latest emissions inventory at Eareckson AS with the anticipated emissions from XBR operation.

Table 4.3.4.1-1: Comparison of Current and Projected Annual Emissions Due to Construction of the X-Band Radar at Eareckson AS

	Current Base-wide Emissions[1]	Construction-related Emissions[2]		Operations Phase-in[3]
		Year 1	Year 2	Year 3
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	91 (100)	13 (14)	13 (14)	115 (131)
Oxides of Nitrogen	349 (385)	16 (18)	16 (18)	265 (292)
Oxides of Sulfur	28 (31)	< 1 (< 1)	< 1 (< 1)	162 (178)
PM-10	9 (10)	40 (44)[4]	2 (2)	14 (16)
Volatile Organics	15 (16)	5 (6)	5 (6)	16 (18)
Hazardous Air Pollutants	1 (1)	--	--	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997—Air Quality Thresholds of Significance.

Construction emission estimates incorporate a building footprint of 9,300 square meters (100,000 square feet). Construction emissions are generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Table 4.3.4.1-2: Comparison of Current and Projected Annual Emissions Due to the Operation of the X-Band Radar at Eareckson AS

	Annual Emissions in Metric Tons (Tons)		
Pollutant	**Current Base-wide Emissions[1]**	**Operational Emissions**	**Projected Base-wide Emissions**
Carbon Monoxide	91 (100)	220 (242)	311 (342)
Oxides of Nitrogen	349 (385)	520 (573)	869 (442)
Oxides of Sulfur	28 (31)	323 (356)	351 (387)
PM-10	9 (10)	28 (31)	37 (41)
Volatile Organics	15 (16)	28 (31)	43 (47)
Hazardous Air Pollutants	1 (1)	--	1 (1)

[1]Current base-wide emissions reflect totals from section 3.

Specifics regarding boiler requirements have not yet been identified. Installation of the boiler may require major modification of the Title V Air Permit and PSD review similar to that expected for the generator. Actual requirements would depend on the boiler's size, fuel, and potential usage.

There are no personal vehicles on Shemya, so any mobile emissions related to the Proposed Action would be limited to operational vehicles. The limited use of operational vehicles and the local conditions and air quality support the assumption that would be no anticipated impact to air quality due to project-related mobile emissions.

It is anticipated that installation and operation of an XBR on Eareckson AS would not cause exceedances of the NAAQS or state AAQS and would not cause a change in the attainment status of the region.

Cumulative Impacts

No other projects have been identified that would have a cumulative impact on the proposed construction or operation at Eareckson AS.

Mitigation Measures

Dust suppression techniques during construction would be implemented to minimize fugitive dust levels. No mitigation measures would be required for long-term operations.

4.3.4.1.2 North Dakota Installations

4.3.4.1.2.1 Cavalier AFS—Air Quality

Construction

Installation of the XBR at Cavalier AFS would require the disturbance of up to approximately 4 hectares (10 acres) of ground. Table 4.3.4.1-3 summarizes potential emissions from construction and operational site activation of the XBR at Cavalier AFS. All construction would be conducted in accordance with appropriate regulations and permits. No exceedances of the NAAQS or state AAQS would be anticipated beyond the immediate construction area due to the Proposed Action.

Operation

The Proposed Action alternative at Cavalier AFS would require the dismantlement of the Perimeter Acquisition Radar. As a result, the five 3-megawatt generators currently dedicated to the Perimeter Acquisition Radar would no longer be operational (and the potential air pollutant emissions would be reduced accordingly). The Proposed Action includes a requirement for a dedicated 7,500-kilowatt generator to be installed and operated on a full-time basis. The generator would be considered a

major source of pollutant emissions and would require a Title V Air Permit and PSD review before its installation and operation. Both of these procedures would take an extended period to finalize (6 months or more each). These processes would probably include requirements for public review. However, both of these processes also limit the impact the Proposed Action could have on the area's air quality. As such, it is not anticipated that the Proposed Action would cause exceedances of the NAAQS or state AAQS or a detrimental change in the area's attainment status. Table 4.3.4.1-4 compares the current emissions at Cavalier AFS and the emissions related to the XBR operation.

Table 4.3.4.1-3: Comparison of Current and Projected Annual Emissions Due to Construction of the X-Band Radar at Cavalier AFS

	Current Base-wide Emissions[1]	Construction-related Emissions[2]		Operations Phase-in[3]
		Year 1	Year 2	Year 3
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	47 (52)	13 (14)	13 (14)	114 (126)
Oxides of Nitrogen	186 (205)	14 (15)	14 (15)	265 (292)
Oxides of Sulfur	3 (3)	< 1 (< 1)	< 1 (< 1)	162 (178)
PM-10	3 (3)	10 (12)[4]	< 1 (< 1)	14 (16)
Volatile Organics	35 (29)	5 (6)	5 (6)	16 (18)
Hazardous Air Pollutants	--	--	--	< 1 (< 1)

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates incorporate a building footprint of 9,300 square meters (100,000 square feet). Construction emissions are generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Table 4.3.4.1-4 Comparison of Current and Projected Annual Emissions Due to the Operation of the X-Band Radar at Cavalier AFS

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Base-wide[1] Emissions	Operational Emissions	Projected Base-wide Emissions[2]
Carbon Monoxide	47 (52)	220 (242)	220 (242)
Oxides of Nitrogen	186 (205)	520 (573)	520 (573)
Oxides of Sulfur	3 (3)	323 (356)	323 (356)
PM-10	3 (3)	28 (31)	28 (31)
Volatile Organics	35 (39)	28 (31)	28 (31)
Hazardous Air Pollutants	--	--	--

[1] Current base-wide emissions reflect totals from section 3.

[2] Reflects that the operation of the Perimeter Acquisition Radar at Cavalier AFS would cease if NMD is deployed at this site. As such, the five 3-megawatt generators currently used at this site would not be in operation.

Specifics regarding boiler requirements have not yet been identified. Installation of the boiler may require major modification of the Title V Air Permit and PSD review similar to that expected for the generator. Actual regulatory requirements would depend on the boiler's output, fuel, and potential usage.

The additional mobile emissions from operations personnel and additional operations vehicles would add incrementally to the area's mobile pollutant emissions, but would not be anticipated to have an impact on air quality.

Construction and operation of the XBR at Cavalier AFS is not expected to cause exceedances of the NAAQS or state AAQS; therefore, no changes in the attainment status of the ROI are expected.

Cumulative Impacts

If the Proposed Action is implemented at Cavalier AFS, future and current Air Force activities would cease. The only project that could represent the potential for cumulative impacts would be the potential dismantlement and destruction of the Perimeter Acquisition Radar at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. It is possible that there could be some overlap of construction operations. It is anticipated that this overlap, if it were to occur, would take the form of initial NMD-related construction conducted during the same time frame as the final cleanup operations from any demolition or dismantlement operations (i.e., removal

of rubble and debris and replanting of the site if required). If the construction operations were in relatively close proximity to each other, simultaneous operations could cause a cumulative impact to air quality. Cumulative impacts could occur due to both increased fugitive dust (PM-10) emissions and increased exhaust emissions. Specific impacts would depend on emission rates, which would vary depending on the levels and types of ongoing activities at the individual construction sites, and on meteorological conditions, which generally favor rapid dispersion of pollutants in North Dakota. Due to the localized and temporary nature of the construction emissions it is unlikely that the simultaneous construction projects would cause exceedances of the NAAQS or state AAQS beyond the immediate construction areas and would not be expected to affect the region's attainment status. No other activities occur at the site or are planned at the site that could represent a cumulative impact with NMD deployment. No regional activities occur or are planned that would result in either short- or long-term cumulative air quality impacts.

Mitigation Measures

Dust suppression techniques would be implemented to minimize fugitive dust levels. Adherence to an appropriate vehicle maintenance program would further reduce exhaust emissions and would also reduce any cumulative impacts.

4.3.4.1.2.2 Missile Site Radar—Air Quality

Construction

Installation of the XBR at the Missile Site Radar would require the disturbance of up to approximately 20 hectares (50 acres) of ground and would include the demolition of the current radar facility. Table 4.3.4.1-5 summarizes potential emissions from construction and operational site activation at the Missile Site Radar. Emissions due to the removal of the current radar facility would depend on the method of demolition chosen and are not included in this estimate. All construction would be conducted in accordance with appropriate regulations and permits. No exceedances of the NAAQS or state AAQS would be anticipated beyond the immediate construction area due to the Proposed Action.

Table 4.3.4.1-5: Comparison of Current and Projected Annual Emissions Due to Construction of the X-Band Radar at Missile Site Radar

	Current Base-wide Emissions[1]	Construction-related Emissions[2]		Operations Phase-in[3]
		Year 1	Year 2	Year 3
Pollutant	Metric Tons (Tons)	Metric Tons (Tons)	Metric Tons (Tons)	Metric Tons (Tons)
Carbon Monoxide	--	14 (15)	14 (15)	114 (126)
Oxides of Nitrogen	--	19 (21)	19 (21)	266 (294)
Oxides of Sulfur	--	1 (1)	1 (1)	162 (178)
PM-10	--	53 (60)[4]	2 (2)	14 (16)
Volatile Organics	--	6 (7)	6 (7)	16 (18)
Hazardous Air Pollutants	--	--	--	--

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions. Missile Site Radar is currently in caretaker status and as such has no appreciable air pollution emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates incorporate a building footprint of 9,300 square meters (100,000 square feet). Construction emissions are generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Operation

The Proposed Action includes a requirement for a dedicated 7,500-kilowatt generator to be installed and operated on a full-time basis. The generator would be considered a major source of pollutant emissions and would require a Title V Air Permit and PSD review before its installation and operation. Both of these procedures would take an extended period of time to finalize (6 months or more each). These processes would probably include requirements for public review. However, both of these processes also limit the impact the Proposed Action could have on the area's air quality. As such, it is not anticipated that the Proposed Action would cause exceedances of the NAAQS or state AAQS or a detrimental change in the area's attainment status. Table 4.3.4.1-6 compares the current emissions at the Missile Site Radar (negligible because of site caretaker status) and the emissions related to the Proposed Action.

Table 4.3.4.1-6: Comparison of Current and Projected Annual Emissions Due to the Operation of the X-Band Radar at Missile Site Radar

Pollutant	Annual Emissions in Metric Tons (Tons)		
	Current Base-wide[1] Emissions	Operational Emissions	Projected Base-wide Emissions
Carbon Monoxide	--	220 (242)	220 (242)
Oxides of Nitrogen	--	520 (573)	520 (573)
Oxides of Sulfur	--	323 (356)	323 (356)
PM-10	--	28 (31)	28 (31)
Volatile Organics	--	28 (31)	28 (31)
Hazardous Air Pollutants	--	--	--

[1] Current base-wide emissions reflect totals from section 3. As noted in section 3, Missile Site Radar is in caretaker status and has no appreciable emissions.

If the Missile Site Radar is selected as a site for the XBR, it may also require a new boiler. Specifics regarding this requirement have not yet been identified. Depending on the boiler's expected output, fuel, and operational requirements, it may also be considered a major source. If so, it would require a Title V Air Permit in a manner similar to the proposed generator. Only one Title V Air Permit would be required for the site. It would incorporate all stationary emissions sources onsite.

The increased mobile emissions due to operation of the XBR at the Missile Site Radar would add incrementally to the current level of mobile emissions, but would not be expected to have an impact on the air quality in the area.

While installation of the XBR would cause a substantial increase in emissions for the area due to the requirement for a dedicated power source, it is not anticipated that construction or operation would cause exceedances of the NAAQS or state AAQS. As such, it is also anticipated that installation and operation of the proposed facility would also not change the attainment status of the area.

Cumulative Impacts

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative impacts would be the potential dismantlement and destruction of some facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. It is possible that there could be some overlap of construction operations. It is anticipated that this overlap, if it were to occur, would take the form of initial NMD-related construction conducted during the same time frame as the final cleanup operations from any

demolition or dismantlement operations (i.e., removal of rubble and debris and replanting of the site if required). If the construction operations were in relatively close proximity to each other, simultaneous operations could cause a cumulative impact to air quality. Cumulative impacts could occur due to both increased fugitive dust (PM-10) emissions and increased exhaust emissions. Specific impacts would depend on emission rates, which would vary depending on the levels and types of ongoing activities at the individual construction sites, and on meteorological conditions, which generally favor rapid dispersion of pollutants in North Dakota. Due to the localized and temporary nature of the construction emissions, it is unlikely that the simultaneous construction projects would cause exceedances of the NAAQS or state AAQS beyond the immediate construction areas and would not be expected to affect the region's attainment status. No other activities occur at the site or are planned at the site that could represent a cumulative impact with NMD deployment. No regional activities occur or are planned that would result in either short- or long-term cumulative air quality impacts.

Mitigation Measures

Standard dust suppression techniques would be implemented to minimize fugitive dust levels. Adherence to an appropriate vehicle maintenance program would further reduce exhaust emissions and would also reduce any cumulative impacts.

4.3.4.1.2.3 Remote Sprint Launch Site 1—Air Quality

Construction

If Remote Sprint Launch Site 1 is selected as an XBR site, it would require the disturbance of up to approximately 17 hectares (42 acres). Table 4.3.4.1-7 summarizes potential emissions from construction and operational site activation of the XBR at Remote Sprint Launch Site 1. All construction would be conducted in accordance with appropriate regulations and permits. No exceedances of the NAAQS or state AAQS would be anticipated beyond the immediate construction area due to the Proposed Action.

Operation

The potential operational emissions and impacts to air quality at this site are similar to those described for the Missile Site Radar in section 4.3.4.1.2.2. The potential operational emissions presented in table 4.3.4.1-6 are also representative of those anticipated for Remote Sprint Launch Site 1. Potential impacts include the potential for a requirement to establish a Title V Air Permit if major stationary sources are required (dedicated power generators or boilers) and potential requirements for PSD reviews before the installation and operation of those sources.

Table 4.3.4.1-7: Comparison of Current and Projected Annual Emissions Due to Construction of the X-Band Radar at Remote Sprint Launch Site 1

	Current Base-wide Emissions[1]	Construction-related Emissions[2]		Operations Phase-in[3]
		Year 1	Year 2	Year 3
Pollutant	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**	**Metric Tons (Tons)**
Carbon Monoxide	--	14 (15)	14 (15)	114 (126)
Oxides of Nitrogen	--	18 (20)	18 (20)	266 (293)
Oxides of Sulfur	--	1 (1)	1 (1)	162 (178)
PM-10	--	46 (51)[4]	2 (2)	14 (16)
Volatile Organics	--	6 (7)	6 (7)	16 (18)
Hazardous Air Pollutants	--	--	--	--

[1] Current base-wide emissions reflect totals from section 3 and do not include mobile emissions. The Remote Sprint Launch sites are in caretaker status and as such have no appreciable base-wide emissions.

[2] Source: derived from Sacramento Metropolitan Air Quality Management District, 1997 – Air Quality Thresholds of Significance.

Construction emission estimates incorporate a building footprint of 9,300 square meters (100,000 square feet). Construction emissions are generally generated from mobile sources and are considered temporary.

[3] Assumes there will be a period of operational run-up with a construction reduction commensurate with anticipated manpower levels. Operational emissions equivalent to 6-months anticipated operational emissions were used in this estimate.

[4] PM-10 estimates for the first year of construction include both fugitive dust and combustion emissions.

Cumulative Impacts

There is a potential for cumulative impacts due to the installation of the GBI facility at the Missile Site Radar. The potential for cumulative impacts is addressed in section 4.3.1.1.2.2. It is not anticipated that the cumulative impacts from operation of the XBR at a Remote Sprint Launch Site and operation of the GBI facility at the Missile Site Radar would cause exceedances of the NAAQS or state AAQS and would not cause a change in the area's attainment status.

Remote Sprint Launch Site 1 is currently inactive. The only other project that could represent the potential for cumulative impacts would be the potential dismantlement and destruction of some facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. It is possible that there could be some overlap of construction operations. It is anticipated that this overlap, if it

were to occur, would take the form of initial NMD-related construction conducted during the same time frame as the final cleanup operations from any demolition or dismantlement operations (i.e., removal of rubble and debris and replanting of the site if required). If the construction operations were in relatively close proximity to each other, simultaneous operations could cause a cumulative impact to air quality. Cumulative impacts could occur due to both increased fugitive dust (PM-10) emissions and increased exhaust emissions. Specific impacts would depend on emission rates, which would vary depending on the levels and types of ongoing activities at the individual construction sites, and on meteorological conditions, which generally favor rapid dispersion of pollutants in North Dakota. Due to the localized and temporary nature of the construction emissions, it is unlikely that the simultaneous construction projects would cause exceedances of the NAAQS or state AAQS beyond the immediate construction areas and would not be expected to affect the region's attainment status. No other activities occur at the site or are planned at the site that could represent a cumulative impact with NMD deployment. No regional activities occur or are planned that would result in either short-or long-term cumulative air quality impacts.

Mitigation Measures

Standard dust suppression techniques would be implemented to minimize fugitive dust levels. Adherence to an appropriate vehicle maintenance program would further reduce exhaust emissions and would also reduce any cumulative impacts.

4.3.4.1.2.4 Remote Sprint Launch Site 2—Air Quality

Potential impacts and mitigation measures for deployment of an XBR at Remote Sprint Launch Site 2 would be similar to those described for Remote Sprint Launch Site 1.

4.3.4.1.2.5 Remote Sprint Launch Site 4—Air Quality

Potential impacts and mitigation measures for deployment of an XBR at Remote Sprint Launch Site 4 would be similar to those described for Remote Sprint Launch Site 1.

4.3.4.2 Airspace

This section addresses potential impacts caused by changes to airspace use due to the construction and operation of the XBR element. The following criteria were used to determine potential impacts:

- Program activities or actions that would lead to a reduction in the amount of navigable airspace in the National Airspace System
- Program activities or actions that would lead to the assignment of new Special Use Airspace (including Prohibited Areas, Restricted Areas, Warning Areas, and Military Operations Areas) or require the modification of existing Special Use Airspace
- Program activities or actions that would require a change in flight course or altitude to an existing or planned military training route or slow route
- Program activities or actions that would: require a change to an existing or planned instrument flight rules minimum flight altitude, a published or special instrument procedure, or an instrument flight rules departure procedure: or, require a visual flight rules operation to change from a regular flight course or altitude
- Program activities or actions that would restrict access to, or effect the use of, airfields and airports available for public use, or effect airfield/airport arrival and departure traffic flows
- Program activities or actions that would cause an electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft
- Program activities or actions that would represent an obstruction to air navigation
- Program activities or actions that would restrict a clear view of runways, helipads, taxiways, or traffic patterns from the airport air traffic control tower; derogate airport capacity/efficiency; affect future visual flight rules and/or instrument flight rules operations indicated by plans on file; and, affect the usable length of an existing or planned runway

4.3.4.2.1 Alaska Installations

4.3.4.2.1.1 Eareckson AS—Airspace

Construction

Construction activities on Eareckson AS would have no impacts on controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, or air navigation and communications facilities in the ROI. Since ongoing activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from any airport traffic control tower; decrease airport capacity or efficiency; affect future visual flight rules or instrument flight rules traffic; or affect the usable length of an existing or planned runway; they would also not constitute an obstruction to air navigation.

Operation

Controlled and Uncontrolled Airspace. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a 6.7-kilometer (3.6-nautical mile) radius radio frequency radiation area, similar to the existing notice for the COBRA DANE (AN/FPS-108) phased array radar on Shemya Island. The establishment of this high energy radiation area would not impose any flight restriction requirements; consequently, there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace. There is no existing special use airspace in the Western Aleutian Islands airspace ROI. Consequently, there would be no impacts to special use airspace.

Military Training Routes. There are no Military Training Routes in the ROI; therefore, there would be no impacts to these routes. However, there is one Military Instrument Flight Rules route (Route 604) between St. Paul Island and Eareckson AS that would pass through the proposed 6.7-kilometer (3.6-nautical mile) radius high energy radiation area. The establishment of the high energy radiation area would not impose any flight restriction requirements; consequently, there would be no change to the existing military instrument flight route, and thus no impacts. In addition, the mitigation measures described below identify two possible means for reducing the potential for airspace use conflicts.

En Route Airways and Jet Routes. One en route low altitude airway, G8, from Adak Island to Eareckson AS, would pass through the proposed 6.7-kilometer (3.6-nautical-mile) radius high energy radiation area, along with three en route high altitude jet routes. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a 6.7-kilometer (3.6-nautical mile) radius radio

frequency radiation area. The establishment of this high energy radiation area would not impose any flight restriction requirements; consequently, no change to an existing or planned instrument flight rules route, minimum flight altitude, a published or special instrument procedure, or an instrument flight rules departure procedure would be required, and no change to a visual flight rules operation from a regular flight course or altitude would be required as a result of implementation of the Proposed Action. Consequently, there would be no impact to the ROI's en route airways and jet routes. In addition, the mitigation measures described below identify two possible means for reducing the potential for airspace use conflicts.

With the full implementation of the FAA's "Free Flight" program, the amount of airspace in the ROI that is likely to be clear of traffic will decrease as pilots, whenever practical, choose their own routes and file a flight plan that follows the most efficient and economical route, rather than following the published preferred instrument flight rules routes across the ROI shown in figure 3.3-2. However, for those aircraft flying above 8,839 meters (29,000 feet) and following their own routes to take advantage of this program, operation of the XBR would have no impact, since establishment of the high energy radiation area would not impose any flight restrictions and "Free Flight" aircraft would be well above the radiation area.

Airports and Airfields. There is one airport, Eareckson AS on Shemya Island itself, located within the proposed 6.7-kilometer (3.6-nautical-mile) high energy radiation area around Eareckson AS. However, since establishment of the high energy radiation area would not impose any flight restriction requirements, would not change any airfield/airport arrival and departure traffic flows. Consequently, there would be no impact to the ROI's airports and airfields. In addition, the mitigation measures described below identify two possible means for reducing the potential for airspace use conflicts.

Air Navigation and Communication Facilities. Implementation of the Proposed Action has the potential to cause an electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Operation of the NMD XBR has the potential to interfere with both aircraft systems and air navigation systems.

There are a number of air navigation facilities within the airspace ROI. However, they operate at lower frequencies (in the megahertz range) than the 10 gigahertz band XBR, and would not normally experience any interference from the XBR. Nevertheless, there is the potential for interference from the grating (side) lobes and the main beam. Section 4.3.4.7 provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band radio

frequency interference, as well as non-frequency-related interference (high power effects).

Emissions from the XBR may also potentially degrade the overall system performance of in-band airborne systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-Band (8 to 12 gigahertz), but most of these potential interference problems could be readily and inexpensively mitigated by implementation of the mitigation measures identified below. Section 4.3.4.7 addresses the potential for aircraft/avionics effects in more detail.

Cumulative Impacts

Because the NMD XBR and the COBRA DANE phased array radar operate in different frequency ranges, there would be no potential for an incremental, additive cumulative electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Moreover, implementation of the mitigation measures identified below would preclude the potential for cumulative impacts.

No other projects in the airspace ROI have been identified that would have the potential for other incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, or airfields and airports in the ROI.

Mitigation Measures

In addition to charting the high energy radiation area notice on aeronautical charts, information of the high energy radiation area would be published in the Airport Facility section of *Supplement Alaska*, and local Notices to Airmen would be issued. Additionally, flight service personnel would brief pilots flying through the area about the high energy radiation area.

Other possible mitigation measures that would reduce the potential for airspace conflicts include:

- Installation of a new airport surveillance radar to be used jointly with the FAA ATC radar system to detect and locate aircraft in the high energy radiation area. Once an aircraft is detected entering the high energy radiation area, commands would be sent to the XBR where software modifications would inhibit the radar transmissions from illuminating the aircraft. This Auxiliary Tracker would perform the detection and tracking of the aircraft externally to the XBR, minimizing or eliminating the amount of changes in the XBR system; or

- Use of an embedded tracker that would provide a secondary function within the XBR for detecting and tracking aircraft operating in the high energy radiation area, which would inhibit the XBR transmission in the direction of the aircraft. The detection and tracking of aircraft, as well as the blanking of radar energy, would be accomplished through hardware and software modifications to the XBR. It is assumed that this tracking function would require a lower power pulse, thus resulting in a negligible electroexplosive hazard zone.

Both systems would have a 0.9998 probability of detecting an aircraft in the high energy radiation area and correctly inhibiting the necessary radar transmission. Neither system requires any pilot, tower personnel, or radar operator actions.

4.3.4.2.2 North Dakota Installations

4.3.4.2.2.1 Cavalier AFS—Airspace

Construction

Construction activities at the Cavalier AFS site would have no impacts on controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, or air navigation and communications facilities in the ROI. Since ongoing activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from any airport traffic control tower; decrease airport capacity or efficiency; affect future visual flight rules or instrument flight rules traffic; or affect the usable length of an existing or planned runway; they would also not constitute an obstruction to air navigation.

Operation

Controlled and Uncontrolled Airspace. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a 6.7-kilometer (3.6-nautical mile) radius radio frequency radiation area. The establishment of this high energy radiation area would not impose any flight restriction requirements, consequently there would be no reduction in the amount of navigable airspace, and thus no impacts to the controlled and uncontrolled airspace in the ROI would result.

Special Use Airspace. No new additional demands would be placed on existing special use airspace, and the Proposed Action would not require the assignment of new special use airspace, or require the modification of existing special use airspace. The high energy radiation area, which would not impose any flight restriction requirements in any case, would not impinge on the Tiger North or Tiger South Military Operations Areas to the west of Cavalier AFS, and thus would have no impact to special use airspace in the ROI.

Military Training Routes. The proposed 6.7-kilometer (3.6-nautical-mile) radius high energy radiation area aeronautical chart notice, which would not impose any flight restriction requirements, would not affect any military training routes in the ROI. In addition, the mitigation measures described below identify two possible means for reducing the potential for airspace use conflicts.

En Route Airways and Jet Routes. A high energy radiation area notice would be published on the appropriate aeronautical charts, notifying aircraft of a 6.7-kilometer (3.6-nautical mile) radius radio frequency radiation area. The establishment of this high energy radiation area would not impose any flight restriction requirements, consequently no change to an existing or planned instrument flight rules route, minimum flight altitude, a published or special instrument procedure, or an instrument flight rules departure procedure would be required, and no change to a visual flight rules operation from a regular flight course or altitude would be required as a result of implementation of the Proposed Action. Consequently, there would be no impact to the ROI's en route airways and jet routes. In addition, the mitigation measures described below identify two possible means for reducing the potential for airspace use conflicts.

Airports and Airfields. There are no airports located within the proposed 6.7-kilometer (3.6-nautical mile) high energy radiation area around the XBR site at Cavalier AFS. The closest airport to the site is Cavalier Municipal airport, approximately 21 kilometers (12 nautical miles) to the northeast. There are, however, two private airstrips within the proposed high energy radiation area: Bohn and Goodman. The closest would be the Bohn airstrip, less than 2 kilometers (1 nautical mile) to the northeast of the Perimeter Acquisition Radar site, while the Goodman airstrip would be just less than 6 kilometers (3 nautical miles) to the west, southwest.

However, the proposed high energy radiation area would not impose any flight restriction requirements and would not, consequently, restrict access to these or any other airfield or airport available for public use, nor would change airfield/airport arrival and departure traffic flows and thus would have no adverse impacts to the ROI's airports and airfields. In addition, the mitigation measures described below identify two possible means for reducing the potential for airspace use conflicts.

Air Navigation and Communication Facilities. Implementation of the Proposed Action has the potential to cause an electromagnetic effect upon the operation of an air navigation facility or the signal used by aircraft. Operation of the NMD XBR has the potential to interfere with both aircraft systems and air navigation systems.

A number of air navigation facilities are distributed throughout the ROI. However, these navigation aids, including nondirectional radio beacon,

VHF omni-directional range, VHF omni-directional range test facility, tactical air navigation, VHF omni-directional range/tactical air navigation, and distance measuring equipment facilities, operate at much lower frequencies (in the kilohertz and megahertz range) than the 10 gigahertz band XBR and would not normally experience any interference from the XBR. However, there is the potential for interference both from the grating (side) lobes and the main beam. Section 4.3.4.7 provides a detailed discussion of the potential for electronic communications (in-band and adjacent band) and harmonic band radio frequency interference, as well as non-frequency-related interference (high power effects). The closest VHF omni-directional range/tactical air navigational aid is 60 kilometers (32 nautical miles) to the northwest, just southeast of Pembina.

Emissions from the XBR may also potentially degrade the overall system performance of in-band airborne systems such as fire control, bomb/navigation in military aircraft, and weather radars in both civilian and military aircraft, which all operate in the X-Band (8 to 12 gigahertz). However, most of these potential interference problems could be readily and inexpensively mitigated by implementation of the mitigation measures identified below. Section 4.3.4.7 addresses the potential for aircraft/avionics effects in more detail.

Cumulative Impacts

No other projects in the airspace ROI have been identified that would have the potential for incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, and air navigation and communications facilities in the ROI.

Mitigation Measures

Mitigation measures would be identical to those described for Eareckson AS in section 4.3.4.2.1.1.

4.3.4.2.2.2 Missile Site Radar—Airspace

Construction

Construction activities at the Missile Site Radar would have no impacts on controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI. Since ongoing activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from any airport traffic control tower; decrease airport capacity or efficiency; affect future visual flight rules or instrument flight rules traffic; or affect the usable length of an existing or planned runway; they would also not constitute an obstruction to air navigation.

Operation

Operation of the XBR at the Missile Site Radar would have the same impacts as identified in section 4.3.4.2.2.1 above for the Cavalier AFS, namely, no impacts to controlled and uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, or air navigation and communications facilities in the ROI.

Cumulative Impacts

No other projects in the airspace ROI have been identified that would have the potential for incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, and air navigation and communications facilities in the ROI.

Mitigation Measures

Mitigation measures would be identical to those proposed for Eareckson AS as discussed in section 4.3.4.2.1.1.

4.3.4.2.2.3 Remote Sprint Launch Site 1—Airspace

Construction

Construction activities at Remote Sprint Launch Site 1 would have no impacts on controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI. Since ongoing activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from any airport traffic control tower; decrease airport capacity or efficiency; affect future visual flight rules or instrument flight rules traffic; or affect the usable length of an existing or planned runway; they would also not constitute an obstruction to air navigation.

Operation

Operation of the XBR at Remote Sprint Launch Site 1 would have the same impacts as identified in section 4.3.4.2.2.1 for the Cavalier AFS site, namely, no impacts to controlled and uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, or air navigation and communications facilities in the ROI.

Cumulative Impacts

No other projects in the airspace ROI have been identified that would have the potential for incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, military training

routes, en route airways and jet routes, airfields and airports, and air navigation and communications facilities in the ROI.

Mitigation Measures

Mitigation measures would be identical to those proposed for Eareckson AS as discussed in section 4.3.4.2.1.1.

4.3.4.2.2.4 Remote Sprint Launch Site 2—Airspace

Construction

Construction activities at Remote Sprint Launch Site 2 would have no impacts on controlled or uncontrolled airspace, special use airspace, en route airways and jet routes, or airfields and airports in the ROI. Since ongoing activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from any airport traffic control tower; decrease airport capacity or efficiency; affect future visual flight rules or instrument flight rules traffic; or affect the usable length of an existing or planned runway; they would also not constitute an obstruction to air navigation.

Operation

Operation of the XBR at Remote Sprint Launch Site 2 would have the same impacts as identified in section 4.3.4.2.2.1 above for the Cavalier AFS site, namely, no impacts to controlled and uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, or air navigation and communications facilities in the ROI.

Cumulative Impacts

No other projects in the airspace ROI have been identified that would have the potential for incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, and air navigation and communications facilities in the ROI.

Mitigation Measures

Mitigation measures would be identical to those proposed for Eareckson AS as discussed in section 4.3.4.2.1.1.

4.3.4.2.2.5 Remote Sprint Launch Site 4—Airspace

Construction

Construction activities at Remote Sprint Launch Site 4 would have no impacts on controlled or uncontrolled airspace, special use airspace, en

route airways and jet routes, or airfields and airports in the ROI. Since ongoing activities would not restrict a clear view of runways, helipads, taxiways, or traffic patterns from any airport traffic control tower; decrease airport capacity or efficiency; affect future visual flight rules or instrument flight rules traffic; or affect the usable length of an existing or planned runway; they would also not constitute an obstruction to air navigation.

Operation

Operation of the XBR at Remote Sprint Launch Site 4 would have the same impacts as identified in section 4.3.4.2.2.1 above for the Cavalier AFS site, namely, no impacts to controlled and uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, or air navigation and communications facilities in the ROI.

Cumulative Impacts

No other projects in the airspace ROI have been identified that would have the potential for incremental, additive cumulative impacts to controlled or uncontrolled airspace, special use airspace, military training routes, en route airways and jet routes, airfields and airports, and air navigation and communications facilities in the ROI.

Mitigation Measures

Mitigation measures would be identical to those proposed for Eareckson AS as discussed in section 4.3.4.2.2.1.

4.3.4.3 Biological Resources

Numerous Federal and state regulations exist that address issues and concerns related to biological resources. Federal regulations include, but are not limited to, the Endangered Species Act, Marine Mammal Protection Act, and the CWA. Federal and state regulatory standards and guidelines have been applied in determining the potential impacts associated with the Proposed Action. The following criteria were used to identify potential impacts:

- The number or amount of the resource that could be impacted relative to its occurrence at the project sites
- The sensitivity of the resource to proposed activities
- The duration of the impact

Impacts are considered if they have the potential to:

- Result in reduction of the population size of Federally listed threatened or endangered species
- Degrade biologically important, critical, or unique habitats
- Result in substantial long-term loss of vegetation
- Reduce the capacity of a habitat to support wildlife

Ground disturbance, habitat loss, an increase in personnel, and noise from demolition and construction, and EMR from operation of an XBR at any of the alternatives in Alaska or North Dakota could result in impacts to biological resources present in the area.

Ground disturbance during construction would result in removal of vegetation and a potential reduction of available habitat. All utilities would be underground. Ground disturbance and other construction activities could also result in the displacement or death of less mobile species of wildlife. Burrowing species could also be displaced or killed if burrows are crushed or filled.

Wetlands can be impacted both directly and indirectly. Direct impacts can result from filling, dredging, or flooding. Indirect impacts can be caused by disturbance to adjacent land that results in degradation of water quality from chemical or sedimentary runoff. Wetlands will be avoided when possible. Disturbance to wetlands would be minimized by using appropriate techniques to control runoff and other Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff.

Typical noise levels at 15 meters (50 feet) from construction equipment range from 70 dBA to 95 dBA. Since the proposed locations are in predominately rural settings, the average background noise levels are 55 dBA. The combination of increased noise levels and human activity would likely displace some small mammals and birds that forage, feed, nest, or have dens within this 15-meter (50-foot) radius. Although flushing would slightly increase individual energy expenditure, the construction is not expected to have a significant effect on wildlife since sufficient foraging and feeding habitat occurs in adjacent areas. Some wildlife may leave the area permanently, while others may likely become accustomed to the increased noise and human presence. The presence of personnel may cause wildlife to avoid the area, at least temporarily, but would therefore further reduce the potential for impacts from elevated noise levels. The level of impact to listed species in areas proposed for the XBR is expected to be minimal since these species are not known to regularly occur within the construction ROI and thus are not anticipated to experience noise levels from construction of sufficient magnitude to cause disturbance.

The XBR is a high-powered radar system that would use a pulsed microwave beam to perform tracking, discrimination, and kill assessments of incoming ballistic missile warheads. Since this system has the potential for exposing regions in its vicinity to EMR, consideration has been given to the evaluation of the potential for any adverse impacts that EMR may have on biological resources.

In terms of the potential for EMR impacts on wildlife, the *Ground-Based Radar (GBR) Family of Radars Environmental Assessment (EA)* (U.S. Army Program Executive Office Missile Defense, 1993) analyzed potential impacts on wildlife from EMR. The GBR EA determined that several factors significantly reduce the potential EMR exposure for birds and other wildlife. The radar main beam would normally be located at least 2 degrees above horizontal, which limits the probability of energy absorption by ground-oriented wildlife. The radar beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time. The size of the beam is relatively small, which further reduces the probability of bird species remaining within this limited region of space, even if the beam were still.

Analysis conducted during preparation of the GBR EA (U.S. Army Program Executive Office Missile Defense, 1993) was based on a conservative approach of limiting the microwave energy absorption rate on the Aplomado falcon (*Falco femoralis*), a bird listed as endangered by the USFWS and the State of New Mexico. The energy absorption rate was based on the falcon remaining continuously within the main beam of the ground-based radar. The absorption rate was then compared to the bird's resting metabolic rate. The analysis indicated power densities

would have to exceed 42 milliwatts per square centimeter to affect the falcon. Power densities of 38 to 61 milliwatts per square centimeter have been determined necessary to affect other birds weighing up to 3.5 kilograms (7.7 pounds). The analysis was based on the conservative assumption that the energy absorption rate of a bird's body was equal to its resting metabolic rate and that this may pose a potential for an adverse effect. Birds in general typically expend energy at up to 20 times their resting metabolic rates during flight. The analysis assumed a thermal loading of only 10 percent of the in-flight metabolic rate may pose a hazard. Since birds are not likely to remain continuously within the radar beam and the power density is not expected to exceed levels stated above that could impact birds, the likelihood of harmful exposure is not great.

Potential impacts from EMR from the XBR on wildlife have been compared to the existing COBRA DANE radar operating on Eareckson AS on Shemya Island, Alaska. The COBRA DANE operates in the L-Band (1,000 to 2,000 megahertz), while the proposed NMD radar would operate in the X-Band (8,000 to 12,000 megahertz). The X-Band has less potential to cause thermal heating in biological resources than the L-Band. Like the COBRA DANE, the proposed NMD radar main beam will be constantly moving and will not be stationary over one area. The USFWS has not noticed die-offs of birds below the COBRA DANE radar (Martin, 1999—Comments received by EDAW, Inc., from the Alaska Maritime National Wildlife Refuge in response to a request for comments). Overall, it is expected that thermal effects would be less than the existing COBRA DANE radar, and no die-off of birds would be expected. An inflatable radome cover that is approximately 34 meters (110 feet) in diameter would enclose the proposed XBR. Because this cover is a solid structure and not a wire tower that birds could try to fly through, the XBR would be like any building structure and have limited bird strike potential.

To summarize, several factors significantly reduce the potential EMR exposure impacts on birds and other wildlife:

- The NMD radar main beam would normally be located at least 2 degrees above horizontal, which limits the probability of energy absorption by ground-oriented wildlife.
- The radar beam would normally be in motion, making it extremely unlikely that a bird would remain within the most intense area of the beam for any considerable length of time.
- The size of the beam is relatively small, which further reduces the probability of bird species remaining within this limited region of space, even if the beam were still.

4.3.4.3.1 Alaska Installations

4.3.4.3.1.1 Eareckson AS—Biological Resources

Eareckson AS has been selected as a possible location for an XBR. Approximately 12 hectares (30 acres) of land would be disturbed during construction of the radar (figure 2.4.4-1).

Vegetation

Construction. Impacts from construction would include removal of vegetation, erosion due to loss of vegetation, and the potential loss of habitat. Vegetation on the air station consists mainly of grasses and small shrubs. Potential sensitive vegetation associated with the Aleutian Canada goose is addressed under threatened and endangered species.

Operation. No impacts to vegetation are anticipated during operation of the XBR.

Wildlife

Construction. Construction impacts would be similar to those discussed above in section 4.3.4.3. The proposed location for the XBR is approximately 530 meters (1,738 feet) from the coastline. No impacts to marine species are expected from these construction-related activities. Two 24-meter (80-foot) wind speed indicators would be required and could potentially impact migrating bird species.

During construction, there is the potential that the construction equipment and supply barge may need to be beached on Eareckson AS to unload equipment. This would only occur if the existing dock does not provide the appropriate support or is being used. A barge landing would only occur twice per year during construction and may require dredging and some minor shore modification (e.g., dirt moving). During the preparation for landing and the unloading process, there is the potential to cause disturbance to the sea otters and harbor seals that use the surrounding area. A study conducted by the Air Force for barge unloading activities at Vandenberg AFB determined a startle response to seals within 85 meters (280 feet) of the activity. Harbor seals that used the area were expected to avoid the area during operations, but were not expected to permanently abandon the area (U.S. Department of the Air Force, 1998; Final Environmental Impact Statement, Evolved Expendable Launch Vehicle). Since barge landing activities would only occur twice per year and for short-time periods, the disturbance would be minor. In addition, it is likely that the first storm event would restore the area to natural conditions. Appropriate permits for dredging activities would be obtained.

Additionally, there may be a requirement to conduct some limited blasting (approximately 10 blasts) during the first 2 years of construction. The

blast noise could startle some wildlife; however, given the temporary nature of the activity, no long-term impacts to wildlife would be expected.

Operation. No operations impacts to terrestrial wildlife on the station are expected from operation of the XBR since the beam of the radar would be at least 2 degrees above horizontal, which limits the probability of energy absorption by ground-oriented wildlife. The safety factors listed above would minimize the potential for EMR effects to waterfowl using the lakes and other portions of the station during migration.

As mentioned above, like the current COBRA DANE, the proposed NMD radar main beam will be constantly moving and will not be stationary over one area. In addition, the proposed NMD radar would be located at a greater distance from the northern cliffs on Shemya Island where most birds (glaucous-winged gulls) cruise on updrafts. The USFWS has not noticed die-offs of birds below the COBRA DANE radar (Martin, 1999—Comments received by EDAW, Inc., from the Alaska Maritime National Wildlife Refuge in response to a request for comments). Overall, it is expected that thermal effects would be less than the existing COBRA DANE radar, and no die-off of birds would occur.

Threatened and Endangered Species

Construction. An initial study on the location of the threatened Aleutian Canada goose feeding areas was conducted as part of a Management Action Plan for Eareckson AS. This study identified the location of feeding and resting areas on the island. In 1999, the Air Force began a 3-year study to further determine the goose population during spring (mid April through mid June) and fall migrations (mid August through mid October) when the species is found on the island. Additional vegetation surveys to be conducted in 2000 will further refine island populations and prime feeding areas. The studies are being conducted by the Air Force along with the USFWS to assist in a bird aircraft strike hazard assessment. The purpose of the assessment is to minimize the potential safety hazard to aircraft from a bird strike during flight operations on Eareckson AS. The USFWS is allowing the Air Force to maintain vegetation on the island to minimize use by the Aleutian Canada goose. NMD related construction activities including equipment noise and limited blasting of quarry material and resulting new facilities could affect feeding and resting areas on the island. However, in discussions with the USFWS Alaska Maritime National Wildlife Refuge, it was concluded that NMD activities would not impact areas considered as critical habitat for the Aleutian Canada goose. Shemya Island is not considered critical habitat because of the need to minimize the bird strike hazard to aircraft and the existence of the Artic fox on the island. Additionally, the goose is in the final steps of being delisted, which is expected by the end of July 2000, prior to the start of NMD construction activities. If the Aleutian Canada goose is not delisted, additional consultation with the

USFWS would be conducted (Boone, 2000—Personal communication with David Hasley, USASMDC, regarding the Aleutian Canada goose.)

General construction activities would occur well inland from the coast line and would result in no impact to marine species. Limited blasting for construction fill at Seal Rock Quarry on Shemya Island would be approximately 2,586 meters (8,484 feet) from a Steller sea lion haul-out area. There is the potential that blasting noise could cause the Steller sea lion to temporarily abandon its haul-out places. However, the NMFS concurred with a March 24, 2000 report on blasting effects at the Seal Rock quarry: "We agree with your determination that blasting, construction, and operation of the project would have 'no effect' on Steller sea lions near the project area." The report (Subterra, Inc., 2000) also provides information related to minimizing blasting effects on the environment. The area around Shemya Island is not considered a Steller sea lion rookery (Augustine, 2000—Personal communication with 611 CES/CEVP regarding natural resources at Eareckson AS, January 25). Barge activities would only occur a few times a year and would not occur next to the Steller sea lion haul-out areas; therefore, no impacts from these activities would be expected.

Operation. The factors listed above regarding EMR would also minimize the potential for impacts to listed species such as the Aleutian Canada goose, spectacled eider, and Steller's eider. The short-tailed albatross is considered an unlikely species to be present on the island, and the potential for impacts to this bird would be remote. Potential mitigation from bird strikes to the proposed near field antenna tower and windspeed indicator towers is discussed under mitigation measures. Potential bird strikes are considered remote. No impacts to marine mammals from EMR would occur since these species would be below the range of the radar beam.

Sensitive Habitat

Construction. Since almost all of Eareckson AS contains wetlands, impacts are unavoidable, but wetlands would be avoided to the extent practicable. Potential deployment could impact up to 12 hectares (30 acres) of wetlands. Section 404 permits and state 401 water quality certification would be obtained after actual siting of the XBR and before any discharge of fill material. Because wetlands generally provide wildlife habitat, any significant changes to these wetlands would likely result in subsequent impacts on wildlife of the area.

Best Management Practices such as stabilizing fill slopes from erosion and the use of sand bags or similar sediment control devices to filter sediment from storm water runoff would be implemented. Section 404 permits and state 401 water quality certification will be obtained if actual siting of the XBR determines that wetlands would be affected and before

any discharge of fill material. The Alaska water quality certification would declare that any discharge to navigable waters would comply with applicable provisions of the Clean Water Act, including water quality standards. Compliance with required wetlands permits would also work to minimize impacts. Maintenance of wetland quality and value would be coordinated with applicable agencies. The permitting process would entail review of proposed activities and possible mitigations by all interested parties and applicable agencies.

Operation. No impacts to sensitive habitat are anticipated during operation of the XBR.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and the loss of a small amount of habitat at the proposed site. The loss of habitat and wetlands (approximately 1 percent of total wetlands on the island) would result in cumulative impacts to biological resources on the island given past development; however, since most of the island has been developed and the XBR site has been previously disturbed the cumulative impacts would be minor. Potential impacts to wetlands would be mitigated as described below. No major future programs have been identified at Eareckson AS or the region that could contribute to cumulative impacts to biological resources. Because Shemya Island is not a nesting area for the Aleutian Canada goose, a breeding or pupping area for the Steller sea lion, and impacts are expected to be minimal, no cumulative impacts are anticipated.

Mitigation Measures

The wetland permitting process will be conducted in accordance with the U.S. EPA's guidelines for evaluating Section 404 permitting applications found in Section 404 (b)(1) of the Clean Water Act. Section 401 water quality certification provided by the State of Alaska could include effluent and other limitations as well as monitoring requirements. Mitigation measures would be developed during the permitting process once a site has been selected. Agency-recommended mitigations would take into account the size and quality of the wetlands involved. Mitigations for wetlands could include (1) avoidance of direct and indirect disturbance of wetlands through facility redesign; (2) on-base (if possible) replacement of any wetlands lost at a ratio determined through consultation with the U.S. Army Corps of Engineers; (3) restoration/enhancement of wetland habitat elsewhere on the base or purchase and fencing of any off-base replacement habitat; and (4) monitoring (until habitat becomes well established) of any replacement wetlands as required to determine the effectiveness of replacement and any remedial measures. Avoidance of impacts, where practicable, represents the lowest cost mitigation and can be accomplished in a shorter time frame than wetland replacement.

Because the creation or development of wetlands represents a substantial financial investment, and the process may take several years to complete, this option is often reserved for wetland mitigation of high quality or for sizable area of affected wetlands. The probability of success that a newly created wetland would survive and flourish could vary, which sometimes makes this option less desirable than wetland restoration or avoidance.

Avoiding disturbance to the wetlands could include controlling runoff from construction and operation sites into the wetland through use of berms, silt curtains, straw bales, and other appropriate techniques. Equipment should be washed in areas where wastewater can be contained and treated or evaporated.

The USFWS is the land owner for Shemya Island and is one of the agencies along with the U.S. Army Corps of Engineers that would be involved in the 404 permitting process. Since most of the island contains wetlands, impacts are unavoidable. In addition, the USFWS has indicated that there is no appropriate area on Shemya to mitigate potential impacts to wetlands. Therefore, the USFWS has initially proposed mitigation measures on other Aleutian islands as follows:

- Reintroduce the Evermann's Rock Ptarmigan to Agattu from Attu
- Study population and distribution of Cormorants in the Near Islands

The final mitigation measures would be developed during the 404 permitting process with the U.S. Army Corps of Engineers who has the final decision authority.

Procedures to minimize the introduction of alien species would be coordinated with the USFWS where applicable. The use of highly visible paints and a change in brightness of warning lights on the antenna towers and guy wires could help to minimize the potential for bird collisions. No other mitigation measures would be required.

4.3.4.3.2 North Dakota Installations

4.3.4.3.2.1 Cavalier AFS—Biological Resources

Cavalier AFS has been selected as a possible location for an XBR. Approximately 4 hectares (10 acres) of land would be disturbed during construction of the radar.

Vegetation

Construction. Cavalier AFS is landscaped with non-native trees and shrubs and is regularly mowed. No sensitive vegetation has been identified on the site.

Operation. No impacts are expected to vegetation from operation of the XBR.

Wildlife

Construction. Construction noise could startle wildlife within the vicinity, but this would be a short-term impact that is not expected to affect migratory patterns. Wildlife on Cavalier AFS is limited due to the lack of good quality habitat for wildlife nesting and foraging.

Operation. No impacts to terrestrial wildlife on the station are expected from operation of the XBR since the beam of the radar would be at least 2 degrees above horizontal, which limits the probability of energy absorption by ground-oriented wildlife. The safety factors listed above would minimize the potential for EMR effects to birds using portions of the station during migration.

Threatened and Endangered Species

Construction. No Federal or state threatened or endangered species have been observed at the site. The bald eagle, peregrine falcon (recently delisted), and whooping crane could potentially be startled by construction noise if flying through the area, but this would be a short-term effect that would not alter migration patterns.

Operation. No impacts to listed species have been identified as a result of the operation of the current radar at the site, and the potential for EMR effects from the XBR to these listed birds using portions of the station during migration is expected to be slight.

Sensitive Habitat

There are no wetlands or other sensitive habitat, including critical habitat, on Cavalier AFS.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and the loss of a small amount of habitat at the proposed site. Given the area proposed for development has already been disturbed, there would be no additional cumulative loss of wildlife habitat in the region. If the NMD XBR is deployed at Cavalier AFS, the existing Air Force mission would cease along with other potential plan upgrades for the base. The only project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of the Perimeter Acquisition Radar at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The destruction of these facilities would result in

ground-disturbing activities and the resultant impacts from noise and human presence occurring over a longer period of time.

Mitigation Measures

The USFWS has recommended clearing vegetation within 15 meters (49 feet) of the radar to reduce the likelihood of wildlife being within this area.

4.3.4.3.2.2 Missile Site Radar—Biological Resources

The Missile Site Radar has been selected as a possible location for an XBR. Approximately 20 hectares (50 acres) of land would be disturbed during construction of the radar.

Vegetation

Construction. Vegetation consists of unmowed grassland, maintained lawn, and upland grassland and thicket. No sensitive vegetation has been observed on the site.

Operation. No impacts are expected to vegetation from operation of the XBR.

Wildlife

Construction. Wildlife in the area may be temporarily disturbed by construction noise. Wildlife is limited to small mammals and birds due to fencing surrounding the installation. Additional grassland and thickets occur in the surrounding area that would provide habitat for any wildlife displaced by noise and human presence. No long-term impacts are anticipated.

Operation. No impacts to terrestrial wildlife on the site are expected from operation of the XBR since the beam of the radar would be at least 2 degrees above horizontal, which limits the probability of energy absorption by ground-oriented wildlife. The factors listed above would minimize the potential for EMR effects to birds using portions of the site during migration.

Threatened and Endangered Species

Construction. No Federal or state threatened or endangered species have been observed at the site. The bald eagle, peregrine falcon (recently delisted), and whooping crane could potentially be startled by construction noise if flying through the area, but this would be a short-term effect that would not alter migration patterns.

Operation. The potential for EMR effects from the XBR to the listed birds mentioned above using portions of the station during migration is expected to be slight.

Sensitive Habitat

Construction. The natural wetlands on the Missile Site Radar associated with Roaring Nancy Creek are jurisdictional wetlands. An NPDES permit would be necessary for any runoff or discharge into Roaring Nancy Creek from demolition activities. The waste stabilization ponds would not be removed and would still provide habitat for birds and small mammals not affected by the presence of fencing. Best Management Practices such as stabilizing fill slopes from erosion and the use of hay bales to filter sediment from storm water runoff would be implemented.

Operation. No impacts to sensitive habitat are anticipated during operation of the XBR.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and operation and loss of habitat at the proposed site. The loss of habitat should be minor since the base is developed and contains little wildlife; thus no additional impacts would occur. The Missile Site Radar is currently inactive. The only project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of some of the facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The destruction of these facilities would result in ground-disturbing activities and the resultant impacts from noise and human presence occurring over a longer period of time.

As part of the standard construction procedures, Best Management Practices would be used to minimize potential impacts to wetlands. However, as addressed under the GBI discussion for Grand Forks AFB, there has been a significant reduction in wetlands in North Dakota. Any potential impacts to wetlands would be mitigated as described below to minimize any cumulative wetland impacts.

Mitigation Measures

The USFWS has recommended clearing vegetation within 15 meters (49 feet) of the radar to reduce the likelihood of wildlife being within this area. Mitigation measures for wetlands would be similar to those described for Eareckson AS.

4.3.4.3.2.3 Remote Sprint Launch Site 1—Biological Resources

Remote Sprint Launch Site 1 has been selected as a possible location for an XBR. Most of this 17-hectare (41-acre) site would be disturbed during construction of the radar.

Vegetation

Construction. Remote Sprint Launch Site 1 is periodically mowed and has been seeded with non-native grasses. No sensitive vegetation has been observed on the site.

Operation. No impacts are expected to vegetation from operation of the XBR.

Wildlife

Construction. Construction noise could startle wildlife within the vicinity, but this would be a short-term impact that is not expected to affect migratory patterns. Wildlife on the site is limited due to the size of the site and the fencing surrounding it. Additional grassland and thickets occur in the surrounding area that would provide habitat for any wildlife displaced by noise and human presence.

Operation. No impacts to terrestrial wildlife on the site are expected from operation of the XBR since the beam of the radar would be at least 2 degrees above horizontal, which limits the probability of energy absorption by ground-oriented wildlife. The factors listed above would minimize the potential for EMR effects to birds using portions of the site during migration.

Threatened and Endangered Species

Construction. No Federal or state threatened or endangered species have been observed at Remote Sprint Launch Site 1. The bald eagle, peregrine falcon (recently delisted), and whooping crane could potentially be startled by construction noise if flying through the area, but this would be a short-term effect that would not alter migration patterns.

Operation. The potential for EMR effects from the XBR to these listed birds mentioned above using portions of the station during migration is expected to be slight.

Sensitive Habitat

There are no wetlands or other sensitive habitat on Remote Sprint Launch Site 1. The sewage lagoon would be enlarged and reactivated.

Cumulative Impacts

Cumulative impacts would include increased activity during construction and operation and loss of habitat at the proposed site. However, since this site is developed and contains little habitat, no additional loss of wildlife habitat that would result in cumulative impacts would occur. The implementation of an XBR at Remote Sprint Launch Site 1 would affect the majority of the site, which was previously disturbed. The only

project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of some of the facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The destruction of these facilities would result in ground-disturbing activities and the resultant impacts from noise and human presence occurring over a longer period of time.

Mitigation Measures

The USFWS has recommended clearing vegetation within 15 meters (49 feet) of the radar to reduce the likelihood of wildlife being within this area.

4.3.4.3.2.4 Remote Sprint Launch Site 2—Biological Resources

Remote Sprint Launch Site 2 has been selected as a possible location for an XBR. Approximately 15 hectares (36 acres) of land would be disturbed during construction of the radar. Potential impacts and mitigation measures for deployment of an XBR at Remote Sprint Launch Site 2 would be similar to those described at Remote Sprint Launch Site 1.

4.3.4.3.2.5 Remote Sprint Launch Site 4—Biological Resources

Remote Sprint Launch Site 4 has been selected as a possible location for an XBR. Approximately 20 hectares (50 acres) of land would be disturbed during construction of the radar. Potential impacts and mitigation measures for deployment of an XBR at Remote Sprint Launch Site 4 would be similar to those described at Remote Sprint Launch Site 1.

4.3.4.4 Cultural Resources

Potential impacts on cultural resources were assessed by (1) identifying types and possible activities that could directly or indirectly affect cultural resources, and (2) identifying the nature and potential significance of cultural resources in potentially affected areas. Potential impacts on historic properties occur through:

- Disturbance of an NRHP-listed, potentially eligible, or eligible prehistoric or historic archaeological site or traditional cultural property
- Modification or visual intrusion upon an NRHP-listed, potentially eligible, or eligible historic buildings or structures
- Disturbance of a paleontological site

Pursuant to the NHPA, consultation as directed by the Section 106-review process has been initiated with the Alaska and North Dakota SHPOs. In addition, consultation was initiated with American Indian Tribes and Alaska Native organizations (see section 5.0 for groups consulted). NMD activities will be conducted in accordance with the primary laws that pertain to the treatment of cultural resources, including the NHPA (especially Sections 106 and 11O), the Archaeological Resources Protection Act, the Antiquities Act of 1906, the American Indian Religious Freedom Act, and NAGPRA.

4.3.4.4.1 Alaska Installations

4.3.4.4.1.1 Eareckson AS—Cultural Resources

Prehistoric and Historic Archaeological Resources

Archaeological survey of the NMD ROI was conducted by Hoeffecker in 1998, and no prehistoric or historic sites were identified. The Alaska SHPO has reviewed the survey report and concurred that no historic properties are present (State of Alaska, Department of Natural Resources 1998—Letter from Bittner, J., August 17); therefore, NMD activities at Eareckson AS are expected to have no effect. The SHPO has concurred (appendix D).

Historic Buildings and Structures

The only potential historic building or structure identified for Eareckson AS is the COBRA DANE radar. Modification of existing buildings for NMD activities will not affect this potential historic property. New construction may occur near this property and visual intrusion affecting its historic character had the potential to occur. As a result, designs of the proposed XBR were reviewed by the SHPO. Results of the review concurred with the findings that no adverse effects would occur.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or Alaska Native issues identified for the Eareckson AS alternative. Consultation with Aleut Corporation has been initiated through the NEPA process, and no issues or concerns with the NMD program have been raised.

Paleontological Resources

Because of the physiographic setting of the Aleutian Islands paleontological resources could occur. However, none have been recorded on Eareckson AS or Shemya Island; therefore, no effects are expected.

Cumulative Impacts

No other future programs that could contribute to cumulative cultural resources impacts have been identified at Eareckson AS or within the region. Minor repairs and alterations to existing facilities are planned; however, they are expected to have no effect.

Mitigation Measures

Although no historic properties have been identified within the ROI, the cultural resources complexion of the installation and the region indicates that prehistoric and historic archaeological sites, traditional cultural properties, and/or paleontological sites do have the potential to occur. If during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the Alaska SHPO notified. Subsequent actions will follow the guidance provided in 36 CFR 800.11 and NAGPRA.

4.3.4.4.2 North Dakota Installations

4.3.4.4.2.1 Cavalier AFS—Cultural Resources

Prehistoric and Historic Archaeological Resources

Location of the XBR at Cavalier AFS would occur adjacent to the current location of the Perimeter Acquisition Radar building. Archaeological surveys conducted at Cavalier AFS have located no prehistoric or historic archaeological resources (HQ SPACECOM, 1991—Draft Cultural Resource Survey of the Cavalier AFS). As a result, no effects on archaeological resources are expected to occur from construction activities at Cavalier AFS.

Historic Buildings and Structures

The SRMSC and associated support facilities, including Cavalier AFS and the Perimeter Acquisition Radar building, have been evaluated for inclusion in the NRHP. All pre-1976 elements of the Perimeter Acquisition Radar building were determined to be eligible for listing on the NRHP (Greenwood, 1999—Comments received by EDAW, Inc., regarding NMD Deployment Coordinating Draft DEIS).

Location of the XBR at Cavalier AFS would occur adjacent to the Perimeter Acquisition Radar building. The operation of the XBR would require the demolition of the Perimeter Acquisition Radar building. Therefore, its demolition could constitute an adverse effect to a historic property. However, all of the SRMSC facilities, including the Perimeter Acquisition Radar building, have been documented in an HAER accepted and approved by the National Park Service. Therefore, potential adverse effects have already been mitigated.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or North Dakota Native issues identified for this location. Consultation with the affected Native American Groups has been initiated through the NEPA process (see section 5.0, Consultation and Coordination), and no issues or concerns with the NMD program have been raised.

Paleontological Resources

There are no recorded fossils or National Natural Landmarks within the vicinity of Cavalier AFS or any other ground-disturbing areas within the Cultural Resources ROI; therefore, no effects are expected.

Cumulative Impacts

If the NMD XBR is deployed at Cavalier AFS, the existing Air Force mission would cease along with other potential plan upgrades for the base. The only other project that could represent the potential for cumulative impacts would be the potential dismantlement and destruction of the Perimeter Acquisition Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. This radar is eligible for the NRHP. However, this facility has been documented in an HAER and before the onset of any activities appropriate consultation would occur with the North Dakota SHPO. Since this NRHP eligible facility has been documented, no cumulative impacts would occur. No other projects have been identified that would result in the potential for cumulative cultural resource impacts.

Mitigation Measures

Because no NRHP-listed or eligible prehistoric or historic archaeological sites or archaeological resources or traditional resources have been identified within the ROI for Cavalier AFS, no mitigation measures have been identified. However, if during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the North Dakota SHPO notified through Cavalier AFS environmental office.

All SRMSC NRHP-eligible properties have been documented in an HAER and accepted and approved by the National Park Service. Therefore, no mitigations would be required (Greenwood, 1999—Comments received by EDAW, Inc., regarding NMD Deployment Coordinating Draft DEIS).

4.3.4.4.2.2 Missile Site Radar—Cultural Resources

Prehistoric and Historic Archaeological Resources

No NRHP-listed or -eligible prehistoric or historic archaeological sites or sensitive areas have been identified within the ROI. Further, the ground disturbance footprint for the construction of the XBR would be the identical to that of the current radar facility and therefore disturbed and unlikely to contain any intact archaeological material. As a result no effects on archaeological resources are expected to occur as a result of construction activities.

Historic Buildings and Structures

The SRMSC and associated support facilities, including the Missile Site Radar, have been evaluated for inclusion in the NRHP. The tactical areas of the Missile Site Radar were determined to be eligible for listing in the NRHP (Greenwood, 1999—Comments received by EDAW, Inc., regarding NMD Deployment Coordinating Draft DEIS).

The location of the XBR at the Missile Site Radar would require the demolition of the existing radar facility (figure 2.4.4-3). The demolition of the Missile Site Radar could constitute an adverse effect to a historic property. However, all of the SRMSC, including those eligible facilities at the Missile Site Radar, have been documented in an HAER and accepted and approved by the National Park Service. Therefore, potential adverse effects have already been mitigated.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or North Dakota Native issues identified for this location. Consultation with the affected Native American Groups has been initiated through the

NEPA process (see section 5.0, Consultation and Coordination), and no issues or concerns with the NMD program have been raised.

Paleontological Resources

There are no recorded fossils or National Natural Landmarks within the vicinity of the Missile Site Radar or any other ground-disturbing areas within the Cultural Resources ROI; therefore, no effects are expected.

Cumulative Impacts

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative impacts could be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. Both the radar and the silos at the Missile Site Radar are eligible for the NRHP. However, these facilities have been documented in an HAER and before the onset of any activities, appropriate consultation would occur with the North Dakota SHPO. Since all of the NRHP eligible facilities at the Missile Site Radar have been documented, no cumulative impacts would occur. No other projects have been identified that would result in the potential for cumulative cultural resource impacts.

Mitigation Measures

Because no NRHP-listed or eligible prehistoric or historic archaeological sites or archaeologically resources or traditional resources have been identified within the ROI for the Missile Site Radar, no mitigation measures have been identified. However, if during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the North Dakota SHPO notified through the U.S. Army Space and Missile Defense Command environmental office.

All SRMSC NRHP-eligible properties have been documented in an HAER and accepted and approved by the National Park Service. Therefore, no mitigation measures would be required (Greenwood, 1999—Comments received by EDAW, Inc., regarding NMD Deployment Coordinating Draft DEIS).

4.3.4.4.2.3 Remote Sprint Launch Site 1—Cultural Resources

Prehistoric and Historic Archaeological Resources

Although no archaeological survey has been conducted within the ROI, the construction of the XBR and its support facilities would occur within a previously disturbed, low-density setting. As a result, no effects to archaeological resources are expected.

Historic Buildings and Structures

The SRMSC and associated support facilities, including the Remote Sprint Launch Sites, have been evaluated for inclusion in the NRHP. Four Remote Sprint Launch Sites were originally constructed as part of the SRMSC. All of these and their associated support structures and infrastructure have been determined to be eligible for the NRHP.

The construction of the XBR and its support facilities would require the demolition of the existing missile silos and the security building located at the Remote Sprint Launch Site. This demolition could constitute an adverse effect to historic properties. However, in accordance with a programmatic agreement with the North Dakota SHPO, only Remote Sprint Launch Site 3, the only Remote Sprint Launch Site not located within the ROI, will be managed as a historic property.

Native Populations/Traditional Resources

There have been no traditional cultural properties identified within the ROI or North Dakota Native issues identified for this location. Consultation with the affected Native American Groups has been initiated through the NEPA process (see section 5.0, Consultation and Coordination), and no issues or concerns with the NMD program have been raised.

Paleontological Resources

There are no recorded fossils or National Natural Landmarks within the vicinity of the Missile Site Radar or any other ground-disturbing areas within the Cultural Resources ROI; therefore, no effects are expected.

Cumulative Impacts

Remote Sprint Launch Site 1 is currently inactive. The only other project that could represent the potential for cumulative impacts would be the potential dismantlement and destruction of some of the facilities at this location. This activity would need to be mostly completed before the start of the main NMD construction activities. However, in accordance with a programmatic agreement with the North Dakota SHPO, only Remote Sprint Launch Site 3, the only Remote Sprint Launch Site not located within the ROI, will be managed as a historic property; the remainder of the Remote Sprint Launch Sites (1, 2, and 4) can be dismantled. Before the onset of any activities, appropriate consultation would occur with the North Dakota SHPO. No other projects have been identified that would result in the potential for cumulative cultural resource impacts.

Mitigation Measures

Because no NRHP-listed or -eligible prehistoric or historic archaeological sites or archaeologically resources or traditional resources have been identified within the ROI for the Missile Site Radar, no mitigation measures have been identified. However, if during the course of NMD program activities, cultural materials (particularly human remains) are unexpectedly discovered, activities will cease in the immediate area and the North Dakota SHPO notified through the U.S. Army Space and Missile Defense Command environmental office. All SRMSC NRHP-eligible properties have been documented in an HAER and accepted and approved by the National Park Service. Therefore, no mitigations would be required (Greenwood, 1999—Comments received by EDAW, Inc., regarding NMD Deployment Coordinating Draft DEIS).

4.3.4.4.2.4 Remote Sprint Launch Site 2—Cultural Resources

Under the Proposed Action, potential impacts and mitigation measures at Remote Sprint Launch Site 2 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.4.2.5 Remote Sprint Launch Site 4—Cultural Resources

Under the Proposed Action, potential impacts and mitigation measures at Remote Sprint Launch Site 4 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.5 Geology and Soils

This section addresses potential impacts and hazards related to geology and soils in the project area. Project activities evaluated in this section primarily are those related to construction, such as grading, cut/fill, and short- and long-term earth stabilization measures. The potential for occurrence of geologic hazards such as major seismic events is also evaluated. Potential geology and soil impacts were evaluated on the following:

- Substantial erosion or siltation from water or wind
- Damage to large areas of permafrost (Alaska)
- Exposure of people and structures to major geologic hazards

4.3.4.5.1 Alaska Installations

4.3.4.5.1.1 Eareckson AS—Geology and Soils

Minor to moderate impacts are anticipated to the geology and soils at Eareckson AS as a result of the Proposed Action. The XBR would be located in the northeast portion of the base. However, new construction of a power plant, fuel storage areas, and connecting infrastructure for electrical lines and sewer lines would affect both the north and south sides of the island. Construction of the XBR site would disturb approximately 12 hectares (30 acres) over a construction period of approximately 2 years. Most of the construction would take place in areas where previous ground disturbance has occurred. Facility designs would have to address the excavation and removal of thick surface layers of tundra peat in order to achieve suitable foundation conditions. Such excavations would expose underlying loam soils to potential erosion and would also create spoils of organically rich materials that would have to be designated for alternative uses.

Site preparation work at Eareckson AS would generate a large quantity of peat and/or overburden material that would be unsuitable for construction purposes and would require disposal. Any soil removal during construction on Eareckson AS would require analytical laboratory testing to ensure the soils are not contaminated. Preferred alternatives for disposal and reuse of organic and overburden materials have included use as cover for landfills and abandoned roads. Disposal and reuse of these materials would be closely coordinated with Eareckson AS Program Manager.

All construction aggregate would be obtained from existing borrow areas on-island, as off-island sources of material are economically impractical and logistically difficult to bring onto the island. The use of the island's sand and gravel resources would not deplete the available resources.

Eareckson lies in seismic zone 4 and would be subject to a high probability of severe earthquake ground shaking during the design life of the XBR. Construction of new facilities would incorporate seismic design parameters consistent with the critical nature of the facilities and its geologic setting. The facility would be located at an elevation above the wave run-up line of a potential tsunami.

Cumulative Impacts

No cumulative impacts are anticipated. 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. However, given the limited disturbance associated with this NMD element, no cumulative impacts should occur from construction or long-term operation.

Mitigation Measures

Best Management Practices would be used to reduce the potential for short-term soil erosion during construction. Various measures may be used to reduce water erosion of slopes, partially graded streets, and pads. Alternative measures may include minimizing the amount of area exposed during grubbing, use of soil stabilizers to reduce fugitive dust, use of sandbags for diverting flow, and revegetating slopes and open areas as soon as possible to enhance long-term stability.

4.3.4.5.2 North Dakota Installations

4.3.4.5.2.1 Cavalier AFS—Geology and Soils

Minor impact is anticipated to the geology and soils at Cavalier AFS as a result of the Proposed Action. A maximum of 4 hectares (10 acres) of land would be disturbed adjacent to the existing Perimeter Acquisition Radar building in the east-central portion of Cavalier AFS. The site topography is relatively flat, which reduces the potential for soil erosion from runoff. Soils at Cavalier AFS are generally fine to medium grained, with little surface relief and generally suitable for cultivation. The primary soil management issue is short-term wind erosion during ground-disturbing activities. Over the 2-year ground-disturbing period, Best Management Practices to minimize fugitive dust would be implemented. Once construction is complete and vegetation is replaced, there should be little soil erosion from operation of the site.

Construction on Cavalier AFS would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process; however, this should not deplete the available resources in the area.

Cumulative Impacts

If the NMD XBR is deployed at Cavalier AFS, the existing Air Force mission would cease along with other potential plan upgrades for the base. The only other project that could represent the potential for cumulative impacts would be the dismantlement and destruction of the Perimeter Acquisition Radar. This activity would need to be mostly completed before the start of the main NMD activities. The destruction of these facilities would result in ground-disturbing activities occurring over a longer period of time. Soils at the site are susceptible to short-term wind and water erosion; therefore, cumulative construction-related impacts would result in some soil loss. As part of the standard construction procedures, Best Management Practices would be used to minimize potential soil erosion. Overall, no short- or long-term cumulative impacts to geology and soils would be expected from construction or operation of the XBR at Cavalier AFS.

Mitigation Measures

Best Management Practices would be used to reduce the potential for soil erosion during construction. Various measures may be recommended to reduce erosion of slopes, partially graded streets, and pads. Alternative recommendations may include minimizing the amount of area exposed during clearing; frequent watering of graded areas; use of soil stabilizers; and revegetation of slopes and open areas as soon as possible to enhance long-term stability.

4.3.4.5.2.2 Missile Site Radar—Geology and Soils

Minor impact is anticipated to the geology and soils at the Missile Site Radar from the Proposed Action. Construction of the XBR and appurtenant facilities would require disturbing up to 20 hectares (50 acres), a portion of which would be associated with the demolition of existing site structures. The site topography is relatively flat, which reduces the potential for soil erosion from runoff. Soils at the site generally reflect minimal susceptibility to erosion. The primary soil management issue would be short-term wind erosion during ground-disturbing activities. Best Management Practices would be implemented to minimize the potential for fugitive dust.

Construction on the Missile Site Radar would not impact any mineral resources on the bases. There is the potential for use of local sand and gravel resources in the area as part of the construction process, but this use should not deplete the available resources in the area.

Cumulative Impacts

The Missile Site Radar is currently inactive. The only other project that could represent the potential for cumulative related impacts could be the

potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD activities. The destruction of these facilities would result in ground-disturbing activities occurring over a longer period of time. Soils at the site are susceptible to short-term wind and water erosion; therefore, cumulative construction-related impacts would result in some soil loss. As part of the standard construction procedures, Best Management Practices would be used to minimize potential soil erosion. Once site vegetation is restored, no long-term soil impacts from erosion would be expected. Overall, no cumulative impacts would occur.

Mitigation Measures

Mitigation measures would be similar to those described for Cavalier AFS discussed in section 4.3.4.5.2.1.

4.3.4.5.2.3 Remote Sprint Launch Site 1—Geology and Soils

Minor impact is anticipated to the geology and soils at Remote Sprint Launch Site 1. Construction of the XBR and appurtenant facilities would require disturbing approximately 17 hectares (41 acres). The site topography is relatively flat, which reduces the potential for soil erosion from runoff. Soils at the site reflect minimal susceptibility to erosion. The primary soil management issue would be short-term wind erosion during ground-disturbing activities. Best Management Practices would be implemented to minimize the potential for fugitive dust.

Construction on Remote Sprint Launch Site 1 would not impact any mineral resources on the base. There is the potential for use of local sand and gravel resources in the area as part of the construction process, but this use should not deplete the available resources of the area.

Cumulative Impacts

Remote Sprint Launch Site 1 is currently inactive. The only other project that could represent the potential for cumulative-related impacts could be the potential dismantlement and destruction of some of the facilities at this site. This activity would need to be mostly completed before the start of the main NMD activities. The destruction of these facilities would result in ground-disturbing activities occurring over a longer period of time. Soils at the site are susceptible to short-term wind and water erosion; therefore, cumulative construction-related impacts would result in some soil loss. As part of the standard construction procedures, Best Management Practices would be used to minimize potential soil erosion. Once site vegetation is restored, no long-term soil impacts from erosion would be expected. Overall, no cumulative impacts would occur.

Mitigation Measures

Mitigation measures would be the same as described for Cavalier AFS discussed in section 4.3.4.5.2.1.

4.3.4.5.2.4 Remote Sprint Launch Site 2—Geology and Soils

Potential impacts to geology and soils, including mitigation measures, at Remote Sprint Launch Site 2 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.5.2.5 Remote Sprint Launch Site 4—Geology and Soils

Potential impacts to geology and soils, including mitigation measures, at Remote Sprint Launch Site 4 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.6 Hazardous Materials and Hazardous Waste Management

This section addresses potential environmental impacts caused by hazardous materials/waste management practices associated with construction and operation of the XBR element, including the potential impacts on the ongoing IRP investigation and remediation activities at existing contaminated sites.

Regulatory standards and guidelines have been applied in determining the potential impacts associated with the use of hazardous materials and the generation of hazardous waste. The following criteria were used to identify potential impacts:

- Amount of hazardous materials brought onto the installations to support the XBR NMD program that could result in exposure to the environment or public through release or disposal practices
- Hazardous waste generation that could increase regulatory requirements
- Pollution prevention practices to be utilized during the NMD program to prevent and/or improve environmental impacts associated with operations
- Program activities that would affect IRP activities
- Accidental release of friable asbestos, lead-based paint, or PCBs during the demolition or modification of a structure
- Construction of facilities in areas where radon levels exceed U.S. EPA recommendations
- Use of pesticides that are not consistent with existing installation practices

Construction Overview

Hazardous wastes generated during construction would consist of materials such as waste oils, hydraulic fluids, cleaning fluids, cutting fluids, and waste antifreeze. These materials would be containerized and properly disposed of by the individual contractors. Any spill of a hazardous material or hazardous waste that may occur during construction would be quickly remediated in accordance with the construction contractor's SWPPP and Project Spill Prevention, Control, and Countermeasure Plan that would be developed for each site. All hazardous materials used and hazardous waste generated during construction would be handled in accordance with applicable Federal, state, and local regulations.

Table 4.3.4.6-1 summarizes estimated quantities of hazardous materials and wastes that would be used and generated during the construction phase of GBI deployment at alternative locations.

Table 4.3.4.6-1: Hazardous Materials and Wastes—Construction Activities

Source	Hazardous Material	Estimated Annual Usage	Estimated Annual Wastes
		kilograms (pounds)	kilograms (pounds)
Construction equipment	Diesel fuel, gasoline, lubricants, oils, hydraulic fluids, antifreeze	100,000 (220,462)	100 (220.5)
Construction vehicles	Diesel fuel, gasoline, lubricants, oils, solvents	100,000 (220,462)	100 (220.5)
Contractor portable offices and personnel support facilities	Heating fuel, cleaning solvents	5,000 (11,023)	10 (22)
Paints, coatings and solvents	Paints, paint thinner	5,000 (11,023)	10 (22)
Portable electric generators	Diesel fuel, oil, lubricants	1000 (2,204)	5 (11)
Storage batteries	Battery acid	100 (220.5)	1 (2.2)
Cloth rags, paper products	Oil, solvents	100 (220.5)	1 (2.2)

Operations Overview

Hazardous Materials Management. Under the Proposed Action, the maintenance and operation activities at the XBR deployment site would be minimal. The specific amounts of hazardous materials required are not currently known; however, it is expected that the hazardous materials would include protective coatings such as paints, lubricants and oils, motor and generator fuels, backup power batteries, solvents, and propylene glycol or ethylene glycol. These materials would be used in the periodic inspection and preventative maintenance to XBR support systems, such as power supplies, environmental control systems, communication systems, security systems, and cooling systems. The hazardous materials would be stored in a centralized location for distribution when needed for maintenance. Appropriate Material Safety Data Sheets will be posted in any location where hazardous materials are stored or used. The appropriate spill response and hazardous materials

management plan would be developed for the deployment site. The use of these materials would be in accordance with Federal, state, and local regulations. An overall pollution prevention plan is being developed for the NMD program.

The main hazardous material associated with the XBR would be for the radar cooling system requiring a 26,498-liter (7,000-gallon) 50/50 mixture of antifreeze (propylene glycol or ethylene glycol) and water. The cooling water would be in a closed-loop system and would be replaced as required. Used cooling water will be disposed of in accordance with Federal, state, and local regulations.

Ozone depleting substances would not be used in the fire suppression system.

Hazardous Waste Management. As discussed above, there would be minimal use of hazardous materials at the XBR deployment site. Any hazardous waste generated from the use of these materials would be handled in accordance with appropriate Federal, state, and local regulations. Hazardous waste generated would be temporarily stored on site before transfer to the host installations main hazardous waste storage facility for appropriate disposal. The appropriate hazardous waste management plan would be developed for the site.

Pollution Prevention. A stated objective of the NMD program is to seek opportunities to eliminate or minimize use of hazardous materials throughout the life cycle of the program. The NMD program has generated a Pollution Prevention Plan, which outlines strategies to minimize the use of hazardous materials including Class II Ozone Depleting Substances and EPCRA 13 chemicals. In addition, the NMD program would comply, as required, with the base pollution prevention plan. This plan will be applied throughout the design of all NMD elements, incorporating trade studies and emphasizing reduction of hazardous materials to be used on government installations. For the XBR system, the potential for recycling the cooling water would be investigated.

Installation Restoration Program. The DOD will continue to remediate all contamination associated with sites proposed for use under the NMD program. Delays or restrictions on facility use for NMD deployment areas may occur depending on the extent of contamination and remedial actions determined for contaminated sites.

Asbestos. No asbestos would be used in the construction of new facilities for the NMD program. Prior to any existing building modifications for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed before modification in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. No PCBs would be used in the construction of new facilities for the NMD program. Prior to any existing building modifications for deployment, it would be determined if PCBs exist in the modification area. If PCBs exist, they would be removed before modification in accordance with appropriate Federal, state, and local regulations.

Lead-based Paint. No lead-based paint would be used in the construction of new facilities for the NMD program. Prior to any existing building modifications for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed before modification in accordance with appropriate Federal, state, and local regulations.

Radon. In areas where existing radon surveys have been found to exceed U.S. EPA recommendations, appropriate design techniques would be utilized for occupied facilities to ensure exposure levels would not exceed recommended levels.

Pesticides. During XBR operational maintenance, pesticides may be needed within the XBR fenced area. The use of pesticides would be in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act. Local installation personnel would be contacted for appropriate materials that should be used for the region.

4.3.4.6.1 Alaska Installations

4.3.4.6.1.1 Eareckson AS—Hazardous Materials and Hazardous Waste Management

Construction

The proposed site for the XBR at Eareckson AS would be on the northeast part of Shemya Island and would require the construction of XBR and operations support facilities. Some personnel support functions would utilize existing facilities on the installation. The expected hazardous materials and wastes include protective coatings, lubricants and oils, motor and generator fuels, backup power batteries, adhesives, and sealants.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. The types of hazardous materials proposed for use under the Proposed Action would be similar to those currently used at Eareckson AS, primarily fuel, oil, solvents, and storage batteries. In addition, the radar cooling system would utilize 26,498 liters (7,000 gallons) of coolant containing propylene glycol or ethylene glycol and water.

Implementation of the XBR element of the Proposed Action would increase the amounts of hazardous materials used on Eareckson AS; however, the increase would be minor. The hazardous materials for the NMD program would be obtained through an existing DOD facility, which has the mechanisms in place to store and manage the increased quantity of hazardous materials. These materials would be incorporated into the station's SWPPP Management Program and Oil and Hazardous Substance Discharge Prevention and Contingency Plan. These materials would be reported to local authorities in accordance with the EPCRA. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at Eareckson AS for the NMD program.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the XBR would contain fuel for electrical generators. The exact number and types of storage tanks are not currently known; however, all storage tanks installed for the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. The types of hazardous waste generated under the Proposed Action would be similar to the waste generated by current Eareckson AS activities. Operation of the XBR would result in a minor increase in hazardous waste generated at Eareckson AS.

The Hazardous Waste Management Plan implemented at Eareckson AS has established appropriate mechanisms for the accumulation, management, and disposal of hazardous waste. Appropriate spill procedures, personnel, and equipment are in place to manage any contingency. All hazardous waste generated at the XBR site would be handled through the station's treatment, accumulation, and disposal facility. This facility has adequate capacity to handle the additional hazardous waste generated by the NMD program. This increased generation of hazardous waste would not change the station's small quantity generator status.

Pollution Prevention. Under the Proposed Action, XBR activities at Eareckson AS would utilize the existing Hazardous Waste Management Plan at the station. This program controls and reduces the use of hazardous materials on the installation. In addition, the NMD program would comply, as required, with the current base pollution prevention plan. As stated above, the NMD program has generated and will continue to update the system-wide pollution prevention plan, which outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. Thirteen of the 50 identified IRP sites currently under remedial investigation, design, or action at Eareckson AS are on or near the proposed site for XBR construction area. The current schedule of investigations and any remediation required at these sites would not be affected by the NMD program.

Before beginning NMD construction, activities would be coordinated with the appropriate installation personnel and Federal and state regulators to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification as part of the XBR deployment at Eareckson AS may contain asbestos-containing material. Prior to any existing building modification for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. There are no remaining PCB-containing materials at Eareckson AS. No PCB-based materials would be used for the XBR system.

Lead-based Paint. Some of the facilities proposed for modification as part of the XBR deployment at Eareckson AS may contain lead-based paint. Prior to any existing building modification for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. Radon testing at Eareckson AS resulted in all samples being below the U.S. EPA guidelines of 4 picocuries per liter or below detection levels (U.S. Department of the Air Force, 1997—Final Installation-Wide

Environmental Baseline Survey). Hence, radon is not a concern at Eareckson AS.

Pesticides. Under the Proposed Action, pesticides would be used within the XBR area. Pesticides would be applied in accordance with Eareckson AS procedures using personnel certified as pesticide applicators. The small amount of pesticides required for the NMD program would be similar to the quantities already applied in developed areas of the installation. Overall, there would be little change in pesticide usage amounts at Eareckson AS.

Cumulative Impacts

Potential cumulative hazardous materials and hazardous waste impacts could occur at Eareckson AS with the combination of XBR activities and ongoing facility maintenance and repair. Current activities at Eareckson AS would not result in a change in the overall installation mission or in ongoing hazardous materials and hazardous waste management programs. NMD activities in combination with ongoing Eareckson AS activities would result in an increase in the amounts of hazardous materials used and hazardous waste generated on Eareckson AS; however, Eareckson AS has the mechanisms and management systems in place to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at Eareckson AS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.6.2 North Dakota Installations

4.3.4.6.2.1 Cavalier AFS—Hazardous Materials and Hazardous Waste Management

Construction

The proposed site for the XBR at Cavalier AFS would be adjacent to the Perimeter Acquisition Radar and would require the construction of XBR and operations support facilities. Some personnel support functions would utilize existing facilities on the installation. The expected hazardous materials and wastes include protective coatings, lubricants and oils, motor and generator fuels, backup power batteries, adhesives, and sealants.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD

construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. The types of hazardous materials proposed for use under the Proposed Action would be similar to those currently used at Cavalier AFS, primarily fuel, oil, solvents, and storage batteries. In addition, the radar cooling system would utilize 26,498 liters (7,000 gallons) of coolant containing propylene glycol or ethylene glycol and water.

All hazardous materials used at the XBR site would be obtained through a designated DOD facility. The hazardous materials for the NMD program would be obtained through a site-specific HAZMAT pharmacy system designed to safely store and manage the required types and quantities of hazardous materials. These materials would be incorporated into a Spill Prevention and Response Plan and would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials for the NMD program.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the XBR would contain fuel for emergency electrical generators. All storage tanks installed for the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. The types of hazardous waste generated under the Proposed Action would be similar to the waste generated by current Cavalier AFS activities.

Utilizing the NMD System-Wide Hazardous Waste Management Plan, appropriate mechanisms would be established for the storage, management, and disposal of hazardous waste. Appropriate spill procedures, personnel, and equipment are in place to manage any contingency. All hazardous waste generated at the XBR site would be handled through the station's treatment, storage, and disposal facility. This facility has adequate capacity to handle the additional hazardous waste generated by the NMD program.

Pollution Prevention. Under the Proposed Action, XBR activities would be in accordance with a hazardous waste management plan. This program controls and reduces the use of hazardous materials. In addition, a site-specific pollution prevention plan would be developed. As stated above, the NMD program has generated and will continue to

update the system-wide pollution prevention plan, which outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. Four of five identified IRP sites at Cavalier AFS have been officially closed by the North Dakota Department of Health. A fifth site is under long-term monitoring. The current schedule of investigations and any remediation required at these sites would not be affected by the NMD program.

Prior to beginning NMD construction, activities would be coordinated with the appropriate installation personnel and Federal and state regulators to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification as part of the XBR deployment at Cavalier AFS may contain asbestos-containing material. Prior to any existing building modification for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. Cavalier AFS uses a variety of electronic and communications equipment that contain PCBs. Most of these items are located in the Perimeter Acquisition Radar building. The station maintains a record of all PCB-containing equipment and has tested suspect equipment for PCB levels. An ongoing project to replace the PCB materials in electrical transformers and major equipment has been completed.

Prior to any existing building modification or demolition, it would be determined if PCB-containing items exist in the modification area. If PCBs do exist, the equipment and material would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel. No PCB-based materials would be used for the XBR system.

Lead-based Paint. Some of the facilities proposed for modification as part of the XBR deployment at Cavalier AFS may contain lead-based paint. Prior to any existing building modification for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification in accordance with appropriate Federal, state, and local regulations.

Radon. Radon testing at Cavalier AFS resulted in all samples being below the U.S. EPA guidelines of 4 picocuries per liter. Hence, radon is not a concern at Cavalier AFS.

Pesticides. Under the Proposed Action, pesticides would be used within the XBR area. Pesticides would be applied in accordance with DOD and state regulations using personnel certified as pesticide applicators. The small amount of pesticides required for the NMD program would be similar to the quantities already applied in developed areas of the installation. Overall, there would be little change in pesticide usage amounts at Cavalier AFS.

Cumulative Impacts

The only known project that could result in a cumulative impact would be the potential dismantlement and destruction of the radar at Cavalier AFS. The majority of this activity would need to be completed before the start of the main NMD construction activities. However, there is the potential that some construction activities could overlap, subsequently increasing the amount of construction-related hazardous materials and wastes at Cavalier AFS. This increase would be minimal and would be stored and managed in accordance with state and Federal laws.

Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at Cavalier AFS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.6.2.2 Missile Site Radar—Hazardous Materials and Hazardous Waste Management

Construction

The proposed site for the XBR at the SRMSC Missile Site Radar is the site of the existing radar system. XBR deployment would require the construction of the XBR and operations and personnel support facilities. The expected hazardous materials and wastes include protective coatings, lubricants and oils, motor and generator fuels, coolant, backup power batteries, adhesives, and sealants.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. There is no current operational hazardous materials program or plan active at the Missile Site Radar. The types of hazardous materials used by the XBR under the Proposed Action would include fuels, paints, solvents, and storage batteries. In addition, the radar cooling system would utilize 26,498 liters (7,000 gallons) of coolant containing propylene glycol or ethylene glycol and water.

All hazardous materials used at the XBR site would be obtained through a designated DOD facility. The hazardous materials for the NMD program would be obtained through a site-specific HAZMAT pharmacy system designed to safely store and manage the required types and quantities of hazardous materials. These materials would be incorporated into a Spill Prevention and Response Plan and would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at the Missile Site Radar for the NMD program.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. The storage tanks proposed for the XBR would contain fuel for the emergency electrical generators. The exact number and type of storage tanks are not currently known; however, all storage tanks installed for the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. There is no current operational hazardous waste program or plan active at the Missile Site Radar. All hazardous waste generated at the XBR site would be handled through a designated DOD treatment, storage, and disposal facility. The types of hazardous wastes generated by the XBR under the Proposed Action would include fuels, paints, solvents, and storage batteries.

Utilizing the NMD System-Wide Hazardous Waste Management Plan, appropriate mechanisms would be established to store, manage, and dispose of hazardous waste. Appropriate spill procedures, personnel and equipment would be in place to manage any contingency. All hazardous waste generated at the XBR site would be handled through an appropriate DOD treatment, storage, and disposal facility. This facility would have adequate capacity to handle the additional hazardous waste generated by the NMD program.

Pollution Prevention. Under the Proposed Action, the NMD XBR activities at the Missile Site Radar, the NMD system-wide pollution prevention plan would be implemented in addition to a site-specific plan. This program would control and reduce the use of hazardous materials on the

installation. In addition, the NMD program would comply, as required, with existing state regulatory requirements. As stated above, the NMD program has generated and will continue to update the system-wide pollution prevention plan, which outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. At the Missile Site Radar facility, a preliminary investigation revealed several potential areas of concern. It is anticipated that proposed NMD activities would not impact continued investigations, and any remediation required at these sites would be completed before construction.

Overall, prior to beginning NMD construction at the Missile Site Radar, activities would be coordinated with the appropriate base personnel to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification and demolition as part of the XBR deployment at the Missile Site Radar may contain asbestos-containing material. Prior to any existing building modification or demolition for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. A PCB survey conducted in 1991 at the Missile Site Radar facility and associated Remote Sprint Launch Sites resulted in the removal of transformers and other items containing PCBs. A subsequent survey has determined that 37 remaining items at these sites may contain PCBs below levels currently regulated by the U.S. EPA (Site Investigation and Analysis Engineering Report, 1994). Prior to any existing building modification or demolition for XBR deployment, it would be determined if PCB-containing items exist in the modification area. If PCBs do exist, the equipment and material would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the XBR deployment at the Missile Site Radar may contain lead-based paint. Prior to any existing building modification or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. Radon concentrations in the vicinity of the Missile Site Radar could exceed the U.S. EPA threshold of 4 picocuries (U.S. Geological Survey, 1993). A radon survey for the Missile Site Radar found Building 348, now demolished, and Building 360 to have radon levels above 4 picocuries per liter. All other facilities surveyed were below 4 picocuries per liter. (Greenwood, 1999—Comments received by EDAW, Inc., regarding the NMD Deployment Coordinating Draft DEIS) Prior to facility construction, the design of the NMD facilities would take into account mitigation measures to reduce radon levels to acceptable standards in all facilities.

Pesticides. Under the Proposed Action, pesticides would be used within the XBR deployment area at the Missile Site Radar. Pesticides would be applied in accordance with DOD and state regulations using personnel certified as pesticide applicators. Only a small amount of seasonal pesticides would be required for the NMD program.

Cumulative Impacts

The only project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at the Missile Site Radar. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of construction-related hazardous materials and wastes at the Missile Site Radar. The appropriate mechanisms and management systems would be implemented to store and manage the increased quantity of hazardous materials and hazardous waste. Overall, it is not expected that there would be any cumulative hazardous materials or hazardous waste management issues at the Missile Site Radar.

Mitigation Measures

No mitigation measures would be required.

4.3.4.6.2.3 Remote Sprint Launch Site 1—Hazardous Materials and Hazardous Waste Management

Construction

The location of XBR at SRMSC Remote Sprint Launch Site 1 would involve the entire existing site. XBR deployment would require the construction of the XBR, and operations and personnel support facilities. The expected hazardous materials and wastes include protective coatings, lubricants and oils, motor and generator fuels, coolant, backup power batteries, adhesives, and sealants.

As discussed above, appropriate plans and measures would be implemented during the construction program to minimize hazardous materials and hazardous waste impacts that may result from NMD construction activities. Overall, hazardous materials and hazardous waste management activities are addressed below under Operation.

Operation

Hazardous Materials Management. There is no current operational hazardous materials program or plan active at Remote Sprint Launch Site 1. The types of hazardous materials used by the XBR under the Proposed Action would include fuels, paints, solvents, and storage batteries. In addition, the radar cooling system would utilize 26,498 liters (7,000 gallons) of coolant containing propylene glycol or ethylene glycol and water.

All hazardous materials used at the XBR site would be obtained through a designated DOD facility. The hazardous materials for the NMD program would be obtained through a site-specific HAZMAT pharmacy system designed to safety store and manage the required types and quantities of hazardous materials. These materials would be incorporated into a Spill Prevention and Response Plan and would be reported to local authorities in accordance with the EPCRA, as required. Overall, all hazardous materials management activities would be in accordance with existing regulations for the use and storage of hazardous materials at Remote Sprint Launch Site 1 for the NMD program.

Any underground or aboveground storage tanks within the proposed NMD construction area would be removed before construction activities in accordance with appropriate Federal, state, and local regulations. All new storage tanks proposed for the NMD program would be aboveground with appropriate spill containment devices. The storage tanks proposed for the XBR would contain fuel for the emergency electrical generators. The exact number and types of storage tanks are not currently known; however, all storage tanks installed for the NMD program would comply with appropriate state and Federal regulations.

Hazardous Waste Management. There is no active operational hazardous waste program in effect at Remote Sprint Launch Site 1. All hazardous waste generated at the XBR site would be handled through a designated DOD treatment, storage, and disposal facility. The types of hazardous wastes generated by the XBR under the Proposed Action would include diesel fuels, paints, solvents, and storage batteries.

Utilizing the NMD System-Wide Hazardous Waste Management Plan, appropriate mechanisms would be established to store, manage, and dispose of hazardous waste. Appropriate spill procedures, personnel and equipment would be in place to manage any contingency. All hazardous

waste generated at the XBR site would be handled through an appropriate DOD treatment, storage, and disposal facility. This facility would have adequate capacity to handle the additional hazardous waste generated by the NMD program.

Pollution Prevention. Under the Proposed Action, the NMD XBR activities at Remote Sprint Launch Site 1, the NMD system-wide pollution prevention plan would be implemented in addition to a site-specific plan. This program would control and reduce the use of hazardous materials on the installation. In addition, the NMD program would comply, as required, with existing state regulatory requirements. As stated above, the NMD program has generated and will continue to update the system-wide pollution prevention plan which outlines strategies to minimize the use of hazardous materials over the lifecycle of the NMD program.

Installation Restoration Program. There are no known hazardous waste contaminated sites at Remote Sprint Launch Site 1; however, the water in the abandoned missile silos has never been inspected. It is anticipated that the silos would be investigated before the end of the year 2000. Results of the investigations and any future efforts at the site would be coordinated with the appropriate agencies. It is anticipated that proposed NMD activities would not impact any potential investigations, and any remediation required at these sites would be completed before construction.

Overall, prior to beginning NMD construction at Remote Sprint Launch Site 1, activities would be coordinated with the appropriate personnel to minimize impacts to remediation efforts and NMD program activities. In addition, construction contractors would be notified of potential ground contamination before construction so appropriate health and safety measures can be taken to avoid human contact with any contaminated areas.

Asbestos. Some of the facilities proposed for modification and demolition as part of the XBR deployment at Remote Sprint Launch Site 1 may contain asbestos-containing material. Prior to any existing building modification or demolition for deployment, it would be determined if asbestos-containing material exists in the modification area. If asbestos exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Polychlorinated Biphenyls. A PCB survey conducted in 1991 at the Missile Site Radar and Remote Sprint Launch Sites resulted in the removal of transformers and other items containing PCBs. A subsequent survey has determined that 37 items at these sites may contain PCBs below levels currently regulated by the U.S. EPA (Site Investigation and Analysis Engineering Report, 1994). Prior to any existing structure

modification or demolition for XBR deployment, it would be determined if PCB-containing items exist in the modification area. If PCBs do exist, the equipment and material would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations by certified personnel.

Lead-based Paint. Some of the facilities proposed for modification and demolition as part of the XBR deployment at Remote Sprint Launch Site 1 may contain lead-based paint. Prior to any existing building modification or demolition for deployment, it would be determined if lead-based paint exists in the modification area. If lead-based paint exists, it would be removed and disposed of before modification or demolition in accordance with appropriate Federal, state, and local regulations.

Radon. Radon concentrations in the vicinity of Remote Sprint Launch Site 1 could exceed the U.S. EPA threshold of 4 picocuries (U.S. Geological Survey, 1993—Generalized Geological Radon Potential of the Upper Midwest). Construction of new facilities may require the addition of radon mitigation measures. Prior to facility construction, the design of the NMD facilities would take into account mitigation measures to reduce radon levels to acceptable standards in all facilities.

Pesticides. Under the Proposed Action, pesticides would be used within the XBR deployment area at Remote Sprint Launch Site 1. Pesticides would be applied in accordance with DOD and state regulations using personnel certified as pesticide applicators. Only a small amount of seasonal pesticides would be required for the NMD program.

Cumulative Impacts

No cumulative hazardous materials and hazardous waste impacts could occur at Remote Sprint Launch Site 1 with the combination of XBR activities and negligible caretaker activities at the site. NMD activities would result in an increase in the amounts of hazardous materials used and hazardous waste generated at Remote Sprint Launch Site 1; however, mechanisms and management systems would be implemented to store and manage the small quantity of hazardous materials and hazardous waste.

The only other project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at Remote Sprint Launch Site 1. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities may overlap, subsequently increasing the amount of construction-related hazardous materials and wastes at Remote Sprint Launch Site 1. This increase would be minimal and would stored and managed in accordance with state and Federal laws. Overall, it is not expected that there would be

any cumulative hazardous materials or hazardous waste management issues since there are no other projects currently at Remote Sprint Launch Site 1.

Mitigation Measures

No mitigation measures would be required.

4.3.4.6.2.4 Remote Sprint Launch Site 2—Hazardous Materials and Hazardous Waste Management

Potential impacts and mitigation measures from deployment of an XBR at Remote Sprint Launch Site 2 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.6.2.5 Remote Sprint Launch Site 4—Hazardous Materials and Hazardous Waste Management

Potential impacts and mitigation measures from deployment of an XBR at Remote Sprint Launch Site 4 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.7 Health and Safety

XBR health and safety impacts are evaluated by determining the processes in the NMD deployment that have the greatest risk to human health and the environment. The primary health and safety issue associated with radar operation is EMR health impacts to the public and workers. EMR impacts to biological resources are addressed in section 4.3.4.3. Possible EMR impacts would occur based on the following:

- EMR exposure presents a health risk to humans or exceeds prescribed safety standard in uncontrolled areas around the XBR
- EMR affects aircraft navigation and flight systems such that aircraft flight becomes unsafe or exceeds a standard for aircraft equipment exposure
- EMR emissions cause the ignition of electroexplosive devices
- EMR affects the operation of critical communication systems
- EMR affects the operation of sensitive electronic equipment

The potential for EMR exposure and general construction-related health and safety issues is common to any deployment location. Therefore, these potential health and safety issues are addressed below. Deployment site specific analysis will focus on those health and safety risks that pertain to each site. Potential impacts related to construction worker exposure to asbestos, lead-based paint, and ground/water site contamination are addressed under Hazardous Materials and Hazardous Waste Management.

The XBR would be radiating during a ballistic missile threat, testing, training, or when supporting collateral missions such as tracking space debris or a space shuttle mission. For analysis purposes, it was assumed the XBR would be operating most of the time.

Electromagnetic Radiation

Communications–Electronics Frequency-related Interference

Communications–Electronics In-band Radio Frequency Interference. In-band frequency interference addressed in this EIS is for the X-Band (8,000—12,000 megahertz). In-band radio frequency interference occurs when two pieces of communications-electronics equipment are located within the same frequency band. Therefore, equipment with frequencies falling within the X-Band would most likely be affected. Some examples of in-band communications-electronics equipment include airborne weather radars, fire control radars, and bomb/navigation radars. Specific adjacent band equipment that may be affected at each proposed location is addressed below.

Communications–Electronics Adjacent Band Interference. Adjacent band radio frequency interference is similar to in-band radio frequency interference. The adjacent bands for the X-Band include all frequencies that are within approximately 5 percent of the operating frequency. Specific adjacent-band equipment that may be affected at each proposed location is addressed below.

Communications–Electronics Harmonic Band Radio Frequency Interference. Harmonic band interference refers to interference produced in harmonically related receivers or interference caused by sub-harmonically related transmitters. Harmonic frequencies include those frequencies that are integer multiples of the operating frequencies. The likelihood and severity of radio frequency interference in the harmonically related bands is based upon the effective radiated power of the interfering source. Specific in-band equipment that may be affected at each proposed location is addressed below.

Communications–Electronics Non-frequency-related Interference

High Power Effects. Non-frequency-related interference from the XBR to the electromagnetic environment is limited to high-power effects. High-power effects typically occur in receivers that are located in proximity to high power transmitters and may be the result of either antenna-coupled signals or equipment case penetration. The impact of high-power effects is similar to that of in-band interference in that it will degrade the performance of the system. An example of the interference caused by high-power effects would be fuzziness on televisions or static on AM/FM car radios encountered while driving near high-voltage power lines. However, high-power effects are non-linear and therefore difficult to predict.

Previous analysis (Franks, 1973—High Power Effects Susceptibility Criteria) of high power effects defined thresholds for military communications-electronics equipment, commercial communications-electronics equipment, as well as commercial equipment such as televisions, radios and avionics equipment such as navigation markers and glideslopes. (See table 4.3.4.7-1.) The distances on table 4.3.4.7-1 are potential interfering distances. For example, the potential interfering distance for televisions is 4 kilometers (2 miles). However, this does not necessarily mean that interference will occur if a television is within 4 kilometers (2 miles) of the XBR, just that it is possible. An analysis of the probability for the XBR to cause interference to commercial electronic equipment such as televisions and FM radios determine that it would occur less than 0.05 percent of the time and therefore would not have an impact on overall operation or reception of the equipment.

Table 4.3.4.7-1: Distances Required to Prevent High Power Effects from the XBR to Communications-Electronics Equipment

Equipment Type	Threshold Peak in dBm per square meter	Threshold Peak in milliwatts per square centimeter	Threshold Peak in watts per square meter	Threshold Peak in volts per meter	Potential Interfering Distances		
					Main Beam in kilometers	Grating Lobe in kilometers	Average Sidelobe in kilometers
Military Standard	40	1.0	10.0	63.2	NA	12	0.0
Commercial Threshold (1)	30	0.1	1.0	20.0	NA	36	0.1
Specific Equipment Types							
AM Broadcast Receiver	45	3.2	31.6	112.5	NA	7	0.0
FM Broadcast Receiver	44	2.5	25.1	100.2	NA	7	0.0
Television Receiver	50	10.0	100.0	200.0	NA	4	0.0
VHF omni-directional range	69	794.3	7,943.3	1,782.5	2.0	0.4	0.0
Glideslope	74	2,511.9	25,118.9	3,169.8	1.0	0.2	0.0
Marker	62	158.5	1,584.9	796.2	5	1	0.0
IFF	48	6.3	63.1	158.9	23	5	0.0
Land-Mobile UHF	48	6.3	63.1	158.9	NA	5	0.0
Land-Mobile VHF	32	0.2	1.6	25.2	NA	29	0.1

Note: NA = Not applicable

(1) Overall probability that civilian equipment would experience interference from the XBR from high power effects is less than 0.05 percent of the time.

Aircraft/Avionics. The potential exists for EMR emissions from the main beam of the XBR to adversely affect fly-by-wire aircraft and avionics systems. The fly-by-wire concept uses an electronic flight control system coupled with a digital computer to replace conventional mechanical flight controls. The impacts to aircraft flying through electromagnetic fields exceeding the recommended standards are the introduction of spurious emissions into the automated flight control systems. The way the spurious emissions are interpreted by the automated flight control systems is dependent on the aircraft. The most publicized incident regarding electromagnetic interference to a fly-by-wire system involved the UH-60 Blackhawk Helicopter. In this case, the spurious emission was interpreted by the automated flight control system as a nose down command.

As shown in table 4.3.4.7-2, both DOD and the FAA have standards for EMR interference to aircraft which should not be exceeded. DOD uses MIL-STD-464 with a peak threshold standard of 3,500 volts per meter and an average of 1,270 volts per meter. The FAA 8110.71 peak threshold is 3,000 volts per meter and an average of 300 volts per meter. The FAA average threshold of 300 volts per meter results in a potential interference distance of up to 6.7 kilometers (4.2) miles from the XBR and the DOD average threshold of 1,270 volts per meter of up to 1.6 kilometers (1 mile). Since the FAA average threshold of 300 volts per meter is more conservative, it is the threshold used in this health and safety analysis.

Table 4.3.4.7-2: Interference to Fly-by-Wire Aircraft from the X-Band Radar

Standard	Threshold in volts per meter	Potential Interfering Distances		
		Main Beam in kilometers (miles)	Grating Lobe in kilometers (miles)	Average Sidelobe in kilometers (miles)
Military Standards				
MIL-STD-464 (1997)	3,500 (peak)	X-Band Radar does not exceed 3,500 volts per meter		
MIL-STD-464 (1997)	1,270 (average)	1.6 (1)	0.3 (0.19)	0
Federal Aviation Administration Standards				
FAA 8110.71 (1998)	3,000 (peak)	X-Band Radar does not exceed 3,000 volts per meter		
FAA 8110.71 (1998)	300 (average)	6.7 (4.2)	1.3 (0.8)	0

To avoid potential impacts to aircraft with fly-by-wire systems, a high energy radiation area warning of 6.7 kilometers (4.2 miles) would be published on appropriate aeronautical charts around the NMD XBR to inform pilots of the potential electromagnetic interference hazard with certain aircraft. This area would provide an extra safety margin to inform pilots who may fly near the XBR. It is unlikely, however, that aircraft would be affected if they moved through this warning area since the main beam of the XBR is in constant motion and the aircraft is also moving. It would be expected that with both the main beam and aircraft moving, it would be highly unlikely that the XBR could illuminate an aircraft long enough to cause significant degradation of the performance of the avionics systems. It should also be noted that the XBR does not present a radiation hazard to fly-by-wire aircraft based upon the peak power threshold of 3,000 volts per meter because emissions from the XBR will not exceed that level. Because the XBR would not illuminate aircraft beyond the 6.7-kilometer (4.2-mile) distance except for very short periods as the aircraft passes through the main beam, EMR exposure levels would not exceed human exposure levels.

Radiation Hazards

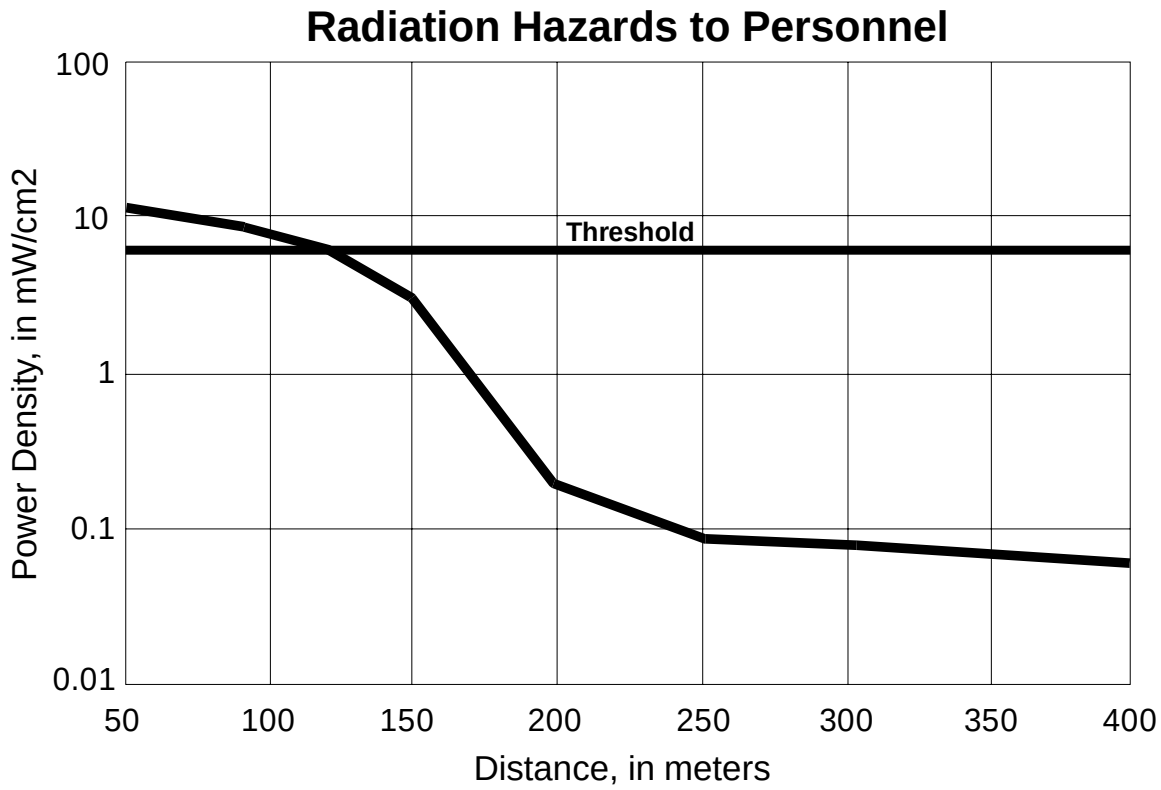
Human Exposure. The potential health impacts of human exposure to EMR (from X-Band emissions) above the levels set by the IEEE are cell tissue damage and radiation burns. Cell tissue damage may occur when the body's ability to regulate temperature through blood flow and perspiration is compromised. Radiation burns occur only in extreme conditions when the body is exposed to a very high level of EMR.

The threshold for human exposure to EMR is 6.33 milliwatts per square centimeter over a 9.5 minute averaging time in uncontrolled environments according to IEEE C95.1 for non-ionizing radiation produced by X-Band transmitters. A threshold of 10 milliwatts per square centimeter over a 10.5-minute averaging time in controlled environments was also identified in IEEE C95.1, but because the threshold was more stringent in uncontrolled environments, it was applied in the analysis. The heating that may take place in the body is equivalent to that generated by doing housework, and thus the body is able to regulate its temperature through blood flow and perspiration.

Also, for exposure to pulsed EMR, the peak value for maximum permissible exposure in terms of the electric field is 100,000 volts per meter for a single pulse, according to IEEE C95.1. However, at no time will the XBR exceed 100,000 volts per meter. Therefore, it was not included in the analysis.

A 150-meter (492-foot) personnel access control zone would be established around the radar and would protect personnel from EMR produced by the XBR. Computer models were used to determine the power density received on the ground over an average time of 9.5 minutes. At a distance of 150 meters and an average time of 9.5 minutes, that power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This is significantly less than the 6.33 milliwatts per square centimeter permitted by the IEEE. In addition, the U.S. EPA recommended analysis using Federal Communication Commission criteria for protecting human health of 1 milliwatt per square centimeter over a 30-minute averaging time. Results of the analysis indicate that power densities would be 0.8 milliwatts per square centimeter average over 30 minutes at a distance of 150 meters (492 feet). This is less than the 1 milliwatt per square centimeter recommended by the Federal Communication Commission. The IEEE guidelines are more stringent based on the shorter averaging time and are therefore shown in table 4.3.4.7-1.

Figure 4.3.4.7-1: Power Density Levels at Ground Level for the XBR Compared to IEEE Guidelines



A comparison of the power density produced by the XBR and the power density produced by household items can be found in table 4.3.4.7-3.

Personnel with Pacemakers. Air Force Regulation 161-9 mandates a threshold for cardiac pacemakers of 200 volts per meter for frequencies ranging from 0.1 to 5 gigahertz. Also, the Georgia Technical Research Institute has conducted several studies to determine the impacts of EMR on cardiac pacemakers. Those studies confirmed the regulation of 200 volts per meter. However, test data does not exist for frequencies in the X-Band. The reason for this is because the potential for interference at 3 gigahertz was so low that it did not mandate further testing of higher frequencies. Therefore, the 150-meter control area boundary is adequate to protect personnel with pacemakers.

Table 4.3.4.7-3: Comparison of EMR Exposures

System	Distance	Power Density in milliwatts per square centimeter	Power Density in dBm per square meter
Microwave Oven	5 centimeters (2 inches)	5	47
Walkie-Talkie	10 centimeters (4 inches)	2.5	44
XBR	150 meters (492 feet)	2.5	44
Cellular Phone	1 centimeters (0.4 inch)	0.6	38

Electroexplosive Devices. The potential impacts to electroexplosive devices from emissions from the XBR are twofold: (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated. The majority of the time, an electroexplosive device is either installed in its intended application with its leads attached (the presence phase) or is in the shipping/storage phase. Typical electroexplosive device applications in the presence phase would include fire extinguishers, automotive airbags, a missile attached to the wing of an aircraft, and military aircraft ejection seats. However infrequently, electroexplosive devices are sometimes handled without the protection of a storage container (handling/loading phase). Therefore, different susceptibility criteria have been developed for each of these two distinct conditions described above. These criteria are provided in table 4.3.4.7-4. As can be seen from table 4.3.4.7-4, electroexplosive devices in the handling/loading phase are substantially more susceptible to EMR hazards; however, main beam illumination on the ground will not occur. It is assumed that the handling/loading of electroexplosive devices will not occur when aircraft are airborne. However, main beam illumination of aircraft with electroexplosive devices (mainly military aircraft ejection seats) in the presence and shipping phases is possible. To ensure aircraft bearing electroexplosive devices are not threatened by grating or sidelobes, a high energy radiation area of 3.6 kilometers (2.2 miles) on the ground and 2.8 kilometers (1.7 miles) in the air will be published on appropriate aeronautical charts around the XBR to inform pilots of the potential electromagnetic interference hazard to certain aircraft.

Based upon a grating lobe illumination from the XBR, a separation distance of 0.6 kilometer (0.4 mile) is recommended for electroexplosive devices in the presence/shipping phase and 3.6 kilometers (2.2 miles) in the handling/loading phase (see table 4.3.4.7-4). Also, there is no predicted potential for inadvertent initiation of vehicle airbags because the metallic body/frame of the vehicle provides sufficient shielding.

Table 4.3.4.7-4: Required Separation Distances for Electroexplosive Devices in the Main Beam and Sidelobe of the XBR for the Presence, Shipping, and Handling/Loading Phases

Electroexplosive Device Phase	Threshold (volts per meter)	Standard	Main Beam Separation Distance in kilometers (miles)	Grating Lobe Separation Distance in kilometers (miles)
Presence/Shipping	1,270 (peak)	MIL-STD-464	2.8 (1.7)	0.6 (0.4)
Handling/Loading	200 (peak)	AFR-127-100	Not applicable	3.6 (2.2)

Fuels. Based upon the threshold of 5,000 milliwatts per square centimeter from Technical Order 31Z-10-4, the XBR does not present a radiation hazard to fuels because the XBR does not emit radiation levels that exceed 5,000 milliwatts per square centimeter.

Cumulative Impacts

In order for signals from different sources to add mathematically, all the sources would have to be in the same frequency range as the XBR and have the interference pulses arrive at the subject at the same time. The potential for this to happen is very low since all in-band systems are pulsed at different rates, have different transmitter powers, have different antenna gains, and are separated at different distances from a particular subject. Even if two sources are at the same frequency and EMR level, the resultant EMR will only be 3 decibels higher than one of the sources. For example:

50 dBm = 100 watts

(50 dBm + 50 dBm) = (100 watts + 100 watts) = 200 watts = 53 dBm

since, dB = 10*log(watts) + 30

No measurements have been performed on the coincidental EMR effects from multiple equipment at different frequency ranges. The controlled area boundary distance of 150 meters (492 feet) for the XBR will prevent non-ionizing heating in the subject. If multiple equipment EMR levels are received at the subject simultaneously, the strongest EMR level will cause the most heating. The likelihood of more than one EMR level being the same intensity is very low due to different separation distances, transmitter powers, and antenna gains. Also, cumulative impacts from the XBR are not likely because safety levels will not be exceeded beyond 150 meters (492 feet), and levels outside 150 meters (492 feet) along with other sources will not cause significant heating.

Moreover, the standard used for radiation hazards to personnel includes a safety factor that reduces the maximum level of body tissue heating to a factor of 10 less than the maximum value that was deemed safe. This

safety factor should be more than sufficient to account for the combined effects of multiple emitters, especially given the relatively small likelihood that a person would be exposed to the maximum permissible levels from two (or more) sources simultaneously.

4.3.4.7.1 Alaska Installations

4.3.4.7.1.1 Eareckson AS—Health and Safety

Construction

Construction of the XBR would not occur within the airfield clear zones, unexploded ordnance areas, or explosive safety zones on the base. In addition, construction activities would occur outside of the EMR hazard area for the COBRA DANE radar. Some of the construction may occur within areas that may have underground structures. These areas would be identified before construction and removed if within the ground disturbance area. Construction workers on Eareckson AS would follow base safety procedures regarding hazardous weather conditions that may occur on the island.

Operation

The main concern from operation of the XBR would be associated with EMR. Discussed below are the specific impacts to the Eareckson AS health and safety environment from EMR generated by the XBR.

Communications–Electronics Frequency-related Interference

In-Band Ground-Based Systems. There are no existing ground-based in-band systems within the ROI of the XBR at Eareckson AS.

Adjacent Band Ground-Based Systems. No adjacent band ground-based systems were identified in the Eareckson AS electromagnetic environment.

Harmonic-Band Ground-Based Systems. No harmonic band ground-based systems were identified in the Eareckson AS electromagnetic environment.

In-Band Airborne Systems. The airborne electromagnetic environment includes three types of in-band systems: fire control, bomb/navigation, and weather radars. Weather radars are utilized on both civilian and military aircraft. Emissions from the XBR may potentially degrade the overall system performance of the aforementioned radars. Section 3.3.1.1 provides an overview of the airspace and airports in the Eareckson AS ROI. As addressed above, it was determined that a 1-kilometer (0.6-mile) distance separation was sufficient to preclude the potential for electromagnetic interference with weather radars. Except for the aircraft utilizing the airfield at Eareckson AS, most other aircraft

with this type of equipment fly at altitudes greater than 1 kilometer (0.6 mile) above ground level around Eareckson AS. Since the main beam of the XBR is in constant motion, any interference to airborne weather radar would only occur for very short periods of time and would create minimal impacts to airborne weather radars in the vicinity of Eareckson AS. No military fire control or bomb/navigation radars are expected to be used in the ROI of the XBR at Eareckson AS.

Communications–Electronics Non-frequency-related Interference

High Power Effects. The out-of-band electromagnetic environment within 30 kilometers (19 miles) includes 48 ground-based systems. The majority of these systems (37) are land-mobile UHF and VHF radios. There is the potential that these systems could have some occasional interference out to 5 kilometers (3 miles) and 29 kilometers (18 miles), respectively, from the XBR. There is also the potential to cause some interference with one airport surveillance radar, one early warning radar, one air traffic control radar beacon, one VHF omni-directional range/tactical air navigational aid, one IFF system, and six fixed/mobile-broadcasting satellites. The navigational aids such as IFF systems, glideslopes, VHF omni-directional range, and marker beacons are present at Eareckson AS. The potential interfering distances based upon high power effects are limited to grating lobe power levels since the main beam of the XBR will not illuminate equipment on the ground. Since the main beam of the XBR is in constant motion, the grating lobes of the XBR are also in constant motion. Thus, any interference would only occur for very short periods of time (less than 0.05 percent of the time) and would not significantly impact the operation of this equipment. However, airborne aircraft systems could be affected if flying within the interference area. One low altitude airway and nine high altitude jet routes are within the potential interfering distance of these navigation systems. Because the potential interference is limited to high power effects, the possibility is unlikely, taking into consideration the shielding present from the frame of the aircraft and the minimal time, if any at all, that the aircraft would fly through the main beam of the XBR.

Aircraft/Avionics. As addressed above, the potential exists for the XBR main beam to adversely affect fly-by-wire aircraft and avionics systems out to 6.7 kilometers (4.2 miles) based upon the FAA standard. The Airspace section provides an overview of the airspace potentially affected around Eareckson AS. The greatest potential to affect fly-by-wire aircraft would be within established air routes. Within the 6.7-kilometer (4.2-mile) distance there is one low altitude airway and three high altitude jet routes, all of which provide service to Eareckson AS. As discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary. The approach of aircraft to the airfield on Eareckson AS

would be controlled so that main beam illumination does not occur. Overall, no health and safety impacts would occur.

Radiation Hazards

Human Exposure. Specific impacts from exposure to EMR generated by the XBR are addressed above. At the controlled area boundary of the XBR for an average time of 9.5 minutes, the power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This level is significantly less than the 6.33 milliwatts per square centimeter permitted by the IEEE standard; therefore, exposure levels at Eareckson AS would be below permitted levels.

Personnel with Pacemakers. As discussed above, persons with pacemakers would not be affected by operation of the XBR.

Electroexplosive Devices. As discussed above, the potential impacts to electroexplosive devices from emissions from the XBR are twofold: (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated.

Within the presence and shipping phase the main concern with electroexplosive devices on aircraft is inadvertent ignition at a distance of 2.8 kilometers (1.7 miles) from Eareckson AS; however, because of the operation of the COBRA DANE radar, there is already a warning area defined on the Western Aleutian Island Sectional Aeronautical Chart for aircraft equipped with electroexplosive devices. This warning area is larger than that required for the XBR. This warning would provide the necessary safety required for the NMD XBR. In addition, there are no military training routes or Military Operations Areas within near Eareckson AS and commercial air routes operate at an altitude greater than 2.8 kilometers (1.7 miles) above the ground in this area except for aircraft utilizing the Eareckson AS runway. However, the approach of aircraft to the airfield would be controlled so that main beam illumination does not occur; therefore, no health and safety impacts would occur.

There is also the potential to affect electroexplosive devices on the ground during the presence and shipping phase at the base out to 0.6 kilometer (0.4 mile). During the handling/loading phase, there is the potential to affect electroexplosive devices out to 3.6 kilometers (2.2 miles) on the base.

Fuels. As addressed above, the XBR does not present a radiation hazard to fuels.

Cumulative Impacts

As discussed above, there would be no cumulative EMR impacts associated with operation of the NMD XBR in combination with other current or future EMR sources operating on Eareckson AS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.7.2 North Dakota Installations

4.3.4.7.2.1 Cavalier AFS—Health and Safety

Construction. Construction of the XBR would not occur within any health and safety zones on Cavalier AFS. In addition, construction activities would occur outside of the EMR hazard area for the Perimeter Acquisition Radar.

Operation. The main health and safety risk from operation of the XBR would be associated with EMR generated from the XBR. Discussed below are the specific impacts to the Cavalier AFS health and safety environment from EMR generated by the XBR.

Communications–Electronics Frequency-related Interference

In-Band Ground-Based Systems. High levels of EMR from the XBR may degrade the performance of in-band systems. The existing ground-based communications-electronics environment around the Cavalier AFS site includes two in-band systems: a precision approach radar in Minot, North Dakota, and a weather radar in Park Rapids, Minnesota. Both radars utilize a plan-position indicator display. The plan-position indicator display is similar to a television screen that displays either storm cells for the weather radar or incoming aircraft for the precision approach radar.

For each interference pulse received by the weather radar, a small blip will be plotted on the screen. If a large number were displayed, it could obscure the legitimate display of a storm or other severe weather condition. Based on a previous analysis (Calspan Corp., 1976—Project EMIR) conducted for air traffic control functions, up to 100 interference pulses can be tolerated for search radars each time the antenna scans across its field of view. In the cases involving weather radars, up to 200 interference pulses can be tolerated since radar returns from storm cells are much larger than radar returns from aircraft. Using the operating characteristics of the XBR, the number of interference pulses can be predicted using computer models. In those cases where more than 200 interference pulses are predicted, a required distance separation is calculated to lower the number of interference pulses below 200. In this case, it was determined that there is not a potential for interference from

the XBR to the weather radar, because the number of interference pulses would always be less than 200.

The analysis of the precision approach radar was performed using a similar approach. However, only five interference pulses can be tolerated each time the antenna scans its field of view. A typical interference threshold is 100 pulses, but because the precision approach radar only scans across 20 degrees rather than 360 degrees and due to the critical nature of the function of the radar, the threshold was decreased by a factor of 20. It was determined that there is not a potential for interference from the XBR to the precision approach radar, because number of interference pulses would always be less than five.

Adjacent Band Ground-Based Systems. No adjacent band ground-based systems were identified in the Cavalier AFS electromagnetic environment.

Harmonic Band Ground-Based Systems. No harmonic band ground-based systems were identified in the Cavalier AFS electromagnetic environment.

In-Band Airborne Systems. The airborne electromagnetic environment includes three types of in-band systems: fire control, bomb/navigation, and weather radars. Weather radars are utilized on both civilian and military aircraft. Emissions from the XBR may potentially degrade the overall system performance of the aforementioned radars. Section 3.3.2.1 provides an overview of the airspace and airports in the Cavalier AFS ROI. As addressed above, it was determined that a 1-kilometer (0.6-mile) distance separation was sufficient to preclude the potential for electromagnetic interference with weather radars (Sages and Peebles, 1998). Given that most aircraft with this type of equipment fly at altitudes greater than 1 kilometer (0.6 mile) above ground level around Cavalier AFS, no weather radar interference is anticipated.

Communications–Electronics Non-frequency-related Interference

High Power Effects. The out-of-band electromagnetic environment within 30 kilometers (19 miles) includes 205 ground-based systems. The majority of these systems (193) are land-mobile UHF and VHF radios. There is the potential that these systems could have some occasional interference out to 5 kilometers (3 miles) and 29 kilometers (18 miles), respectively, from the XBR. There is also the potential to cause some interference with speed gun use, the 1 satellite communication terminal, and 10 fixed/mobile broadcasting satellites within the 30-kilometer (19-mile) ROI. There are no ground-based VHF omni-directional range, glideslope, or markers aviation equipment within the potential interfering distance of these ground-based systems (5 kilometers [3 miles]). The potential interfering distances based upon high power effects are limited to grating lobe power levels since the main beam of the XBR will not illuminate equipment on the ground. Since the main beam of the XBR is

in constant motion, the grating lobes of the XBR are also in constant motion. Thus, any interference would only occur for very short periods of time (less than 0.05 percent of the time) and would not significantly impact the operation of this equipment. However, airborne aircraft systems could be affected if flying within the interference area. There are no high or low altitude jet routes or military training routes within the potential interfering distance of these navigation systems. Since there are no ground-based navigation systems or aircraft flight routes in the interfering distance of the XBR there should be a low risk to affect aircraft navigation systems in the area around the XBR.

Aircraft/Avionics. As addressed above, the potential exists for the XBR main beam to adversely affect fly-by-wire aircraft and avionics systems out to 6.7 kilometers (4.2 miles) based upon the FAA standard. Section 3.3.2.1 provides an overview of the airspace potentially affected around Cavalier AFS. The greatest potential to affect fly-by-wire aircraft would be within established air routes or Military Operations Areas. Within the 6.7-kilometer (4.2-mile) distance there are no commercial air routes, Military Operations Areas, or military training routes. In addition, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

The operation of the XBR is not anticipated to affect aerial sprayers that provide services to the farmers in the region typically from April through October. Although there could be occasional interference with communication equipment, it would not significantly degrade their ability to communicate with ground stations. Since aerial sprayers do not use fly-by-wire system or have electroexplosive devices, it would not be expected that XBR operations would affect the aircraft flight systems. In addition, the EMR from the XBR would not affect the pilots, because both the constant movement of the aircraft and main beam of the radar would preclude any exposure long enough to exceed health standards.

Radiation Hazards

Human Exposure. Specific impacts from exposure to EMR generated by the XBR are addressed above. At the controlled area boundary of the XBR for an average time of 9.5 minutes, the power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This level is significantly less than the 6.33 milliwatts per square centimeter permitted by the IEEE standard; therefore, exposure levels at Cavalier AFS would be below permitted levels.

Personnel with Pacemakers. As discussed above, persons with pacemakers would not be affected by operation of the XBR.

Electroexplosive Devices. As discussed above, the potential impacts to electroexplosive devices from emissions from the XBR are twofold; (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated.

Within the presence and shipping phase the main concern with electroexplosive devices on aircraft is inadvertent ignition at a distance of 2.8 kilometers (1.7 miles) from Cavalier AFS; however, there are no military training routes, Military Operations Areas, or commercial air routes within this distance of Cavalier AFS. There is also the potential to affect electroexplosive devices on the ground during the presence and shipping phase out to 0.6 kilometer (0.4 mile). Within this area there are no major highways or operations that would typically use electroexplosive devices as part of day to day operations. As discussed above, the XBR would not impact car airbags. During the handling/loading phase, there is the potential to affect electroexplosive devices out to 3.6 kilometers (2.2 miles). There are no operations within this area that typically handle electroexplosive devices around Cavalier AFS. State Highway 5 and State Highway 32 are approximately 3 kilometers (2 miles) and 2 kilometers (1 mile) from Cavalier AFS, respectively.

Fuels. As addressed above, the XBR does not present a radiation hazard to fuels.

Cumulative Impacts

As discussed above, there would be no cumulative EMR impacts associated with operation of the NMD XBR in combination with other current or future EMR sources operating on Cavalier AFS.

If the NMD XBR is deployed at Cavalier AFS, current and future Air Force activities would cease and only NMD activities would occur. The only other project that could represent the potential for construction-related cumulative health and safety impacts would be the potential dismantlement and destruction of the Perimeter Acquisition Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The combination of these two construction activities occurring at the same time could increase the risk to workers' health and safety. This increase in risk should be minimal since all activities would be conducted in accordance with appropriate health and safety regulations and activities would be similar to any large construction project. No other activities occur at the site or are planned at the site that could represent a cumulative impact with deployment of the XBR. No regional activities occur or are planned that would result in cumulative health and safety risks.

Mitigation Measures

No mitigation measures would be required.

4.3.4.7.2.2 Missile Site Radar—Health and Safety

Construction

Construction of the XBR would not occur within any health and safety zones on the Missile Site Radar.

Operation

The main concern from operation of the XBR would be associated with EMR. Discussed below are the specific impacts to the Missile Site Radar health and safety environment from EMR generated by the XBR.

Communications–Electronics Frequency-related Interference

In-Band Ground-Based Systems. The potential impacts to in-band ground-based systems for the Missile Site Radar would be the same as described for Cavalier AFS.

Adjacent Band Ground-Based Systems. No adjacent band ground-based systems were identified in the Missile Site Radar electromagnetic environment.

Harmonic Band Ground-Based Systems. No harmonic band ground-based systems were identified in the Missile Site Radar electromagnetic environment.

In-Band Airborne Systems. The airborne electromagnetic environment includes three types of in-band systems: fire control, bomb/navigation, and weather radars. Weather radars are utilized on both civilian and military aircraft. Emissions from the XBR may potentially degrade the overall system performance of the aforementioned radars. Section 3.3.2.2 provides an overview of the airspace and airports in the Missile Site Radar ROI. As addressed above, it was determined that a 1-kilometer (0.6-mile) distance separation was sufficient to preclude the potential for electromagnetic interference with weather radars (Sages and Peebles, 1999—GBR-0 Waveform Simulation EMC Analysis). Given that most commercial aircraft with this type of equipment fly at altitudes greater than 1 kilometer (0.6 mile) above ground level around the Missile Site Radar, no weather radar interference is anticipated to commercial aircraft. Military aircraft with weather radars, fire control, and bomb/navigation equipment could be affected if they are utilizing Tiger North Military Operations Area, which is within this distance from the Missile Site Radar. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts

would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Communications–Electronics Non-frequency-related Interference

High Power Effects. The out-of-band electromagnetic environment within 30 kilometers (19 miles) includes 204 ground-based systems. The majority of these systems (191) are land-mobile UHF and VHF radios. There is the potential that these systems could have some occasional interference out to 5 kilometers (3 miles) and 29 kilometers (18 miles), respectively from the XBR. There is also the potential to cause some interference with one FM radio station, five pager/cellular tower, five satellite communication systems, and one speed gun within the 30-kilometer (19-mile) ROI. There is only one air navigation beacon within the ROI; however, it is outside the potential interfering distance for ground-based systems (5 kilometers [3 miles]). The potential interfering distances based upon high power effects are limited to grating lobe power levels since the main beam of the XBR will not illuminate equipment on the ground. Since the main beam of the XBR is in constant motion, the grating lobes of the XBR are also in constant motion. Thus, any interference would only occur for very short periods of time (less than 0.05 percent of the time) and would not significantly impact the operation of this equipment. However, airborne aircraft navigation systems could be affected if flying within the interference area. There are no high or low altitude jet routes and only one military training route and one Military Operations Area (Tiger North Military Operations Area) within the potential interfering distance. Since there are no commercial ground-based navigation systems or aircraft flight routes in the interfering distance of the XBR there should be a low risk to affect commercial aircraft navigation systems in the area around the XBR. There is the potential to affect military aircraft operations in the interfering distance. However, because the potential interference is limited to high power effects the possibility is unlikely, taking into consideration the shielding present from the frame of the aircraft and the minimal time, if any at all, that the aircraft would fly through the main beam of the XBR.

Aircraft/Avionics. As addressed above, the potential exists for the XBR main beam to adversely affect fly-by-wire aircraft and avionics systems out to 6.7 kilometers (4.2 miles) based upon the FAA standard. The greatest potential to affect fly-by-wire aircraft would be within established air routes or Military Operations Areas. Within the 6.7-kilometer (4.2-mile) distance there is one military training route and the Tiger North Military Operations Area. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Potential impacts to aerial sprayers would be similar to those described for Cavalier AFS.

Radiation Hazards

Human Exposure. Specific impacts from exposure to EMR generated by the XBR are addressed above. At the controlled area boundary of the XBR for an average time of 9.5 minutes, the power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This level is significantly less than the 6.33 milliwatts per square centimeter permitted by the IEEE standard; therefore, exposure levels at the Missile Site Radar would be below permitted levels.

Personnel with Pacemakers. As discussed above, persons with pacemakers would not be affected by operation of the XBR.

Electroexplosive Devices. As discussed above, the potential impacts to electroexplosive devices from emissions from the XBR are twofold: (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated.

Within the presence and shipping phase the main concern with electroexplosive devices on aircraft is inadvertent ignition at a distance of 2.8 kilometers (1.7 miles) from the Missile Site Radar; there is one Military Operations Area and no commercial air routes within this distance of the Missile Site Radar. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

There is also the potential to affect electroexplosive devices on the ground during the presence and shipping phase out to 0.6 kilometer (0.4 mile). Within this area there is one highway, but no operations that would typically use electroexplosive devices as part of day to day operations. As discussed above, the XBR would not impact car airbags. During the handling/loading phase, there is the potential to affect electroexplosive devices out to 3.6 kilometers (2.2 miles). There are no operations within this area that typically handling electroexplosive devices around the Missile Site Radar. State Highway 1 runs adjacent to the site.

Fuels. As addressed above, the XBR does not present a radiation hazard to fuels.

Cumulative Impacts

As discussed above, there would be no cumulative EMR impacts associated with operation of the NMD XBR in combination with other current or future EMR sources operating in the vicinity of the Missile Site Radar.

The Missile Site Radar is currently inactive. The only other project that could represent the potential for construction-related cumulative health and safety impacts would be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The combination of these two construction activities occurring at the same time could increase the risk to workers' health and safety. This increase in risk should be minimal since all activities would be conducted in accordance with appropriate health and safety regulations and activities would be similar to any large construction project. No other activities occur at the site or are planned at the site that could represent a cumulative impact with deployment of the XBR. No regional activities occur or are planned that would result in cumulative health and safety risks.

Mitigation Measures

No mitigation measures would be required.

4.3.4.7.2.3 Remote Sprint Launch Site 1—Health and Safety

Construction

Construction of the XBR would not occur within any health and safety zones on Remote Sprint Launch Site 1.

Operation

The main concern from operation of the XBR would be associated with EMR. Discussed below are the specific impacts to Remote Sprint Launch Site 1 health and safety environment from EMR generated by the XBR.

Communications–Electronics Frequency-Related Interference

In-Band Ground-Based Systems. The potential impacts to in-band ground-based systems for Remote Sprint Launch Site 1 would be the same as described for Cavalier AFS.

Adjacent Band Ground-Based Systems. No adjacent band ground-based systems were identified in the Remote Sprint Launch Site 1 electromagnetic environment.

Harmonic-Band Ground-Based Systems. No harmonic band ground-based systems were identified in the Remote Sprint Launch Site 1 electromagnetic environment.

In-Band Airborne Systems. The airborne electromagnetic environment includes three types of in-band systems: fire control, bomb/navigation,

and weather radars. Weather radars are utilized on both civilian and military aircraft. Emissions from the XBR may potentially degrade the overall system performance of the aforementioned radars. Section 3.3.2.3 provides an overview of the airspace and airports in the Remote Sprint Launch Site 1 ROI. As addressed above, it was determined that a 1-kilometer (0.6 mile) distance separation was sufficient to preclude the potential for electromagnetic interference with weather radars (Sages and Peebles, 1999—GBR-0 Waveform Simulation EMC Analysis). Given that most commercial aircraft with this type of equipment fly at altitudes greater than 1 kilometer (0.6 mile) above ground level around Remote Sprint Launch Site 1, no weather radar interference is anticipated to commercial aircraft. Military aircraft with weather radars, fire control, and bomb/navigation equipment could be affected if they are utilizing Tiger North and South Military Operations Areas, which are within this distance from Remote Sprint Launch Site 1. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Communications–Electronics Non-frequency-related Interference

High Power Effects. The out-of-band electromagnetic environment within 30 kilometers (19 miles) includes 198 ground-based systems. The majority of these systems (184) are land-mobile UHF and VHF radios. There is the potential that these systems could have some occasional interference out to 5 kilometers (3 miles) and 29 kilometers (18 miles), respectively from the XBR. There is also the potential to cause some interference with eight pager/cellular towers, five satellite communication systems, and one fixed based broadcasting satellite within the 30-kilometer (19-mile) ROI. There are no ground-based VHF omni-directional range, glideslope, or markers aviation equipment within the potential interfering distance of these ground-based systems (5 kilometers [3 miles]). The potential interfering distances based upon high power effects are limited to grating lobe power levels since the main beam of the XBR will not illuminate equipment on the ground. Since the main beam of the XBR is in constant motion, the grating lobes of the XBR are also in constant motion. Thus, any interference would only occur for very short periods of time (less than 0.05 percent of the time) and would not significantly impact the operation of this equipment. However, airborne aircraft systems could be affected if flying within the interference area. There are no high or low altitude jet routes or military training routes within the potential interfering distance of these navigation systems. Both the Tiger North and South Military Operations Areas are within the potential interfering distance. Since there are no ground-based navigation systems or aircraft flight routes in the interfering distance of the XBR there should be a low risk to affect commercial aircraft navigation systems

in the area around the XBR. There is the potential to affect military aircraft operations in the potential interfering distance. However, because the potential interference is limited to high power effects the possibility is unlikely when you take into consideration the shielding present from the frame of the aircraft and the minimal time, if any at all, that the aircraft would fly through the main beam of the XBR.

Aircraft/Avionics. As addressed above, the potential exists for the XBR main beam to adversely affect fly-by-wire aircraft and avionics systems out to 6.7 kilometers (4.2 miles) based upon the FAA standard. The greatest potential to affect fly-by-wire aircraft would be within established air routes or Military Operations Areas. Within the 6.7-kilometer (4.2-mile) distance, there are the Tiger North Military Operations Area and the Tiger South Military Operations Area. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Potential impacts to aerial sprayers would be similar to those described for Cavalier AFS.

Radiation Hazards

Human Exposure. Specific impacts from exposure to EMR generated by the XBR is addressed above. At the controlled area boundary of the XBR for an average time of 9.5 minutes, the power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This level is significantly less than the 6.33 milliwatts per square centimeter permitted by the IEEE standard; therefore, exposure levels at Remote Sprint Launch Site 1 would be below permitted levels.

Personnel with Pacemakers. As discussed above, persons with pacemakers would not be affected by operation of the XBR.

Electroexplosive Devices. As discussed above, the potential impacts to electroexplosive devices from emissions from the XBR are twofold: (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated.

Within the presence and shipping phase the main concern with electroexplosive devices on aircraft is inadvertent ignition at a distance of 2.8 kilometers (1.7 miles) from Remote Sprint Launch Site 1; there are two Military Operations Areas within this distance of Remote Sprint Launch Site 1. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

There is also the potential to affect electroexplosive devices on the ground during the presence and shipping phase out to 0.6 kilometer (0.4 mile). Within this area there is no major highway or operations that would typically use electroexplosive devices as part of day to day operations. As discussed above, the XBR would not impact car airbags. During the handling/loading phase, there is the potential to affect electroexplosive devices out to 3.6 kilometers (2.2 miles). There are no operations within this area that typically handle electroexplosive devices around Remote Sprint Launch Site 1. The nearest major highway (State Highway 1) is approximately 15 kilometers (9 miles) from the site.

Fuels. As addressed above, the XBR does not present a radiation hazard to fuels.

Cumulative Impacts

As discussed above, there would be no cumulative EMR impacts associated with operation of the NMD XBR in combination with other current or future EMR sources operating in the vicinity of Remote Sprint Launch Site 1.

Remote Sprint Launch Site 1 is currently inactive. The only other project that could represent the potential for construction-related cumulative health and safety impacts would be the potential dismantlement and destruction of some of the facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. The combination of these two construction activities occurring at the same time could increase the risk to workers' health and safety. This increase in risk should be minimal since all activities would be conducted in accordance with appropriate health and safety regulations and activities would be similar to any large construction project. No other activities occur at the site or are planned at the site that could represent a cumulative impact with deployment of the XBR. No regional activities occur or are planned that would result in cumulative health and safety risks.

Mitigation Measures

No mitigation measures would be required.

4.3.4.7.2.4 Remote Sprint Launch Site 2—Health and Safety

Construction

Construction of the XBR would not occur within any health and safety zones on Remote Sprint Launch Site 2.

Operation

The main concern from operation of the XBR would be associated with EMR. Discussed below are the specific impacts to Remote Sprint Launch Site 2 health and safety environment from EMR generated by the XBR.

Communications–Electronics Frequency-related Interference

In-Band Ground-Based Systems. The potential impacts to in-band ground-based systems for Remote Sprint Launch Site 2 would be the same as described for Cavalier AFS.

Adjacent Band Ground-Based Systems. No adjacent band ground-based systems were identified in the Remote Sprint Launch Site 2 electromagnetic environment.

Harmonic-Band Ground-Based Systems. No harmonic band ground-based systems were identified in the Remote Sprint Launch Site 2 electromagnetic environment.

In-Band Airborne Systems. The airborne electromagnetic environment includes three types of in-band systems: fire control, bomb/navigation, and weather radars. Weather radars are utilized on both civilian and military aircraft. Emissions from the XBR may potentially degrade the overall system performance of the aforementioned radars. As addressed above, it was determined that a 1-kilometer (0.6-mile) distance separation was sufficient to preclude the potential for electromagnetic interference with weather radars (Sages and Peebles, 1999—GBR-0 Waveform Simulation EMC Analysis). Given that most commercial aircraft with this type of equipment fly at altitudes greater than 1 kilometer (0.6 mile) above ground level around Remote Sprint Launch Site 2, no weather radar interference is anticipated to commercial aircraft. Military aircraft with weather radars, fire control, and bomb/navigation equipment could be affected if they are utilizing Tiger North Military Operations Area, which is within this distance from Remote Sprint Launch Site 2. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Communications–Electronics Non-frequency-related Interference

High Power Effects. The out-of-band electromagnetic environment within 30 kilometers (19 miles) includes 153 ground-based systems. The majority of these systems (142) are land-mobile UHF and VHF radios. There is the potential that these systems could have some occasional interference out to 5 kilometers (3 miles) and 29 kilometers (18 miles), respectively from the XBR. There is also the potential to cause some interference with one air navigation system, one speed gun, six

pager/cellular towers, one satellite communication systems, and one fixed based broadcasting satellite within the 30-kilometer (19-mile) ROI. There is only one air navigation beacon within the ROI; however, it is outside the potential interfering distance for ground-based systems (5 kilometers [3 miles]). The potential interfering distances based upon high power effects are limited to grating lobe power levels since the main beam of the XBR will not illuminate equipment on the ground. Since the main beam of the XBR is in constant motion, the grating lobes of the XBR are also in constant motion. Thus, any interference would only occur for very short periods of time (less than 0.05 percent of the time) and would not significantly impact the operation of this equipment. However, airborne aircraft navigation systems could be affected if flying within the interference area. There are no high or low altitude jet routes and only one Military Operations Area (Tiger North Military Operations Area) within the potential interfering distance. Since there are no commercial ground-based navigation systems or aircraft flight routes in the interfering distance of the XBR there should be a low risk to affect commercial aircraft navigation systems in the area around the XBR. There is the potential to affect military aircraft operations in the interfering distance. However, because the potential interference is limited to high power effects the possibility is unlikely, taking into consideration the shielding present from the frame of the aircraft and the minimal time, if any at all, that the aircraft would fly through the main beam of the XBR.

Aircraft/Avionics. As addressed above, the potential exists for the XBR main beam to adversely affect fly-by-wire aircraft and avionics systems out to 6.7 kilometers (4.2 miles) based upon the FAA standard. Section 3.3.2.4 provides an overview of the airspace potentially affected around Remote Sprint Launch Site 2. The greatest potential to affect fly-by-wire aircraft would be within established air routes or Military Operations Areas. Within the 6.7-kilometer (4.2-mile) distance there is the Tiger North Military Operations Area. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Potential impacts to aerial sprayers would be similar to those described for Cavalier AFS.

Radiation Hazards

Human Exposure. Specific impacts from exposure to EMR generated by the XBR is addressed above. At the controlled area boundary of the XBR for an average time of 9.5 minutes, the power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This level is significantly less than the 6.33 milliwatts per square centimeter permitted by the IEEE standard; therefore, exposure levels at Remote Sprint Launch Site 2 would be below permitted levels.

Personnel with Pacemakers. As discussed above, persons with pacemakers would not be affected by operation of the XBR.

Electroexplosive Devices. As discussed above, the potential impacts to electroexplosive devices from emissions from the XBR are twofold: (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated.

Within the presence and shipping phase the main concern with electroexplosive devices on aircraft is inadvertent ignition at a distance of 2.8 kilometers (1.7 miles) from Remote Sprint Launch Site 2; there is one Military Operations Area within this distance of Remote Sprint Launch Site 2. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

There is also the potential to affect electroexplosive devices on the ground during the presence and shipping phase out to 0.6 kilometer (0.4 mile). Within this area there is no major highway or operations that would typically use electroexplosive devices as part of day to day operations. As discussed above, the XBR would not impact car airbags. During the handling/loading phase, there is the potential to affect electroexplosive devices out to 3.6 kilometers (2.2 miles). There are no operations within this area that typically handling electroexplosive devices around Remote Sprint Launch Site 2. The nearest major highway (State Highway 1) is approximately 5 kilometers (3 miles) from the site.

Fuels. As addressed above, the XBR does not present a radiation hazard to fuels.

Cumulative Impacts

Potential cumulative impacts at Remote Sprint Launch Site 2 would be similar to those described for Remote Sprint Launch Site 1.

Mitigation Measures

No mitigation measures would be required.

4.3.4.7.2.5 Remote Sprint Launch Site 4—Health and Safety

Construction

Construction of the XBR would not occur within any health and safety zones on Remote Sprint Launch Site 4.

Operation

The main concern from operation of the XBR would be associated with EMR. Discussed below are the specific impacts to Remote Sprint Launch Site 4 health and safety environment from EMR generated by the XBR.

Communications–Electronics Frequency-related Interference

In-Band Ground-Based Systems. The potential impacts to in-band ground-based systems for Remote Sprint Launch Site 4 would be the same as described for Cavalier AFS.

Adjacent Band Ground-Based Systems. No adjacent band ground-based systems were identified in the Remote Sprint Launch Site 4 electromagnetic environment.

Harmonic-Band Ground-Based Systems. No harmonic band ground-based systems were identified in the Remote Sprint Launch Site 4 electromagnetic environment.

In-Band Airborne Systems. The airborne electromagnetic environment includes three types of in-band systems: fire control, bomb/navigation, and weather radars. Weather radars are utilized on both civilian and military aircraft. Emissions from the XBR may potentially degrade the overall system performance of the aforementioned radars. Section 3.3.2.5 provides an overview of the airspace and airports in the Remote Sprint Launch Site 4 ROI. As addressed above, it was determined that a 1-kilometer (0.6-mile) distance separation was sufficient to preclude the potential for electromagnetic interference with weather radars (Sages and Peebles, 1999—GBR-0 Waveform Simulation EMC Analysis). Given that most commercial aircraft with this type of equipment fly at altitudes greater than 1 kilometer (0.6 mile) above ground level around Remote Sprint Launch Site 4, no weather radar interference is anticipated to commercial aircraft. Military aircraft with weather radars, fire control, and bomb/navigation equipment could be affected if they are utilizing Tiger South Military Operations Area, which is within this distance from Remote Sprint Launch Site 4. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Communications–Electronics Non-frequency-related Interference

High Power Effects. The out-of-band electromagnetic environment within 30 kilometers (19 miles) includes 132 ground-based systems. The majority of these systems (112) are land-mobile UHF and VHF radios. There is the potential that these systems could have some occasional interference out to 5 kilometers (3 miles) and 29 kilometers (18 miles), respectively from the XBR. There is also the potential to cause some

interference with 1 speed gun, 7 pager/cellular towers, 12 satellite communication systems, and 1 fixed based broadcasting satellite within the 30-kilometer (19-mile) ROI. There are no ground-based VHF omni-directional range, glideslope, or markers aviation equipment within the potential interfering distance of these ground-based systems (5 kilometers [3 miles]). The potential interfering distances based upon high power effects are limited to grating lobe power levels since the main beam of the XBR will not illuminate equipment on the ground. Since the main beam of the XBR is in constant motion, the grating lobes of the XBR are also in constant motion. Thus, any interference would only occur for very short periods of time (less than 0.05 percent of the time) and would not significantly impact the operation of this equipment. However, airborne aircraft systems could be affected if flying within the interference area. There are no high or low altitude jet routes, only two Military Operations Areas (Tiger North and Tiger South Military Operations Areas) within the potential interfering distance. Since there are no commercial ground-based navigation systems or aircraft flight routes in the interfering distance of the XBR there should be a low risk to affect commercial aircraft navigation systems in the area around the XBR. There is the potential to affect military aircraft operations in the interfering distance. However, because the potential interference is limited to high power effects, the possibility is unlikely taking into consideration the shielding present from the frame of the aircraft and the minimal time, if any at all, that the aircraft would fly through the main beam of the XBR.

Aircraft/Avionics. As addressed above, the potential exists for the XBR main beam to adversely affect fly-by-wire aircraft and avionics systems out to 6.7 kilometers (4.2 miles) based upon the FAA standard. The greatest potential to affect fly-by-wire aircraft would be within established air routes or Military Operations Areas. Within the 6.7-kilometer (4.2-mile) distance, there is the Tiger North Military Operations Area and the Tiger South Military Operations Area. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

Potential impacts to aerial sprayers would be similar to those described for Cavalier AFS.

Radiation Hazards

Human Exposure. Specific impacts from exposure to EMR generated by the XBR are addressed above. At the controlled area boundary of the XBR for an average time of 9.5 minutes, the power density was calculated to be 2.5 milliwatts per square centimeter. (See figure 4.3.4.7-1.) This level is significantly less than the 6.33 milliwatts per

square centimeter permitted by the IEEE standard; therefore, exposure levels at Remote Sprint Launch Site 4 would be below permitted levels.

Personnel with Pacemakers. As discussed above, persons with pacemakers would not be affected by operation of the XBR.

Electroexplosive Devices. As discussed above, the potential impacts to electroexplosive devices from emissions from the XBR are twofold: (1) the electroexplosive device could be dudded, or (2) the electroexplosive device could be inadvertently initiated.

Within the presence and shipping phase the main concern with electroexplosive devices on aircraft is inadvertent ignition at a distance of 2.8 kilometers (1.7 miles) from Remote Sprint Launch Site 4; there is one Military Operations Area within this distance of Remote Sprint Launch Site 4. However, as discussed above, publishing a high energy radiation area warning on the appropriate aeronautical charts would inform pilots of the potential electromagnetic interference hazard to certain aircraft so the area could be avoided, if necessary.

There is also the potential to affect electroexplosive devices on the ground during the presence and shipping phase out to 0.6 kilometer (0.4 mile). Within this area there is no major highway or operations that would typically use electroexplosive devices as part of day to day operations. As discussed above, the XBR would not impact car airbags. During the handling/loading phase, there is the potential to affect electroexplosive devices out to 3.6 kilometers (2.2 miles). There are no operations within this area that typically handling electroexplosive devices around Remote Sprint Launch Site 4. The nearest major highway (State Highway 1) is approximately 10 kilometers (6 miles) from the site.

Fuels. As addressed above, the XBR does not present a radiation hazard to fuels.

Cumulative Impacts

Potential cumulative impacts at Remote Sprint Launch Site 2 would be similar to those described for Remote Sprint Launch Site 1.

Mitigation Measures

No mitigation measures would be required.

4.3.4.8 Land Use and Aesthetics

This section addresses potential environmental impacts caused by changes to the land use or aesthetic environment due to the construction and operation of the XBR element. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Construction of facilities or disturbance of land that may create conflicts with adjacent land use, zoning, or other planning regulations
- Compatibility with existing land use on and off-base
- Construction or operational activities that may affect the visual environment
- Construction or operational activities that would affect the consistency of the coastal zone

4.3.4.8.1 Alaska Installations

4.3.4.8.1.1 Eareckson AS—Land Use and Aesthetics

Construction

An XBR could be constructed and become operational at Eareckson AS, under the Proposed Action. This action would coincide with the existing mission of the base, which is to monitor and track space and missile activity; the existing mission would continue. Currently, the base has no zoning or land use conflicts, and this should not change because the proposed XBR would be located well within the boundaries of Eareckson AS and the entire island of Shemya is surrounded by ocean.

Construction of this element would require grading of approximately 12 hectares (30 acres) of land in the northeast portion of the island between East Road and AWS Road. This would include construction of a new power plant adjacent to the existing one and a new fuel storage area. All new utility lines would follow existing corridors where possible. The siting of the XBR would be in accordance with DOD standards taking into account EMR safety criteria. The land potentially affected is a relatively small area compared to the rest of the base and would not significantly diminish the amount of open space. This element would be consistent with the military nature of the base and compatible with the existing land uses.

Eareckson AS is operated under a memorandum of understanding between the Air Force and the USFWS that expires in 2011. NMD activities would comply with this agreement and section 1310 of the ANILCA. If activities on the island are required to continue beyond 2011, a new agreement would be obtained with the USFWS for continued military operations.

The activities at Eareckson AS under the Proposed Action would be consistent to the maximum extent practicable with the policies of the AWCRSA coastal management program (see appendix G). The Proposed Action does not have the potential to impact coastal development, geophysical hazard areas, recreation, transportation and utilities, timber harvest and processing, mining and mineral processing, subsistence activities, habitats, air, land and water quality and archaeological, historic, and prehistoric resources. This project would not be located on a freshwater or saltwater shoreline, nor is it water dependent or related. Facilities would be sited and built to minimize damage in the event of a geophysical hazard. Very little recreation activities occur in this area. All new transportation and utility routes would be located inland. No timber harvesting, mining, or mineral processing will take place. No subsistence activities occur on the base. With the implementation of appropriate mitigation measures, no impacts to biological habitats are anticipated. Proposed construction and operation would not impact local air, land, or water quality. The SHPO has been consulted and has concurred that there would be no adverse effects to cultural resources.

The new XBR would be of similar nature to the existing radar and would not be out of character with the surrounding military uses of the base. Due to the remoteness of Shemya Island, lack of surrounding populations and the limited amount of opportunity for public access, the visual environment would not be altered and the visual sensitivity would remain low.

Operation

Operation of this element could cause interference to certain unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR. However, the probability of any interference occurring is less than 0.05 percent of the time. Due to the island being surrounded by ocean and uninhabited islands, this should not have any effect on the surrounding land uses of Eareckson AS. The operation of the XBR would not create any zoning or land use conflicts.

Cumulative Impacts

The construction of a XBR at Eareckson AS would only affect a very small portion of the base. Proposed activities would comply with both the Coastal Zone Management Act and Section 1310 of the ANILCA. No programs have been identified that would contribute to cumulative land use or aesthetic impacts at Eareckson AS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.8.2 North Dakota Installations

Currently, there are no plans for components of the XBR to affect any off-base land uses in North Dakota. However, requirements for additional elements such as the fiber optic cable line have not been determined. This fiber optic cable line would follow existing easements and rights of way, and additional easements and rights of way would be obtained if necessary.

4.3.4.8.2.1 Cavalier AFS—Land Use and Aesthetics

Construction

Under the Proposed Action, an XBR would be constructed and become operational and the current Air Force mission of Cavalier AFS would cease. Currently, the base has no zoning or land use conflicts and this is not expected to change because the XBR and its control area boundary would be located within the existing boundaries of Cavalier AFS.

Construction of this element would require grading of approximately 1 hectare (3 acres) of previously disturbed land adjacent to the existing Perimeter Acquisition Building. A maximum of 4 hectares (10 acres) could be used for construction laydown. The siting of the XBR would be in accordance with DOD standards taking into account EMR safety criteria. Other than the modification of the power plant and improvement of the roads, no infrastructure improvements would have to be made, thus requiring less land disturbance. The XBR element would be consistent with the military nature of the base and would be compatible with the existing land uses.

The new XBR would be of similar nature to the existing facilities and would not be out of character with the surrounding military uses on the base. The new radar would be somewhat taller than the existing radar, but due to the sparse population and the flatness of the land, views would be limited and the visual sensitivity would remain relatively low.

Operation

Operation of this element could cause interference to certain unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR. Most of the land in the area of Cavalier AFS is used for agriculture. In addition, there are approximately 20 communities within the ROI of the XBR at Cavalier AFS (see table 3.9-1). However, the probability of interference occurring is less than 0.05 percent of the time and is considered unlikely. Therefore, interference caused by the operation of the XBR within the ROI would have minimal effects on land use.

Cumulative Impacts

The implementation of an XBR at Cavalier AFS would only affect a small portion of the base. Once the NMD XBR is deployed, other Air Force related current and planned activities at Cavalier AFS would cease; therefore, no other activities would occur on Cavalier AFS that could contribute to short- or long-term cumulative impacts. The removal of the Perimeter Acquisition Radar before NMD would not impact surrounding land uses.

Mitigation Measures

No mitigation measures would be required.

4.3.4.8.2.2 Missile Site Radar—Land Use and Aesthetics

Construction

Under the Proposed Action, an XBR would be constructed and become operational and the current mission of the Missile Site Radar would change from an inactive status to support the new XBR. As described in the No-action Alternative (section 4.2.8.2.3), the base has no zoning or land use conflicts, and this is not expected to change because the XBR and its control area boundary would be located within the existing boundaries of the Missile Site Radar.

Construction of this element could require grading of approximately 20 hectares (50 acres) of previously disturbed land at the existing Missile Site Radar. The existing Missile Site Radar building would have to be demolished to allow for XBR construction and operation. Most of the other existing facilities would be demolished to allow for the construction of new support facilities. The siting of the XBR would be in accordance with DOD standards taking into account EMR safety criteria. Although most of the site would be altered, the construction of XBR element and support facilities would be consistent with the previous military use of the base and would be compatible with the existing land uses that surround the Missile Site Radar.

The new XBR and support facilities would be of similar nature to the existing facilities and would not be out of character with the previous military uses on the base. The new radar would be somewhat taller than the existing radar, but due to the sparse population and the flatness of the land, views would be limited and the visual sensitivity would remain relatively low.

Operation

Operation of this element could cause interference to certain unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR.

Most of the land in the area of the Missile Site Radar is used for agriculture. In addition, there are approximately 13 communities within the ROI of the XBR at the Missile Site Radar (see table 3.9-2). However, the probability of interference occurring is less than 0.05 percent of the time and is considered unlikely. Therefore, interference caused by the operation of the XBR within the ROI would have minimal effects on land use.

Cumulative Impacts

The implementation of an XBR at the Missile Site Radar would affect some of the base, and would require the removal of the existing Missile Site Radar building. However, the entire site has been previously disturbed, and no undisturbed lands would be affected. No other future programs have been identified that would that would combine to create any cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.4.8.2.3 Remote Sprint Launch Site 1—Land Use and Aesthetics

Construction

Under the Proposed Action, an XBR would be constructed and become operational and the current mission of the Remote Sprint Launch Site 1 would change from an inactive status to support the new XBR. As described in the No-action Alternative (section 4.2.8.2.4), the site has no zoning or land use conflicts, and this is not expected to change because the XBR and its control area boundary would be located within the existing boundaries of Remote Sprint Launch Site 1.

Construction of this element could involve most of the 17-hectare (41-acre) site of previously disturbed land at Remote Sprint Launch Site 1. Most of the existing facilities would be demolished to allow for the construction of new radar and support facilities. The abandoned launch control would remain, and the sewage lagoon would be enlarged and reactivated. The siting of the XBR would be in accordance with DOD standards taking into account EMR safety criteria. Although most of the site would be altered, the construction of XBR element and support facilities would be consistent with the previous military use of the base and would be compatible with the existing land uses that surround the site.

The new XBR and support facilities would be of similar nature to the existing facilities and would not be out of character with the previous military uses on the base. The new radar would be larger than any previous structures at this site, but due to the sparse population and the flatness of the land, views would be limited and the visual sensitivity would remain relatively low.

Operation

Operation of this element could cause interference to certain unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR. Most of the land in the area of Remote Sprint Launch Site 1 is used for agriculture. In addition, there are approximately 15 communities within the ROI of the XBR at Remote Sprint Launch Site 1 (see table 3.9-3). However, the probability of interference occurring is less than 0.05 percent of the time and is considered unlikely. Therefore, interference caused by the operation of the XBR within the ROI would have minimal effects on land use.

Cumulative Impacts

The implementation of an XBR at Remote Sprint Launch Site 1 would affect the majority of the base and would require the removal of most of the facilities on the base as well as ground disturbance on the entire base. However, the entire site has been previously disturbed, and no undisturbed lands would be affected. No other future programs have been identified that would that would combine to create any cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.4.8.2.4 Remote Sprint Launch Site 2—Land Use and Aesthetics

Construction

Potential construction-related impacts to land use at Remote Sprint Launch Site 2 for XBR deployment would be similar to that described for Remote Sprint Launch Site 1.

Operation

Operation of this element could cause interference to certain unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR. Most of the land in the area of Remote Sprint Launch Site 2 is used for agriculture. In addition, there are approximately 13 communities within the ROI of the XBR at Remote Sprint Launch Site 2 (see table 3.9-4). However, the probability of interference occurring is less than 0.05 percent of the time and is considered unlikely. Therefore, interference caused by the operation of the XBR within the ROI would have minimal effects on land use.

Cumulative Impacts

The implementation of an XBR at Remote Sprint Launch Site 2 would affect the majority of the base and would require the removal of most of the facilities on the base as well as ground disturbance on the entire base. However, the entire site has been previously disturbed, and no undisturbed lands would be affected. No other future programs have been identified that would that would combine to create any cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.4.8.2.5 Remote Sprint Launch Site 4—Land Use and Aesthetics

Construction

Potential construction-related impacts to land use at Remote Sprint Launch Site 4 for XBR deployment would be similar to that described for Remote Sprint Launch Site 1.

Operation

Operation of this element could cause interference to certain unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR. Most of the land in the area of Remote Sprint Launch Site 4 is used for agriculture. In addition, there are approximately 13 communities within the ROI of the XBR at Remote Sprint Launch Site 4 (see table 3.9-5). However, the probability of interference occurring is less than 0.05 percent of the time and is considered unlikely. Therefore, interference caused by the operation of the XBR within the ROI would have minimal effects on land use.

Cumulative Impacts

The implementation of an XBR at Remote Sprint Launch Site 4 would affect the majority of the base and would require the removal of most of the facilities on the base as well as ground disturbance on the entire base. However, the entire site has been previously disturbed, and no undisturbed lands would be affected. No other future programs have been identified that would that would combine to create any cumulative land use or aesthetic impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.4.9 Noise

This section addresses the potential impacts to the noise environment due to the construction and operation of the XBR element. During the construction phase the sources of noise would be construction equipment and construction-related traffic. During the operational phase the sources of noise would include operational-related traffic and power plants.

A general discussion of construction and traffic noise is provided in section 4.3.1.8. The following criteria were used to determine potential impacts to the noise environment:

- Traffic noise levels incompatible with the Federal Highway Administration's Noise Abatement Criteria (table 3.10-4)
- Long-term noise levels incompatible with DOD Land Use Compatibility for Noise guidelines (table 3.10-3)
- Short-term noise greater than 85 dBA

The analysis in this section is concerned with human receptors; noise effects on wildlife are discussed under Biological Resources.

XBR Construction

Construction Equipment. Under current planning, pile drivers are not expected to be used at either Eareckson AS or the proposed North Dakota sites for the XBR. Therefore, as explained in section 4.3.1.8, the DNL equals 65 dBA and DNL equals 75 dBA contours are expected to occur within approximately 0.55 kilometer (0.34 mile) and 0.16 kilometer (0.10 mile) from the construction site, respectively. For the purpose of analysis, it is assumed that XBR construction at both Eareckson AS and the North Dakota sites will occur at all times except the nighttime hours between 10 p.m. and 7 a.m. Furthermore, consistent with the discussion in section 3.10, average nighttime noise levels are assumed to not exceed 55 dBA.

XBR Operation

As noted in chapter 2, a new power plant is part of the proposed XBR site. Several megawatt-class generators would be used in the XBR power plant. Typically, generators of this size would produce noise levels above 85 dBA (Bruce and Moritz, 1997—Sound Power Level Predictions for Industrial Machinery). As an 8-hour time-weighted average SPL of 85 dBA is the minimum level of noise to be of occupational concern under OSHA regulations (29 CFR 1910.95), it is anticipated that personal hearing protection, such as ear plugs, would have to be worn by workers inside the power plant.

Due to the attenuation caused by the walls of the building, noise levels outside the power plant would be expected to be below 85 dBA. For the purpose of analysis, it is assumed that the power plant operates 24 hours per day and that the noise level at the outside of the building is equal to 85 dBA. Given these assumptions, then the DNL equals 65 dBA contour generated by the power plant would occur at a distance of approximately 6 meters (21 feet) from the power plant.

As no noise sensitive receptors would be anticipated to occur with 6 meters (21 feet) of the XBR power plant, no significant impact to the noise environment would be expected from the operation of the XBR power plant.

4.3.4.9.1 Alaska Installations

4.3.4.9.1.1 Eareckson AS—Noise

Construction

As no noise sensitive receptors are known to exist within 0.55 kilometer (0.34 mile) of the proposed XBR construction site at Eareckson AS, no significant impacts to the noise environment would be expected from construction equipment noise.

Eareckson AS is located on Shemya Island in the Western Aleutians. This island is remote and sparsely populated with few roads. Consequently, no impact to the noise environment from traffic noise would be expected from locating the XBR at Eareckson AS.

Operation

Both the noise potentially created by the operation of the XBR and any other activity would be expected to be minimal and indistinguishable from the background noise at Eareckson AS. Consequently, no impact to the noise environment from operation the XBR at Eareckson AS would be expected.

Cumulative Impacts

Potential cumulative impacts to the noise environment could occur at Eareckson AS with the combination of XBR deployment activities and ongoing noise from current military activities. However, no other future programs that could contribute to cumulative impacts to the noise environment have been identified at Eareckson AS or within the region. Consequently, it is not expected that XBR deployment at Eareckson AS would cause a significant impact to the noise environment when combined with other ongoing and future programs.

Mitigation Measures

No mitigation measures would be required.

4.3.4.9.2 North Dakota Installations

With respect to traffic noise, under current planning, all the potential North Dakota sites for the XBR would have approximately the same increases to traffic counts. As discussed in section 4.3.4.11, during the peak of construction it is currently estimated that approximately 350 construction personnel would travel to and from the XBR construction site, thus adding up to 700 to the daily traffic count. It is expected that the construction personnel would be divided into shifts, and thus would not all arrive and leave at the same time. This traffic increase would last approximately 3 years, with the peak occurring during the first 2 years of construction. For the purpose of analysis, for construction, the total 700 was added to the daily traffic count for each roadway examined.

Similarly, it is currently estimated that approximately 105 personnel would staff the XBR during operation, thus adding up to 210 to the daily traffic count. It is expected that the personnel would be divided into shifts and would not all arrive and leave at the same time. For the purpose of analysis, for operation, the total 210 was added to the daily traffic count for each roadway examined.

As all areas potentially affected by traffic noise are expected to be of Activity Category B with respect to the Federal Highway Administration's Noise Abatement Criteria (table 3.10-4), only the distances to the location of $L_{eq(1\ hour)}$ equals 67 dBA were estimated. The estimated distances to $L_{eq(1\ hour)}$ equals 67 dBA for the 18 segments of roadway in North Dakota examined are summarized in table 4.3.4.9-1.

The right of way for North Dakota county roads (denoted by CR) and state roads (denoted by ND) are 23 meters (75 feet) and 30 meters (100 feet) from the centerline (Papacek, 1999—Personal communication). As the locations of $L_{eq(1\ hour)}$ equals 67 dBA would be expected to occur within the right of way for all cases, no impacts from traffic noise would be expected to occur for the construction or operation of the XBR at any of the proposed sites.

4.3.4.9.2.1 Cavalier AFS—Noise

Construction

As described in section 3.10.2.1, the only noise sensitive receptor identified in the vicinity of the Cavalier AFS is a farmhouse located approximately 90 meters (300 feet) from the western edge of the base's boundary. Because the proposed XBR construction site at Cavalier AFS is located in the eastern portion of Cavalier AFS, no noise sensitive

receptors are known to exist within 0.55 kilometer (0.34 mile) of the proposed construction site. Consequently, no significant impacts to the noise environment would be expected from construction equipment noise.

Table 4.3.4.9-1: Estimated Traffic Noise for XBR Construction and Operation at North Dakota Sites

Roadway (Location)	Assumed Average Speed in kilometers per hour (miles per hour)	XBR Construction		XBR Operation	
		AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)	AADT	$L_{eq(1\ hour)}$ = 67 dBA in meters (feet)
CR 89 (Cavalier AFS)	89 (55)	1,000	11 (36)	508	5 (16)
ND 5 (Cavalier AFS)	105 (65)	1,700	19 (62)	1,208	112 (39)
ND 32 (Cavalier AFS)	105 (65)	1,250	16 (52)	758	9 (30)
ND 5 (Cavalier)	72 (45)	4,200	24 (79)	3,708	16 (53)
ND 5 (Langdon)	72 (45)	2,025	15 (49)	1,533	9 (30)
ND 32 (Walhalla)	72 (45)	2,100	15 (49)	1,608	9 (30)
CR 26 (MSR)	89 (55)	880	11 (36)	388	5 (16)
ND 1 (MSR)	105 (65)	1,300	17 (56)	808	9(30)
ND 66 (MSR)	105 (65)	980	15 (16)	488	7 (23)
CR 3 (RSL 1)	89 (55)	980	14 (46)	488	7(23)
CR 32 (RSL 1)	89 (55)	765	10 (32)	273	4 (13)
ND 1 (RSL 1)	105 (65)	1,210	16 (52)	718	9 (30)
CR 55 (RSL 2)	89 (55)	850	10 (32)	358	4 (13)
ND 1 (RSL 2)	105 (65)	1,275	17 (56)	783	9 (30)
CR 9 (RSL 4)	89 (55)	870	11 (16)	378	5 (16)
CR 22 (RSL 4)	89 (55)	900	11 (36)	408	5 (16)
ND 1 (RSL 4)	105 (65)	1,190	16 (52)	698	8 (26)
ND 17 (RSL 4)	105 (65)	1,150	15 (49)	658	8 (26)

Note: Based on the methodology of the U.S. Federal Highway Administration (1978)
AADT = annual average daily traffic, Leq = equivalent noise level

As discussed above, up to approximately 700 vehicles per day would be expected to be added to CR 89, ND 5, and ND 32 in the vicinity of Cavalier AFS during construction of the XBR. Similarly, up to approximately 700 vehicles per day would be expected to be added to ND 5 and ND 32 in the vicinity of the cities of Cavalier, Langdon, and Walhalla during construction of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR construction would be expected.

Operation

As discussed above, up to approximately 210 vehicles per day would be expected to be added to CR 89, ND 5, and ND 32 in the vicinity of Cavalier AFS during operation of the XBR. Similarly, up to approximately 500 vehicles per day would be expected to be added to ND 5 and ND 32 in the vicinity of the cities of Cavalier, Langdon, and Walhalla. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR operation would be expected.

Cumulative Impacts

The only other project that could contribute to noise-related impacts would be the potential dismantlement and destruction of the Perimeter Acquisition Radar at Cavalier AFS. This activity would need to be mostly completed before the start of the main NMD activities. The main noise source from the dismantlement and destruction activities would result from the demolition of this facility. Demolition could require the use of explosive that may generate loud noise levels. However, it is expected that the demolition activities would be completed before the start of NMD construction for safety reasons. The only anticipated overlapping activities would be the use of heavy construction equipment. As no noise sensitive receptors have been identified in the vicinity of the construction area, it would be expected that the combination of these short-term construction projects would not result in cumulative noise-related impacts. It is anticipated that any cumulative transportation-related noise on the local roadways would be short-term during the time these two programs could be in progress. No other programs have been identified within the region that would result in cumulative noise-related operations impacts at Cavalier AFS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.9.2.2 Missile Site Radar—Noise

Construction

Two residences are located within approximately 0.3 kilometer (0.2 mile) of the western boundary of the Missile Site Radar. They are therefore potentially within the DNL equals 65 dBA contour, which is estimated to occur within 0.55 kilometer (0.34 mile) of the proposed XBR construction site, but outside the DNL equals 75 dBA contour, which is estimated to occur within 0.16 kilometer (0.10 mile).

As noted in guidance given in table 3.10-3, for DNLs between 65 dBA and 75 dBA the Army categorizes land use as normally unacceptable for residences. Consequently, depending on the details of the final site layout, the potential for a negative impact to the noise environment exists for the construction of the XBR at the Missile Site Radar. However, due to the conservative assumptions used to estimate the location of the DNL equals 65 dBA contour, and due to the temporary nature of the noise, any impacts would be expected to be minor.

As discussed above, up to approximately 700 vehicles per day would be expected to be added to CR 26, ND 1, and ND 66 in the vicinity of the Missile Site Radar during construction of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR construction would be expected.

Operation

As discussed above, up to approximately 210 vehicles per day would be expected to be added to CR 26, ND 1, and ND 66 in the vicinity of the Missile Site Radar during operation of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR operation would be expected.

Cumulative Impacts

The only other project that could contribute to noise-related impacts would be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD activities. The main noise source from the dismantlement and destruction activities would result from the demolition of facilities. Demolition could require the use of explosive that may generate loud noise levels. However, it is expected that the demolition activities would be completed before the start of NMD construction for safety reasons. The only anticipated overlapping activities would be the use of heavy construction equipment. Other than the two residences identified above in the vicinity of the construction site that may experience noise above guidance levels, it would be expected that the overall construction noise from the combination of these programs would be short-term and would not result in any long-term cumulative impacts. It is expected that any cumulative transportation-related noise on the local roadways would be short-term during the time these two programs could be in progress. No other programs have been identified within the region that would result in cumulative noise-related operations impacts at the Missile Site Radar.

Mitigation Measures

No mitigation measures are expected to be required; however, mitigation measures could be taken to minimize the impacts from construction noise to the two residences west of the site. These measures could include designing the final layout of the site to minimize the time that the noisiest construction equipment would spend near the western edge of the site and erecting a temporary noise barrier along the western side of the construction site.

4.3.4.9.2.3 Remote Sprint Launch Site 1—Noise

Construction

As no noise sensitive receptors are known to exist within 0.55 kilometer (0.34 mile) of the proposed XBR construction site, no significant impacts to the noise environment would be expected from construction equipment noise.

As discussed above, up to approximately 700 vehicles per day would be expected to be added to CR 3, CR 32, and ND 1 in the vicinity of the Remote Sprint Launch Site 1 during construction of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA is estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR construction would be expected.

Operation

As discussed above, up to approximately 210 vehicles per day would be expected to be added to CR 3, CR 32, and ND 1 in the vicinity of the Remote Sprint Launch Site 1 during operation of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR operation would be expected.

Cumulative Impacts

As no noise sensitive receptors have been identified in the vicinity of the construction site, it would not be expected that XBR construction noise would cause a significant impact to the noise environment when combined with the noise from dismantlement and destruction of facilities at Remote Sprint Launch Site 1 in combination with NMD activities.

Overall, it is not expected that XBR operations would cause a significant impact to the noise environment when combined with other ongoing and future programs including other NMD elements such as the GBI at the Missile Site Radar, that could be located in the area.

Mitigation Measures

No mitigation measures would be required.

4.3.4.9.2.4 Remote Sprint Launch Site 2—Noise

Construction

As no noise sensitive receptors are known to exist within 0.55 kilometer (0.34 mile) of the proposed XBR construction site, no significant impacts to the noise environment would be expected from construction equipment noise.

As discussed above, up to approximately 700 vehicles per day would be expected to be added to CR 55 and ND 1 in the vicinity of Remote Sprint Launch Site 2 during construction of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR construction would be expected.

Operation

As discussed above, up to approximately 210 vehicles per day would be expected to be added to CR 55 and ND 1 in the vicinity of Remote Sprint Launch Site 2 during operation of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR operation would be expected.

Cumulative Impacts

Potential cumulative impacts would be the same as described for Remote Sprint Launch Site 1.

Mitigation Measures

No mitigation measures would be required.

4.3.4.9.2.5 Remote Sprint Launch Site 4—Noise

Construction

As no noise sensitive receptors are known to exist within 0.55 kilometer (0.34 mile) of the proposed XBR construction site, no significant impacts to the noise environment would be expected from construction equipment noise.

As discussed above, up to approximately 700 vehicles per day would be expected to be added to CR 9, CR 22, ND 1, and ND 17 in the vicinity of

the Remote Sprint Launch Site 4 during construction of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR construction would be expected.

Operation

As discussed above, up to approximately 210 vehicles per day would be expected to be added to CR 9, CR 22, ND 1, and ND 17 in the vicinity of Remote Sprint Launch Site 4 during operation of the XBR. However, as shown in table 4.3.4.9-1, the locations of $L_{eq(1\ hour)}$ equals 67 dBA are estimated to occur well within the each roadway's right of way. Consequently, no impacts from traffic noise during XBR operation would be expected.

Cumulative Impacts

Potential cumulative impacts would be similar to those described for Remote Sprint Launch Site 1.

Mitigation Measures

No mitigation measures would be required.

4.3.4.10 Socioeconomics

The analysis of the socioeconomic consequences of the alternative actions considers how they might impact the population, employment, housing, education, health, and the fiscal wellbeing of the local communities. The following criteria were used to evaluate possible positive and negative impacts of the action:

- The increase in the local population arising from the in-migration of construction and operational personnel and their families
- The amount of money spent in the local economy on construction materials for the action
- The amount of "new" money spent in the local economy on consumption goods by construction and operational personnel
- The number of jobs created in the local economy as a result of the "multiplier" effect
- The number of additional houses, hospital beds and school places in the ROI required to meet the needs of the in-migrating construction and operational personnel and their families
- The amount of additional taxes of various kinds paid to the local communities of the ROI by the in-migrating construction and operational personnel

For the purposes of this socioeconomic analysis, the Proposed Action would have two phases likely to result in impacts: the construction phase and the operational phase. This analysis assumes that the operational phase immediately follows the construction phase.

4.3.4.10.1 Alaska Installations

4.3.4.10.1.1 Eareckson AS—Socioeconomics

The construction phase of the action would require an average of 230 construction workers per year for 3 years. The operational phase would require a complement of up to 70 for the XBR element, plus 35 personnel operating support facilities. Eareckson AS is an isolated, self-contained installation with all personnel, whether construction or operational, being required to live on-base. All personal expenditures, while on-base, would be through the base exchange. There are no local communities in which to purchase goods or services.

Positive economic impacts arising from the construction program would be spread throughout the United States. Similar impacts would arise from the operational phase of the action.

Cumulative Impacts

There would be no cumulative impacts arising from the action.

Mitigation Measures

No mitigation measures would be required.

4.3.4.10.2 North Dakota Installations

4.3.4.10.2.1 Cavalier AFB—Socioeconomics

Construction of the facilities required to operate the XBR would take approximately 3 years, employing, on average, 230 construction and site activation workers a year. It would be expected that the majority of the construction workers would move to the area on a temporary basis from outside the region. The existing local labor pool for construction workers expanded to over 6,000 in response to the 1997 flood of the Red River.

The operational phase of the XBR and its support facilities would directly employ up to 105 personnel, mostly joining the project from outside the region.

The Proposed Action, however, would replace the existing Air Force mission at Cavalier AFS. Its termination would amount to a realignment of approximately 130 personnel and their families (Cavalier AS, undated—10th Space Warning Squadron Site Fact Sheet).

Population

Construction. A study of the economic impacts of a major missile site construction program (North Dakota State University, undated—The Impact of the Safeguard Antiballistic Missile System Construction on North Dakota) cited several population impacts. Primarily, it was found that about 70 percent of the construction workers relocated to the area from elsewhere in the United States. If 70 percent of the construction workers for the XBR and its support facilities came from outside the area, then 70 workers would come from the local labor pool.

The North Dakota State University study also showed that a proportion of those construction workers relocating to the area brought their dependents with them. Each relocating worker brought 1.1 dependents with them. If this ratio were maintained for the Proposed Action, then it would be expected that 160 relocating construction workers would bring with them 176 dependents, suggesting a total population impact of 237 persons. According to the study, about one in three of the dependents, or 60, would be of school age.

Operation. The net effect of the operation on the population of the ROI would be similar to current conditions, given that the action would require the realignment of an existing mission of similar size.

Employment Income and Retail Impact

Construction. The construction program for the XBR and its support facilities would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. Some of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, from local suppliers, would generate additional income and jobs within the local economy.

The construction cost of the XBR and its support facilities at Cavalier AFS would be approximately $50 million over a 3-year period, or an average of $17 million per year. At least half this cost, however, would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. It is assumed, therefore, that the action would generate about $12 million of construction-related impacts in the local economy per year.

This money would help create further jobs throughout the local economy providing a trickle down or multiplier effect. It would be expected that 80 jobs would be created in this manner during the 3-year construction program.

Operation. The net effect of the operation on the employment, income and retailing base of the ROI would be similar to current conditions, given that the action would require the realignment of an existing mission of similar size.

Impacts on Housing, Education, and Health

Construction. The northeast corner of North Dakota has successfully accommodated a large contingent of construction workers during the Red River Flood rebuilding program. The construction phase of the action would commence as the Flood rebuilding program slows down. It would be expected that some of those involved in the Flood rebuilding program would become part of the construction phase workforce, continuing to live in their existing homes in Grand Forks.

New members of the construction workforce, and their dependents, would be expected to live in and around Grand Forks and in the ROI. The existing vacant housing stock, increased in recent months by the post-Flood construction programs, would be sufficient to accommodate additional construction workers. Between 1970 and 1973, Langdon and

Cavalier almost doubled their populations in response to the Safeguard Missile construction program, which involved over 3,000 workers, plus their dependents. Many of the facilities constructed to mitigate the impacts of that program survive and could be re-activated if necessary.

The construction workforce would bring dependents to the ROI and Grand Forks, including up to 60 children of school age. If, as posited above, a proportion of the construction workers already lived in Grand Forks and the surrounding region as a result of the Flood restoration program, their children would already be attending local schools. It is unlikely therefore that new school places would have to be found for all 60 children. The regional school systems would have sufficient capacity to accommodate the number of children involved.

The nearest medical facilities available to the action are at Cavalier and Langdon and were upgraded in response to the Safeguard program. They have sufficient fixed capacity to meet the needs of construction workers, though they may require increased medical staff. As the major center of population within the region, Grand Forks has a hospital and health system capable of supporting the more fundamental medical needs of the construction workers and their dependents.

Operation. The net effect of the operation on housing, education, and health in the ROI would be similar to current conditions, given that the action would require the realignment of an existing mission of similar size.

Fiscal Impacts

Construction. The main fiscal impact arising from the construction phase would be as a result of sales tax generated on the purchases of construction workers, as well as the various materials purchased locally. The ROI has a sales tax of 6 percent. If the construction workforce earned a gross income of $5.5 million, it would be expected that about $2.64 million would be disposed on consumption goods on which the sales tax would be levied. Approximately $158,000 in sales taxes would, therefore, be generated each year of the construction program.

Negative fiscal impacts arising from construction activities would be limited to the potential for increased demands on the public safety services of fire, police, and ambulance.

Operation. The net fiscal effect of the operation on the ROI would be similar to current conditions, given that the action would require the realignment of an existing mission of similar size.

Cumulative Impacts

Flood control works at Devils Lake will also involve construction work over the coming years. Restoration works arising from the Red River flood damage are slated to end in 2002. A significant overlap between the action and the flood restoration program might lead to local labor shortages which, in turn, would require a greater number of construction workers to migrate into the region to meet the demands of the action.

These projects already contribute positive economic impacts to the region. The construction element of the action would add further positive impacts. In addition, there is the potential that dismantlement and destruction of the Perimeter Acquisition Radar may occur before the start of NMD activities. This activity would result in some construction-related economic benefits, and along with NMD would provide for a longer-term construction-related economic benefit. The surrounding infrastructure has enough capacity to meet the increased demand.

Mitigation Measures

No mitigation measures would be required.

4.3.4.10.2.2 Missile Site Radar—Socioeconomics

The ROI for the action would be the same as that for Cavalier AFS. As a result, the majority of the construction impacts would be the same as those stated in 4.3.4.10.2.1. The exception would be in terms of overall construction costs.

Population

Construction. The construction impacts would be similar to those outlined for Cavalier AFS, as stated in 4.3.4.10.2.1.

Operation. The operational complement of the XBR would comprise 105 personnel. This complement would be expected to be accompanied by approximately 150 dependents, representing an estimated total increase in the local population of 254 people. About 50 would be expected to be of school age.

Employment Income and Retail Impact

Construction. The construction program for the XBR and its support facilities would generate additional income in the local economy in two ways. The first is in the form of wages earned by the construction workers. Some of these wages would be spent locally on lodging, food, and transportation. Second, the construction program would include a proportion of locally purchased materials. These purchases, from local

suppliers, would generate additional income and jobs within the local economy.

The construction cost of the XBR and its support facilities at would be approximately $71 million over a 3-year period, or an average of $24 million per year. At least half this cost, however, would include high value equipment, manufactured and assembled at locations throughout the United States, the purchase of which would have no local economic impact. It is assumed therefore that the action would generate about $12 million of construction-related impacts in the local economy per year.

This money would help create further jobs throughout the local economy providing a trickle down or multiplier effect. It would be expected that 120 jobs would be created in this manner during the 3-year construction program.

Operation. The 105 personnel required to carry out the operational phase would generate approximately $2.7 million of direct income per year. Although not all of this income would be spent locally, it would be expected that the benefit of this income in the local community would have a multiplied effect. In other words, jobs, and the additional income they would generate, would be created indirectly in the community by the operational phase of the action. This positive economic impact would be particularly beneficial to the communities of the ROI. Cavalier and Langdon have been declining in population and employment for over 30 years, and many of the retail services currently offered in these communities have become marginal. An influx of up to 105 households would help slow this demographic trend. It is estimated that approximately 30 jobs would be generated indirectly by the operational phase of the action.

Impacts on Housing, Education, and Health

Construction. The construction impacts would be similar to those outlined for Cavalier AFS, as stated in 4.3.4.10.2.1.

Operation. The operational staff compliment would live throughout the ROI. Recent rebuilding of Grand Forks following the Red River flood, has generated a surplus of housing stock in the wider region. In addition, permanent and temporary accommodation could be found in the communities nearest to the action.

The operational worker dependents of school age would be absorbed by the local school system with minimal disruption. The school at Langdon was increased in size to meet the needs of the Safeguard program. It has since required fewer and fewer facilities as a result of declining school rolls. This excess capacity would absorb the demand generated by the action.

The local hospital facilities in Langdon and Cavalier would meet the health needs of the operational staff.

Fiscal Impacts

Construction. The construction impacts would be similar to those outlined for Cavalier AFS, as stated in 4.3.4.10.2.1.

Operation. The main positive fiscal impacts arising from the operational phase of the action would be reflected in an increase in sales tax collections, resulting from increased sales of goods and services from the influx of operational personnel.

Negative fiscal impacts usually would be associated with increased education costs for the younger dependents of operational personnel.

Cumulative Impacts

Flood control works at Devils Lake will also involve construction work over the coming years. Restoration works arising from the Red River flood damage are slated to end in 2002. A significant overlap between the action and the flood restoration program might lead to local labor shortages which, in turn, would require a greater number of construction workers to migrate into the region to meet the demands of the action.

These projects already contribute positive economic impacts to the region. The action would add further positive impacts. In addition, there is the potential that dismantlement and destruction of some of the facilities at the Missile Site Radar may occur before the start of NMD activities. This activity would result in some construction-related economic benefits, and along with NMD would provide for a longer-term construction-related economic benefit. The surrounding infrastructure has enough capacity to meet the increased demand. The operation of the XBR at the Missile Site Radar along with continued operation of the Air Force Perimeter Acquisition Radar at Cavalier AFS would provide for an additional economic benefit within the region.

Mitigation Measures

No mitigation measures would be required.

4.3.4.10.2.3 Remote Sprint Launch Site 1—Socioeconomics

The ROI for the action would be the same as that for the Missile Site Radar. The impacts would be the same as those covered in section 4.3.4.10.2.2, except for potential cumulative impacts regarding GBI deployment at the Missile Site Radar, which is addressed in section 4.3.1.9.2.2.

4.3.4.10.2.4 Remote Sprint Launch Site 2—Socioeconomics

The ROI for the action would be the same as that for the Missile Site Radar. The impacts would be the same as those covered in section 4.3.4.10.2.2, except for potential cumulative impacts regarding GBI deployment at the Missile Site Radar, which is addressed in section 4.3.1.9.2.2.

4.3.4.10.2.5 Remote Sprint Launch Site 4—Socioeconomics

The ROI for the action would be the same as that for the Missile Site Radar. The impacts would be the same as those covered in section 4.3.4.10.2.2, except for potential cumulative impacts regarding GBI deployment at the Missile Site Radar, which is addressed in section 4.3.1.9.2.2.

4.3.4.11 Transportation

This section describes the potential environmental impacts caused by transportation activities associated with construction and operation of an XBR element. The following criteria were used to identify potential transportation impacts:

- A reduction in level of service by two or more level of service values
- A reduction in level of service that exceeds a level acceptable by state and local guidelines

Of all of the potential XBR deployment locations, only Eareckson AS has an airfield. Operation of the XBR would use the existing air service provided to the base and thus no additional flights would be anticipated; therefore, there would be no impact to airport operations on Eareckson AS. The North Dakota locations would not require the use of any airports in the region for operations. Potential impacts to airspace use surrounding the XBR including impacts to aircraft and airport operations from EMR generated during operations is addressed in section 4.3.4.2, Airspace.

Prior to NMD construction activity, a pre-road survey would be conducted of the roadways potentially impacted by NMD construction to determine the current condition. Upon completion of NMD construction, an exit road survey would be conducted of these same roadways. The roadways would then be repaired, if needed, to return them to pre-construction conditions.

4.3.4.11.1 Alaska Installations

4.3.4.11.1.1 Eareckson AS—Transportation

Eareckson AS is located on Shemya Island in the Western Aleutians. This island is remote and sparsely populated with few roads. Consequently, there are no transportation issues with locating the XBR at Eareckson AS.

4.3.4.11.2 North Dakota Installations

4.3.4.11.2.1 Cavalier AS—Transportation

Construction

The XBR would be located adjacent to the existing Perimeter Acquisition Radar, which would need to be demolished to allow for XBR operation. Construction activities at Cavalier AFS would include building modifications and roadway improvements. All installation traffic enters the base through one gate via CR 89. During the peak of construction,

350 construction personnel would pass through this gate an estimated two times per day. The off-base traffic volume on CR 89, ND 5, and ND 32 would increase accordingly. This traffic increase would last approximately 3 years, with the peak occurring during the first 2 years of construction. This increase in volume would not change the level of service of roadways on-base or in the vicinity of the installation. No transportation impacts are expected due to NMD construction activities.

Operation

The implementation of an XBR at Cavalier AFS would result in a total employment of 105 personnel, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This is approximately the same number of personnel presently employed at the Perimeter Acquisition Radar. Once the NMD XBR is deployed, other Air Force related current and future planned activities at Cavalier AFS would cease. The effect of NMD activities on Cavalier AFS and the surrounding area would be neutral since there would be no increase in the number of personnel at Cavalier AFS due to the XBR, and traffic volumes would stay at a level comparable to the present volume. No transportation impacts are expected with the placement of the XBR at Cavalier AFS.

Cumulative Impacts

The only known project that could result in a cumulative impact would be the potential dismantlement and destruction of the radar at Cavalier AFS. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of traffic within the area. The only roadways that could experience a change of level of service would be ND 1 and ND 5 within Langdon. This change of level of service would be temporary and would return to LOS A upon completion of construction activities.

Mitigation Measures

No mitigation measures would be required.

4.3.4.11.2.2 Missile Site Radar—Transportation

Construction

The XBR would be located in the same location as the existing radar, requiring demolition of this facility. Construction activities at the Missile Site Radar would include support facilities for the XBR and demolition of existing site structures. All installation traffic enters the base through one gate via CR 26. During the peak of construction, 350 construction personnel would pass through this gate an estimated two times per day. The off-base traffic volume on CR 26, ND 1, and ND 66 would increase

accordingly. This traffic increase would last approximately 3 years, with the peak occurring during the first 2 years of construction. This increase in volume would not change the level of service of roadways on-base or in the vicinity of the installation. CR 26, ND 1, and ND 66 currently operate at LOS A. There are no transportation impacts expected due to NMD construction activities.

Operation

Once the XBR is fully operational, the total number of personnel would be 105, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 210 trips per day to the Missile Site Radar site, assuming each employee made two trips through the gate per day. Currently, this site is in a caretaker status; thus, the increased traffic volume does not present a problem. CR 26, ND 1, and ND 66 currently operate at LOS A, and the traffic volume increase will not affect the level of service on these roadways. No transportation impacts are expected due to NMD activities at the Missile Site Radar.

Cumulative Impacts

The only known project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at the Missile Site Radar. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of traffic within the area. The only roadways that could experience a change of level of service would be ND 1 and ND 5 within Langdon. This change to LOS B would be temporary and would return to LOS A upon completion of construction activities.

Mitigation Measures

No mitigation measures would be required.

4.3.4.11.2.3 Remote Sprint Launch Site 1—Transportation

Construction

Construction activities at Remote Sprint Launch Site 1 would include support facilities, road resurfacing, a new water line, and demolition of existing silos and the security building. All installation traffic enters through one gate via CR 32. During the peak construction, 350 construction personnel would pass through this gate an estimated two times per day. Traffic volumes in the area would increase accordingly. This traffic increase would last approximately 3 years, with the peak occurring during the first 2 years of construction. Currently, the roadways in the vicinity of the site, CR 32, CR 3, and ND 1, all operate

at LOS A, and the increase in volume due to NMD construction activities would not change this level of service. No transportation impacts are expected due to NMD construction activities.

Operation

Once the XBR is fully operational, the total number of personnel would be 105, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 210 trips per day to Remote Sprint Launch Site 1, assuming each employee made two trips through the gate per day. Currently, this site is in a caretaker status; thus, the increased traffic volume does not present a problem. CR 3, CR 32, and ND 1 currently operate at LOS A, and the traffic volume increase would not affect the level of service on these roadways. No transportation impacts are expected due to NMD activities.

Cumulative Impacts

It is possible that the BMC2 and GBI elements could be located at the Missile Site Radar and the XBR element located at Remote Sprint Launch Site 1. If this occurs, the traffic increase within the region would be greater due to the close proximity of the sites. However, this increase would not be enough to change the level of service on the roadways in the vicinity of the sites. The only roadways that could experience a change of level of service, LOS A to LOS B, would be ND 1 and ND 5 within Langdon, due to the centralized location of Langdon to the proposed sites. It is expected that Langdon will be the primary city utilized by the construction and operation workforce. The change of level of service for Langdon would occur during the construction phase of the NMD project and would return to LOS A once construction was completed. No change in the level of service would be experienced due to NMD operation activities.

The only other project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at the Remote Sprint Launch Site 1. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of traffic within the area. The only roadways that could experience a change of level of service would be ND 1 and ND 5 within Langdon. This change to LOS B would be temporary and would return to LOS A upon completion of construction activities.

Mitigation Measures

No mitigation measures would be required.

4.3.4.11.2.4 Remote Sprint Launch Site 2—Transportation

Construction

Construction activities at Remote Sprint Launch Site 2 would include support facilities, road resurfacing, new water line, and demolition of existing silos and the security building. All installation traffic enters through one gate via ND 1. During the peak construction, 350 construction personnel would pass through this gate an estimated two times per day. Traffic volumes in the area would increase accordingly. This traffic increase would last approximately 3 years, with the peak occurring during the first 2 years of construction. Currently, the roadways in the vicinity of the site, ND 1 and CR 55, both operate at LOS A, and the increase in volume due to NMD construction activities would not change this level of service. No transportation impacts are expected due to NMD construction activities.

Operation

Once the XBR is fully operational, the total number of personnel would be 105, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 210 trips per day to Remote Sprint Launch Site 2, assuming each employee made two trips through the gate per day. Currently, this site is in a caretaker status; thus, the increased traffic volume does not present a problem. ND 1 and CR 55 currently operate at LOS A, and the traffic volume increase would not affect the level of service on these roadways. No transportation impacts are expected due to NMD activities.

Cumulative Impacts

It is possible that the BMC2 and GBI elements could be located at the Missile Site Radar and the XBR element located at Remote Sprint Launch Site 2. If this occurs, the traffic increase within the region would be greater due to the close proximity of the sites. However, this increase would not be enough to change the level of service on the roadways in the vicinity of the sites. The only roadways that could experience a change of level of service, LOS A to LOS B, would be ND 1 and ND 5 within Langdon, due to the centralized location of Langdon to the proposed sites. It is expected that Langdon will be the primary city utilized by the construction and operation workforce. The change of level of service for Langdon would occur during the construction phase of the NMD project and would return to LOS A once construction was completed. No change in the level of service would be experienced due to NMD operation activities.

The only other project that could result in a cumulative impact would be the potential dismantlement and destruction of facilities at the Remote

Sprint Launch Site 2. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of traffic within the area. The only roadways that could experience a change of level of service would be ND 1 and ND 5 within Langdon. This change to LOS B would be temporary and would return to LOS A upon completion of construction activities.

Mitigation Measures

No mitigation measures would be required.

4.3.4.11.2.5 Remote Sprint Launch Site 4—Transportation

Construction

Construction activities at Remote Sprint Launch Site 4 would include support facilities, road resurfacing, new water line, and demolition of existing silos and the security building. All installation traffic enters through one gate via an unnamed county road. During the peak construction, 350 construction personnel would pass through this gate an estimated two times per day. Traffic volumes in the area would increase accordingly. This traffic increase would last approximately 3 years, with the peak occurring during the first 2 years of construction. Currently, the roadways in the vicinity of the site, ND 1, ND 17, CR 9, and CR 22, all operate at LOS A, and the increase in volume due to NMD construction activities would not change this level of service. No transportation impacts are expected due to NMD construction activities.

Operation

Once the XBR is fully operational, the total number of personnel would be 105, including military, contractor positions, site maintenance, operations support, fire, and security personnel. This would result in an increase of 210 trips per day to Remote Sprint Launch Site 4, assuming each employee made two trips through the gate per day. Currently, this site is in a caretaker status; thus, the increased traffic volume does not present a problem. ND 1, ND 17, CR 9, and CR 22 currently operate at LOS A, and the traffic volume increase will not affect the level of service on these roadways. No transportation impacts are expected due to NMD activities.

Cumulative Impacts

It is possible that the BMC2 and GBI elements could be located at the Missile Site Radar and the XBR element located at Remote Sprint Launch Site 4. If this occurs, the traffic increase within the region would be greater due to the close proximity of the sites. However, this increase would not be enough to change the level of service on the roadways in

the vicinity of the sites. The only roadways that could experience a change of level of service, LOS A to LOS B, would be ND 1 and ND 5 within Langdon, due to the centralized location of Langdon to the proposed sites. It is expected that Langdon will be the primary city utilized by the construction and operation workforce. The change of level of service for Langdon would occur during the construction phase of the NMD project and would return to LOS A once construction was completed. No change in the level of service would be experienced due to NMD operation activities.

The only other project that could result in a cumulative impact would be the potential dismantlement and destruction of some facilities at the Remote Sprint Launch Site 4. The majority of this activity would need to be completed before the start of the main NMD construction activities. There is the potential that some construction activities could overlap, subsequently increasing the amount of traffic within the area. The only roadways that could experience a change of level of service would be ND 1 and ND 5 within Langdon. This change to LOS B would be temporary and would return to LOS A upon completion of construction activities.

Mitigation Measures

No mitigation measures would be required.

4.3.4.12 Utilities

This section provides an evaluation of system capacities and current and future service demands for the XBR element of the NMD program for four major public utilities including water supply, wastewater treatment, solid waste disposal, and energy. Under the Proposed Action, potential impacts to the utility systems would occur if it resulted in one or more of the following:

- The need for new utilities distribution facilities
- Shortages in public supplied utility systems

If under-capacity scenarios exist for Proposed Action activities, the service short-fall and currently planned mitigations to augment existing capacity are identified. New utility demands from NMD project activities have been identified and are included quantitatively where specific data is available. The discussion of cumulative impacts and mitigations within this section generally include planned projects and system additions that have been approved.

4.3.4.12.1 Alaska Installations

4.3.4.12.1.1 Eareckson AS—Utilities

Under the XBR deployment at Eareckson AS, there would be an increase in utility usage on the base. This increased demand should be easily handled, since the base at one time had approximately 1,500 personnel located on the base and the infrastructure system was designed to accommodate those employees. Currently there are approximately 100 employees stationed at Eareckson AS, and with the addition of NMD personnel the demand on the utility system would remain well below the capacity for Eareckson AS.

Water

An increase in water usage would occur both under construction and operation of the XBR. For construction, all of the water increase would occur on-base as a result of construction personnel having to reside on Shemya. Construction worker-related water usage would be approximately 0.066 million liters per day (0.018 million gallons per day). On-base water usage from construction would also include site watering and any required batch plants. The available capacity of 1.28 million liters per day (0.33 million gallons per day) would be sufficient to handle this increased demand.

All of the operations-related water usage would occur on-base. On-base water usage would be expected to increase by 0.02 million liters per day (0.0052 million gallons per day), which is within the available base capacity of 1.28 million liters per day (0.33 million gallons per day).

Wastewater

An increase in wastewater usage would occur both under construction and operation of the XBR. For construction, it is expected that all of the wastewater increase would occur on-base as a result of construction workers residing on Shemya. Construction worker-related wastewater generation would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing wastewater system has the available capacity of 0.69 million liters per day (0.18 million gallons per day) and would be sufficient to handle increased demand.

All of the operations related to wastewater generation would occur on-base. On-base wastewater generation would be expected to increase by 0.02 million liters per day (0.0052 million gallons per day), which could be handled by the existing system.

Solid Waste

Current estimates expect the landfill to reach capacity in less than 15 years. It is expected that construction and operation of the XBR at Eareckson AS would reduce the landfill operational capacity. However, there is space available on Eareckson AS to expand the landfill, if necessary. The base operations manager may recommend installation of a temporary efficient incinerator to reduce debris going to the landfill and removal of construction waste from the island.

Electricity

Eareckson AS has approximately 15 megawatts available electrical capacity from the current use of the generators on-base. This available electrical capacity would be sufficient to meet the demands of the XBR at Eareckson AS. However, to meet reliability electrical requirements, a power plant would be constructed to accommodate the power needs of the XBR element.

Natural Gas

There is no natural gas usage on Eareckson AS.

Cumulative Impacts

No other future programs that could contribute to cumulative utility system impacts have been identified at Eareckson AS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.12.2 North Dakota Installations

4.3.4.12.2.1 Cavalier AFS—Utilities

Under the XBR deployment at Cavalier AFS there would be a mission change to support the new NMD system. This would result in a slight decrease in the amount of operational personnel; therefore, there should be sufficient utility capacity in the ROI and on-base to handle NMD deployment.

Water

An increase in water usage would occur during construction of the XBR. For construction, it is expected that most of the water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the surrounding region and thus would not increase regional demand. Construction worker-related water usage would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing available capacity in the ROI of 6.40 million liters per day (1.69 million gallons per day) has sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. On-base water is supplied through the surrounding water providers.

Most of the operations-related water usage would occur on-base as most personnel would reside on-base in existing housing that would be available due to the new mission of Cavalier AFS. Since the NMD program would replace the existing Air Force mission, with a reduction in water requirements, water usage would be expected to decrease and be within the available capacity of the local providers within the ROI as noted above.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the XBR. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the surrounding region and thus would not increase regional demand. Construction worker-related wastewater generation would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing private commercial wastewater systems, which have an available capacity of 2.04 million liters per day (0.54 million gallons per day), in the surrounding ROI would have the available capacity to handle this temporary increase in demand. Portable wastewater facilities would be used for construction workers during the workday on Cavalier AFS.

The operations-related wastewater generation would occur mostly on-base as most personnel would reside on-base. Wastewater generation would be expected to remain relatively the same and remain within the existing off-base capacity in the ROI noted above. In addition, the Cavalier AFS wastewater system has an available capacity of 0.05 million liters per day (0.01 million gallons per day) to handle any increase on the installation.

Solid Waste

A new municipal landfill is planned for construction in the Grand Forks area by 1999. This landfill would be expected to have an operational life span of 40 years. This proposed landfill would have sufficient capacity to handle the increased demand from NMD activities at Cavalier AFS.

Electricity

A local commercial provider provides electricity to Cavalier AFS. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities. However, to meet reliability electrical requirements, a power plant would be constructed to accommodate the power needs of the XBR element.

Natural Gas

A local commercial provider provides natural gas to Cavalier AFS. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Cumulative Impacts

If this site were selected for the XBR element, the current mission would change to support the new NMD mission. Therefore, any planned programs or projects would no longer be applicable. The potential dismantlement and destruction of the Perimeter Acquisition Radar before NMD construction activities would not result in cumulative utility system impacts. Overall, no cumulative utility system impacts are expected under the Proposed Action for the XBR element.

Mitigation Measures

No mitigation measures would be required.

4.3.4.12.2.2 Missile Site Radar—Utilities

The Missile Site Radar was an active site in 1975. As part of deployment and operation of this site and other facilities as part of the SRMSC, many of the local community's infrastructure systems were improved to handle the large influx of construction and operational

workers. When the SRMSC was deactivated, the local communities continued to maintain the improved infrastructure systems. This has resulted in excess capacity for most of the utility systems.

Water

An increase in water usage would occur both under construction and operation of the XBR. For construction, it is expected that most of the water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the surrounding region and thus would not increase regional demand. Construction worker-related water usage would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing available capacity in the ROI of 3.32 million liters per day (0.88 million gallons per day) has sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. On-base water is supplied through the surrounding water providers.

Most of the operations-related water usage would occur on-base, as housing would be built as part of XBR deployment at this site. Water to the site is provided by the local commercial water system, which has an available capacity of 3.32 million liters per day (0.88 million gallons per day). It is expected that XBR operations would require 0.02 million liters per day (0.0052 million gallons per day) of water, which is within the available capacity.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the XBR. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the region and thus would not increase regional demand. Construction worker-related wastewater generation would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing commercial wastewater systems in the nearby communities have sufficient capacity to handle the increased demand.

Most of the operations-related wastewater generation would occur on-base, as housing would be built as part of the XBR deployment at this site. The existing onsite two-cell evaporative sewage lagoon system would need to be reactivated for XBR deployment. The system would have sufficient capacity to handle the increased demand. Reactivation of this system would be in accordance with appropriate regulations.

Solid Waste

A new municipal landfill is planned for construction in the Grand Forks area by 1999. This landfill would be expected to have an operational life span of 40 years. This proposed landfill would have sufficient capacity to handle the increased demand from NMD activities.

Electricity

A local commercial provider provides electricity to the Missile Site Radar. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities. However, to meet reliability electrical requirements, a power plant would be constructed to accommodate the power needs of the XBR element.

Natural Gas

A local commercial provider provides natural gas to the Missile Site Radar. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Cumulative Impacts

The potential dismantlement and destruction of facilities at the Missile Site Radar would not be expected to result in cumulative utility system impacts in connection with NMD activities. No other future programs that could contribute to cumulative utility system impacts have been identified at the Missile Site Radar or within the region. Overall, no cumulative utility system impacts are expected under the Proposed Action for the XBR element.

Mitigation Measures

No mitigation measures would be required.

4.3.4.12.2.3 Remote Sprint Launch Site 1—Utilities

The Remote Sprint Launch Site 1 was an active site in 1975. As part of deployment and operation of this site and other facilities as part of the SRMSC, many of the local community's infrastructure systems were improved to handle the large influx of construction and operational workers. When the SRMSC was deactivated, the local communities continued to maintain the improved infrastructure systems. This has resulted in excess capacity for most of the utility systems.

Water

An increase in water usage would occur both under construction and operation of the XBR. For construction, it is expected that most of the

water increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the surrounding region and thus would not increase regional demand. Construction worker-related water usage would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing available capacity in the ROI of 3.32 million liters per day (0.88 million gallons per day) has sufficient capacity to handle this potential increase. On-base water usage from construction would be related to site watering and any required batch plants. On-base water would be supplied or hauled in by the surrounding water provider. Currently, there is no potable water at the site and the existing underground water storage tanks and piping are assumed to be in poor condition. Therefore, new water lines would be installed to accommodate the water needs of the XBR at Remote Sprint Launch Site 1.

Most of the operations-related water usage would be off-base because there would be no permanent housing constructed as part of XBR deployment at Remote Sprint Launch Site 1. The existing water system in the ROI has an available capacity of 3.32 million liters per day (0.88 million gallons per day). It is expected that XBR operations would require 0.02 million liters per day (0.0052 million gallons per day) of water, which is within the available capacity of the water system in the ROI.

Wastewater

An increase in wastewater usage would occur both under construction and operation of the XBR. For construction, it is expected that most of the wastewater increase would occur off-base as a result of construction workers taking up temporary residence in nearby communities. However, it is expected that many of these workers would come from the region and thus would not increase regional demand. Construction worker-related wastewater generation would be approximately 0.066 million liters per day (0.018 million gallons per day). The existing commercial wastewater systems in the nearby communities have sufficient capacity to handle this increased demand.

Most of the operations-related wastewater generation would occur off-base, because no permanent housing would be constructed as part of the XBR deployment at this site. The existing onsite two-cell evaporative sewage lagoon system would need to be reactivated for XBR deployment. The system would have sufficient capacity to handle the increased demand. Reactivation of this system would be in accordance with appropriate regulations.

Solid Waste

A new municipal landfill is planned for construction in the Grand Forks area by 1999. This landfill would be expected to have an operational life span of 40 years. This proposed landfill would have sufficient capacity to handle the increased demand from NMD activities.

Electricity

A local commercial provider could provide electricity to the Remote Sprint Launch Site 1. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities. However, to meet reliability electrical requirements, a power plant would be constructed to accommodate the power needs of the XBR element.

Natural Gas

A local commercial provider could provide natural gas to the Remote Sprint Launch Site 1. The commercial provider in the ROI has sufficient capacity to handle the increased use from NMD deployment activities.

Cumulative Impacts

The potential dismantlement and destruction of facilities at Remote Sprint Launch Site 1 would not be expected to result in cumulative utility system impacts in combination with NMD activities. No other future programs that could contribute to cumulative utility system impacts have been identified at Remote Sprint Launch Site 1. However, there is the potential that the GBI and BMC2 could be located at Missile Site Radar. As addressed under the GBI element for Missile Site Radar, no cumulative impacts to the utilities systems would be expected within the region. Overall, no cumulative utility system impacts are expected under the Proposed Action for the XBR element.

Mitigation Measures

No mitigation measures would be required.

4.3.4.12.2.4 Remote Sprint Launch Site 2—Utilities

Potential construction and operational-related impacts and mitigation measures for Remote Sprint Launch Site 2 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.12.2.5 Remote Sprint Launch Site 4—Utilities

Potential construction and operational-related impacts and mitigation measures for Remote Sprint Launch Site 4 would be the same as described for Remote Sprint Launch Site 1.

4.3.4.13 Water Resources

This section addresses potential environmental impacts caused by changes to the water resources environment due to the construction and operation of the XBR element. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Construction within floodplains that could result in impacts to surface water
- Changes in drainage patterns that could result in increased erosion resulting in an increase in the amount of sediment in surface waters
- Construction or operational activities that may contribute contaminates to surface and ground waters
- Storm water discharges relative to existing storm water permits
- Groundwater withdrawals that could affect regional aquifers

4.3.4.13.1 Alaska Installations

4.3.4.13.1.1 Eareckson AS—Water Resources

Construction

Construction of an XBR would require grading of approximately 12 hectares (30 acres) of land in the northeast portion of the island between East Road and AWS Road. Construction would also include a new power plant adjacent to the existing one and a new fuel storage area. All new utility lines would follow existing corridors where possible. A new sewer line from the proposed XBR to the existing sewage treatment plant would also be required.

The proposed XBR site would not be within the 100-year floodplain. The proposed site is currently unused. Due to the topography of the site, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the lack of distinct drainages and the relatively high permeability of the soils. Construction of the XBR would be outside of the base's potable water and infiltration gallery system in the central part of the base used for the base's drinking water supply. Construction of the XBR and related support infrastructure would not affect the infiltration gallery system.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency

response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

XBR construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. A copy of the Notice of Intent for Storm Water Discharges Associated with Construction Activity Under a NPDES General Permit that would be filed with the U.S. EPA would also be provided to the Alaska Department of Environmental Conservation. A copy of the SWPPP would also be provided to the Alaska Department of Environmental Conservation. The SWPPP would include specific Best Management Practices to mitigate potential impacts to several small surface water bodies adjacent to the XBR site. A Short Term Variance from Water Quality Standards would be submitted to the Alaska Department of Environmental Conservation if potential effects on surface water are identified during preparation of the SWPPP. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA and the Alaska Department of Environmental Conservation.

The water requirements for the construction workforce would be approximately 0.066 million liters per day (0.018 million gallons per day). Although this represents a 30 percent increase in the current water usage, it is much less than when Eareckson AS was at full force. The XBR construction water requirements would result in a total installation water usage of approximately 19 percent of the total water system capacity and would not adversely impact the water supply system.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, the current SWPPP would be amended to define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the XBR site, and would include individual Best Management Practice Plans for controlling the discharge of pollutants in the storm water runoff from individual XBR facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities. The XBR would be outside of the base's potable water and infiltration gallery system in the central part of the base used for the base’s drinking water supply.

Operation of the XBR and related support infrastructure would not affect the infiltration gallery system.

The water requirements for operations would be approximately 0.02 million liters per day (0.0052 million gallons per day), which represents a 9 percent increase in the current water usage but is much less than when Eareckson AS was at full force. The XBR operational water requirements would result in a total installation water usage of approximately 16 percent of the total water system capacity and would not adversely impact the water supply system.

Cumulative Impacts

The construction of an XBR at Eareckson AS would only affect a very small portion of the base. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff levels and quality so as not to contribute to cumulative impacts. No other programs have been identified that, when combined with the Proposed Action would contribute to cumulative water resources impacts at Eareckson AS.

Mitigation Measures

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands and ponds, would provide all necessary mitigation relative to storm water. If, during review of the SWPPP, it is determined that NMD construction would cause a negative effect on surface water, a Short Term Variance from Water Quality Standards would be submitted to the Alaska Department of Environmental Conservation. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.4.13.2 North Dakota Installations

4.3.4.13.2.1 Cavalier AFS—Water Resources

Construction

Under the Proposed Action, the current mission of Cavalier AFS would be replaced with the NMD XBR activities. Construction of the XBR would require grading of approximately 1 hectare (3 acres) of previously disturbed land adjacent to the location of the existing Perimeter Acquisition Radar Building. A maximum of 4 hectares (10 acres) could be used for construction laydown.

The proposed XBR site would not be within the 100-year floodplain. Due to the level topography of the site, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the topography and the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

XBR construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before demolition of the Perimeter Acquisition Radar building and construction of the XBR. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA.

The water requirements for the construction workforce in the region would be approximately 0.066 million liters per day (0.018 million gallons per day). As discussed under the utilities section, there is adequate water supply on-base and within the region to meet this demand. The Icelandic Aquifer, from which water is obtained, has not shown any noticeable declines, and this relatively small increase in water use would not impact the water supply aquifer.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, an XBR SWPPP would be required in accordance with the U.S. EPA NPDES General Permit for Storm Water Discharges Associated with Industrial Activity. The SWPPP would define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the XBR site. The SWPPP would include individual Best Management Practice Plans for controlling the discharge of pollutants in the storm water runoff from individual XBR facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.02 million liters per day (0.0052 million gallons per day), which is less than 5 percent of the current Cavalier AFS water use. As discussed under the utilities section, there is adequate water supply on-base and within the region to meet this demand. In addition, the NMD XBR would replace the existing Air Force mission at this site, with a reduction in water demand. The main factor in the water reduction is that the NMD XBR does not require cooling water like the current radar operated at Cavalier AFS. Overall, there would be a decrease in water usage in the region. The Icelandic Aquifer, from which water is obtained, has not shown any noticeable declines.

Cumulative Impacts

If the NMD XBR is deployed at Cavalier AFS, current and future Air Force activities would cease and only NMD activities would occur. Since deployment of the NMD XBR at this site would require the use of less water than the existing Air Force mission, no cumulative impacts would be expected to water resources in the region. The only other project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of the Perimeter Acquisition Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. Even if there is some overlap from these two construction activities, the combined water requirements would not result in cumulative impacts to water resources.

Past agricultural activities and development have resulted in a decrease in wetlands and an increase in the amount of surface runoff. This has in turn resulted in increased contamination and flooding. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff level and quality so as not to contribute to cumulative impacts.

Mitigation Measures

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.4.13.2.2 Missile Site Radar—Water Resources

Construction

Under the Proposed Action, an XBR would be constructed and become operational, and the current mission of the Missile Site Radar would change from an inactive status to support the new XBR. Construction of this element could require grading of approximately 20 hectares (50 acres) of previously disturbed land at the existing Missile Site Radar.

The proposed XBR site would not be within the 100-year floodplain. Due to the level topography of the site, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the topography; however, there may be some minor increase in sedimentation in Roaring Nancy Creek that crosses the installation.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

XBR construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction of the XBR. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA.

The water requirements for the construction workforce would be approximately 0.066 million liters per day (0.018 million gallons per day). This represents less than 50 percent of the GBI requirements discussed in section 4.3.1.12.2.2 and would not impact the surface water supply availability.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, an XBR SWPPP would be required in accordance with the U.S. EPA NPDES General Permit for Storm Water Discharges Associated with Industrial Activity. The SWPPP would define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the

XBR site. The SWPPP would include individual Best Management Practice Plans for controlling the discharge of pollutants in the storm water runoff from individual XBR facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.02 million liters per day (0.0052 million gallons per day). This represents less than 55 percent of the GBI requirements discussed in section 4.3.1.12.2.2 and would not impact the surface water supply availability.

Cumulative Impacts

The implementation of an XBR at the Missile Site Radar site would affect the majority of the base. However, the entire site has been previously disturbed and no undisturbed lands would be affected. Past agricultural activities and development have resulted in a decrease in wetlands and an increase in the amount of surface runoff. This has in turn resulted in increased contamination and flooding. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff level and quality so as not to contribute to cumulative impacts. No other future programs have been identified that would that would combine to create any cumulative impacts to water resources.

The only other project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of some of the facilities at the Missile Site Radar. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. Even if there is some overlap from these two construction activities, the combined water requirements would not result in cumulative impacts to water resources.

Mitigation Measures

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. All construction and operations would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.4.13.2.3 Remote Sprint Launch Site 1—Water Resources

Construction

Under the Proposed Action, an XBR would be constructed and become operational and the current mission of the Remote Sprint Launch Site 1 would change from an inactive status to support the new XBR. Construction of the NMD XBR would use most of the 17-hectare (41-acre) site of previously disturbed land at Remote Sprint Launch Site 1.

The proposed XBR site would not be within the 100-year floodplain. Due to the level topography of the site, drainage patterns would only be altered slightly, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the topography and the distance between the construction site and surface water bodies.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

XBR construction activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction of the XBR and associated facilities. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA.

The water requirements for the construction workforce within the region would be approximately 0.066 million liters per day (0.018 million gallons per day). As discussed under the utilities section, there is adequate water supply in the region to meet this demand. Water for construction activities (i.e., cement mixing) is not currently available at the site and would need to be transported to the site and/or a connection would be made to a nearby water-supply pipeline.

Operation

Potential impacts to water resources resulting from accidental spills of hazardous materials during operation would be minimized because all activities would follow spill prevention, control, cleanup, and emergency response procedures described in section 4.3.4.6, Hazardous Materials and Hazardous Waste Management.

Impacts from storm water are not expected. Following construction, an XBR SWPPP would be required in accordance with the U.S. EPA NPDES General Permit for Storm Water Discharges Associated with Industrial Activity. The SWPPP would define the methods and procedures for controlling the discharge of pollutants in the storm water runoff from the XBR site. The SWPPP would include individual Best Management Practice Plans for controlling the discharge of pollutants in the storm water runoff from individual XBR facilities. Storm water control measures could include detention areas such as constructed wetlands or ponds to contain runoff from the impervious areas at NMD facilities.

The water requirements for operations would be approximately 0.02 million liters per day (0.0052 million gallons per day). Water is not currently available at the site and therefore a connection would be made to a nearby water-supply pipeline. Withdrawal of this amount of water would not impact the water availability of the area.

Cumulative Impacts

The implementation of an XBR at Remote Sprint Launch Site 1 would affect the majority of the base which was previously disturbed. Past agricultural activities and development have resulted in a decrease in wetlands and an increase in the amount of surface runoff. This has in turn resulted in increased contamination and flooding. Although the NMD facilities would result in increased runoff and potential decrease in water quality, the mitigation measures to be incorporated into the final design at each location would maintain the pre-NMD storm water runoff level and quality so as not to contribute to cumulative impacts.

The only project that could represent the potential for construction-related cumulative impacts would be the potential dismantlement and destruction of some of the facilities at this site. This activity would need to be mostly completed before the start of the main NMD construction activities. However, there is the potential that some construction activities may overlap. Even if there is some overlap from these two construction activities, the combined water requirements would not result in cumulative impacts to water resources. No other programs have been identified that would combine to create any cumulative impacts to water resources.

Mitigation Measures

NPDES permit requirements, including the SWPPP for construction and operations and associated Best Management Practices and storm water control measures such as constructed wetlands or ponds, would provide all necessary mitigation relative to storm water. All construction and operations would be completed in accordance with state and Federal

water resources regulations. No additional mitigation measures for water resources are proposed.

4.3.4.13.2.4 Remote Sprint Launch Site 2—Water Resources

Potential impacts and mitigation measures for this site would be similar to those described in section 4.3.4.13.2.3 for Remote Sprint Launch Site 1.

4.3.4.13.2.5 Remote Sprint Launch Site 4—Water Resources

Potential impacts and mitigation measures for this site would be similar to those described in section 4.3.4.13.2.3 for Remote Sprint Launch Site 1.

4.3.4.14 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies identify and address disproportionately high and adverse environmental effects (including human, health, and economic and social effects) of its programs, policies, and activities on minority and low-income populations. An environmental justice impact would be a long-term health, environmental, cultural, or economic effect that has a disproportionately high and adverse effect on a nearby minority or low-income population, rather than all nearby residents. The potential for a disproportionately high and adverse effect could occur under either of two conditions: (1) the percentage of persons in low-income or minority populations in the census area meaningfully exceeds the percentage in the borough (Alaska) or county (North Dakota), the regions of comparison, or (2) the percentage of low-income or minority population in the census area exceeds 50 percent (see tables 3.15-1 and 3.15-2).

4.3.4.14.1 Alaska Installations

4.3.4.14.1.1 Eareckson AS—Environmental Justice

Deployment of the XBR at Eareckson AS would not disproportionately affect any minority or low-income populations. Eareckson AS is on Shemya Island, and only military personnel and contractors live at this site. None of the potential environmental or human health impacts noted above for XBR deployment at Eareckson AS affect any populated or subsistence use areas. No Native American or traditional cultural resources would be impacted from XBR deployment.

Cumulative Impacts

No other projects or activities in the region along with NMD have been identified that would contribute to potential cumulative environmental justice impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.4.14.2 North Dakota Installations

Deployment of an XBR in North Dakota includes five potential locations: Cavalier AFS, the Missile Site Radar, Remote Sprint Launch Site 1, Remote Sprint Launch Site 2, and Remote Sprint Launch Site 4. As described above, no human health or other environmental impacts that could impact low-income or minority populations have been identified, and no Native American or traditional resources would be impacted.

4.3.4.14.2.1 Cavalier AFS—Environmental Justice

Deployment of the XBR at Cavalier AFS would not disproportionately affect any minority or low-income populations. As discussed above, there would be few environmental impacts from the deployment of the XBR at Cavalier AFS. Environmental and human health impacts would be contained within the base boundary and would not impact any nearby communities or residential areas.

Cumulative Impacts

No other projects or activities in the region, including the potential dismantlement and destruction of the SRMSC, along with NMD have been identified that would contribute to potential cumulative environmental justice impacts at Cavalier AFS.

Mitigation Measures

No mitigation measures would be required.

4.3.4.14.2.2 Missile Site Radar—Environmental Justice

Environmental justice impacts at the Missile Site Radar would be the same as described for Cavalier AFS.

4.3.4.14.2.3 Remote Sprint Launch Site 1—Environmental Justice

Environmental justice impacts at the Remote Sprint Launch Site 1 would be the same as described for Cavalier AFS.

4.3.4.14.2.4 Remote Sprint Launch Site 2—Environmental Justice

Environmental justice impacts at the Remote Sprint Launch Site 2 would be the same as described for Cavalier AFS.

4.3.4.14.2.5 Remote Sprint Launch Site 4—Environmental Justice

Environmental justice impacts at the Remote Sprint Launch Site 4 would be the same as described for Cavalier AFS.

4.3.4.15 Subsistence

This section addresses potential subsistence-related impacts due to changes caused by the construction and operation of the XBR element. These impacts include potential effects from ongoing projects and activities at these sites. The following criteria were used to determine potential impacts:

- Are there any subsistence activities occurring on the land potentially affected
- Construction or operational activities that may reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes
- Construction or operational activities that may limit or deny reasonable access to subsistence resources on public lands

4.3.4.15.1 Eareckson AS—Subsistence

Under the Proposed Action, an XBR could be constructed and become operational at Eareckson AS. This action will have no effect on subsistence, since access to the island is restricted to site-related personnel and no hunting is allowed. In addition, deployment of the XBR would not affect any subsistence uses or subsistence resources in the water surrounding the island.

Cumulative Impacts

Eareckson AS could also be the location of an IFICS Data Terminal as part of the NMD program. However, it still would not change its subsistence status. No other programs have been identified that would contribute to cumulative subsistence impacts.

Mitigation Measures

No mitigation measures would be required.

4.3.5 FIBER OPTIC CABLE LINE

To provide a communication line between NMD elements, a fiber optic cable line may be required for potential deployment in Alaska and North Dakota. In Alaska, fiber optic cable would be laid in the ocean along the Aleutian Islands, and in Interior Alaska to connect potential NMD elements in central Alaska. In North Dakota, the cable would be laid in the ground. The laying of fiber optic cable for the NMD program would be performed by a commercial fiber optic cable installation company per regional guidelines. In addition to the laying of new fiber optic cable lines, some connection terminals may need to be shielded to protect them against high altitude electromagnetic pulse. This would only require minor changes to the terminals.

Consistent with Council on Environmental Quality regulations, the scope of the analysis presented in this EIS for the fiber optic cable line was defined by the range of potential environmental impacts that would result from implementation of the Proposed Action. Resources that have a potential for impacts were considered in the analysis to provide the decisionmakers with sufficient evidence and analysis for evaluation of potential effects of the action. For this EIS, the environment is discussed in terms of 15 resource areas. Initial analysis indicated that the potential deployment of the fiber optic cable line in Alaska and North Dakota would not result in short-or long-term impacts to air quality, airspace, hazardous materials and hazardous waste management, health and safety, land use, noise, socioeconomics, transportation, utilities, and environmental justice. The reasons for not addressing these resource areas in Alaska and North Dakota is briefly discussed in the following paragraphs.

Alaska

Air Quality. In Alaska, the fiber optic cable line laying operation would occur in both the ocean and on land. The only source of air emissions would be associated with the fiber optic cable line laying ship and trenching equipment, which would be short-term; therefore, there would be no impact to air quality, and this resource area is not analyzed further.

Airspace. Under the Proposed Action, there are no requirements for any restricted airspace for the fiber optic cable line deployment as a result of the NMD program; therefore, there would be no impact to regional airspace, and this resource area is not analyzed further.

Hazardous Materials and Hazardous Waste Management. Other than the temporary use of hazardous materials and generation of hazardous waste for maintenance of equipment during the fiber optic cable line laying process, no hazardous materials would be used or hazardous waste generated once the cable is deployed; therefore, there would be no

impact to hazardous materials and hazardous waste management, and this resource area is not analyzed further. Potential impacts to water quality from any spill that may occur from equipment maintenance during the fiber optic cable line laying process is addressed below.

Health and Safety. The laying of fiber optic cable line for the NMD program would be similar to any commercial cable laying operation, and no health and safety risks have been identified to the public. Therefore, there would be no impact to public health and safety, and this resource area is not analyzed further.

Land Use. The laying and operation of the fiber optic cable line would not change land use at or around the fiber optic cable line; therefore, there would be no impact to local or regional land use, and this resource area is not analyzed further.

Noise. The main noise generated under the Proposed Action would be from the initial fiber optic line laying procedure, which would be short-term and affect a small area around the laying operation; therefore, there would be no noise-related impacts, and this resource area is not analyzed further.

Socioeconomics. The only effect from fiber optic cable line to the socioeconomic resource would be related to short-term construction jobs, and temporary disruption of transportation corridors and fishing areas during laying of the cable. No long-term impacts would be anticipated. Once laying of the cable is complete in a given area, there would be no socioeconomic impacts. Overall no impacts to the socioeconomic resource area would occur, and this resource area is not analyzed further.

Transportation. The laying of fiber optic cable line in the ocean may cause some temporary disruption of ocean vessels but this would be short-term; therefore, there would be no impact to local or regional transportation resources, and this resource area is not analyzed further.

Utilities. There would be no use of utilities during the laying or operation of the fiber optic cable line other than minor amounts of electricity; therefore, there would be no impact to utilities, and this resource area is not analyzed further.

Environmental Justice. Other than short-term impacts that may occur during the cable laying process, no long-term disproportionate impacts to minority or low-income populations would occur from the fiber optic cable line deployment; therefore, this resource is not analyzed further.

North Dakota

Air Quality. Most of the fiber optic cable line laying operation would occur along existing transportation right of ways. The only source of air

emissions would be associated with the fiber optic cable line laying equipment, and any minor amounts of dust generated which would be short-term; therefore, there would be no impact to air quality, and this resource area is not analyzed further.

Airspace. Under the Proposed Action, there are no requirements for any restricted airspace for the fiber optic cable line deployment as a result of the NMD program; therefore, there would be no impact to regional airspace, and this resource area is not analyzed further.

Hazardous Materials and Hazardous Waste Management. Other than the temporary use of hazardous materials and generation of hazardous waste for maintenance of equipment during the fiber optic cable line laying process, no hazardous materials would be used or hazardous waste generated once the cable is deployed; therefore, there would be no impact to hazardous materials and hazardous waste management, and this resource area is not analyzed further. Potential impacts to water quality from any spill that may occur from equipment maintenance during the fiber optic cable line laying process is addressed below.

Health and Safety. The laying of fiber optic cable line for the NMD program would be similar to any commercial cable laying operation and no health and safety risks have been identified to the public. Therefore, there would be no impact to public health and safety, and this resource area is not analyzed further.

Land Use. The laying and operation of the fiber optic cable line would not change land use at or around the fiber optic cable line; therefore, there would be no impact to local or regional land use, and this resource area is not analyzed further.

Noise. The main noise generated under the Proposed Action would be from the initial fiber optic line laying procedure, which would be short-term and affect a small area around the laying operation; therefore, there would be no noise-related impacts, and this resource area is not analyzed further.

Socioeconomics. The only effect from the fiber optic cable line to the socioeconomic resource would be related to short-term construction jobs and temporary disruption of transportation corridors during laying of the cable, no long-term impacts would be anticipated. Once laying of the cable is complete in a given area, there would be no socioeconomic impacts. Overall no impacts to the socioeconomic resource area would occur, and this resource area is not analyzed further.

Transportation. The laying of fiber optic cable line may cause some temporary disruption of traffic along the roads but this would be short-

term; therefore, there would be no impact to local or regional transportation resources, and this resource area is not analyzed further.

Utilities. There would be no use of utilities during the laying or operation of the fiber optic cable line other than minor amounts of electricity; therefore, there would be no impact to utilities, and this resource area is not analyzed further.

Environmental Justice. Other than short-term impacts that may occur during the cable laying process, no long-term disproportionate impacts to minority or low-income populations would occur from the fiber optic cable line deployment; therefore, this resource is not analyzed further.

4.3.5.1 Alaska

To provide a communication link between the NMD elements in Alaska, new fiber optic cable line would be required to connect some of the elements to the existing cable network. Cable in Alaska would be required for both interior locations and an ocean route out to Eareckson AS on the Aleutians Islands.

Land Fiber Optic Cable

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 the existing cable. This would require connections from the main line to the NMD element on that installation. In addition, to meet NMD reliability and security requirements, some longer redundant lines may be needed in central Alaska. These redundant lines would provide back-up communication in the event the primary line becomes in-operational. It is expected that the new fiber optic cable lines would utilize existing utility or road corridors when possible; however, there is the potential that undeveloped land would be used. Potential impacts would be short-term during the construction period and limited in scope given the small area of disturbance required for the fiber optic cable line. Since none of the Interior Alaska sites has any threatened or endangered species, few impacts to biological resources would be expected. Potential wetland areas would be avoided where possible or restored once the cable laying process is complete. If wetlands are anticipated to be impacted, consultation with the appropriate agencies would be conducted and appropriate permits would be obtained. If the proposed route crosses streams/rivers determined to have Essential Fish Habitat, a Fish Habitat Permit from the Alaska Department of Fish and Game would be required. Additionally, directional drilling may be required if the route crosses anadromous fish streams. Prior to the cable laying process, the appropriate cultural resources regulations would be followed to ensure no impacts to cultural resources would occur. Given the limited disturbance area during construction, few impacts to geology and soils or water

resources would be expected. Once the cable laying process is complete and the land restored, no impacts would be expected.

Ocean Fiber Optic Cable

In order to provide a communication link to the potential XBR on Eareckson AS (Shemya Island), new fiber optic cable line would be required. This would likely require one line along the Aleutian Islands and a second redundant line connecting to existing cable in the central Pacific or along the northwestern United States, or a new route north of the Aleutian Islands. The only route that has been planned is the route along the Aleutian Islands; the second redundant fiber optic cable alignment has not yet been determined.

The fiber optic cable line along the Aleutian Islands for Alaska would include a cable from Whittier or Seward to Eareckson AS. The exact alignment for this fiber optic cable line has not been determined but would basically run along the Aleutian Islands. The following analysis is based on an initial study for a proposed fiber optic cable line along the Aleutian Islands. The analysis includes the general types of impacts expected from laying the fiber optic cable line in both a shallow and deep ocean environment, and would therefore include the types of impact expected on any fiber optic cable alignment (e.g., central Pacific or northwestern United States, or north of the Aleutian Islands). If it is determined that fiber optic cable lines are required to connect the XBR at Eareckson AS, a detailed ocean bottom survey would be conducted to determine the exact alignment of the fiber optic cable lines. Once the survey is completed, the proposed alignment would be reviewed against the analysis in this EIS to determine if supplemental environmental documentation is required. The appropriate Federal, state, and local agencies would be informed of any proposed changes or additions to the fiber optic cable line route.

The main potential for impacts as a result of laying the cable would be to biological resources in the ocean and to fishermen that use the surrounding water. The fiber optic cable would be buried at a depth of 1 meter (3 feet) or more up to 1,372 meters (4,500 feet) to avoid interference with fishing equipment and activities. In addition, once the cable is put in place, the location may be noted on oceanic charts to assist fisherman in avoiding snagging their equipment on the cable. The cable would be approximately 8 centimeters (3 inches) in diameter. The cable laying ship moves at approximately 5 kilometers (3 miles) per hour and operates 24 hours a day. This constant movement by the ship would help avoid any scheduling conflicts with fisherman since the ship would not be in any one place for more than a few minutes. Once the cable is in place normal fishing activities can resume. Overall, it is not expected that the cable laying process would impact fishing schedules.

The general types of impacts that could be expected from this activity are described in the following paragraphs.

4.3.5.1.1 Biological Resources

Plankton, Algae, and Marine Invertebrates

Cable laying activities will produce impacts that will affect the environment for the length and width of the cable and trench (table 4.3.5-1). Trenching will occur whenever soft sediments are found in less than 1,372 meters (4,500 feet) of water. Wherever trenching occurs, the sea floor substrate will be directly disturbed. Any benthic biota, almost exclusively invertebrates, directly in the path of the trench that are non-motile will be displaced or killed. The areas immediately to either side of the trench will be buried by the material removed from the trench. This will, again, cause displacement or death.

Table 4.3.5-1: Summary of Impacts—Plankton, Algae, and Marine Invertebrates

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Trenching and cable laying	Once	2 months	Entire route of cable	Direct disturbance to benthic communities	Short-term destruction to habitat
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is susceptible to fishing gear contact	Possible new habitat for benthic communities	Long-term enhancement of habitat diversity
Cable repairs	Occasionally	1 week	Localized at site of cable damage	Direct disturbance to benthic communities	Short-term destruction to habitat

An unknown percentage of the invertebrates displaced will be consumed by other invertebrates or fishes. Fishes, in particular, are likely to be attracted to the disturbance. Any potential prey uncovered or displaced by the trenching are likely to be consumed. The result of this impact in the deeper waters offshore would be very minor. The deeper sea floor covers many thousands of square miles of fairly uniform habitat. Since the area actually disturbed will be very small, the direct impact will be very small. Most of the small benthic invertebrates affected have high reproductive rates and the ability to move at least short distances, and any impact will be reversed within a short time by recruitment or immigration from nearby areas.

Impacts on rocky bottoms, both in the intertidal and subtidal regions are likely to be of longer duration. Algae and sessile invertebrates will be killed by either trenching or cable laying. Trenching might occur through the intertidal at one or more sites. The disturbance to the rocky substrate would kill any algae or invertebrates present. This type of

habitat is recolonized much more slowly, so a scar would exist for much longer. However, since there are few locations where this might occur, the impact would be very minor.

Laying the cable on rocky substrate in deeper water would also cause direct damage to any algae or invertebrate communities present. Laying the cable would crush any invertebrates or algae directly under it. After installation, the presence of the cable, especially of it were subject to any movement after installation, could constantly damage any invertebrates or algae present. The duration of the damage could last as long as the cable were present, but the extent of the damage would be quite small, as the area affected is quite small.

The results of cable repairs are likely to be the same as cable laying, with the exception of a much smaller area involved.

Fishes

Impacts of the project include displacement of some fishes away from construction activities (table 4.3.5-2). As the plow is dragged through soft sediments during cable laying activities, there will be a mechanical disturbance of the sediments and the water column. The sediment disturbance may physically push fishes away from the trench. Noise may also be a concern, forcing fishes to move away. Increases in turbidity from the trenching may irritate fish gills.

Table 4.3.5-2: Summary of Impacts—Fishes

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Cable laying vessel movements/ activities	Once	2 months	Entire route of cable	None	None
Trenching and cable laying	Once	2 months	Entire route of cable	Some species may flee disturbance, some may be attracted to disturbance	Short-term change in fish density and activities
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is susceptible to fishing gear contact	May provide micro-habitats	Potential long-term increase species diversity
Cable repairs	Occasionally	1 week	Localized at site of cable damage	Localized interference with fishing activities	Short-term change in fish density and activities

Some species will be attracted toward the disturbance as a potential food source. These fishes will be primarily feeding on displaced or fleeing invertebrates. While the effects will be negative on the prey, no impacts are expected for the fishes.

Fisheries

Provided below are the potential impacts to shellfish, finfish, and other finfish species. Also provided is an evaluation to Essential Fish Habitat along the proposed fiber optic cable route.

Project impacts on crab fisheries include potential disturbance of benthic feeding or nursery habitat, direct mortality of juvenile or adult crabs, or indirect impacts on crabs or their habitat from trenching activities (table 4.3.5-3). These are all short-term impacts that would occur only during cable laying operations. Important nursery and adult feeding areas, egg concentration areas, larval and juvenile crab concentration areas, and spawning areas have been mapped as part of a Federal effort to define Essential Fish Habitat (North Pacific Fisheries Management Council, 1998—Essential Fish Habitat Assessment Report for the Bering Sea and Aleutian Islands King and Tanner Crabs). These maps will give guidance to areas in the study area that may be sensitive to disturbance, although not all areas are sensitive year-round.

Table 4.3.5-3: Summary of Impacts—Fisheries

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Cable laying vessel movements/ activities	Once	2 months	Entire route of cable	None	None
Trenching and cable laying	Once	2 months	Entire route of cable	Direct interference with fishing activities	Short-term change in fishermen's fishing activities
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is susceptible to fishing gear contact	Direct interference with fishing gear	None
Cable repairs	Occasionally	1 week	Localized at site of cable damage	Localized interference with fishing activities	Localized and short-term change in fishermen's fishing activities

Herring and salmon are fished inshore with shallow gear, so they would not be impacted by the project. Potential impacts of the cable on the groundfish fishery include some remote chance of trawl, longline, pot, or jig gear snagging a section of cable. The longlines used in many fisheries may be strengthened to withstand abrasion with the deck gear used to set and retrieve the longline skates and to withstand the pressures of gear setting and retrieval. This stout gear and particularly the anchors attached at both ends could snag the subsea cable, causing either fishing gear loss or damage to the fiber-optic cable line.

Impacts of the proposed project on the harvest of other finfish species will be minimal since skates, sharks, and other species described above are harvested along with other species and are not the subject of a current directed fishery. Impacts would be the same as described above for other groundfish fisheries conducted with trawls, longlines, jigs, or pots.

Essential Fish Habitat Evaluation. There is little likelihood of negative impacts to the fisheries habitat along the proposed fiber optic cable line route. The primary reason is that most of the length of the fiber optic cable is in water much deeper than these fisheries are found. A great deal of the fiber optic cable crosses water from 1,000 to 3,000 meters (3,280 to 9,840 feet) deep.

The mid-water habitat will not be disturbed during the fiber optic cable-laying activities. The only interaction will be the fiber optic cable dropping through the water as it is laid.

Substrate disturbance during the fiber optic cable-laying activities will vary with the substrate and depth. The fiber optic cable will be laid directly on the substrate whenever the water depth is greater than 1,370 meters (4,500 feet). Few species inhabit these depths, and those that do are not fished heavily. The project is therefore not likely to have a measurable impact to the habitat for the species present.

Approximately one-half of the route is likely to be in water shallow enough to require trenching and fiber optic cable burial. Of the 1,800 kilometers (1,118 miles) crossing shallow water, only a portion will be across soft sediments. Where the plow is used for trenching and fiber optic cable burial, the trench will disturb a swath less than 2 meters (6.5 feet) wide. For each kilometer (0.6 mile) of alignment, the disturbed area covers a maximum of 2,000 square meters (2,400 square yards). Over the 3,600-kilometer (2,237-mile) length of the fiber optic cable route, the area disturbed is likely to be between 3.6 and 7.2 square kilometers (1.4 and 2.8 square miles), assuming between 50 and 100 percent of the shallow habitat is fine sediments. Since the continental shelf and slope along the route covers many thousands of square kilometers, the area impacted is likely to be a very small fraction of 1 percent of that area.

The impacts that do occur are of short duration, and are expected to be insignificant.

The substrate disturbance that occurs is likely to be temporary. Mounds will be produced along both sides of the trench as it is opened. Much of the sediment will collapse back into the trench immediately after the plow passes. The soft sediments will be further reworked by infauna and epifauna starting shortly after the disturbance occurs. As the reworking occurs, gravity and even minor currents will work together to smooth out the fiber optic cable alignment.

Re-colonization of the disturbed fiber optic cable alignment is likely to be rapid along the continental shelf. Many of the infaunal species present are rapid colonizers. They, along with inmigration by members of longer lived species moving into the area from outside the disturbance zone, will allow biomass to return quickly. In areas where there is little infauna and epifauna to rework the sediment, the habitat is likely to be of low quality, and therefore of little value to the fisheries.

When crossing rocky habitat, placement of the fiber optic cable is likely to have no effect on physical habitat. The weight of the fiber optic cable will keep it in place. Any effect on existing biota will be minimal. Any habitat covered by the fiber optic cable will in turn be replaced by new habitat for small sessile or benthic biota provided by the fiber optic cable. In particular, the fiber optic cable will provide small-scale refugia and habitat complexity wherever the fiber optic cable is on the surface.

The fish and invertebrate species for which there are management plans, including scallops, are mobile, and as such are capable of movement to evade the equipment being dragged across the ocean floor during the fiber optic cable laying operations. In those areas along the fiber optic cable where these species occur, the greatest effect expected is an attraction of some groundfish and flatfish species to the vicinity of the plow as it is dragged across the ocean floor. They are likely to be drawn to the disturbance, and also to prey items in the water column or on the sediment surface displaced as a result of the plowing. The resulting feeding effects at any given location are likely to be short-term, as the plow is pulled across the substrate. The prey species are not likely to be depleted during the short duration and limited area of the disturbance.

A limited number of areas along the fiber optic cable line route are closed to scallop dredging to protect essential habitat in the Bering Sea and Gulf of Alaska. One of these areas is north of Adak Island, in the Bering Sea. The other is south of Unimak Island in the Gulf of Alaska. In both cases the potential for disturbance to scallop beds is minimal, since the water depths along the route are typically over 3,650 meters (12,000 feet) deep. Typically, the maximum depth of scallops is 300 meters (985 feet), with the greatest population concentrations found between 45 and

130 meters (150 and 425 feet) deep; therefore, few impacts to scallops would be anticipated since the depth of the fiber optic cable would be much greater than the range given for scallops.

The areas that are closed to protect king crab habitat in the Bering Sea and the Gulf of Alaska will not be crossed by the fiber optic cable line.

Many of the streams and water bodies along the route provide fish spawning, rearing, and migration habitat. There is one stream in Whittier, three in Monashka Bay on Kodiak Island, and several along the route across Umnak Island, and along the Aleutians. Trenching and other construction activities in the vicinity of these streams could cause damage to spawning habitat due to excessive erosion, siltation, alteration of natural drainage patterns, and water quality deterioration. Impacts on anadromous fish streams are only expected if trenching and/or construction occurs near the streams. Timing construction activities to avoid major spawning runs would eliminate most impacts.

Other than the unlikely potential for an oil or fuel spill from the ships laying the fiber optic cable line, the current proposed project should have no significant short-term or long-term impacts to Essential Fish Habitat along the proposed route.

Potential impacts to anadromous fish streams for the interior Alaska GBI sites was evaluated in section 4.2.3.1. Although there are several anadromous fish streams near the potential GBI sites, given the level topography, distance to the streams, small amount of precipitation, and lack of drainage courses near the sites, no direct or indirect impacts would occur to any anadromous streams.

Measures to mitigate environmental impacts would depend on actual siting of the proposed NMD components and the value of the habitats that could potentially be impacted. Any mitigation required would be developed in coordination with applicable agencies. Listed below are suggested mitigation measures to minimize or reduce impacts.

Terrestrial

Terrestrial landings of the cable have been proposed for Whittier, Seward, Kodiak Island, Umnak Island, and Shemya Island. An unknown amount of time will be required for construction at each of these landing sites to build terminal facilities, and to trench and bury the cable between the shoreline and the facility. Cable conduits may be either buried or directionally drilled through the surf zones at each site in order to speed the installation of the cables and safeguard the cable once it is in place. Impacts of construction at Whittier, Seward, Kodiak, and Shemya are likely to be localized and temporary, with minor

disturbances to terrestrial fauna, and minor changes in the terrestrial landscape (table 4.3.5-4).

Table 4.3.5-4: Summary of Impacts—Terrestrial Habitats

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Onshore construction activities and terrestrial/ aquatic habitat disturbance at landfall tie-in sites	Once	2 months	Localized during construction activities at tie-in site	Disturbance of terrestrial animals and/or aquatic organisms and terrestrial and/or aquatic habitat	Reduced carrying capacity of habitats altered by permanent onshore facilities
Onshore contaminant spills	Rare	1 day to long term	Localized during construction activities on land	Mortality of terrestrial animals, plants, and/or aquatic organisms. Localized damage to/contamination of terrestrial and/or freshwater habitat	Sublethal and delayed mortality of terrestrial animals, plants, and/or aquatic organisms. Reduced carrying capacity of damaged habitats for plants and animals

Terrestrial impacts are anticipated to be greatest at the Umnak landing site due to the extensive trenching that will be necessary to bury the cable between Driftwood Bay and Nikolski. This will cause more disturbance of the flora at this site, as well as more extensive and longer-lasting construction-related disturbance of the terrestrial fauna. Trenching will be more extensive, potentially crossing wetlands and anadromous fish streams, and the period of construction will be longer than that of the other landing sites.

Seasonal timing and length of construction period will be major factors in the amount of environmental impact. Wildlife that is present should be accustomed to human disturbance, making project impacts minimal. Potential impacts include:

- Disruption of normal behavior patterns due to general activity and presence of humans and noise associated with construction activities, vehicle traffic, trenching, etc.
- Reduced carrying capacity of habitats altered by permanent onshore facilities
- Disruption of nesting and breeding due to general activity and presence of humans and noise associated with construction activities, vehicle traffic, trenching, etc.
- Disturbance of fall/spring staging areas and/or nesting and breeding areas
- Alteration of nesting habitat

- Reduced carrying capacity of habitats altered by permanent onshore facilities
- Potential attraction to lights of cable-laying boats at night—possible collision mortality

Timing construction activities to avoid nesting and breeding periods would eliminate many impacts.

Many of the streams and water bodies along the route provide fish spawning, rearing, and migration habitat. There is one stream in Whittier, three in Monashka Bay on Kodiak Island, and several along the route across Umnak Island, and along the Aleutians. Trenching and other construction activities in the vicinity of these streams could cause damage to spawning habitat due to excessive erosion, siltation, alteration of natural drainage patterns, and water quality deterioration. These impacts can be minimized through mitigation measures, such as the use of filter fabric silt fences along construction areas. Impacts on anadromous fish streams are only expected if trenching and/or construction occurs near the streams. Timing construction activities to avoid major spawning runs would eliminate most impacts.

The proposed cable route may cross several types of wetland on Umnak Island, including intertidal wetlands, marshes, bogs, and wet sedge meadows. These wetlands could potentially be affected by the project through filling, draining, trenching and other general construction activities. Because wetlands generally constitute valuable wildlife habitat, any significant changes to these wetlands will likely result in subsequent impacts on wildlife of the area. Some functions of wetlands that may be affected by project impacts include:

- Recharging and discharging of groundwater
- Lowering flood peaks by retaining flood waters
- Protecting banks and shores from erosion by flood waters
- Retaining sediments and toxic substances that may be harmful to downstream habitats
- Producing and exporting organic matter that may support downstream food chains
- Providing fish and wildlife habitat

Use of an existing road system across Umnak will limit the effects on wetlands to the relatively small area of trenching necessary to bury the cable adjacent to the road. Implementation of appropriate erosion control procedures and other management practices will minimize water quality impacts. Compliance with the necessary wetlands permits required by

the U.S. Army Corps of Engineers will also work to minimize impacts. Overall impacts to Umnak's wetlands are anticipated to be minimal.

Marine Mammals

Although the fiber optic cable line will pass adjacent to known marine mammal rookeries in the Aleutian Islands, no project activities are proposed at the rookeries (table 4.3.5-5). The proposed project should have no significant direct impacts on marine mammals in the Aleutian Islands area. To reduce potential disturbance to hauled out Steller sea lions, the cable-laying vessel should not operate within three nautical miles of the Steller sea lion rookeries or the major haulouts identified in the Gulf of Alaska or Bering Sea. The only potential indirect impact that may be caused by the fiber optic cable line project to the marine mammals is related to disturbance of the benthic and epibenthic environmental areas designated as Steller sea lion critical aquatic habitat where some prey species of marine mammals may be displaced.

Table 4.3.5-5: Summary of Impacts—Marine Mammals

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Cable laying vessel movements and activities	Once	2 months	Entire route of cable	Disturbance to haulouts/rookeries	None
Trenching and cable laying	Once	2 months	Entire route of cable	None	None
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is suspended over submarine trenches	Large baleen whales contacting cable during feeding	None
Cable repairs	Occasionally	1 week	Localized at site of cable damage	Disturbance to marine mammal haulouts or rookeries near activities	None

Marine Birds

Although the fiber optic cable line will pass adjacent to known marine bird colonies in Prince William Sound, the Gulf of Alaska, and the Bering Sea, no activities are proposed at the colonies. Other than the potential for collisions of birds attracted to the lights of ships laying cable at night, the currently proposed project should have no significant direct impacts on marine birds in any of these areas (table 4.3.5-6). Any loud noises within 1 to 2 kilometers (0.6 to 1.2 miles) of the colony might disturb seabirds, especially during the period of nesting, egg-laying, hatching, and early growth of chicks. These noises include, but are not limited to, blowing a ship's horn, dropping heavy items on deck, launching small

boats with noisy outboard motors, and messages to the crew over loudspeakers. These noises would be especially disturbing under calm conditions or with a light wind blowing toward the colony. However, the noise impact would be very short-term, as the ship moves at 5 kilometers (3 miles) per hour. The only potential indirect impacts on marine birds is related to disturbance of the benthic and epibenthic environment where some prey species of marine birds are likely to be displaced.

Table 4.3.5-6: Summary of Impacts—Marine Birds

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Cable laying vessel movements and activities	Once	2 months	Entire route of cable	Attraction to ship(s) and possible collision mortality	None
Trenching and cable laying	Once	2 months	Entire route of cable	None	Minor short-term impacts on benthic and epibenthic food supply
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is susceptible to fishing gear contact	None	Minor short-term impacts on benthic and epibenthic food supply
Cable repairs	Occasionally	1 week	Localized at site of cable damage	Attraction to ship(s) and possible collision mortality	None

Endangered Species, Threatened Species, or Species of Special Concern

There are several potential impacts of the proposed project to listed marine mammals. Although the fiber optic cable line would pass adjacent to known Steller sea lion rookeries and major haulouts in the Gulf of Alaska and Aleutian Islands, no activities are proposed at or within 3 nautical miles of the identified major haulouts or rookeries. The only known potential indirect impact on marine mammals is related to disturbance of the benthic and epibenthic environment in areas designated as Steller sea lion critical aquatic habitat (50 CFR 226.12; Bogoslof Area) where some prey species of marine mammals may be displaced.

The fiber optic cable line would pass through offshore habitat where the threatened or endangered bird species could occur; no activities are proposed that would have an impact on this species. Other than the unlikely potential for collisions of birds attracted to the lights of ships laying cable at night, the currently proposed project should have no significant impacts on any of the bird species listed.

Terrestrial impacts are anticipated to be greatest at the Umnak landing site due to the trenching that would be necessary to bury the cable

between Driftwood Bay and Nikolski. This would cause more disturbance of the flora at this site, as well as more extensive and longer-lasting construction-related disturbance of the terrestrial fauna. Trenching would be more extensive, potentially crossing wetlands and anadromous fish streams, and the period of construction would be longer than that of the other landing sites.

Seasonal timing and length of construction period would be major factors in environmental impact. Wildlife that is present should be accustomed to human disturbance, making project impacts minimal. Potential impacts include:

- Disruption of normal behavior patterns due to general activity and presence of humans and noise associated with construction activities, vehicle traffic, trenching, etc.
- Reduced carrying capacity of habitats altered by permanent onshore facilities
- Disruption of nesting and breeding due to general activity and presence of humans and noise associated with construction activities, vehicle traffic, trenching, etc
- Disturbance of fall/spring staging areas and/or nesting and breeding areas
- Alteration of nesting habitat
- Reduced carrying capacity of habitats altered by permanent onshore facilities
- Potential attraction to lights of cable-laying boats at night—possible collision mortality

Timing construction activities to avoid nesting and breeding periods would eliminate many impacts.

These impacts are not considered to be serious (table 4.3.5-7). Most are short-term, and of minimal impact during that time. All are based on worst case scenarios. Under normal conditions, none are likely to occur. None are expected to have measurable consequences on the species listed above.

Table 4.3.5-7: Summary of Impacts: Endangered, Threatened and Species of Special Concern

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Cable laying vessel movements/ activities	Once	2 months	Entire route of cable	Possible attraction of birds to ship(s) and possible collision mortality, disturbance to marine mammals haul-outs and rookeries	None
Trenching and cable laying	Once	2 months	Entire route of cable	None	None
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is suspended over submarine trenches	Large baleen whales contacting cable during feeding	None
Cable repairs	Occasionally	1 week	Localized at site of cable damage	Possible attraction of birds to ship(s) and possible collision mortality, disturbance to marine mammals haul-outs and rookeries	None
Onshore construction activities and terrestrial/aquatic habitat disturbance at landfall tie-in sites	Once	2 months	Localized during construction activities at tie-in site	Disturbance of terrestrial animals and/or aquatic organisms and terrestrial and/or aquatic habitat	Possible reduced carrying capacity of habitats altered by permanent onshore facilities

Cumulative Impacts

Because the project primarily involves laying the cable, with little activity later, there are not expected to be any long-term cumulative impacts to the marine biota, fishes, or marine birds.

The cumulative effects could be both short-term and long-term to fisheries. The effects of the cable laying are likely to be of short duration, and in a very small area compared to the vast areas nearby that would not be affected. Long-term cumulative impacts to fishermen are expected to be minimal because the cable would be buried where fishing equipment is likely to come in contact within it. However, there is the small potential for snagging of the cable by fishing gear in some areas. Snagging could be an ongoing problem for the fisherman, and possibly for the integrity of the cable. Mitigation might require discussions with fishermen to minimize the length of cable crossing valuable fishing areas.

The cumulative impacts to the terrestrial environment are expected to be short-term. Construction will affect terrestrial environments during trenching. Long-term cumulative impacts, however, are not expected. Efforts to protect stream and wetland environments will prevent adverse impacts. There are expected to be no cumulative impacts from the project to marine mammals. As noted above, there are no activities planned within the immediate vicinity of any rookery or haulout.

Cumulative impacts are possible, but not likely, for several threatened or endangered species or groups discussed. Activities too close to rookeries or feeding grounds could force sea lions to move away, lowering their potential for success. This is not likely, as the cable laying activities should remain outside of the buffers described by law to protect them. The birds are not likely to be impacted by the project, because the cable laying activities will be of short duration, and only along corridors inspected to verify they will not disturb any of the above mentioned species. Therefore, there are not expected to be any cumulative impacts to endangered or threatened species or species of concern.

Mitigation

Potential impacts of the cable on the groundfish fishery include interference during cable laying, and some remote chance of trawl, longline, pot, or jig gear snagging a section of cable. Mitigation might require discussions with fishermen to minimize the length of cable crossing valuable fishing areas.

Timing construction activities to avoid nesting and breeding periods would eliminate many impacts to the terrestrial environment. There is one stream in Whittier, three in Monashka Bay on Kodiak Island, and several along the route across Umnak Island. Trenching and other construction activities in the vicinity of these streams could cause damage to spawning habitat due to excessive erosion, siltation, alteration of natural drainage patterns, and water quality deterioration. These impacts can be minimized through mitigation measures, such as the use of filter fabric silt fences along construction areas. Impacts on anadromous fish streams are only expected if trenching and/or construction occurs near the streams. Timing construction activities to avoid major spawning runs would eliminate most impacts.

Other potential mitigation measures for the proposed fiber optic cable include the following recommendations from the NMFS (see chapter 9, written comment P-W-068):

- Preliminary bottom survey results and potential fiber optic cable routes should be shared with the NMFS and the North Pacific Fisheries Management Council. Placement of the fiber optic cable should avoid, to the greatest extent practicable,

sensitive habitat areas such as submerged aquatic vegetation and scallop beds.

- To determine what habitats the fiber optic cable crossed and to assess the effects upon those habitats, it is recommended that the fiber optic cable laying process be filmed at the point of cable contact, or plow insertion at the bottom substrate. To identify species of flora and/or fauna the camera should record color pictures, have enough light to discern details, and be aimed so that items in front of the plow can be identified. The video should be recorded with time, depth, and location burned into the corner of the film. A copy of the video should be provided to the NMFS. The information would be useful in determining habitats affected and potential impacts for the second redundant line, if needed.
- Fiber optic cable laying should include timing to avoid areas where fishing openers are occurring. Coordination should be done with the North Pacific Fisheries Council.
- In order to minimize impacts to nearshore habitat, cable landfalls should be directionally bored, avoiding trenching in beach fringes, intertidal, and sublittoral zones. The exact boring distances would be determined by a site-specific survey when the final location is determined.
- To minimize impacts to streams and riparian areas, cable crossing anadromous streams should be directionally bored, with no surface disturbance within 30 meters (100 feet) of ordinary high water on each side of the stream.

To reduce potential disturbance to hauled out Steller sea lions, the cable-laying vessel should not operate within 5.6 kilometers (3 nautical miles) of the Steller sea lion rookeries or the major haulouts identified in the Gulf of Alaska or Bering.

4.3.5.1.2 Coastal Consistency Determination—Fiber Optic Cable Line

It has been determined that installation of the fiber optic cable line would be consistent to the maximum extent practicable with the Alaska Coastal Management Program. Appendix G provides a detailed overview of the evaluation of the consistency determination with the 12 primary categories of the Alaska Coastal Management Program. It was determined that the fiber optic cable line would be consistent with coastal development and recreational activities along the Aleutian Islands. The laying of the cable would not impact subsistence, fishing, mining or mineral processing, or timber harvesting activities. The air, land, and water quality would not be impacted from the fiber optic cable line activities, and known geophysical hazards would be avoided. There may be some temporary short-term impacts to habitat during the initial laying of the cable, but no long-term impacts would be expected. Once the

actual route has been defined, consultation with the SHPO would be initiated to ensure no historic, prehistoric, and archaeological resources would be impacted. Prior to the laying of the cable, all necessary Federal, state, and local permits would be obtained.

4.3.5.1.3 Cultural Resources—Fiber Optic Cable Line

The exact route for the installation of the fiber optic cable line has not yet been finalized. The primary type of impact caused by installation of a fiber optic cable line is site disturbance. Once the exact location has been identified, record searches and/or surveys will be conducted to determine whether historic properties are present within the ROI. If historic properties are identified, potential effects will be analyzed, and any necessary mitigation measures developed in consultation with the Alaska SHPO.

Cumulative Impacts

There are no other known projects in the region that would result in cumulative impacts to historic properties.

Mitigation Measures

Before laying the fiber optic cable line, consultation would occur with the SHPO to identify historic properties and develop appropriate mitigation measures. These mitigation measures would include avoidance by altering the route of the fiber optic cable line, or if necessary, data recovery.

4.3.5.1.4 Geology and Soils—Fiber Optic Cable Line

The ocean floor would suffer no adverse impact from the fiber optic cable line alignment. The exact location of the cable route would be predicated on a sea floor survey for the proposed fiber optic cable line. For the offshore reaches, submarine sediments should be favorable for hydro-plow burial. The sea floor survey would reveal geologic features, such as fault scarps, emerging volcanoes, or subsurface landslide areas, that could require special cable engineering or routing. The offshore cable route would traverse high potential oil and gas resource lands within the Outer Continental Shelf planning area. The cable should not restrict exploration or potential development of the planning area. In addition, no impact to marine sediments or the ocean floor was determined in an EA prepared for a similar cable laying project from Whittier, Alaska to the State of Washington (U.S. Army Corps of Engineers, 1998—Alaska United Fiber System Partnership).

Shore landings will result in impacts to geology and soil ranging from minor to moderate, depending on the coastal geologic setting, wave action, the length of land traversed, and the presence of preexisting cable corridors or other utility structures established for similar purposes. Two

areas pose moderate potential for soil erosion due to the length of undeveloped area the cable must cross. At Kodiak (first shore landing) the cable would cross 457 meters (1,500 feet) of beach before reaching the existing utility corridors. At Umnak Island (the second shore landing) the cable would transition from the south side to the north side of the island. The cable would follow an existing dirt track and would tie at a terminal structure with a foot print of about 18 square meters (196 square feet). Shore landings at Shemya (third) would generally follow existing utility corridors and would constitute low potential impacts to geology and soils.

A detailed geotechnical survey would be made along the land corridor reaches to assess critical geologic and soil conditions that could be impacted by short-term excavation and long-term operation of the cable and support facility. The survey would also provide design recommendations for earthquake and faulting hazards as well as recommendations to enhance runoff diversion and storm wave and tsunami protection. No permafrost is anticipated along the route. Given the limited area of ground disturbance and short-term nature of the construction project there would be limited impacts from soil erosion. Best Management Practices will be implemented to control surface erosion of soils during construction near water bodies. Overall, no impacts to geology and soils are anticipated from laying of the fiber optic cable line.

Cumulative Impacts

No significant impact to the seabed or ocean environment is expected. Any environmental disturbance resulting from the fiber optic cable line laying or maintenance activity will be temporary, and no long-term cumulative impacts are expected.

Mitigation Measures

No mitigation measures would be required.

4.3.5.1.5 Water Resources—Fiber Optic Cable Line

The ocean environment would suffer no adverse impact from the fiber optic cable line project (table 4.3.5-8). The cable laying activities are likely to cause minor disturbance to sediments along the route wherever the cable is buried. The substrate will be dug up to a maximum depth of 2 meters (6 feet) and a width of less than 2 meters (6 feet). The cable will be set in the trench and buried. Damage to the sea floor will be minimal. Over time, currents will smooth over the trenching with sediment. No long-term impacts will result to the ocean floor or water column from the fiber optic cable line laying activity. In addition, no impact to marine sediments or water quality was determined in an EA prepared for a similar cable laying project from Whittier, Alaska to the

State of Washington (U.S. Army Corps of Engineers, 1998—Alaska United Fiber System Partnership).

Table 4.3.5-8: Impact Summary—Physical Oceanography

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Trenching	Once	2 months	Entire route of cable	Digging up bottom (habitat), increased turbidity	Short-term impacts to benthic biota
Burying cable	Once	2 months	Entire route of cable	Increased turbidity	Short-term impacts to benthic biota
Cable repairs	Occasionally	1 week	Where needed	Increased turbidity	Short-term impacts to benthic biota

Any repair to the fiber optic cable line that might occur will cause only a short-term, local disturbance to the ocean bottom. No long-term impacts to the ocean floor environment will result.

Cumulative Impacts

No significant impact to the seabed or ocean environment is expected. Any environmental disturbance resulting from the fiber optic cable line laying or maintenance activity will be temporary, and no long-term cumulative impacts are expected.

Mitigation Measures

No mitigation measures would be required.

4.3.5.1.6 Subsistence—Fiber Optic Cable Line

The most likely manner in which the project could impact community harvesters is if the project coincides with a community harvesting activity in time and area. Depending on the cable route location, the likelihood of this occurring is great as both the project and commercial/subsistence fishing/harvesting occur near shore and offshore during the summer months. Furthermore, the project is scheduled to be continuous over a several month period and will traverse areas of active fishing and harvesting. Thus, the potential for the project to affect commercial and subsistence fishing and other harvesting exists.

Potential and perceived impacts to commercial and subsistence harvesters may be caused by resource damage; for example, damage, including injury or death to individuals and/or resource population decline. Resource displacement or disturbance may also occur. For example, increased

turbidity or noise may cause target species to move temporarily, and if this coincides with local harvest efforts, it could cause a conflict between harvesters and the cable laying vessel. With commercial fishing openings, the project could be scheduled to avoid the fishing area during regularly scheduled fish openings. However, subsistence harvests do not typically have short openings but are open for longer periods of time. Conflicts could occur if the cable vessel is working in the vicinity of harvesters. Meetings in the communities would facilitate discussions between project personnel and community harvesters related to key harvest areas, times of harvests, and proposed cable corridors and cable laying schedules.

Diminished or loss of access to resources may be caused by either resource displacement as a result of cable laying activities or the cable laying vessel operating in active commercial or subsistence fishing and harvesting areas and potentially interfering with the fishing vessels as they set or retrieve gear. The potential exists for both activities to coincide at the same place at the same time, creating a conflict. Coordination with local fishing groups could facilitate scheduling cable laying activities.

Contact between fishing gear and the cable may occur where the cable crosses undersea canyons or rocky substrates and cannot be buried. This would primarily occur with crabbers and longliners. Community meetings could provide information to project personnel where key harvest areas are located and the relevant fishing seasons. In addition, community meetings would be instructive at Nikolski to inform residents of plans to cross the cable over land at their village, and also meetings would be useful at Kodiak and Unalaska to inform residents and discuss with them the cable onshore cable. In general, meetings or another public information process to inform community residents throughout the potentially affected area about the project would facilitate project personnel learning local concerns and potential mitigation measures.

If fishers are restricted from harvesting due to gear/cable vessel conflicts (e.g., the cable laying vessel is in the way while people are fishing), fishers snagging gear on exposed portions of the cable, or the displacement of target species, reduced harvest levels could result. For commercial fishers it could result in reduced income. However, given the short time required to lay the cable, these impacts would be temporary.

Harvesters may incur the following responses. If the project interferes with harvester efforts in traditional areas at normal times, harvesters may be required to increase their effort by spending longer time to harvest and travelling to other areas. Spending additional time and travelling further to harvest target species may increase the risk to harvesters as they go further into areas with which they are less familiar. Additional time and further distances traveled could increase the cost to the harvester. However, as noted above, this increased time and distance to fish caused

by the cable laying process would only occur for a day or two in any one area, and would therefore be temporary in nature.

An overview of potential impacts is provided in table 4.3.5-9.

Table 4.3.5-9: Community-Based Commercial and Subsistence Fishing Impacts

Action/Event	Frequency	Duration	Scope	Direct Impacts	Indirect Impacts
Cable laying vessel movements/activities	Once	2 months	Entire route of cable	Direct interference with fishing activities: potential to displace resource resulting in diminished access to resource; potential conflict between cable vessel and harvesters during harvest periods.	Temporary change in fishermen's fishing activities: harvesters may have to increase effort at greater risk and increased cost.
Trenching and cable laying	Once	2 months	Entire route of cable	Direct interference with fishing activities: potential to displace resource resulting in diminished access to resource; potential conflict between cable vessel and harvesters during harvest periods.	Temporary change in fishermen's fishing activities: harvesters may have to increase effort at greater risk and increased cost.
Presence of cable on bottom	Once	Long term	Portions of cable route where cable is susceptible to fishing gear contact	Direct interference with fishing gear	Temporary change in fishermen's fishing activities: harvesters would have to repair/replace lost gear and may have to increase effort at greater risk and increased cost.
Accidents/contaminant spills–offshore	Rare	1 day to long term	Localized during cable laying construction along cable route	Mortality of pelagic fish and crabs or demersal fish harvested by fishermen	Contamination concerns: harvesters fearful of eating potentially contaminated organism.
Cable Repairs	Occasionally	1 week	Localized at site of cable damage	Localized interference with fishing activities	Localized and temporary change in fishermen's fishing activities: harvesters may have to increase effort at greater risk and increased cost.

Cumulative Impacts

Cumulative impacts, if they occur, are likely to be short-term. They will most likely be related to conflicts between the fishermen and the cable laying operation. Meetings in the villages near the cable route to explain the project details and timing will help fishermen and the cable laying operation to plan around each other's activities.

The other cumulative impact would be loss of income from conflicts with the cable laying operations. This would have to be worked out between the fishermen and the contractor laying the cable. The potential for this type of problem is fairly low.

Mitigation Measures

Subsistence harvests do not typically have short openings but are open for longer periods of time, and conflicts could occur if the cable vessel is working in the vicinity of harvesters. Meetings in the communities would facilitate discussions between project personnel and community harvesters related to key harvest areas, times of harvests and proposed cable corridors and cable laying schedules.

In general, meetings or another public information process to inform community residents throughout the potentially affected area about the project would facilitate project personnel learning local concerns and potential mitigation measures.

4.3.5.2 North Dakota

The fiber optic cable line route for North Dakota is still being identified based on systems requirements. To the extent possible, the fiber optic cable line route would follow existing road, utility, or rail corridors in North Dakota. The analysis below includes the general types of impacts expected from laying the fiber optic cable line along the road, utility, and rail corridors. Once the fiber optic cable line route is selected through the siting process, it would be reviewed against the analysis in this EIS to determine if supplemental environmental documentation is required. The appropriate Federal, state, and local agencies would be informed and consulted with on the alignment of the fiber optic cable line route.

4.3.5.2.1 Biological Resources—Fiber Optic Cable Line

Vegetation

Vegetation within the ROI is indicative of disturbed areas and consists primarily of grasses and weedy species; however, some of the vegetation provides important habitat for wildlife. The remainder of the area in the fiber optic cable line ROI is used for agricultural purposes.

Wildlife

The wildlife habitat along the roadways is some of the only remaining within the region and has been found to be highly productive nesting sites for over 40 birds and animals that nest on the ground or in the low vegetation (U.S. Department of the Interior, 1999—comments received on the NMD Deployment Draft EIS). The types of wildlife would be similar to that described above for the North Dakota installations. Impacts would also be similar, although on a smaller scale, to those described above for North Dakota installations. Potential ways to minimize impacts are to time construction to allow for nesting and the restoration of habitat following construction.

Threatened and Endangered Species

Potential threatened and endangered species in the fiber optic cable line alignment area would be similar to those described above for the North Dakota installations. Additional species include the endangered gray wolf, black-footed ferret, and the pallid sturgeon. The gray wolf, an occasional visitor in North Dakota, and the black-footed ferret, normally found in forested areas in the north central part of the state in the Turtle Mountains, are, however, not likely to be affected. The pallid sturgeon is not known to exist within the ROI for the fiber optic cable line alignment (U.S. Department of the Air Force, 1999–Final EIS, Minuteman III Missile System Dismantlement).

Sensitive Habitats

The sensitive habitat would mainly consist of wetlands and prairie potholes that can be found along the roadways in North Dakota. This habitat provides nesting for migrating waterfowl and shorebirds and for other wildlife species. These wetlands have been found to be highly productive nesting sites for more than 40 kinds of birds.

The proposed cable route may cross several types of wetlands. These wetlands could potentially be affected by the project through filling, draining, trenching, and other general construction activities. Because wetlands generally constitute valuable wildlife habitat, any significant changes to these wetlands would likely result in subsequent impacts on wildlife of the area. Some functions of wetlands that may be affected by project impacts include:

- Recharging and discharging of groundwater
- Lowering flood peaks by retaining floodwaters
- Protecting banks and shores from erosion by floodwaters
- Retaining sediments and toxic substances that may be harmful to downstream habitats

- Producing and exporting organic matter that may support downstream food chains
- Providing fish and wildlife habitat

Use of an existing road system would limit the effects on wetlands to the relatively small area of trenching necessary to bury the cable adjacent to the road. Implementation of appropriate erosion control procedures and other management practices will minimize water quality impacts. Compliance with the necessary wetlands permits required would also work to minimize impacts.

Cumulative Impacts

The cumulative impacts to the terrestrial environment are expected to be short-term because the project primarily involves laying the cable, with little activity later. Construction will affect terrestrial environments during trenching. Long-term cumulative impacts, however, are not expected. Efforts to protect stream and wetland environments will prevent adverse impacts.

Mitigation Measures

The permitting process will be conducted in accordance with the U.S. EPA's guidelines for evaluating Section 404 permitting applications found in Section 404 (b)(1) of the Clean Water Act. Mitigation measures would be developed during the permitting process once a site has been selected. Agency-recommended mitigations would take into account the size and quality of the wetlands involved. Mitigations for wetlands could include (1) avoidance of direct and indirect disturbance of wetlands through facility redesign; (2) on-base (if possible) replacement of any wetlands lost at a ratio determined through consultation with the U.S. Army Corps of Engineers; (3) restoration/enhancement of wetland habitat elsewhere on the base or purchase and fencing of any off-base replacement habitat; and (4) monitoring (until habitat becomes well established) of any replacement wetlands as required to determine the effectiveness of replacement and any remedial measures. Avoidance of impacts, where practicable, represents the lowest cost mitigation and can be accomplished in a shorter time frame than wetland replacement. Because the creation or development of wetlands represents a substantial financial investment, and the process may take several years to complete, this option is often reserved for wetland mitigation of high quality or for sizable area of affected wetlands. The probability of success that a newly created wetland would survive and flourish could vary, which sometimes makes this option less desirable than wetland restoration or avoidance.

Avoiding disturbance to the wetlands could include controlling runoff from construction and operation sites into the wetland through use of

berms, silt curtains, straw bales, and other appropriate techniques. Equipment should be washed in areas where wastewater can be contained and treated or evaporated.

To avoid potential impacts to wildlife, construction could be timed to allow for nesting, and restoring habitat could allow for continued habitat suitability.

4.3.5.2.2 Cultural Resources—Fiber Optic Cable Line

The exact route for the installation of the fiber optic cable line has not yet been finalized. The two principal types of impacts caused by installation of a fiber optic cable line include site alteration and transfer, both of which would result in the removal of artifacts from the site. Once the exact location has been identified, cultural resources identification will be conducted to determine whether historic properties are present within the ROI. If properties are identified, potential effects will be analyzed, and any necessary mitigation measures developed in consultation with the North Dakota SHPO.

Cumulative Impacts

No other projects in the region that could result in cumulative impacts to cultural resources has been identified.

Mitigation Measures

Prior to laying the fiber optic cable line consultation would occur with the SHPO to identify potential mitigation measures. These mitigation measures could include identifying areas which may have been surveyed, and any potential sites so they may be avoided. In areas were no previous surveys have been conducted and have not been extensively disturbed, archaeological surveys could be conducted to determine if any archaeological resources are present.

4.3.5.2.3 Geology and Soils—Fiber Optic Cable Line

Minor impacts to geology and soil are anticipated as a result of linking all North Dakota system elements by a fiber optic cable line. The cable would be buried 2 to 3 meters (6 to 10 feet) below ground surface. No specific cable route has been selected, however the route would follow an existing road or rail corridor. Terrain in the region is generally rolling to flat, and soils generally reflect minimal to moderate susceptibility to erosion. The primary soil management issue would be short-term wind erosion during ground-disturbing activities. Over the construction period, Best Management Practices would be implemented to minimize fugitive dust. Once construction is complete, there should be little soil erosion associated with the operation of the cable network. Construction of the

fiber optic cable line would not impact mineral resource operations in the region.

Cumulative Impacts

No other projects in the region that could result in cumulative impacts to geology and soils have been identified.

Mitigation Measures

No mitigation measures would be required.

4.3.5.2.4 Water Resources—Fiber Optic Cable Line

During the construction period previously disturbed land within road and/or railroad corridors would be trenched to accommodate the fiber optic cable line. The trench would be dug to a maximum depth of 2 to 3 meters (6 to 10 feet) and a width of less than 2 meters (6 feet). The cable will be set in the trench and buried. Damage to the road or railroad corridor would be minimal. No long-term impacts would be expected from the fiber optic cable line laying activity.

Due to the previous disturbance along road and railroad corridors, the drainage pattern would not be altered, and surface water runoff and erosion would be minimal. A minor increase in sediment in surface waters is possible, but not likely due to the minimal disturbance of the cable-laying operation.

Potential impacts to water resources resulting from accidental spills of hazardous materials during construction would be minimized because all activities would follow appropriate spill prevention, control, cleanup, and emergency response procedures.

The fiber optic cable line activities would result in the disturbance of more than 2 hectares (5 acres) of land and would be subject to Federal NPDES permitting requirements. A general construction NPDES permit and associated SWPPP would be required before construction. Upon completion of all activities covered under the NPDES construction permit, a Notice of Termination must be filed with the U.S. EPA.

Any repair to the fiber optic cable line that might occur would cause only a short-term, local disturbance to the road or railroad corridor.

Cumulative Impacts

No other projects in the region that could result in cumulative impacts to water resources have been identified.

Mitigation Measures

NPDES permit requirements, including the SWPPP for construction and associated Best Management Practices would provide all necessary mitigation relative to storm water. All construction would be completed in accordance with state and Federal water resources regulations. No additional mitigation measures for water resources are proposed.

4.4 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, which 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. During the decommissioning/disposal phase, disposal equipment and procedures would conform to DOD Instruction 4715.9 and other Joint Service Regulations. These regulatory requirements, in conjunction with the DOD services environmental regulations, would be followed to ensure environmentally sound disposal methods would be used. Decommissioning of the site could include removal of all structures and infrastructure and site restoration, if required. Disposal of obsolete missiles would conform with all Federal and state laws so as to minimize waste products and emissions. Disposal plans and procedures will comply with all required environmental regulations at the time of decommissioning and disposal. Decommissioning and disposal would have no appreciable effect on airspace, biological resources, cultural resources, geology and soils, health and safety, land use and aesthetics, noise, socioeconomics, utilities, water resources, subsistence and environmental justice.

Air quality could be slightly impacted due to emissions from disposal of explosives and recycling of metals. The waste products and emissions would impact the environment only to the extent the regulations and procedures allow.

Disposal of hazardous or nonhazardous materials would fall under the jurisdiction of the Defense Reutilization and Marketing Office, except in the case of radioactive materials. Radioactive materials, if any, would either be returned to the original vendor for disposal or would come under the auspices of the depot Radiation Protection Officer.

Demilitarization requirements for Military Explosives and Solid and Liquid Propellants are addressed by item 3, appendix 4, of DOD 4160.21-M-1. Key items to 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. Instructions relating to the demilitarization of ballistic missiles, large rockets, and ground handling equipment (as published in MICOM Series 43 Technical Manuals) will be furnished by Redstone Arsenal, Alabama. 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 following activities would be required for NMD system disposal:

- Establish disposal facility availability
- Ship hardware to disposal site

Disposal of material will then conform to DOD directives, Joint Service Regulations, and comply with all Federal and state laws.

It is intended that all items of salvable value be salvaged as scrap or reusable material. Propellant materials that can be successfully recovered and reused would be recovered; otherwise, the materials would be disposed of by an environmentally safe and approved method.

Except for potential impacts from the handling and shipping of hardware to the designated demilitarization or disposal facility, there are no substantial indirect impacts expected during the disposal phase. Commercial or government ground transportation would be utilized and would follow U.S. Department of Transportation, state, and local regulations for transportation safety measures.

4.5 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

In general, most known effects resulting from implementation of the NMD program would be mitigated through project planning and design measures, consultation with the appropriate agency, and utilization of Best Management Practices. As a result, most potential adverse effects would be avoided, and those that could not be avoided should not result in a significant impact to the environment.

Unavoidable adverse effects associated with the GBI would mostly be associated with the initial deployment. The potential Alaska sites have dense forested vegetation, while the sites in North Dakota have been previously disturbed and consist of open fields. During construction, there would be disturbance to wildlife and the loss of vegetation; however, few long-term impacts to vegetation or wildlife would be expected. None of the proposed sites have threatened and endangered species that would be impacted. The potential GBI sites, except Fort Greely, have wetlands that would be impacted during construction.

Consultation with the appropriate agency would assist in developing mitigation measures to minimize the potential impacts to wetlands. Some short-term construction-related impacts to air quality, soils, and water resources may occur. However, once construction is complete, no long-term impacts would be expected. Because the GBI is a dormant system, no adverse impacts would be expected from normal long-term operations.

Some unavoidable effects would be associated with the deployment of the XBR. During construction there would be disturbance to wildlife and the loss of vegetation; however, given the small area required for XBR deployment few long-term impacts to vegetation or wildlife would be expected. Eareckson AS has wetlands that would be impacted during construction and could not be avoided. Consultation with the appropriate agency would assist in developing mitigation measures to minimize the potential impacts to wetlands. Some short-term construction-related impacts to air quality, soils, and water resources may occur. However, once construction is complete, no long-term impacts would be expected.

During XBR operation, most EMR effects to human health and the environment would be contained within the base boundary and would not impact any nearby communities or residential areas. EMR levels would not exceed safety guidance outside the base boundary and would not affect the public or wildlife species. Operation of the XBR could cause interference to certain civilian unshielded electronic equipment within a 30-kilometer (19-mile) area around the XBR. However, the overall probability that equipment would experience interference from the XBR would be less than 0.05 percent of the time and thus would not adversely impact the operation or reception of the equipment. Other adverse effects would be from the implementation of the 6.7-kilometer (3.6-nautical-mile) high energy radiation area warning notification on aeronautical charts. Although this would not restrict aircraft from the area around the radar, some pilots may avoid the area, resulting in potential delays in flight time. No commercial air navigation routes would be impacted by this warning area.

Impacts from the proposed new fiber optic cable line routes would occur during the construction phase. During this phase there would be temporary disturbance to the immediate area around the fiber optic cable line; however, once the cable is installed, there would be no long-term impacts.

4.6 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Most activities would occur on existing military facilities that are dedicated to supporting the DOD. Although undeveloped land on these installations would be used for NMD deployment, most of the land has been used for some training activities and would not result in a significant reduction of available area in Alaska. All of the proposed North Dakota sites would occur on land that has already been developed for military activities and therefore would not result in the loss on any sensitive environmental resource areas. Some new development outside of DOD land would occur as a result of proposed fiber optic cable line requirements along the Aleutian Islands, Interior Alaska, and in North Dakota. However, once the fiber optic cable line is deployed, no impacts to the long-term productivity of the environment would be anticipated.

4.7 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES FROM IMPLEMENTATION OF THE PROPOSED ACTION

Under the No-action Alternative and the Proposed Action there would be the use of irretrievable resources (e.g., construction materials, fuel, labor). There would be some loss of biological habitat and wetlands, but impacts would be minimized through the implementation of mitigation measures. Potential impacts to historic properties at some sites would also be minimized through the implementation of mitigation measures in consultation with the SHPO. Proposed activities would not result in the change of any existing land uses and would not irreversibly curtail the range of potential uses of the environment.

4.8 COMPATIBILITY OF THE PROPOSED ACTION AND NO-ACTION ALTERNATIVE WITH THE OBJECTIVES OF FEDERAL, REGIONAL, STATE, AND LOCAL LAND USE PLANS, POLICIES AND CONTROLS

For the proposed site at Eareckson AS, existing documentation on the Alaskan Coastal Management Program was reviewed to help determine compatibility of the NMD program. For all Interior Alaska sites, all

existing regional or borough plans were reviewed. In areas where there were no regional or borough plans, existing environmental documentation was used and personal data contacts were made to better understand the land use policies and controls.

North Dakota sites were reviewed for compatibility by considering all regional, county, and local land use and comprehensive plans. If there were no land use or comprehensive plans, then existing environmental documents were used and personal data contacts made to find out more about the land use policies and controls.

After review of the documentation, neither the No-action Alternative nor the Proposed Action conflicts with any land use plans, policies, or controls.

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