U.S. Department of
Homeland Security

United States Coast Guard

PRELIMINARY DRAFT

ENVIRONMENTAL ASSESSMENT

for

Relocation of
USCG LORAN Station Port Clarence

Alaska 17-S02005

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U.S. COAST GUARD

ENVIRONMENTAL ASSESSMENT

FOR

RELOCATION OF

USCG LORAN STATION PORT CLARENCE

TO

NOME, ALASKA

This Coast Guard environmental assessment was prepared in accordance with Commandant's Manual Instruction M16475.1B and is in compliance with the National Environmental Policy Act of 1969 (P.L. 91-190) and the Council on Environmental Quality Regulations dated 29 November 1978 (40 CFR Parts 1500-1508).

This environmental assessment serves as a concise public document to briefly provide sufficient evidence and analysis for determining the need to prepare an environmental impact statement or a finding of no significant impact.

This environmental assessment concisely describes the need for the proposal, the proposed action, alternatives to the proposed action, environmental impacts of the proposal and alternatives, and agencies and persons consulted during its preparation.

Date	Preparer	Environmental Engineer
Date	Environmental Reviewer	Chief, Project Div. Alpha
Date	Responsible Official	Commanding Office

FONSI

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LIST OF ACRONYMS

AC&I	Acquisition, Construction, and Improvement
ACMP	Alaska Coastal Management Program
ADFG	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ADOT&PF	Alaska Department of Transportation and Public Facilities
AGL	Above Ground Level
Alaska DGC	Alaska Division of Governmental Coordination
ANCS	Alaska Native Claims Settlement
APE	Area of Potential Effect
ATSDR	Agency for Toxic Substances and Disease Registry
ATV	All-terrain vehicle
BLM	Bureau of Land Management
CAA	Clean Air Act
CCD	Coastal Consistency Determination
CDR	Commander
CEQ	Council on Environmental Quality
CERL	Construction Engineering Laboratories
CEU	Civil Engineering Unit
CFR	Code of Federal Regulations
CMP	Coastal Management Plan
CO	Carbon Monoxide
Corps	U.S. Army Corps of Engineers
CRSA	Coastal Resource Service Area
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dBA	Decibel (A-weighted)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FRP	Federal Radio navigation Plan of 1999

LIST OF ACRONYMS (cont.)

FY	Fiscal Year
GPS	Global Positioning System
HAP	Hazardous Air Pollutants
HUD	Department of Housing and Urban Development
HVAC	Heating, Ventilation, and Air Conditioning
IFR	Instrument Flight Rules
ISA	Industrial Support Activity
ISC	Industrial Support Command
KVA	Kilovolt
KW	Kilowatt
LORAN	Long Range Aid to Navigation
LORSTA	LORAN Station
LRP	LORAN Recapitalization Program
LSU	LORAN Support Unit, Wildwood, N.J.
LT	Lieutenant
M	Million
MDA	Minimum Descent Altitude
MDLI	MLCP Logistics Industrial Staff
MHHW	Mean High Highest Water
MLCP	Maintenance & Logistics Command Pacific
MLLW	Mean Low Lowest Water
MSL	Mean Sea Level
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NH3	Ammonia
NJUS	Nome Joint Utility System
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen Oxides
NPL	National Priorities List
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OSHA	Occupational Safety and Health Administration
PALS III	?????
Pb	Lead
PCB	Polychlorinated Biphenyl

PM	Particulate Matter
PRV	Plant Replacement Value
PVC	Polyvinyl chloride
ROC	Record of Communication
SCS	U.S. Soil Conservation Service
SF	Square Foot
SFCAM	Shore Facility Capital Asset Management Plan
SNC	Sitnasuak Native Corporation
SO2	Sulfur Dioxide
TSDF	Treatment, Storage, and Disposal Facility
USCG	United States Coast Guard
USFWS	U.S. Fish and Wildlife Service
VFR	Visual Flight Rules
VHF	Very High Frequency
VOC	Volatile Organic Compound
VOR	???
WHO	World Health Organization

1.0 NEED FOR ACTION

The United States Coast Guard (USCG) is considering the relocation of the Long Range Aid to Navigation (LORAN) Station Port Clarence from Point Spencer on the Bering Straits in northwestern Alaska to the environs of Nome, Alaska. Pursuant to Council on Environmental Quality regulations (40 CFR Parts 1500-1508) implementing procedural provisions of the National Environmental Policy Act (NEPA), the USCG has prepared an Environmental Assessment (EA). The purpose of this EA is to provide information and comparative analyses for determining whether to prepare an Environmental Impact Statement (EIS) or to adopt a Finding of No Significant Impact (FONSI) for the proposed action. The USCG is the lead Federal agency for this NEPA-related action, and the EA will be used to determine if the action would result in potentially significant environmental impacts. It concisely describes the need for the proposal, the proposed action, alternatives to the proposed action, environmental effects of the proposal and alternatives, and agencies and persons consulted during its preparation. This EA was prepared in accordance with the Commandant's Manual Instruction M16475.1B.

The proposed action consists of relocation of a LORAN station from its current location in Port Clarence, Alaska to one of several sites in Nome, Alaska, a distance of approximately 85 miles. The relocated LORAN station would be rebuilt as an unmanned, remotely monitored transmitter on approximately 160 acres of land. The current station occupies 2,648 acres of land and requires 24 full-time operational personnel. Alternatives considered include review of multiple sites in the vicinity of Nome, as well as rebuilding the transmitter with modern solid state electronics at Port Clarence. This environmental assessment evaluates the potential site specific environmental and socio-economic impacts of implementing any one of these alternatives.

1.1 Background

Port Clarence is a USCG LORAN Station, whose sole purpose is to maintain and operate the LORAN-C equipment providing the electronic navigation signal for this portion of the Bering Sea. The USCG originally developed the Loran-C system to provide radio navigation service for U.S. coastal waters; the system was later expanded to include complete coverage of the continental U.S. as well as most of Alaska. Twenty-four U.S. Loran-C stations work in partnership with Canadian and Russian stations to provide coverage in Canadian waters and in the Bering Sea. Loran-C provides better than 0.25-nautical mile absolute accuracy for suitably equipped users within the published areas. LORAN-C is widely used for navigation by the aviation community as well as the nautical community. The originally scheduled phase-out date for the LORAN-C Program was December 31, 2000. Due to continued user support, the decision has been made to continue the program at least through 2008 (USCG 2002).

Port Clarence was constructed in the early 1960s as one of the first generation of LORAN-C stations. Located on 2,646 acres of land on Point Spencer, a 12-mile long gravel spit extending into the Bering Sea at the west end of Alaska's Seward Peninsula, Port Clarence's 1,350-foot high transmitting tower is the tallest structure in Alaska. It is also the only one of the original generation of tall LORAN towers still standing, as all of the others have experienced catastrophic failure, typically due to ice build-up and wind pressure. Port Clarence is a part of the four-member "7,960 - Gulf of Alaska Chain" of LORAN stations, along with Tok, Alaska; Shoal Cove, Alaska; and Kodiak/Narrow Cape, Alaska (USCG 2003). Of these, Tok is the Master

Station. It operates by generating a powerful, precisely timed signal at 100 kHz. This signal is followed 7,960 microseconds later by signals from the 3 subordinate transmitting stations in the chain. It is the various signal delays that allows the receiver to calculate its precise geographical position.

Point Spencer had been used by the Federal government during World War II as an advance airfield. Later it was a backup airfield to the Nome airfield as a part of the Lend Lease Program supplying military equipment to the USSR. Evidence of some of the former Army facilities and use remain at Port Clarence.

Due to the extreme isolation of Point Spencer, Port Clarence is a small, self-contained community with 23 to 25 personnel at any given time. Large for a LORAN station, this many personnel are needed to keep this isolated station operational. The nearest communities are Brevig Mission and Teller, small Native Alaskan subsistence communities approximately 13 and 16 miles away by water, respectively (Figure 1.1-1, presented at the end of this chapter). The nearest town of any size is Nome, at approximately 70 miles distance and about 45 minutes away by commercial air. There are no roads available for travel between these communities and Port Clarence. Climate conditions at Port Clarence are Arctic, with extreme winds and lows of -50° F in winter months. The spit is only 5 feet above sea level, and apparently was completely washed over by a minor tsunami wave in the early 1990s that resulted in a reported 18 inches of water within the main station building.

Most supplies arrive by C-130 transport plane every 3 weeks from the USCG station in Kodiak, Alaska. Maintenance and plowing of the 4,800-foot long paved runway is a major work task for the Station crew, particularly in winter due to deep drifting snow blown off the frozen Bering Sea by prevailing winds. Snow plowing can be an almost constant activity at times during winter months in an effort to keep the runway open. There are some major supply shipments by barge in the summertime, notably the annual fuel barge shipment. There are no waterfront docking facilities at Port Clarence – watercraft anchor off the gravel beach and offload cargo from there. No shipments can reach the station by water during the winter months, which is within the Bering Sea icepack from late November until early July.

The Station consists principally of the transmitting tower, the transmitter building, a single large operations building, a tank farm, the runway, and a large equipment building, known locally as the “Heavy Duty Shed,” on the eastside of the runway (see Figures 1.1-2 and 1.1-3). Overall, it is comprised of 70,000 square feet (SF) of floor space in 12 buildings (USCG 2001). The plant replacement value (PRV) is the second highest of any USCG facility in Alaska, exceeded only by Industrial Support Command (ISC) Kodiak. It operates its own electric generators, its own potable water and wastewater treatment plants, and permitted landfill. All of the mechanical systems are located within the main station building. The 400,000 gallon fuel tank farm containing fuel for the diesel generators is adjacent to the station building. A long, enclosed walkway structure connects the main operations building to the transmitter building, allowing protected access in winter weather. Station personnel serve a year-long tour of duty at Port Clarence. Due to the isolation, many of them never leave the station during that time and are limited to the company of other Station personnel for companionship.

At the time the Station was originally built, the LORAN program was scheduled to be phased out in December 31, 2000. In recent years, many users of the original navigation functions performed by the LORAN system have converted over to alternative systems such Global Positioning System (GPS) units, which are sufficiently accurate and inexpensive. However, the LORAN system has certain functional qualities that cannot be replaced by GPS, and some authorities feel it should be continued as a Federal program. The Federal Radio Navigation Plan of 1999 (FRP) allows for the short-term continuing operation of the LORAN program while the U.S. government evaluates the long-term need for the system. The Federal government continues to evaluate this need, although it is not currently known when a decision to support LORAN long-term will be made, although the Federal Aviation Administration (FAA) is committed to supporting the program through 2008, at a minimum (USCG 2002).

Starting in 1997, the Federal government, through the FAA, has provided some funding for the USCG to upgrade and modernize the LORAN system in the lower 48 states. Many of the stations, including Port Clarence, still operate using electronics based on vacuum-tube technologies that had been replaced by solid-state electronics for many years in commercial operations. Since 1997, more than $132 million worth of projects have been planned, and some executed, as a part of the LORAN Recapitalization Program (LRP). The USCG's LORAN Support Unit (LSU) in Wildwood, New Jersey has been responsible for much of this planning.

The initial plan at Port Clarence was to replace the existing tall tower and install a new transmitter building there with solid-state electronics as early as Fiscal Year (FY) 2003. However, the USCG Civil Engineering Unit (CEU) Juneau released the results of a Shore Facility Capital Asset Management (SFCAM) Plan in 2001 (USCG 2001) that resulted in the redefinition of the LORAN recapitalization approach in Alaska. This study showed that there were opportunities to leverage the LRP funding and achieve substantial cost-avoidance opportunities as well as long-term operational savings through the relocation and reconstruction of Port Clarence as a remotely operated unmanned station. This was based on the assumption that the FAA-funded portion of the recapitalization work (i.e., the tower and transmitter system) could be installed almost anywhere in Alaska at approximately the same cost, but that relocating to a less remote location would result in long-term operational cost savings for the USCG.

The USCG then undertook the development of a Planning Proposal to investigate the options for the relocation of the Port Clarence LORAN station (USCG 2002). A number of options were reinvestigated, including supplying commercial power to Port Clarence, reusing existing Air Force sites in northwest Alaska, and relocating the station to Nome. Of these options, the one that was judged to be most viable was the relocation to Nome. A Site Selection Study (Tryck Nyman Hayes 2002) was then undertaken to review potential sites in the vicinity of Nome. This study identified a number of potential candidate sites. It is the purpose of this EA to evaluate the potential environmental impacts of LORAN development at these alternative sites.

1.2 Purpose and Need for the Proposed Action

1.2.1 Purpose

The purpose of the Proposed Action to rebuild and modernize the existing LORAN Station (LORSTA) Port Clarence. The preferred method of achieving this goal is to relocate the

LORSTA to a site near Nome, Alaska, where there is ready access to a commercial power supply and an airport with daily scheduled commercial flights. This modernized station can then be built as an unmanned transmitter station monitored remotely and initially serviced by a small crew of three to four personnel quartered in Nome, with operations support eventually transferred to a private contractor. This form of an unmanned, remotely operated and contractor-supported LORAN station is known as the PALS III concept of operations.

1.2.2 Need

This modernized LORAN station is needed for a wide variety of reasons, all of them essentially related to the age of the existing LORAN station at Port Clarence. Facilities age rapidly in the extremely harsh Arctic climate on the Seward Peninsula, while the existing LORAN program itself was originally scheduled to end in 2001. According to the SFCAMS Study, the facilities at Port Clarence have reached the end of their useful life. Due to uncertainty in recent years about the continuation of the LORAN Program, much major maintenance has been deferred, rather than invest scarce resources in buildings anticipated to be soon demolished. Following the release of the 1999 FRP, it has been decided that the LORAN program will be maintained at least through 2008. The deferred maintenance at Point Clarence must now be addressed in some manner under any scenario retaining the LORAN stations through at least 2008. In addition, many advances in electronics design now allow for a much more efficient solid-state design to be installed. This design will greatly enhance signal reliability, while resulting in major energy savings.

The SFCAMS Study (USCG 2001) identified an "as is" recapitalization cost for the entire LORSTA system in Alaska– that is, without any changes to the current facility design and operations – of $59 million (M). These costs could be decreased by $30M if the system were recapitalized for "unmanned" remotely operated contractor-supported LORAN sites. The greatest single savings resulted from the relocation of LORSTA Port Clarence to Nome. The principal points related to the need for such a modernized LORAN station are as follows:

- The existing tower at Port Clarence is the last of its generation still standing. All of the others of its design generation have experienced catastrophic failure, and it is assumed that this one will, too. It is deemed a better management strategy to plan for its replacement than to be forced to rapidly fund a replacement following failure. The latter course of action would result in greater downtime. Current USCG policy requires a LORSTA to be transmitting for 99.997 percent of the time of a given year, which allows for a total annual downtime of 26 hours and 17 minutes. Although it is estimated that the planned replacement of the tower will require up to 6 months of downtime, an unplanned replacement would require even longer. In addition, the internal electronics design is of an early 1960s vintage. The system still uses outmoded vacuum tube technologies that are expensive to rebuild, and there are very few specialized facilities remaining with the capability to service these tubes.

- Port Clarence is one of the most costly stations in the LORAN program, operated by the USCG at a premium. All resupply and logistics operations are by C-130 airplane and the occasional barge. A large contingent of personnel must be assigned to the Station merely to support operations and to keep the physical plant functioning. Modern LORAN stations are stand-alone, remotely monitored stations that need only occasional servicing.

- Moving LORSTA Port Clarence to Nome would avoid an estimated $19.2M in projected mandatory recapitalization work on the existing fuel farm and station building (USCG 2001), a cost savings to the Federal government of approximately $7M to $9M, with the relocation costs factored in. This does not include unknown costs related to an anticipated requirement for rebuilding the runway. The Station would run cleaner, with little risk of fuel spill, if it were attached to the commercial power grid. In addition, it would result in anticipated recurring annual savings of greater than $3M per year, due to reduced personnel and energy costs. As only one first class petty officer (E-6 grade) would be required for such a station, 22 billets and hundreds of flight hours would be available for reprogramming.

1.3 Scoping and Public Outreach

As a matter of policy, NEPA does not require a public scoping process for preparation of an EA. The USCG has discretionary authority to determine whether or not to conduct scoping. In this case, the USCG decided to hold a scoping meeting in the project vicinity, due to the potential impacts of such a facility on the public. A public meeting was held in Nome, Alaska, on April 16, 2003 in the City Hall Council Chambers, for the purpose of informing the public regarding the potential move of the LORSTA from Port Clarence to Nome, and to take public input about concerns of potential environmental impacts from such a move. The meeting was attended by representatives of four different Coast Guard support units, as well as several members of the FAA, as listed in Table 1.3-1. During the course of this meeting, a presentation regarding the scope of the potential development and potential sites was made by Commander (CDR) Virginia Holtzman-Bell of the USCG CEU Juneau, and a separate presentation regarding potential aviation obstructions was made by the FAA's Dennis Bell. Each of these sessions included an extensive question and answer period. They were followed by a Public Comment Session, a transcript of which is included in Appendix A.

The public comment session identified a strong sentiment in support of siting the LORAN station in Nome. With one exception, every speaker took time to voice support for the project, and no one spoke against it. One speaker noted that there were five elected officials in the room, and that the City Council supported the move. Several speakers identified some additional potential sites for consideration by the USCG. These sites are included in the alternatives discussion in Chapter 2. A number of speakers identified environmental benefits of the proposed action, including improving the robustness of the life safety systems needed in the far north of Alaska, and the reduced likelihood of environmental contamination due to fuel spills. The following concerns were raised with regards to potential environmental impacts:

- The potential for conflict with the Bering Straits Native Corporation with regards to subsurface mineral rights;
- The potential for danger to aviators, particularly those following Visual Flight Rules (VFR rules); and
- The potential for the LORAN signal to interfere with AM radio signals from Nome's two AM radio stations.

Table 1.3-1: List of Scoping Meeting Attendees.

Name	Organization
Carol Meyer	USCG Maintenance and Logistics Command Pacific
CDR Virginia Holtzman-Bell	USCG Civil Engineering Unit Juneau
Raymond Agostini	USCG LORAN Support Unit
LT Robert Berger	USCG Navigation Center
LT John Thompson	USCG Navigation Center
Robert Deering	USCG Civil Engineering Unit Juneau
Dennis Stoner	FAA, Anchorage
Russ Crooks	FAA
Irene Anderson	Sitnasuak Native Corporation City of Nome Planning Commission
Christian Clark	Private Citizen
John Handeland	General Manager, Nome Joint Utility System
Jim Hansen	Private Citizen
Robbie Fagerstrom	City of Nome Council Member President, Sitnasuak Native Corporation
Hon. Leo Rasmussen	Mayor, City of Nome
Paul Korchin	KNOM 780 radio station
Dennis Weidler	KICY 850 radio station

Source: Glacier Stenographic Reporters

1.4 Permits and Approvals

It has been found that the USCG will likely need to obtain the following permits and approvals before proceeding with the Proposed Action.

1.4.1 Federal Permits

Due to the presence of jurisdictional wetlands over all of the sites in the vicinity of Nome, a U.S. Army Corps of Engineers (Corps) review and permit will be needed for relocation of the LORAN station to Nome. A Corps Section 404 permit will be needed.

1.4.2 State Permits and Approvals

A coastal consistency determination will be required from the State of Alaska for implementation of the proposed action for several of the sites in the vicinity of Nome. The Army Peak site, however, will not need such determination as it is outside the coastal zone.

1.4.3 Local Permits

The Sitnasuak Native Corporation's (SNC) Land Committee will need to authorize construction of any facility on its lands through a land use permit. However, the Board of the SNC has already endorsed relocation of the LORAN tower to its lands in the vicinity of Nome in the Board of Directors Resolution No. 03-01 (SNC 2003a).

Source: USGS, GIS

P:/2002/2E401_04/Graphics/Figures/Finalpdfs/figure1_1.doc

Site Context Map

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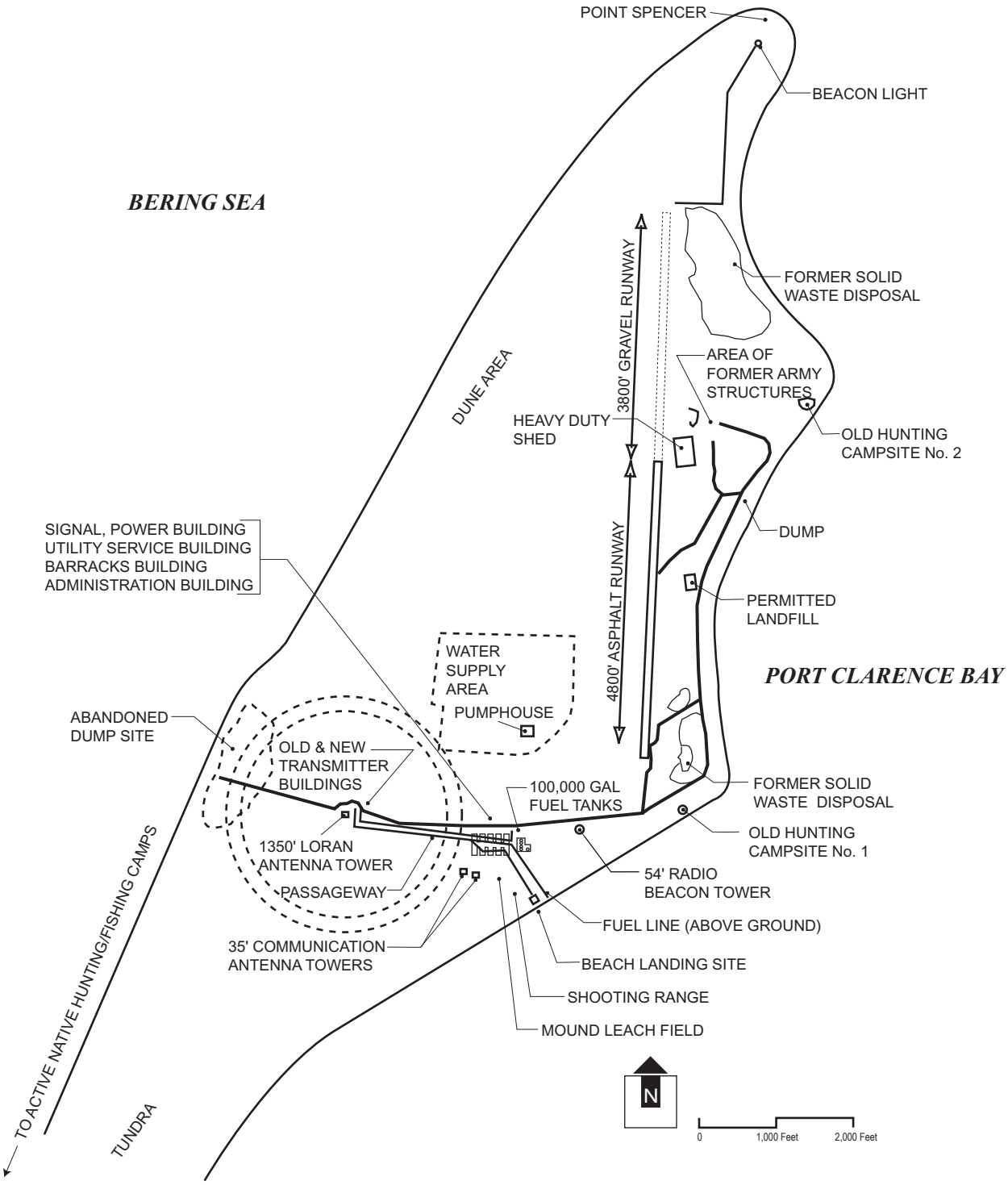
FIGURE 1.1-1



Source: USGS, URS

P:/2002/2E401_04/Graphics/Figures/FinalPdfs/Figure1_2.doc

Overall Site Plan of LORSTA Port Clarence

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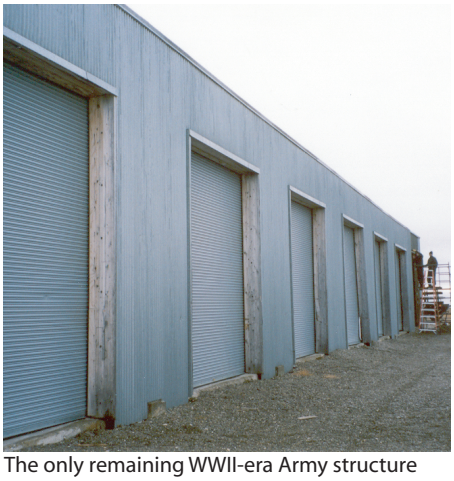
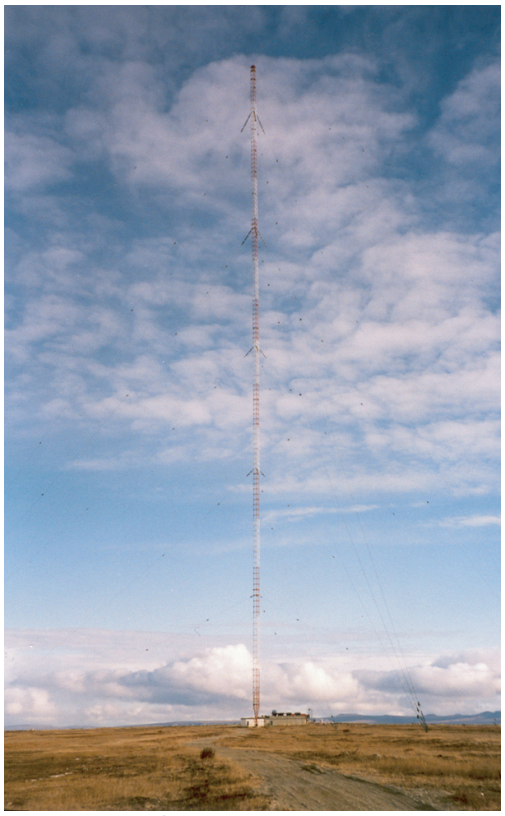
FIGURE 1.1-2

The village of Teller from the air, with Point Spencer in the distance.



The only remaining WWII-era Army structure now used as a heavy equipment shed.



LORAN antenna from the west, with transmitter building at the base.

LORSTA Port Clarence with water supply ponds in the foreground.

Abandoned refuse heap west of the LORAN antenna.

Source: EDAW

P://2002/2E401_04/Graphics/Figures/FinalPdfs/Figure1_3.doc

Site Photos of Port Clarence

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FIGURE 1.1-3

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Reasonable Alternatives

This section describes a reasonable number of alternatives to meet the requirements related to the recapitalization of the Port Clarence LORAN Station. The focus is on alternatives that build a modern, high-quality solid-state LORAN navigation aid with reliable access to a source of commercial power. Initial siting investigations reviewed a number of alternative siting areas around northwestern Alaska, including the villages of Kotzebue and Unalakleet, as well as existing Air Force properties, but only the Nome area met the initial criteria for adequate air service, power service, manpower availability, and other requirements. The alternatives site selection was therefore narrowed down to the Nome area. The SNC proposed a number of potential alternative sites for the tower location, and others were proposed to the USCG by members of the public at a public meeting in April 2003. A number of these sites are described below. Additional alternatives that were considered but not analyzed in detail are discussed in Section 2.4. These include alternatives that initially may have appeared to be reasonable, but following analysis, were recognized as having a fatal flaw rendering them unsuitable for implementation. Section 2.5 provides a summary of environmental impacts in a tabular format.

2.2 Description of Proposed LORAN Station Modernization Measures

The goal of modernizing the LORAN System to solid-state electronics and eliminating the use of outmoded tube technology, while greatly reducing the required work force and allowing for the eventual outsourcing of maintenance and operations, leads to a very different facility design than the one currently found at Point Clarence. Such a station would be stand-alone, without billeted personnel in the immediate vicinity. It would be monitored remotely, by means of electronic surveillance media, so the station must have good year-round access to allow maintenance personnel to reach it during periods of malfunction. It would operate more reliably and efficiently due to the solid-state electronics involved, and the associated transmitting tower can be much shorter than the extreme height required by the older LORAN C versions. Although facility requirements other than the tower have been greatly reduced, there is still a need for a structure to house back-up generators and provide shelter under Alaska conditions. The core facility requirements for the type of remote-operated LORAN stations, such as proposed for Nome and elsewhere, include the following (USCG 2001):

- Minimum of 160 acres of land – this represents a quarter section of land and is typical of CONUS stations. Depending on final site design, less property may be required.
- A 625- to 700-foot tall guyed transmission tower. This antennae structure would include up to 120 copper ground-plane wire radials that would be splayed out at equal intervals, like spokes in a bicycle wheel, each stretching out for a distance of approximately 1,000 feet from the base of the tower (See Figures 2.2-1 and 2.2-2, presented at the end of this chapter). This ground plane would create a circle with a diameter of approximately 2,000 feet. It would also include up to 24 “top loading elements” radiating out from the top of the tower at equal intervals and meeting the ground plane at a distance of approximately 750 feet from the tower base (Record of Communication [ROC], Healy, 2003).

- A 5,000 SF building to house transmitter equipment and provide emergency shelter to maintenance personnel. A toilet for maintenance personnel would be provided, along with bottled water for drinking. A heating/ventilation/air conditioning (HVAC) system would be included.
- 3-phase electricity source from reliable commercial power with a minimum 300 Kilovolt amperes (KVA) electrical utility transformer.
- Two 400 Kilowatt (KW) backup generators to provide multiple redundant uninterruptible backup power systems.
- Associated fuel tank.
- Operational control and monitoring, preferably to be located in Nome.
- Reliable communications for remote monitoring and control. Line-of-site microwave technology is appropriate, particularly in a treeless environment.
- Access to publicly maintained roads and a commercial airport, as well as a good access road.

One consequence with the movement of the transmitting tower from Port Clarence would be the need for end users to replace their existing charts and signal processing equipment, which would be required in the case of a shift in the LORAN signal location. The LORAN system is extremely sensitive to signal location, and even very minor shifts can render the signal useless to end users. The Coast Guard previously encountered this signal-shift issue in the mid-1970s with the relocation of a LORAN Station from Sitkanek, AK to Cape Narrow, AK, which resulted in the Coast Guard compensating many users for the coast of retrofitting their electronic receivers to process the new signal location (ROC, Berger, 2003). Unfortunately, there are currently no commercial producers of LORAN receivers, so retrofitting or upgrading receivers is not possible at this time. This lack of equipment is due in large part to the major shift by end users in recent years to GPS navigational systems, so there is very little market for LORAN receivers. In addition, the U.S. Government does not currently have a process in place to revise the LORAN system charts. Therefore, much of the capability to produce both electronic equipment and charts would need to be rebuilt. However, both public and private organizations have been reluctant to make new investments in the LORAN system awaiting the Federal Government's decision on whether or not to continue the LORAN program beyond 2008. Although much planning has been done about future navigation systems, in the short-term relocation of the individual LORAN signals will be problematic.

Replacement of the existing LORAN C system at LORSTA Port Clarence, regardless of location, would render that system obsolete. Consequently, any alternative that involves construction of a new generation LORAN station also involves the decommissioning of LORSTA Port Clarence, the demolition of the facilities there, and the potential for relinquishment of the property there. The existing navigation beacon at the end of Point Spencer would continue to be maintained by other Coast Guard units, as it is currently. It is unlikely that the existing airfield runway would be demolished. However, the runway would not be maintained and would eventually deteriorate to the point of unusability. It is possible that an outside party, such as the State of Alaska or a Native Corporation, would want to take advantage of the facility development at Point Clarence and assume ownership for an as-of-yet unforeseen

purpose. However, the potential for such an occurrence is low given the overhead and maintenance costs involved in keeping the facility in operational condition under these very remote and harsh conditions. For example, annual operating costs for the USCG at Port Clarence are currently about $4.25M (USCG 2001).

2.3 Description of the Alternatives

To evaluate the potential environmental impacts associated with implementing the Proposed Action, the USCG has developed three alternatives, ranging from rebuilding the LORAN tower at Port Clarence to relocating to one of three alternative sites in Nome. These include "action alternatives," as well as the No Action Alternative, as required by NEPA. This section describes the three alternatives examined in detail in this EA, with the full analysis of potential impacts presented in Chapter 4.

2.3.1 Status Quo (No Action Alternative)

NEPA requires the analysis of the "Status Quo" or No Action Alternative, against which the effects of the action alternatives can be evaluated and compared. Under the No Action Alternative, the LORAN station at Port Clarence would remain operating as it has since its commissioning in the early 1960s. The tower and the current tube-based electronics and timing equipment would continue to be the source of the navigational signal. The existing station facilities would continue to house the crew and equipment needed to fulfill the LORAN mission. The full crew of 23 to 25 personnel currently billeted at Port Clarence would continue at that strength to maintain all of the systems necessary to keep the station operational, including airport operations; electrical generation; equipment maintenance; electronics maintenance; and water, heating, solid waste disposal, and wastewater treatment systems. The 400,000 gallon fuel farm would remain operational, with attendant environmental risks.

The opportunity to recapitalize the LORAN mission at a more advantageous location would be lost. The USCG would be forced to reinvest considerable funds to perform deferred maintenance. The SFCAM Plan placed these deferred maintenance costs as $19.2M, plus any costs related to the runway reconstruction. These investments would be needed to keep the current structure operational. For reasons of life safety, it is necessary to ensure that facilities are adequate for all personnel to make it safely through the harsh Arctic winter. In case of catastrophe, the nearest rescue force is located approximately 70 miles by air to the west in Nome.

Under the No Action Alternative, the tower would be structurally reinforced, by such means as replacing all guy cabling. The tower itself would not be replaced. It should be noted that the tower itself is the only tower of its design generation that has not experienced catastrophic failure, which in the past has come as a result of ice buildup and wind stress. There can be no assurance that it will continue to remain intact. The USCG considers it likely the tower will fail at some point in the future.

2.3.2 Action Alternative A (Milepost 11A and B Sites)

Alternative A addresses two potential sites in the immediate vicinity of Milepost 11 along the Nome-Teller Road on the coastal plain west of Nome (see Figures 2.3-1 and 2.3-2). Both are fairly level sites, lying several hundred feet from the south side of the road. Several hundred yards apart and separated by a small, natural drainage way, both sites slope away from the road. These sites are so close together and so similar in nature that they are analyzed as variants to a single alternative. Both sites are owned by Native corporations, with the SNC owning the surface rights and the Bering Straits Corporation owning the underlying mineral rights. The sites lie approximately 3 miles inland from the sea, which is visible from the sites. Milepost 11A lies slightly farther to the west, 150 feet above sea level. Milepost 11B is about 50 feet higher above sea level. The Penny River lies about 1 mile to the west, while the Snake River lies about 3.5 miles to the east.

Contemporary human disturbance or development in the vicinity of the site is very minor. A small private dwelling, possibly seasonal, lies several hundred feet north and upslope from Site 11A. A series of abandoned reindeer corrals lie between Site 11A and the road. They are remnants from a time when reindeer were actively herded in the vicinity, as are other corrals visible in the distance. They appear not to have been used in many years, judging by their state of disrepair. A designated winter trail leading out of Nome crosses both sites from east to west. According to people familiar with local custom, it receives little use (ROC, Anderson, 2003).

The Sunset Mine, an inactive dredge mining site, lies several miles to the east. There are no signs of previous mining activity on the sites themselves.

In general, vegetation on the sites consists of typical low-lying tundra flora, with patches of low willows, found predominantly along the main drainageways, but elsewhere as well. This is typical of the entire region in the vicinity of Nome, which is devoid of taller trees. Most of the tundra is wet. Although small ponds are located in the vicinity of Milepost 11, there are none on the sites under consideration themselves.

Downtown Nome lies 8 miles to the southeast, while the Nome commercial airport is a bit closer. The west end of the main runway lies 2.8 miles from Site 11B. An extension of the centerline of the runway would pass 1.7 miles to the south of these sites. Other small private aircraft use the area as well, particularly flying to and from Teller, Brevig Mission, and other destinations on the coast at the west end of the Seward Peninsula.

2.3.3 Action Alternative B (Army Peak Site)

Alternative B addresses the Army Peak site which lies on the crest of a long, flat ridge extending south from Army Peak, just over 5 miles northeast of Nome (see Figures 2.3-3 and 2.3-4). Similar to the Alternative A site, this site is owned by Native Corporations, with the SNC owning the surface rights and the Bering Straits Corporation owning the underlying mineral rights. While the land is sloping in all directions, the slope is a gentle enough to meet the design requirements. The area lies approximately 300 feet above sea level, with an unobstructed visual connection to Nome and to Norton Sound to the south. Due to this line of site connection, a tower at this location would support a VHF transmitter as well as the LORAN signal. The VHF

signal would be useful for vessel traffic communication on Norton Sound. The tower would be built in the center point of this ridge, far enough south of Army Peak to accommodate the full radius of the ground plane wiring, which would be laid out across the tundra for 360 degrees. The small support structure would be constructed at the south end of the site nearest the Nome-to-Council Road.

There are no roads or houses in the immediate vicinity of this site, with the nearest buildings being beach-front residences along the Nome to Council Road 3.5 miles to the south, and minor development along Beam Road, 2.5 miles to the west. The surrounding terrain consists principally of low tundra, with an occasional small pond. Army Peak rises to a height of 612 feet above sea level immediately to the north. There is no evidence of prior ground disturbance or historic mining on the site. No major perennial streams flow across or near the site, while the Nome River flows past at a distance of little over 1 mile. Local reports identify the area as being used occasionally by free-roaming reindeer herds at certain times of the year.

Road access would most likely consist of a new 3.5-mile long gravel road running north across the tundra from near where Cunningham Creek meets the Nome-to-Council Road. This road would also provide access for construction of a new 3-phase power line to the proposed tower structure. An alternative route for this gravel access road would be to extend the existing access road that leads to the FAA's VOR navigational instrument station up the hill to the Army Peak site. This route would likely result in a slightly longer road and potentially more impacts to wetlands and drainage features. The new power line would begin at the intersection of Beam Road and the Nome-to-Council Road, several miles to the west. It would run east along the Nome-to-Council Road, then turn and proceed north to the transmitter site along the proposed access road.

Other radio transmitting towers exist to the east of Nome, in the vicinity of the intersection of the Beam Road and the Nome-to-Council Road. These consist of commercial AM radio transmitters for stations KICY and KNOM, an inactive tower array, and communications antennae for the main Nome Airport. The site itself lies 5.8 miles away from the end of the main east-west runway at the Nome Airport, approximately 4 miles north of the centerline of that runway. The Nome Sanitary Landfill lies about 2 miles to the west along Beam Road.

2.3.4 Action Alternative C (Rebuild at Port Clarence)

This alternative would consist of removing the existing tower at USCG Station LORSTA Port Clarence and rebuilding the new transmitting tower on the exact same site. The existing electronic systems would be completely replaced by new solid-state electronics, eliminating the older high-maintenance tube-type electronics, and providing a higher quality signal. One of the advantages of this alternative compared to other alternatives is that it would eliminate the need for end users to replace their existing charts and receiving equipment that would result from a shift in the LORAN signal location, which is inherent to all other alternatives.

A disadvantage of this alternative is that it would take 6 months or more to rebuild the tower, during which time no signal would be accessible. Another disadvantage is that the government would need to continue staffing a very remote station at great effort and expense, at least through 2008, and perhaps longer. Costly logistic arrangements would continue to be needed, including

regular C-130 flights from Kodiak every 3 weeks, and a major fuel delivery by barge every summer. The current well-documented facility recapitalization needs could no longer be delayed or deferred and would have to be undertaken at considerable expense.

Beyond the tower itself, the current facilities at LORSTA Port Clarence would be adequate to accommodate the new signal transmission process, although a new transmitter building and other facility improvements may be needed. Personnel requirements may decrease slightly due to the need for fewer electronic technicians to service the much more dependable and trouble-free solid-state electronics systems [Note to Coast Guard reviewers: Please confirm]. In general, the number of Coast Guard personnel would stay fairly stable, as the majority of billets are focused on the day-to-day operations of keeping the station, its systems, and the airfield operational, and are not concerned with maintaining the electronics signal.

2.4 Alternatives Considered but Not Analyzed

The following alternatives were initially considered to varying degrees, but were not analyzed in detail for environmental impacts, as each of them suffered from one or more "fatal flaws" that made it evident prior to analysis that they would not be appropriate solutions. These alternatives either would not meet the purpose and need of the Proposed Action or the environmental impacts would be excessive.

- Rebuild Elsewhere at Port Clarence: This option would require that the transmitting tower be rebuilt on the gravel spit at Port Clarence outside of the zone of the structural guy wires for the existing tower. Upon completion of the new tower and associated facility infrastructure, the LORAN signal would be transferred to the new tower, and the old tower demolished. Although this alternative would provide a more stable and dependable signal, it would require almost all of the same support personnel and infrastructure as the existing tower and would continue to drain Coast Guard resources and budgets. The flight logistics, costly operating, and resupply efforts would continue for the foreseeable future. At the same time, it would have the drawbacks of other tower relocation sites – new LORAN monitoring equipment would have to be acquired by users, as the signal shift would have rendered the new signal unusable.

- Develop Port Clarence as an Unmanned Remote Station: A potential variant on Alternative C would be to run commercial power from Nome to LORSTA Port Clarence, develop Port Clarence as a remote unmanned station, and demolish the existing facilities. This would involve the construction of approximately 85 miles of 3-phase power lines and 10 miles of new road. The potential for extended signal outages during winter months would be great, however. The airfield would not be maintained, and there would be times that the station could not be reached to effect repairs. The extensive remote power line would also be vulnerable to damage from weather and ice, and could develop into a very high maintenance item. This variant to Alternative C was considered an excessively high risk strategy by the USCG, and therefore discarded.

- Relocate to Grass Valley Site: This option would construct the relocated tower and the associated facility on open tundra at a site 9 miles east of Nome and approximately ¾ of a mile north of the Nome-to-Council Road, just west of Saunders Creek. Extending

commercial 3-phase power to this site would require constructing about 6 miles of new line, well in excess of other sites. This site also poses dangers to both small VFR aircraft and migrating waterfowl. Both planes and birds have a general tendency to follow the coastline for navigation purposes, but to cross Cape Nome by a low saddle to the north of the cape, away from the coast, rather than flying around the cape. This would bring both aircraft and birds in direct conflict with the tall tower that would be standing west of that saddle if this site were chosen.

- Relocate to Snake River Site: This site is located in a low-lying area in the Snake River Valley to the northwest of Nome, approximately ½ mile north of the Nome-Teller Road. Choice of this site would require construction of a ½-mile long gravel access road, as well as the construction of approximately 3 miles of a 3-phase power line. Overall, the site appears to be level, but closer inspection reveals the ground plane to be quite hummocky, and apparently subject to frequent flooding. Construction would be difficult under these circumstances, as would development of a level ground plane for the antenna. Light aircraft safety is also an issue at this site. Tower development appears to violate FAA rules regarding vertical obstructions around the Nome Airport, and is also an obstruction for light aircraft following the Snake River Valley.

- Relocate to Buster Creek Site: This site is located to the east of Beam Road, the main road leading north out of Nome. The site itself is on a low ridge to the east of the Nome River, about 7.5 miles from downtown Nome. Several miles of gravel access road and new 3-phase commercial power would need to be constructed to provide proper infrastructure, which is an obstacle for this site. Other obstacles to the use of this site include the need to cross the Nome River at a ford, which can be problematic at certain times of the year, particularly during times of high water or during the spring break-up time, and issues of aviation safety. There is a small airstrip a few miles north of the site along the Nome River Valley at Basin Creek. This airport is often used by small local aircraft when the Nome Airport is blocked by coastal fog, and there is a risk that a tower at the Buster Creek site would be a danger to small planes following the Nome River valley.

2.5 Comparison of Environmental Consequences

Table 2.5-1 summarizes all identified impacts as well as related mitigations for each element of the environment analyzed. The summary information presented in the table is based on the full environmental analysis presented in Chapter 4.

[Note to Coast Guard reviewers: this table will be completed in the next phase of the EA, following receipt of reviewer comments]

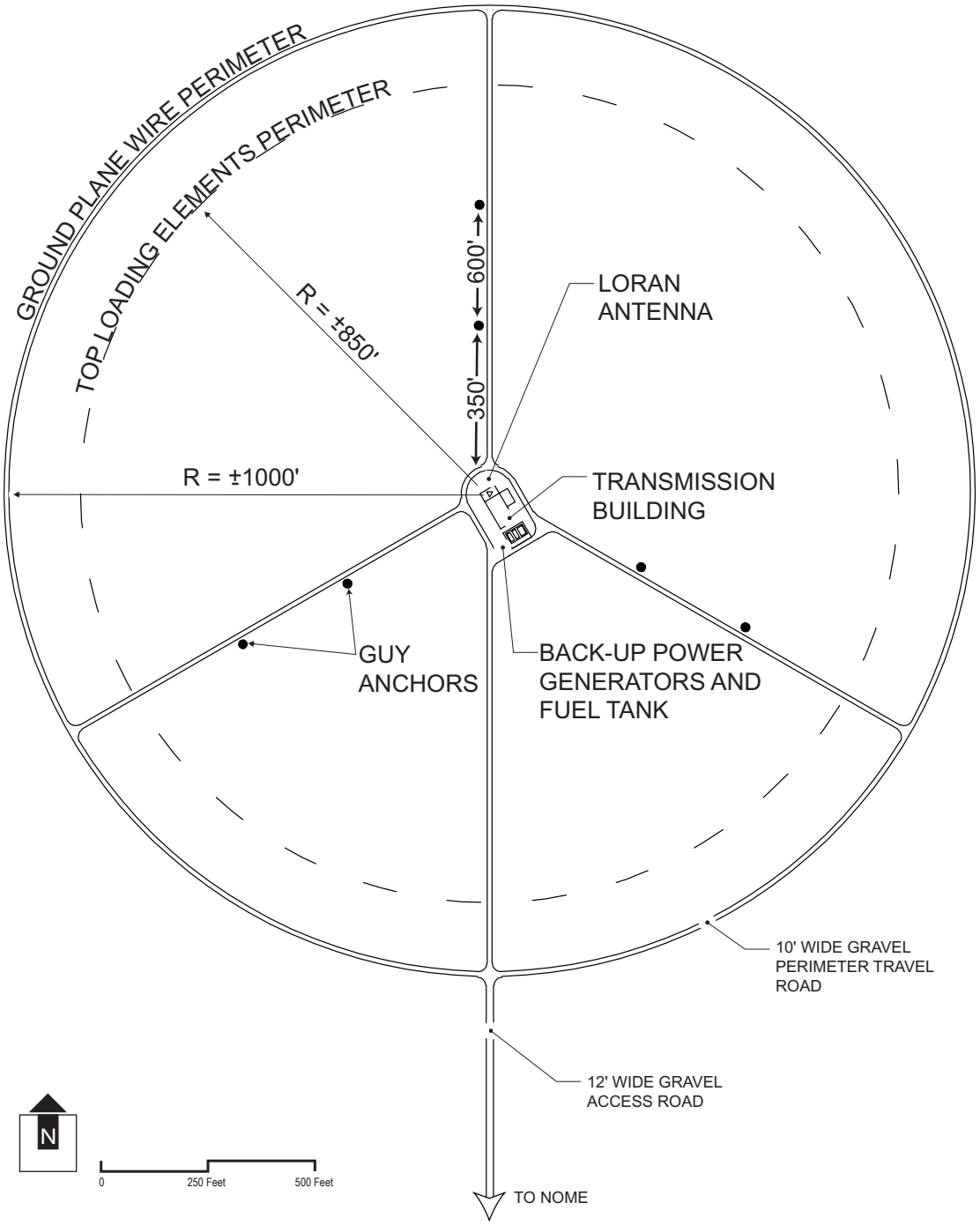
Table 2.5-1: Comparison of Environmental Consequences.

Element of the Environment	Alternative A	Alternative B	Alternative C
Air Quality			
Noise			
Water Resources			
Geology and Soils			
Vegetation, including wetlands			
Wildlife			
Land Use			
Coastal Zone Resources			
Transportation			
Cultural Resources			
Visual Resources			
Hazardous Materials			
Socio-economics			
Public Services, including communications			
Environmental Justice			
Children's Health and Safety			

Note: This table will be completed for subsequent phases of the EA.

2.6 FONSI or EIS Recommendation

Based on the analysis presented in this EA, the USCG has determined that implementation of the Proposed Action would not (would) cause significant impacts to the environment; therefore, preparation of an Environmental Impact Statement (EIS) is not (is) necessary, and a Finding of No Significant Impact (FONSI) is (is not) recommended.



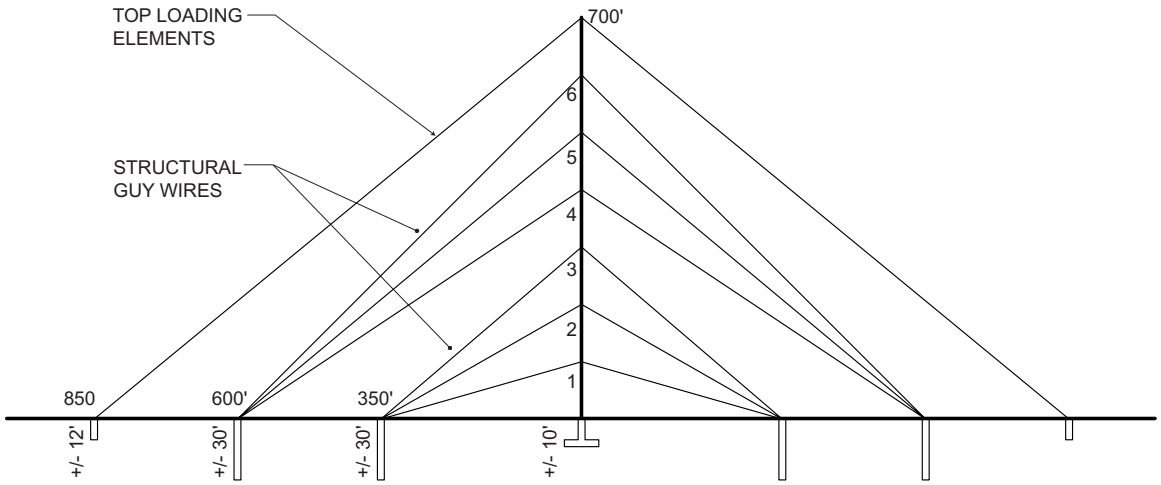
Source: USGS, URS

P://2002/2E401_04/Graphics/Figures/FinalPdfs/Figure2_1.doc

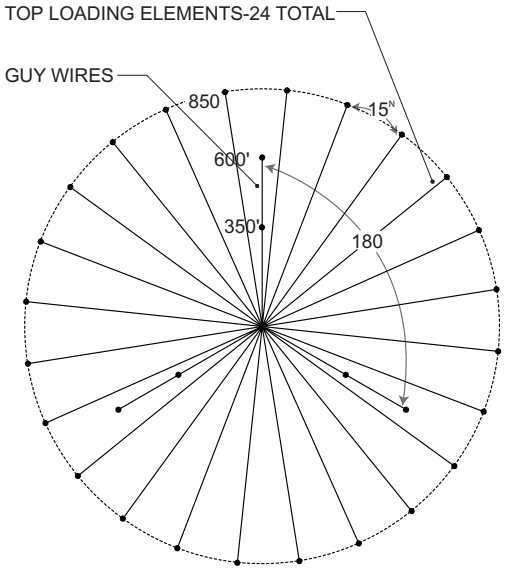
Conceptual Site Plan for Remote LORAN Station

Alaska 17-S02005

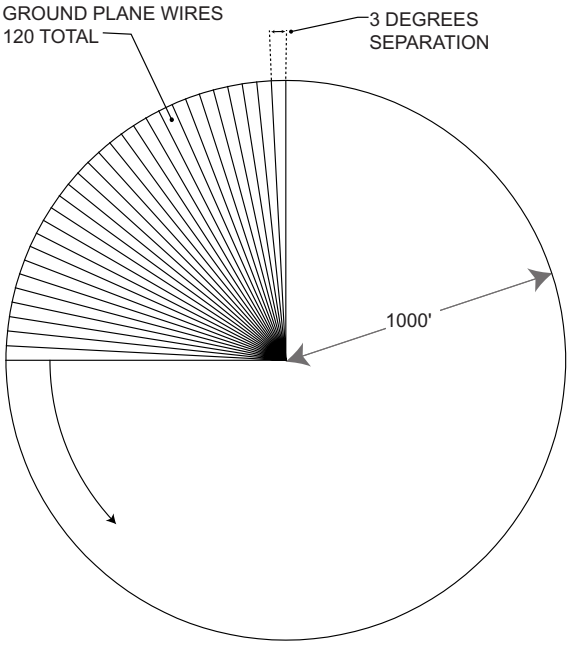
FIGURE 2.2-1



A. Antenna Elevation



B. Layout for guy wires and top loading elements



C. Ground plane diagram:
copper transmission lines buried just below surface

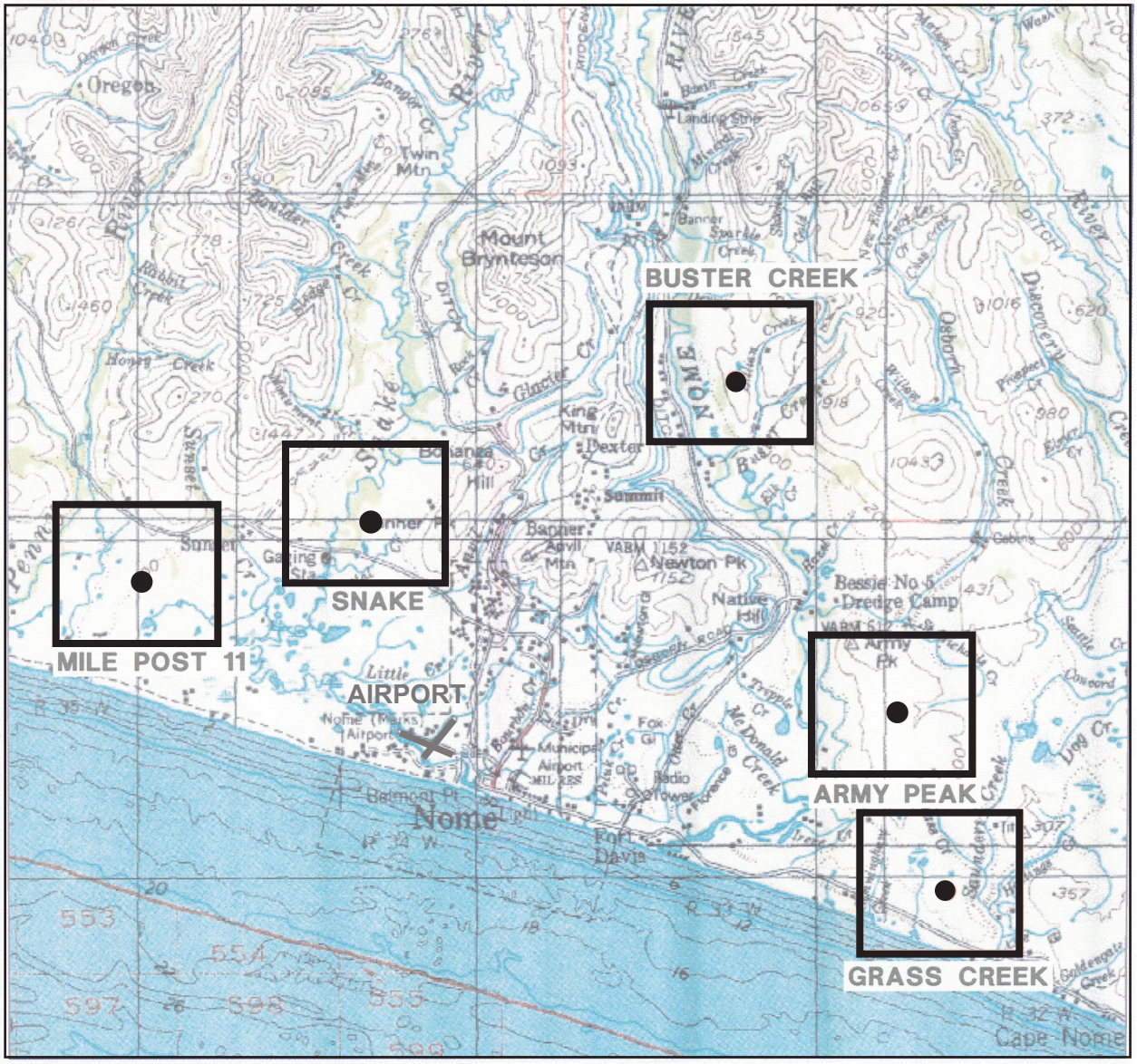
Source: USGS, URS

P://2002/2E401_04/Graphics/Figures/FinalPdfs/Figure2_2.doc

Diagrammatic Overview of LORAN Antenna Structure

Alaska 17-S02005

FIGURE 2.2-2



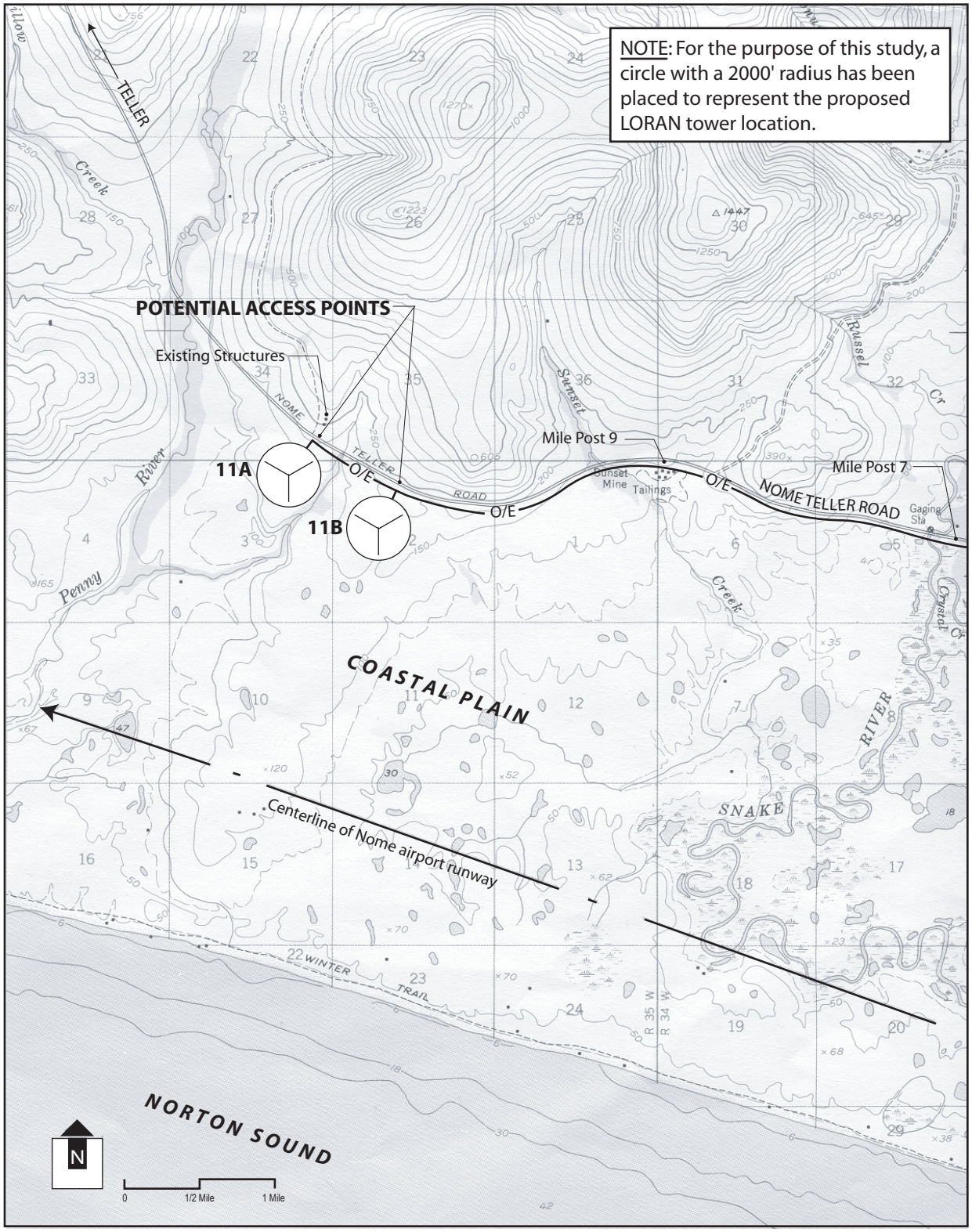
Source: USGS, URS

P://2002/2E401_04/Graphics/Figures/FinalPdfs/Figure2_3.doc

Alternative LORAN Relocation Sites in the Vicinity of Nome

Alaska 17-S02005

FIGURE 2.3-1



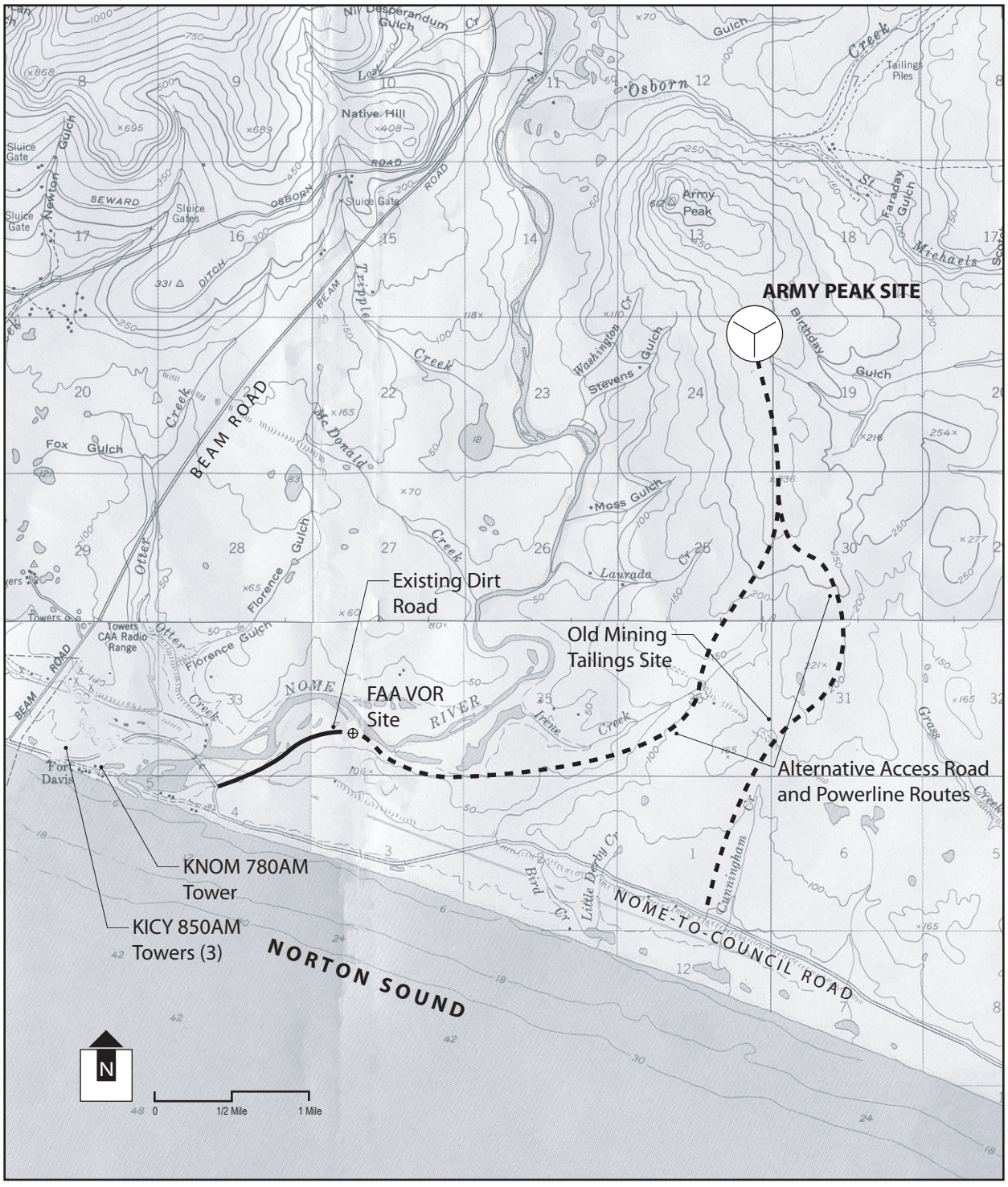
Source: USGS, URS

P://2002/2E401_04/Graphics/Figures/FinalPdfs/Figure2_4.doc

Mile Post 11 Sites West of Nome, AK

Alaska 17-S02005

FIGURE 2.3-2



Source: USGS, URS

P://2002/2E401_04/Graphics/Figures/FinalPdfs/Figure2_5.doc

Army Peak Site East of Nome, AK

Alaska 17-S02005

FIGURE 2.3-3

3.0 AFFECTED ENVIRONMENT

The alternatives analyzed below include rebuilding LORAN Station Port Clarence as an unmanned, remotely monitored station at either Milepost 11 or Army Peak sites in the vicinity of Nome, Alaska, or modernizing the existing station at Port Clarence, as well as the No Action Alternative. No Preferred Alternative has been identified at this time.

Data on the affected environment are provided below for both the Milepost 11A and 11B sites, the Army Peak site, and Point Clarence. The environmental consequences of the Proposed Action are analyzed for all sites and all elements of the environment, as are the mitigation measures.

3.1 Air Quality

There are no air quality monitoring sites in the vicinity of LORSTA Port Clarence, and no data are available, but there are few sources of air pollution in the vicinity. LORSTA Port Clarence currently generates its own power with the use of three stationary diesel engines. Permit conditions limit annual fuel use to 319,000 gallons. The small villages of Brevig Mission and Teller are located across Port Clarence Bay from the LORAN Station, and these are primarily subsistence villages with no pollutant sources other than vehicles, wood stoves, snow machines, and small plane traffic. In general, the air quality of Port Clarence is excellent.

Air quality in the Nome area is generally good, meeting the U.S. Environmental Protection Agency (EPA) attainment standards for all pollutants (BLM 2003). A summary of the relative levels of pollutants in the Nome vicinity is displayed in Table 3.1-1.

Table 3.1-1: Relative Level of Air Pollutants in Nome Vicinity.

Pollutant	CO	Pb	NO_x	VOC	PM_{10}	$PM_{2.5}$	NH_3	SO_2	HAP	Acrolein
Relative Score	B	B	A	B	A	A	A	A	B	C

CO –carbon monoxide, Pb-lead and lead compounds, NO_x-nitrogen oxides, VOC volatile organic compounds, PM_{10}-particulate matter less than or equal to 10 microns, $PM_{2.5}$-particulate matter less than or equal to 2.5 microns, NH_3-ammonia, SO_2-sufur dioxide, HAP-hazardous air pollutants, and acrolein (product of open burning, forest fires, etc.)

A is the best air quality, F is the worst. A grade of F exceeds the EPA standards. Scores are based on a statistical calculation from the mean of pollutant tons per square mile.

Source: Creative Methods website; EPA website.

3.2 Noise

At Port Clarence, the only artificial noise sources are the occasional aircraft landing or taking off from the airstrip and limited vehicle use. The station generators are inside a building and do not contribute to outside noise. Most noise associated from the station blends into the background noise of the wind and beach wave action within 50 yards from the station. Due to its extreme isolation, there are no sensitive receptors in the general vicinity of the station. The nearest habitation is at Brevig Mission, a small native village approximately 15 miles away across the open water of Port Clarence.

In general, the rural character of Sites 11A and 11B and the surrounding area is reflected by low ambient noise levels. Noise sources present are primarily from occasional vehicular noise on the Nome-Teller Road. In general, these sites are characterized by extreme quiet. There is only one sensitive receptor near either of these sites – a residence located approximately 1,300 feet from Site 11A. The Army Peak site is located about 3.5 miles from the coast road and the nearest residence and no other development in the vicinity. The only human-caused noise is from the occasional small aircraft traveling east or west to or from the Nome airport.

No specific data have been collected at Port Clarence or at the alternative sites regarding ambient noise data.

3.3 Water Resources

The Port Clarence LORAN Station is located on a narrow spit, with the Bering Sea to the west and Port Clarence Bay on the east side. There are no stream courses on the spit; the only surface water features are the numerous thaw lakes that hold melt water that slowly dissipates throughout the short summer.

For Site 11A, the Penny River flows south about 1 mile west, and a minor unnamed tributary to the Penny River flows south on the eastern edge of Site 11A. This unnamed tributary separates Sites 11A and 11B. The unnamed tributary flows into the Penny River about 1 mile southeast of Site 11A, which then flows another 2 miles southwest and into Norton Sound.

Army Peak includes a number of drainages along its flanks that flow into the Nome River, west of the peak. Michaels Creek flows northwest along the northeast shoulder of the peak and into Osborn Creek, which flows west into the Nome River. Birthday Gulch and several unnamed drainages flow from the mid-slopes of Army Peak southeast and into Michaels Creek. A number of drainages flow west into the Nome River from Army Peak's western slopes including Washington Creek, Stevens Gulch, Moss Gulch, Laurada Creek, and Irene Creek. Little Derby Creek and Cunningham Creek originate within 1 mile of the Nome-to-Council road, flow south and under the road, and into Norton Sound. A number of seasonal tributaries to the creeks dissect the lower elevations of the Army Peak ridge. Numerous seasonal and permanent open water thaw lakes are present on the ridge leading up to the Army Peak site.

3.4 Geology and Soils

The existing LORAN station is located several feet above sea level on a relatively flat spit of land. The coastal region is composed of unconsolidated interlayered alluvial marine sediments. Gravel, sand, silt, and clay are prominent components of the spit (SAIC 1993). Point Spencer lies in a region of permafrost about 16 feet thick. There is no soil survey of this vicinity. Thaw lakes are common on the peninsula both north and south of the station. The gravel beach is about 40 feet wide in most places and leads to up to sandy/gravelly deposits above the beach often combined with shell fragments. Toward the center of the peninsula, a thin organic soil covers gravelly deposits, often interspersed with old sandy beach deposits. Landforms consist of a series of east-to-west trending (perpendicular to the long axis of the spit) beach ridges separated by shallow marshy swales. The ridges vary between about 25 to 30 feet wide and

about 3 feet high. The area south of the station does not have well-defined ridges and is generally flat with shallow lakes and marsh areas.

In the Nome area, the coastal plain is a dominant geologic feature and is about 4 miles wide, extending from Cape Nome to the hills west of Cripple Creek. The coastal plain slopes gently from the hills toward the sea, is underlain by deposits laid down in part by ocean currents and streams, and consists of silt, interstratified fine sand, well-rounded gravels, and beds of angular fragments. These deposits are overlain by silt loessial deposits that range from several inches to several feet in depth and underlain by permafrost. Thaw lakes, drained thaw lakes, and pingos are characteristic features, especially near the coast. Surface water features flow from the hills in the north and cross the coastal plain in meandering courses within wide floodplains. The hills that border the coastal plain to the north range from about 1,000 to 1,500 feet in elevation and consist of folded and faulted schists and limestones. Soils of the upper hills are gravelly and cover bedrock at shallow depths.

While there is no official Soil Survey of the Nome area, a smaller scale Soil Investigation was conducted around Nome in 1966 (SCS 1996). The investigation included 25,603 acres in the Nome vicinity extending from 1.5 miles east of Nome to about 6 miles west of the city and north from Norton Sound for about 6 miles. This Soil Investigation did not include any of the three alternative sites considered in this EA, but does provide baseline information about soil characteristics in the Nome area.

From soil cores taken during the field visits, it appears that the alternative sites are dominated by soils of the Kuskokwim Series, as identified in the 1996 Soil Investigation. The Kuskokwim series consists of poorly drained, silty soils with thick surface mats of organic materials. The soils are perennially frozen up to the base of the organic mat. They are the principal soils of the Nome coastal plain, but also occur on benches, foot slopes, and side slopes of adjoining hills. Most areas are nearly level, but slopes range up to 12 percent. Thaw lakes and drained lakes are common. A representative profile consists of a peaty mat 6 to 16 inches thick over a dark gray silt loam mottled with brown and olive. The soil above the permafrost is always saturated (SCS 1966). This description is consistent with field observations of soils on the three alternative sites around Nome.

Scattered areas on these sites also likely contain peat soils of the Lemeta Series, based on topography. These soils consist of very poorly drained, very strongly acid, perennially frozen peat soils in shallow depressions. A typical profile consists of matted moss peat containing thin layers of sedge peat and thin lenses of silty material. Free water may stand on the surface of areas in shallow depressions. Similar conditions were observed on Sites 11A and 11B and on the access route to the Army Peak site during a site visit in October 2003.

3.5 Vegetation

The landscape of the western Seward Peninsula is dominated by tundra, which is the treeless ecotype found north of the boreal forest and above tree line in the mountains of Alaska (Lincoln 1987). Tundra occurs where extreme winter cold and wind, brief cool summers, and shallow continuous permafrost prevent tress from growing. Seasonal thawing of the surface layer of

permafrost in tundra creates an active layer of thaw that reaches from a few inches to a few feet deep each summer. The rooting zone of plants and the infiltration of water are limited to this active layer. Tundra vegetation is characterized by low-growing plants including mosses, lichens, grasses, sedges, and dwarf shrubs. Because of the extreme growing conditions, only a limited variety of plants can thrive here.

Tundra is categorized into four general types – dry tundra, moist tundra, wet tundra, and aquatic tundra. Dry tundra occurs where there is good drainage and a deep active layer to create dry soil conditions. Moist tundra is found where the soil is saturated throughout the growing season and standing water is shallow or present for only part of the growing season. Wet tundra is present where standing water persists through the growing season at depths less than 1 foot, and aquatic tundra includes open water areas of ponds, lakes, and streams and may occur as an extension of adjacent wet tundra. The following narrative describes the vegetation at Point Clarence and the alternative sites.

3.5.1 Port Clarence

The landscape at Port Clarence is a mosaic of dry tundra, wet tundra, small un-vegetated seasonal ponds, and gravel beach. A gravel beach borders the peninsula and is bordered on the landward side by a narrow strip of beach grass. Dry tundra at Port Clarence is comprised of low-growing woody plants including willows (*Salix* spp.), blueberries (*Vacannium* spp.), and cranberry (*V. oxycoccos*) with a number of sedges (*Carex* spp.), grasses, lichens, and moss. Wet tundra areas are dominated by cottongrass (*Eriophorum angustifolium*), some woody plants, and willow. Seasonal ponds (thaw lakes) with a gravel bottom are common on the Port Clarence peninsula. During the October site visit, a majority of these seasonal ponds were dry or nearly so. Discussions with the Port Clarence USCG staff indicate that these ponds are filled with snow/ice melt and can range in depth from about 1 to 4 feet. Persistence of the ponds into the early autumn depends on the previous year snow and ice cover and the temperatures through the summer. A National Wetland Inventory (NWI) map of the Port Clarence area has not been prepared by the U.S. Fish and Wildlife Service (USFWS).

The area around the base of the existing LORAN tower is mostly dry tundra. Both south and north of the existing tower is a mosaic of moist, wet, and dry tundra with scattered seasonal ponds. Regulatory wetlands are included in this mosaic.

Previous documentation indicates that an eelgrass bed is located just offshore from the barge landing area in Port Clarence Bay. This could not be confirmed during the site visit, but there were detached pieces of eelgrass floating near the shore, indicating that an eelgrass bed was nearby. USCG staff at Port Clarence indicated that they had heard that there was an eelgrass bed just offshore from other staff, but were unable to determine its location while fishing from a boat in the vicinity (ROC, Stone, 2003).

3.5.2 Milepost 11 Sites

3.5.2.1 Site 11A

Site 11A is located on a bench that is south of the Nome-Teller Road at about Milepost 11 on a parcel with a slope of 0 to 3 percent. A drainage runs roughly parallel with the road about 200 feet south of the road and eventually turns south and flows into an unnamed tributary of the Penny River. South of this drainage, the slope is relatively flat and the soil is consistently saturated. Soil is composed of an organic layer for the first 8-10 inches and underlain by a dark, silty loam.

Vegetation at Site 11A is similar to that found on the Army Peak site but more strongly dominated by cottongrass, a variety of sedges, moss, and lichens and less woody vegetation.

The NWI map for this site appears to be fairly accurate in depicting wetland vs. upland tundra. Between the road and the parallel drainage, the site is upland; south of the drainage, the site is wetland tundra with willows in drainages. This flat area is bordered by shallow ravines on either side, which eventually flow into a tributary of the Penny River.

3.5.2.2 Site 11B

Site 11B is also south of the Nome-Teller Road about 0.25 mile, east of Site 11A. A drainage separates Site 11B from Site 11A. Vegetation on Site 11B is similar to that found on Site 11A and dominated by cottongrass, sedges, lichens, and mosses. The NWI map for this area appears accurate and indicates a small area of upland that extends about 75 feet south of the Nome-Teller Road. Beyond this line southward, Site 11B is wetland tundra. There is another small drainage that borders the eastern end of the site and is dominated by a variety of willows and small (30 ft by 30 ft) areas of open water.

3.5.3 Army Peak

This site is located on a north-south trending ridge on the shoulder of Army Peak, about 3.5 miles north of the coast road. The site is on a relatively flat bench with a slope of between 3 and 5 percent adjacent to a distinctive topographic break at the foot of the summit ridge to Army Peak. The vegetation association is a mix of moist tundra and wet tundra species, often in a complex array. The site is dominated by herbaceous plants, such as cottongrass, sedges, lichens, and mosses. Relief is often provided by peat ridges, hummocks, and polygonal features from frost action or ice wedges.

Woody plants are found on slightly drier sites where the micro-topography places them higher above the water table. These are diminutive plants that are often ground-hugging species including alpine bearberry (*Arctostaphylos alpine*), dwarf arctic birch (*Betula nana*), entire-leaf mountain-avens (*Dryas integrifolia*), narrow-leaf Labrador-tea (*Ledum decumbens*), bog rosemary (*Andromeda polifolia*), and a number of the *Vaccinium* species such as bog cranberry (*V. oxycoccos*), bog blueberry (*V. uliginosum*), and mountain cranberry (*V. vitis-idaea*).

Willow bands are particularly prominent in drainages and in bands across the slope on the steeper shoulder of Army Peak above the proposed tower site. Common willow species include diamondleaf willow (*Salix planifolia*), netleaf willow (*S. reticulate*), and Richardson willow (*Salix lanata* ssp. *richardsonii*).

NWI maps (USFWS 1991) indicate a mosaic of upland and wetland leading from the coast road to the flat ridge of the proposed Army Peak site. The NWI map indicates that most of the broad, flat ridge of the proposed site is upland tundra, but a field visit indicates otherwise. A triple parameter wetland delineation was not completed, but rather a wetland reconnaissance of the site was conducted. While there are some upland tundra areas leading up to the site, field observations of the soil, hydrology, and vegetation indicate that the vast majority of the broad ridge qualifies as a regulatory wetland. During a field visit on October 8, 2003, a drier time of the year, soils were saturated to or near the surface. The upper 8 – 10 inches is an organic layer with a dark silty loam below the organic layer. Vegetation is dominated by hydrophytic plants. Surface saturation was common within average depths of 1 to 4 inches. Tundra wetlands are often difficult to distinguish from upland tundra on aerial photographs because of minor changes in elevation and small variations in vegetation signatures, so it is not surprising that field investigations show that this area is actually wetland instead of upland, as shown on NWI maps.

3.6 Fish and Wildlife

LORSTA Port Clarence Station is located on an isolated spit of land that is about 1.5 miles wide near the USCG station and narrows to less than a tenth of a mile south of the station. While waterfowl are particularly abundant in the late spring and summer, large mammals are only transient visitors to the area. There are no surface waters on the sand spit that support fish, but the adjacent Bering Sea is inhabited by a number of species including Pacific herring (*Clupea pallasi*), several species of salmon (*Oncorhynchus* spp.), rainbow smelt (*Osmerus mordax*), starry flounder (*Platichthys stellatus*), saffron cod (*Eleqinus gracilis*), capelin (*Mallotus villosus*), whitefish (*Coregonus* spp.), and Dolly Varden trout (*Salvelinus malma*) (NOAA 2003).

Table 3.6-1 lists bird species that can be found in the vicinity of the station during the breeding season. Black scoter (*Melanitta nigra*), pelagic cormorant (*Phalacrocorax pelagicus*), raven (*Corvus corax*), and snow bunting (*Plectrophenax nivalis*) were the only birds observed during the October site visit. Arctic ground squirrel (*Spermophilus parryii*) and red fox (*Vulpes vulpes*) were mammals observed during the site visit. USCG staff reported that grizzly bears (*Ursus arctos*) commonly wander along the peninsula, and one sighting a several years ago included five bears at one time. Polar bears (*Ursus maritimus*) infrequently visit the area once the pack ice forms and encloses the peninsula. Seals, walrus (*Odobenus rosmarus*), and a number of whale species are often sighted in the Bering Sea or in the Port Clarence Bay. Reindeer (*Ranifer tarandus*) that are herded by local villagers occasionally wander across the site. Due to the lack of shrubs or other woody vegetation at Port Clarence, songbirds are unlikely to be attracted to the site.

Table 3.6-1: Common Birds of the Port Clarence, Alaska Vicinity.

COMMON NAME	LATIN NAME
Tundra swan	*Cygnus columbianus*
White-fronted goose	*Anser albifons*
Canada goose	*Branta Canadensis*
Black brant	*Branta bernicla*
Northern pintail	*Anas acuta*
American wigeon	*Anas Americana*
Mallard	*Anas platyrhynchos*
Northern shovelers	*Anas clypeata*
Greater scaup	*Aythya marila*
Canvasback	*Aythya valisineria*
Long-tailed duck	*Clangula hyemalis*
Black scoter	*Melanitta nigra*
Common eider	*Somateria mollissima*
King eider	*Somateria spectabilis*
Pacific loon	*Gavia pacifica*
Red-throated loon	*Gavia stellata*
Red-breasted merganser	*Mergus serrator*
Semipalmated plover	*Charadrius semipalmatus*
Bar-tailed godwit	*Limosa fedoa*
Ruddy turnstone	*Arenaria interpres*
Dunlin	*Calidris alpine*
Glaucous-winged gull	*Larus hyperboreus*
Rough-legged hawk	*Bueto lagopus*
Short-eared owl	*Asio flammeus*
Snow bunting	*Plectrophenax nivalis*
Lapland longspur	*Calcarius lapponicus*
Pelagic cormorant	*Phalacrocorax pelagicus*
Raven	*Corvus Corax*

Source: Harris 1996

Similar wildlife species can be found at the Army Peak and Milepost 11 sites, but because these sites are up to 5 miles inland, seabirds and gulls are not be present. These more inland sites offer a variety of habitat not available at Port Clarence, particularly taller willow shrubs. Species that could be expected at these inland sites in addition to those listed above include muskox (*Ovibos moschatus*), moose (*Alces alces*), wimbrel (*Numenius phaeopus*), golden eagle (*Aquila chrysaetos*), gyrfalcon (*Falco rusticolus*), peregrine falcon, (*Falco peregrinus*), gray-cheeked thrush (*Catharus minimus*), northern wheatear (*Oenanthe oenanthe*), yellow wagtail (*Motacilla flava*), and white-crowned sparrow (*Zonotrichia leucophrys*). There are no known raptor nest sites in the general vicinity, although ground nesting species, such as short-eared owl (*Asio flammeus*), snowy owl *(Nyctea scandiaca*), or northern harrier (*Circus cyaneus*), likely breed in the vicinity.

There is a known nesting site for gyrfalcons in an old dredge structure along Penny River about 2.5 miles from Site 11A. Chum salmon, coho salmon, Dolly Varden, and pink salmon occur in the Penny River near Sites 11A and 11B.

Near the Army Peak site, two dredge structures occur along Osborne Creek that are alternately used by ravens and gyrfalcons. The first is about 1.5 miles from the Army Peak site on the

opposite (northwest) side of the peak. The second is about 3 miles northeast of the site (ROC, Bente, 2003). Osborne Creek, which flows west around the north side of Army Peak, supports coho salmon, pink salmon, and Dolly Varden (Alaska Department of Fish and Game 2003).

3.7 Endangered Species

No Federally listed or proposed threatened or endangered plants or animals occur at Sites 11A, 11B, or Army Peak (ROC, Swem, 2003; ROC, Lipkin, 2003; ROC, Lenz, 2003). The Steller sealion (*Eumetopias jubatus*) is listed as Endangered under the Federal Endangered Species Act and may occur in the Bering Sea and in Port Clarence Bay adjacent to LORSTA Port Clarence. There are no rookery or haul-out sites for Steller sealions on the sand spit.

The USFWS indicates that threatened spectacled eiders (*Somateria fischeri*) and Steller's eiders (*Polysticta stelleri*) are known to migrate though the Port Clarence vicinity and along the coast near Nome.

3.8 Land Use

The Seward Peninsula is a very remote, thinly populated region in northwestern Alaska. Human settlement is largely limited to the immediate maritime coastal area and along certain interior river valleys. Traditional subsistence lifestyles continue to drive settlement patterns, with many residents dispersing to summer hunting and fishing camps and homes, then retreating to small towns and villages during the winter months. Subsistence practices are predominantly oriented to the exploitation of maritime resources, such as fish, seaweed, and sea mammals. The few roads and public services that exist are principally found in the vicinity of Nome and the villages. There is no agriculture or animal husbandry, other than some limited grazing of semi-domesticated reindeer, herds of which wander freely over unfenced tundra.

Land ownership is concentrated in the hands of a few large landowners – the Federal Government and the Alaska Native Corporations. The principal Federal land managing agencies on the Seward Peninsula are the National Park Service and the Bureau of Land Management (BLM), although other agencies also control land holdings, including the USCG. The Alaska Native Corporations were created by the Alaska Native Claims Settlement (ANCS) Act of 1971, which established 12 regional corporations and 200 smaller village corporations. Signed by President Nixon on December 18, 1971, the Act settled land ownership disputes between the U.S. and State governments and the aboriginal owners stemming from the time of Alaska statehood and earlier. Approximately 1/9th of the land area of Alaska was deeded over to the native corporations by the Act (Chance 1995).

3.8.1 Port Clarence

LORSTA Port Clarence sits at the end of the 12-mile long Point Spencer, which juts into the Bering Straits, forming Port Clarence Bay. It is accessible only by water or air during the summer and over the snow and ice during the winter. The point is very low lying, at a height of approximately 5 feet above high water. Reportedly it was completely overwashed by water during a tsunami event in the early 1984, inundating the station building (Hart Crowser 2001),

and earlier records suggest that this had occasionally occurred in the past, based on physical evidence (USCG 1951). The USCG controls approximately 2,648 acres of land on the Point Spencer peninsula, withdrawn from public lands in 1962 to establish a navigation station. This land was selected by the Brevig Mission Native Corporation during the ANCS Act Negotiations as land that should be transferred to the village corporation, but was denied by the USCG on the grounds that all lands were needed to protect the critical facilities vital to the operation of the LORAN station and to protect the station, including the runway, from encroachment.

The only residents at the LORSTA consist of the 23 to 25 Coast Guard sailors. There are several small, native seasonal hunting and fishing camps on Point Spencer, 1 mile or more south of the LORSTA. These camps are occupied intermittently during the summer months by several native families. Two other permanent villages exist around Port Clarence: Brevig Mission to the north, and Teller to the east. These are small, native subsistence villages. The surrounding land area consists of unfenced tundra.

3.8.2 Army Peak/Milepost 11 Sites

The majority of the land in the coastal plain in the vicinity of Nome is under the jurisdiction and ownership of the Sitnasuak Native Corporation (SNC). The SNC was established under the provisions of the Alaska Native Claims Settlement Act, and incorporated in 1973. SNC is the largest of the 16 village corporation in the Bering Straits region, and controls approximately 150,000 acres of land, plus another 81,000 acres of Section 12(b) class land, as defined by the ANCS, whose subsurface mineral rights are owned by the Bering Straits Regional Corporation. The SNC corporate headquarters are located in Nome. SNC owns the land under the Army Peak site, as well as the Milepost 11A and 11B sites. The SNC Land Committee has the authority to develop land use policies for the regulation of land use within Sitnasuak properties, and to issue or revoke land use permits for such lands (SNC 2003b). The Board of the SNC has endorsed the relocation of the LORAN tower to its lands in the vicinity of Nome in Board of Directors Resolution No. 03-01 (SNC 2003a).

3.9 Coastal Zone Resources

LORSTA Port Clarence and the coastal plain in the vicinity of Nome are situated within the designated state coastal zone boundary. Although Federal lands are excluded from a state's coastal zone jurisdiction, Federal agencies are required by the Federal Coastal Zone Management Act (CZMA) to be consistent to the maximal extent practicable with policies of the state program. In this case, that is the Alaska Coastal Management Program (ACMP).

The ACMP requires that projects in Alaska's coastal zone be reviewed by coastal resource management professionals and found consistent with the statewide standards of the ACMP. Through the State's consistency review process, these standards and the enforceable policies of an affected coastal district ensure that development interests observe the vision set out for the future by the State and coastal communities. A finding of consistency with the ACMP must be obtained before permits can be issued for the project (State of Alaska Division of Governmental Coordination Website, accessed 12/2003).

The specific Coastal Management Plan (CMP) that regulates CZM issues within the area affected by the various EA alternatives is the Bering Straits Coastal Resource Service Area (CSRA) CMP. This coastal area encompasses a combination of selected watersheds, drainage basins, and uniform 1 mile corridors from ordinary high water along each side of fish streams and rivers that provide habitat for important populations of anadromous fish. To protect anadromous fish resources and habitats in the areas with greatest potential for mineral development, the Bering Straits CRSA coastal area boundary includes watersheds and drainages where mineral potential is rated as high or very high by the Alaska Department of Natural Resources (ADNR) (ADNR 1989). This presumably includes potential for gold mining. The Bering Straits CRSA CMP identifies the subsistence use of coastal lands and waters as traditionally being of the primary and highest priority use. It defines water-dependant uses and activities as having the highest priority within the coastal zone, followed by water-related uses, with all other activities being lowest on the scale.

3.10 Transportation

Western Alaska is a very remote region, with very few roads. There is no road link from the Seward Peninsula to the rest of Alaska, and thus to Canada and the lower 48 states. Nome is located on the southwestern tip of the Seward Peninsula, and is the hub of a rudimentary road network. Three unpaved rural highways lead out from Nome. The Nome-to-Council Road runs approximately 85 mile northeast to the town of Council, Beam Road runs about 85 miles due north into the interior, and the Nome Teller Road runs about 80 miles northwest, ending in the community of Teller, about 15 miles across open water from LORSTA Port Clarence.

Aviation is the most important means of transportation in western Alaska, and most supplies reach the outlying villages and communities by air or water. In winter, overland or even over-water travel by snow machine becomes possible, and this becomes a more important mean of transportation. Large distances between communities and harshness of the climate mean that air travel remains the most important transportation option year-round. There is a large aviation community, and while there are numerous commercial options for travel, much of the traffic is by light aircraft navigating by Visual Flight Rules (VFR), which may not have the capacity for Instrument Flight Rule (IFR) navigation during bad weather, as do commercial aircraft.

Port Clarence is accessible only air or sea during the summer, and by air or overland by snow machine during the winter. There are no roads out to Port Clarence – the nearest road runs from Teller-to-Nome, about 35 miles overland by an All Terrain Vehicle (ATV) from Port Clarence. Even an ATV travels very slowly over the tundra, due to roughness of the terrain. There is a runway at Port Clarence large enough to accommodate the C-130 transport planes that arrive with supplies from Coast Guard Station Kodiak every 3 weeks throughout the year.

3.11 Cultural Resources

3.11.1 Port Clarence

A qualitative archeological exploration of Point Spencer was undertaken in 2001 (Hart Crowser 2001), related to the potential for replacing the LORAN tower with a shorter solid-state system. The area of potential effect (APE) for that survey was defined as a circular area with a 1,400-foot radius centered on the current LORAN tower. It concluded that the Point Spencer area had a documented history of occupation by both Europeans and Alaska Natives that extended back into prehistory. The survey noted that although five prehistoric to early historic Eskimo sites had been reported in the literature, it was not possible to relocate these sites, possibly because they had been destroyed either through airstrip construction or shoreline erosion. The exploration did identify two previously unknown prehistoric sites on coastal settings at a distance of at least ½ mile away from the tower radius, which are still intact.

One of these sites is adjacent to the beach on the Port Clarence side of the spit, a short distance north of the tank farm. A large mound marked with an older sign identifying it as an archeological site, it has been extensively burrowed into by ground squirrels, and old mammal bones are plentiful. The second site is located some distance to the south of the LORAN tower.

Point Spencer was known to have been the site of two semi-permanent fall and winter Eskimo settlements during the early historic period. It also was historically a major trading site on the Bering Strait, where native peoples would gather from all over northwest Alaska to trade and engage in group interactions (Hart Crowser 2001). These gatherings included a number of European and American trading vessels during the latter part of the 19th century. Later, Point Spencer became an important point of call for whaling and sealing vessels, and several coaling stations were established there in the 1880s. A lighthouse was established there in 1925, and in 1941 Port Clarence Army Base was established as an outpost supporting Marks Field in Nome during WWII. Marks Field was constructed as a bomber field in 1941, and later in the war was taken over by Air Transport Command for use in the Lend Lease Program once the Japanese threat in the North Pacific subsided.

Hart Crowser contacted local Traditional Councils representing the Alaska Native villages, but none of them expresses knowledge regarding the presence of traditional cultural properties, archeological sites, or other concerns for the area within the APE. It was generally conceded in these interviews that the lands around Port Clarence traditionally belonged to the people who were now living in Brevig Mission. Test pits were dug within the APE as part of the study, but no evidence of any prehistoric archeological remains were found (Hart Crowser 2001). Several seasonal hunting and fishing camps are still in current use by native peoples on Point Spencer, possibly on USCG property. These are located on the beach several miles south of LORSTA Port Clarence. The users come and go at will, with little or no interaction with Coast Guard personnel.

Most of the features of the Port Clarence Army Base were obliterated by construction of the LORAN station and runway in the early 1960s. Reportedly, some abandoned Army buildings remained on base but all save one were demolished by 1977. There are conflicting reports

regarding the fate of the last Army building. There are reports that it burned down in 1995 (Hart Crowser 2001), but the current Coast Guard crew maintain that the existing Heavy Duty Shed adjacent to the runway is the remaining Army building. It is located in the vicinity of the former Army encampment and consists of an older wooden structure that has been substantially modified with roll-up metal doors and metal siding. Both the Alaska State Historic Preservation Officer and the Coast Guard concur that neither the Army base nor the LORAN station are eligible for the National Register of Historic Places (USCG 1997; ROC, Bittner, 1997).

3.11.2 Army Peak/Milepost 11 Sites

Nome was the site of a major gold-mining industry beginning in 1900. A major strike in 1910 led to a gold rush, and at one point Nome was the largest city in Alaska with a population of approximately 20,000 inhabitants. Early mining consisted of gold panning and drift mining through frozen permafrost. As gold mining technology evolved, large dredge mining machines came into use, with the first dredge active on the Seward Peninsula as early as 1900 (Mcintosh 2003). These powerful machines could move 3,000 cubic yards of material or more per day. They came into use in the coastal plain around Nome, and in the Snake River and Nome River drainages, as well as elsewhere. These powerful machines have disturbed the landscape extensively in the vicinity of Nome, to the degree that large spoils piles are observed readily in all directions. The dredge buckets can be readily seen around town, used as street furnishings, and the old dredges themselves can be spotted in severe stages of deterioration in numerous sites about Nome. The gold dredges were shut down by Federal order during WWII, and afterward the dredge industry never recovered. The National Register of Historic Places includes some sites related to the gold mining industry in the vicinity of Nome. Although the exact locations of these listed sites has not been pinpointed, there are no major historic mining or dredging sites within several miles of any of the proposed relocation sites.

3.12 Visual Resources

The Port Clarence LORAN Station is located in a very remote and pristine landscape. Visibility is very good in all directions. A high level of air quality, and a complete lack of vegetation other than low shrubs, along with the absence of topographic relief, allows for unobstructed distant views. At 1,350 feet in height, the existing LORAN tower is reputedly the tallest structure in Alaska, which aids its visibility making it a local landmark. It is the only structure more than several stories high at Port Clarence. Outside of Port Clarence, the next nearest structures are across the bay at Brevig Mission, a distance of 15 miles. At night, the safety lighting on the tower, consisting of blinking red or white lights placed at 200-foot intervals, is visible at great distances. Although the tower is quite tall, it is a narrow lattice structure, which helps minimize its visibility during the day.

The Milepost 11 sites are located at the northern edge of the coastal plain west of Nome. This plain is characterized by openness, lack of vegetation taller than about 5 feet, and lack of topographic relief. It gently slopes from the foothills down to the sea, a distance of approximately 3 miles at this site. These sites are immediately adjacent to the Nome-Teller Road. From the road in the vicinity of Milepost 11, the gaze of passersby is drawn south toward the sea across the coastal plain by the long vistas. Vistas to the north are blocked by the adjacent

slopes. There is a single nearby residence, about a quarter mile to the north upslope from Site 11A. It is unclear whether this is a year-round residence or a summer cabin. There are no other buildings in the immediate vicinity of Sites 11A and B. The only other visible structures are some abandoned reindeer corrals adjacent to Site 11A, as well as some additional corrals visible in the distance. Several miles nearer to Nome, there are the remnants of historic mining activity, including dredges and dredge spoils.

The Army Peak site is located on the upper elevation of a ridge extending south from Army Peak. It is located at an elevation of 300 feet, so it sits above the coastal plane. While vegetation is low and sparse around the site, the topography is somewhat folded and dissected by streams running off the flanks of Army Peak, which limits longer views in certain directions and from certain vantage points. Downtown Nome is visible from the site. A number of residences are visible as well, almost all of them along Beam Road to the west, a distance of 2.5 miles. These are the nearest structures to the site. Army Peak cuts off views to the north, while to the east there are no roads or buildings, only open tundra to the horizon. To the south there are some residences along the Nome-to-Council Road at a distance of 3.5 miles.

3.13 Hazardous Materials

Handling and storage of hazardous materials are regulated by a complex system of State and Federal regulations. The USCG has its own operational instructions with regards to the handling of these materials, including petroleum products; flammable materials; corrosive materials; health hazards such as asbestos, lead paint, toxic substances, and polychlorinated biphenyls (PCBs); "solid wastes"; and others. It is the responsibility of LORSTA Port Clarence to maintain accurate records and to follow correct procedures with respect to the handling and storage of hazardous material.

3.13.1 Port Clarence

Port Clarence has undergone many years of human use. Industrial uses were first established in the 1880s when several coaling stations were established there to service the whaling and sealing industries (Hart Crowser 2002). Later, the Port Clarence Army base was established. Although almost all remnants of Army occupation are gone, remnants of Army buildings and waste materials remain. A contamination site remains immediately north of the Heavy Duty Shed, adjacent to the runway, which is mounded and covered with a PVC sheet as it undergoes remediation (Note to reviewers: Need more information about the nature of contamination).

The USCG station was established in 1962. As a remote, self-contained community, local USCG personnel are responsible for the station's life support systems, including power generation, wastewater treatment, solid waste disposal, and water production. Its operational requirements require the handling of many classes of hazardous materials. Procedures for operating these systems have evolved in response to new technologies and a changing regulatory environment over the years. It currently operates a licensed sanitary landfill and a wastewater treatment plant. Power generation requirements require that the station maintain up to 400,000 gallons of diesel fuel in four 100,000 gallon tanks, located outside within secondary storage containers. Prior to recent operational modifications to minimize the potential of oil spills,

secondary storage of diesel fuel occurred in numerous smaller "day tanks" around the station. Numerous spills occurred over the years at these day tanks, resulting in diesel soaking into the ground to rest against the permafrost layer. These day tanks have been replaced with a more secure single interior tank, and the spill sites are slowly being cleaned up using bioremediation techniques. However, these techniques work slowly in this severe northern climate with very low ambient biological activity.

Power is generated by diesel generators, and the station is permitted to burn 319,500 gallons of diesel per year by the State of Alaska. It also operates a waste incinerator to dispose of waste paper. While the current landfill is licensed, there are several older landfills around the station, perhaps going back to the Army use period. However, these older landfills have been evaluated by the EPA according to its Hazard Ranking System protocols used to evaluate Federal facilities for inclusion on the National Priorities List. EPA has determined that the facility does not rank high enough for inclusion on the NPL (NPL 1997). The current status is No Further Remedial Action Planned (NFRAP) on the EPA's Federal Agency Hazardous Waste Tracking Docket.

An Environmental Compliance Evaluation was recently completed for LORSTA Port Clarence (URS 2002). This evaluation followed the U.S. Army Construction Engineering Laboratories (CERL) September 2001 version of *The Environmental Assessment and Management Guide* (TEAM Guide) for Federal requirements, and incorporated local regulations as well. A total of 15 findings of non-compliance were found. However, none of these were Class I Significant, Class I Major, or Positive findings. The most notable findings related to solid waste and program management issues. Not all of the permit requirements for the solid waste landfill were being followed, and the facility lacked a system for storing and maintaining environmental records. High staff turnover rates was a contributing factor.

3.13.2 Army Peak/Milepost 11 Sites

All three of these sites are "greenfield" sites that show little or no evidence of previous disturbance. Human activities appear to be confined to reindeer grazing and transiting during the winter months, when a winter trail crossing Sites 11A and B is active. There is an old reindeer corral adjacent to Site 11A, and an old rusted 55 gallon barrel was found in the southwest corner of the site. It lay on its side in the tundra, and a large hole was rusted through its side. The barrel contained a number of old empty glass bottles, perhaps indicative of former use as a trash receptacle. A 36-inch long wooden stake was driven into the ground in the center of Site 11B. It was weathered and appeared to have been in the ground for a long time, perhaps years. No other sign of human development or use was observed on any of the sites.

Some old mining tailings were observed about 2 miles above the Nome-to-Council Road along the likely route of an Army Peak access route.

3.14 Socioeconomics

Due to its remoteness, LORSTA Port Clarence operates in enforced isolation. There are currently 24 authorized billets at Port Clarence, and personnel are typically assigned there for a 12-month tour of duty. Although personnel are authorized to take leave after 5 months of duty, it

is not uncommon for personnel to spend their entire tour at Port Clarence and never leave (ROC, Stone, 2003). Consequently, the benefit to the area economy from USCG paychecks is not great. Local native carvers occasionally come by Port Clarence and sell ivory carvings to Coast Guard personnel, thus gaining some economic benefit. There is some regular light commercial air traffic from Nome that bring mail, smaller amounts of supplies, and official visitors, thereby benefiting financially by providing these services. However, most of the Station's logistics support is provided by a C-130 transport flight every 3 weeks from Kodiak, rather than by commercial flight from Nome. Local economic inputs related to logistics supply to Port Clarence are not substantial.

Maintenance costs associated with LORSTA Port Clarence are high. Some Nome-based contractors do benefit from construction and maintenance contracts at the station, thus benefiting the local economy. Many of the maintenance and construction contracts are awarded to firms outside of northwest Alaska, including firms in the lower 48 states, for reasons of size, contracting relationships, or technical complexity.

3.15 Public Services, Including Communications

There are no public services available at LORSTA Port Clarence. It is a remote, self-contained operating unit. The Coast Guard provides public services from Port Clarence in the form of aids to navigation, such the LORAN signal and visual navigation devices. However, the navigation signal at the end of Point Spencer is not under the control of LORSTA Port Clarence, and would remain should the LORAN station be decommissioned.

Nome was incorporated in 1901 and is the only urban center on the Seward Peninsula capable of providing significant amounts of public services. As an incorporated city of approximately 3,500 inhabitants, it has a city manager, mayor, city council, city staff, and police and fire service. A branch of the city government, the Nome Joint Utility System (NJUS), provides water, sewer, and power service. NJUS is in the process of constructing a new power generation plant that will significantly increase the capacity of the system to provide public power. Nome also runs the public school system. The Port of Nome operates the waterfront port facilities and the airport. The Nome Airport is capable of handling large commercial jets, such as the Boeing 737.

Although public services are available in Nome, service areas are limited. Beam Road is the eastern limit of 3-phase power distribution, with Milepost 4 on the Nome-Teller Road being the approximate western limit (Tryck Nyman Hayes 2002). The local highways are plowed by the Alaska Department of Transportation (ADOT) in the wintertime, but plowing ends at the High School (Milepost 4) on the Nome-Teller Road, and at the Nome River on the Nome-to-Council Road.

3.16 Environmental Justice

In the past decade, the concept of Environmental Justice has emerged as an important component of Federal regulatory programs, initiated by Executive Order No. 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations. This

Executive Order (EO) directed each Federal agency to “make achieving environmental justice by avoiding disproportionately high or adverse human health or environmental effects on minority and low-income populations” a part of its mission. EO 12898 emphasized that Federally recognized Native tribes or bands are to be included in all efforts to achieve environmental justice (Section 6.606).

The demographics of the affected area were examined to determine the presence of minority populations, low-income populations, or tribal peoples in the area potentially impacted by the Proposed Action. If these populations are present, a determination must be made as to whether the proposed project would cause a disproportionately high and adverse human health or environmental effects on the minority populations or low-income populations present. The Council on Environmental Quality (CEQ) defines "minority" to consist of the following groups:

- Black - a person having origins in any of the black racial groups in Africa;
- Hispanic - a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
- Asian - a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;
- Native Hawaiian or Other Pacific Islander - a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands; and
- American Indian or Alaska Native - a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition.

The CEQ also provides a definition of “low income populations” as those identified with the annual statistical poverty thresholds from the Bureau of the Census. The accepted rationale in determining what constitutes a low income population for purposes of an environmental justice analysis is similar to that for minority populations, in that the low income population percentage within the area of interest must be “meaningfully greater” than the low income population in the general population. For this study, Alaska State as a whole is used for comparison to the study areas.

The Nome Census Area covers all of the western and southern portions of the Seward Peninsula, as well as the eastern shore of Norton Sound. It is coincident with the census area for the Bering Straits Alaska Native Regional Corporation. As shown in Table 3.16-1, approximately 75 percent of the overall Nome Census Area population consists of Alaskan Natives. This rises to 79.1 percent if people with mixed racial ancestry are included. Within this census area, Tract 2, consisting of the Nome metropolitan area, has a much lower percentage of the population identifying themselves as Alaskan Native, at 50.2 percent. However, this is still three times higher than that of the State of Alaska as a whole, which is 15 percent. For the rest of the Census Area, or Tract 1, including Port Clarence, the percentage is much higher, at 91.2 percent of Alaska Natives. Clearly, there is a high percentage of minority persons in the vicinity of the proposed project sites; thus, it is necessary to determine the potential for this project to cause a disproportionately high and adverse human health or environmental effects on minority populations, in this case Alaskan Natives.

Table 3.16-1: Alaska Native Populations on the Seward Peninsula.

Census Area	One Race – American Indian or Alaska Native	American Indian or Alaska Native in Combination With One or More Races
Census Tract 1, Nome Area	91.2 %	92.6 %
Census Tract 2, Nome Area	50.5 %	58.2 %
Nome Census Area	75.2 %	79.1%
Alaska	15.0 %	19.0 %

Source: Bureau of the Census 2000

3.17 Children's Health and Safety

A review of potential risks to health and safety of children is required under Federal policy (EO 13045, April 21, 1997). The issues that affect children's health and safety are generally the same as those described elsewhere in this document. However, because young children may be more sensitive to the effects of certain environmental exposures and because they may absorb chemicals more readily (WHO 1986), children may be disproportionately affected by environmental exposures. In addition, children's behaviors can increase contact rates with soil (ROC, Ader, 1997). Specifically, children are more likely to put things containing lead (e.g., lead paint chips) into their mouths and are more likely to ingest soil (ATSDR 1997).

Children are only rarely on site at LORSTA Port Clarence, due to the remoteness. However, LORSTA does have an indoor swimming pool used for fitness purposes, and it has been used on occasion to teach swimming to children from the native villages of Teller and Brevig Mission.

The proposed sites for relocation of the LORAN station in the vicinity of Nome are remote enough that children will typically have no access to them on their own.

4.0 ENVIRONMENTAL CONSEQUENCES

This section analyzes the impacts to the environment of implementing each of the identified Action Alternatives and the No Action Alternative. It also identifies potential mitigation measures for off-setting or mitigating the consequences of those actions. Alternatives Considered but not Analyzed are not considered herein. These are addressed in Section 2.4.

4.1 Impacts to Elements of the Environment

4.1.1 Air Quality

4.1.1.1 No Action Alternative

There would be no effects to air quality from continuing the existing LORSTA Port Clarence. Emissions from generators, vehicles, trash incineration, and the occasional plane traffic are minor. Required maintenance to the station would produce no significant emissions beyond the current low background levels. Similarly, construction activities to reinforce the existing tower would not substantially affect air quality.

4.1.1.2 Action Alternative A

Road construction, assembly of the tower and associated facilities, and installation of guy wires would require the use of earth-moving equipment, large machinery, and the likely use of a helicopter. Construction over a several-month period would increase the local emissions, but this would not affect air quality standards in the Nome area. Because the new facility would be powered by commercial power, there would be no emissions from operation, except during operation of emergency backup generators. Removal of the old facility at Port Clarence would eliminate a minor source of existing emissions.

4.1.1.3 Action Alternative B

There would be only minor, temporary, localized effects to air quality from road construction and tower installation. There would be no effect to regional air quality, and there are no residences in the vicinity that would be affected. Construction of the 3.5 mile access road would take considerably longer for the Army Peak site than those of Action Alternative A, which requires only a short drive, so there would be increased exhaust from heavy machinery. This construction activity would not alter the air quality of the Nome vicinity, however.

4.1.1.4 Action Alternative C

There would negligible effects to air quality from dismantling and constructing a new tower at Port Clarence. Use of cranes and other heavy machinery would not affect the local air quality. Ongoing impacts following construction would be the same as for the No Action Alternative.

4.1.1.5 Mitigation Measures

No mitigation measures are needed, as no significant impacts are identified.

4.1.2 Noise

4.1.2.1 No Action Alternative

There would be no noise effects from maintaining the existing LORSTA Port Clarence. There are no sensitive noise receptors near this remote facility. Continued noise from routine maintenance activities, air traffic, and potential tower reinforcement would not affect any sensitive receptors.

4.1.2.2 Action Alternative A

Sites 11A and 11B are about 11 miles outside of Nome, and there is only one residence nearby. Because the area is so isolated and quiet, the relative noise level would substantially increase for the several months during construction. Construction would be limited to an 8- to 10-hour period during the day and would avoid noise during the early morning or evening hours. Table 4.1-1 gives an overview of noise sources and their intensity. Vehicle and machinery noise would likely range between 80 and 90 decibels (dBA). There is only one sensitive noise receptor in the vicinity, and there would be negligible impact from the increase in local noise levels.

Table 4.1-1: Decibel Levels of Particular Noises for Comparison Purposes.

Noise Level/Threshold	Decibels (dBA)
Threshold of pain	130
Jet flyover at 1,000 feet	100-120
Gas lawn mower at 100 feet	90-100
Diesel truck at 50 feet	80-90
Garbage disposal at 3 feet	70-80
Normal speech at 3 feet	60-70
Quiet urban daytime	50-60
Dishwasher (next room)	40-50
Library	30-40
Concert hall (background)	20-30
Quiet rural nighttime	10-20
Threshold of hearing	0-10

Source: Cool Math website; SHPNA website.

4.1.2.3 Action Alternative B

Local noise would increase for the several-month construction period. There are no residences or other buildings in the vicinity. Thus, there would be no noise impacts during construction. Power would be supplied by utility lines and so there would be little noise associated with operation of the facility.

4.1.2.4 Action Alternative C

Construction of the new tower would temporarily increase the noise level but there are no sensitive receptors in the vicinity of the station. Construction noise would not be audible from the villages across the bay from Port Clarence. Ongoing noise levels following construction would be the same as the No Action Alternative.

4.1.2.5 Mitigation Measures

No mitigation measures are needed, as no significant impacts are identified.

4.1.3 Water Resources

4.1.3.1 No Action Alternative

The greatest risk to water resources from continuing operation of the existing station is the potential for a large diesel oil spill. A large spill while pumping during the annual barge delivery or a rupture of one of the 100,000 gallon storage tanks could cause serious degradation of local water resources.

Coast Guard personnel employ a number of standard protection and oil spill prevention measures for the annual delivery of diesel fuel, including the use of spill booms, safety checks, and appropriate training. Thus, the likelihood of an oil spill is reduced, and if there is a spill, then an adequate response could be implemented quickly. A failure of one of the storage fuel tanks would be contained by the lined berm that surrounds the fuel tanks. Successive failure of a second tank would spill oil over the safety berm, but this scenario is extremely unlikely.

Several diesel oil spills have occurred in the past when transferring fuel from the large storage tanks to one of several small day storage tanks adjacent to the buildings. To simplify the system and reduce the chance of a similar occurrence, the oil handling facility was improved and now uses only one day storage tank that routes fuel to the appropriate areas. Small oil spills on land could infiltrate into the groundwater and permafrost zone but would not affect the station's water source.

While there is a risk of an oil spill affecting water quality during the annual barge delivery, this risk is small. However, the results of a large spill could cause significant effects to local water resources. Continued operations at LORSTA Port Clarence are not expected to affect water quality.

4.1.3.2 Action Alternative A

There would be no major land-disturbing activity near streams or small lakes in the project area at Sites 11A or 11B. Short access roads would avoid drainages, and the tower and related facility would be located in the middle of a relatively flat bench. There would be relatively minor land disturbance from setting guy wire and top-loading element anchors, and while placing the ground plane wires. The ring road around the tower would be the greatest source of ground disturbance. These activities would come within about 200 feet of a tributary to the Penny River, but would have no effect to these surface waters. Standard road construction and earth-moving practices for permafrost areas would be implemented during construction to prevent excess erosion. There would be no effect to groundwater from construction or operation of the project at either site.

4.1.3.3 Action Alternative B

Effects to water resources would be similar to those described for Action Alternative A, but because the access road for Army Peak is longer (about 3.5 miles long), there is a greater potential to disturb surface water features. One access route under consideration would travel east from the existing FAA VOR site for about 1 mile and then traverse north for about 2 miles. This route would require a crossing of Irene Creek, a tributary to the Nome River. A more direct route would start from the coast road just west of Cunningham Creek and travel northward

avoiding Irene Creek and open water wetlands. This second route would not require any crossings of surface water features and is the more favorable approach.

4.1.3.4 Action Alternative C

Construction activity would focus on the existing footprint of the station. Thus, there would be no effects to water resources. Continued operation of the remote facility would require annual deliveries of diesel fuel. There is a small risk that an accident could occur during pumping operations and cause substantial damage to marine resources (as described for the No Action Alternative).

4.1.3.5 Mitigation Measures

No mitigation measures are needed, as no significant impacts are identified.

4.1.4 Geology and Soils

4.1.4.1 No Action Alternative

The little land disturbance that occurs at LORSTA Port Clarence is limited to maintenance of a small landfill for material not burned, recycled, or barged out. Under this alternative, the general disturbance zone of the station would remain within the existing footprint, and no expansions of that footprint are proposed. The minor soil-disturbing activities are negligible compared to the wind and ice scour that occurs on the exposed site. Continuing the existing operations would not affect geology or soils of the Port Clarence area.

4.1.4.2 Action Alternative A

Soil disturbance would occur from constructing a short access road (less than several hundred feet in length), developing the site footprint, and minor disturbances associated with the guy wire anchors, top-loading element anchors, and ground plane wire installation. Road and pad construction would require the use of gravel fill from existing sources around Nome. Placement and compaction of fill would be implemented using standard practices for permafrost soils. Localized impacts from construction activity would be minor. There would be no impacts to geology or soils from operation of the facility. Development of either Site 11A or 11B would permanently affect about 4.3 acres of land from access road construction, site preparation, and construction of a 2,000-foot diameter ring road centered on the tower.

4.1.4.3 Action Alternative B

All road construction would be conducted at the time of year and using road building techniques recommended for permafrost soils. There would be minor, localized effects resulting from soil disturbance and road-building. Because of the more extensive road-building necessary for the Army Peak site, there would be a greater amount of soil disturbance and fill necessary than Action Alternative A. The gravel access road would be approximately 3.5 miles in length. Gravel would be supplied from existing borrow sites around Nome. Soils disturbance from the access road, ring road, and site footprint would disturbing approximately 10.5 acres.

4.1.4.4 Action Alternative C

Dismantling the old tower and constructing a new tower would cause some soil disturbance on previously disturbed land around the existing tower footprint. There would be no need for additional roads or buildings; thus, the soil disturbance would be minimal.

4.1.4.5 Mitigation Measures

No mitigation would be required for any of the alternatives. All of the alternatives assume the development and implementation of site-specific construction and erosion and sedimentation control plans applicable to construction and road building in permafrost zones.

4.1.5 Vegetation

4.1.5.1 No Action Alternative

Ongoing operations at LORSTA Port Clarence would have negligible effects to vegetation on the spit. Current and future activities would be limited to the disturbed area within the existing footprint. Some dry tundra disturbance would occur from reinforcement of the existing LORAN tower, but this would cause no substantial impacts to vegetation.

Current oil spill prevention measures would ensure that eelgrass beds near the barge landing area would be protected. There are no anticipated effects to terrestrial or marine vegetation from implementation of the No Action Alternative.

4.1.5.2 Action Alternative A

A 0.5-mile long, 17-foot wide access road (1.03 acres of fill) would be required to reach the center of either site, and a 0.8-acre footprint would be prepared for the tower base and building. About 50 feet of the road would be through upland tundra and can be designed to avoid drainages where willow shrubs predominate. A 2,000-foot diameter ring road would be constructed around the tower that would require clearing about 2.5 acres. Thus, a total of about 4.3 acres of clearing/fill of tundra wetland would be required for either site. In addition, there would be a minor additional amount of fill associated with setting the anchors into the ground. There would also be some temporary disturbance of tundra wetland from construction activity. The wires installed as part of the ground array would result in a temporary disturbance of vegetation. These wires are small and can be pushed beneath the vegetation mat by hand or with a small discing machine. This would temporarily disturb vegetation, but vegetation would eventually grow over the minor disturbance.

Once the facility is in operation, there would be no further disturbance to vegetation. Developing the site and the associated wetland fill would require a Clean Water Act (CWA) Section 404 permit from the U.S. Army Corps of Engineers (Corps).

4.1.5.3 Action Alternative B

Effects to vegetation would be greater under the Army Peak alternative than under Action Alternative A because of the longer access road required. A 3.5-mile long, 17-foot wide access road (7.2 acres of fill) would be required to reach the center of the site, and a 2,000-foot diameter ring road would be constructed (2.5 acres of fill). A 0.8-acre footprint would be prepared for the tower base and building, for a total of 10.5 acres of vegetation disturbance. The long access road

may traverse a small section of upland that could reduce the total wetland fill by about 5 percent, depending on the exact route. During the field reconnaissance of the site, it appeared that this route could avoid drainages where willows occur; thus, the habitat that would be lost would be moist tundra and a limited amount of dry tundra. This cottongrass/low shrub habitat is very common in the Nome coastal plain, and loss of this habitat would cause minor impacts. Placement of the ground plane wires would cause only minor, temporary disturbance to vegetation. Installation of wire anchors also would cause some minor, temporary vegetation disturbance.

Most of the Army Peak road access would be through tundra wetland, and the proposed site is located on a flat bench of tundra wetland. These wetlands do not perform much hydrologic storage function because of the shallow depth to permafrost; the primary impact would be the loss of habitat as discussed above. A CWA 404 permit would be required by the Corps for fill placement in wetlands.

4.1.5.4 Action Alternative C

Dry tundra would be disturbed from machinery necessary for dismantling the old tower and constructing a new tower. These disturbances would be temporary, and expansion of the facility footprint is not necessary. There would be some minor disturbance to wetland tundra from some new anchor placements, but the disturbance would be below the 0.1 acre permit threshold, and there would be no need for a CWA 404 permit from the Corps.

4.1.5.5 Mitigation Measures

Construction activity for all alternatives must be planned and implemented to avoid, to the maximum extent possible, disturbance to wetlands. This is particularly important for Action Alternatives A and B that require the building of access roads. These roads should be planned and constructed to avoid and minimize impacts to wetlands (ROC, Wolf, 2003).

4.1.6 Fish and Wildlife

4.1.6.1 No Action Alternative

Continuing operations at Port Clarence would not affect fish or wildlife. There would be no expansion of facilities outside the existing disturbance footprint. Continued limited use of the existing barge landing would have negligible effects to fish habitat. Oil spill prevention measures provide an adequate measure of safety, but a large oil spill could cause serious consequences to marine wildlife, particularly seabirds.

Communication towers greater than 500 feet above ground level (AGL) can be a hazard to migrating birds. Birds can be attracted to the tower lights and collide with the structure's guy wires (Kerlinger 2000). Little research has been conducted in this field, but it is known that birds collide with towers, particularly during inclement weather. Night-migrating songbirds appear to be affected the most, though smaller numbers of waterfowl, shorebirds, and other species have been documented.

Conversations with regional USCG staff in Juneau and with staff at Port Clarence do not indicate that avian collisions at Port Clarence are a problem. Staff at Port Clarence who have been on

their second 1-year-long rotation could not recall finding any dead birds in the tower vicinity. Past environmental documentation does not mention any problem with avian mortality from tower collisions at Port Clarence.

Tower lighting is limited to blinking red or white lights at about 200-foot intervals. Some researchers believe that birds are attracted more to red lights than white lights, but there is no empirical evidence to support this opinion (Kerlinger 2000). While it is conceivable that some birds may be killed by collision with the tower guy wires and carcasses are removed or eaten by scavengers such as foxes or ravens, it does not appear that the tower is a significant hazard to birds. If substantial numbers of birds were colliding with the tower, some evidence would be found by the crew that lives at Port Clarence. Therefore, continuing the existing operations is not expected to affect fish or wildlife.

4.1.6.2 Action Alternative A

The loss of about 4.3 acres of wet tundra habitat would have a corresponding effect to wildlife that use the area. Wet tundra is the most common habitat type along the coastal plain outside of Nome, and loss of this habitat would be a minor adverse effect to ground-nesting birds and a number of ground-nesting raptors. Construction activity would cause minor, temporary disturbances to wildlife in the local area.

Muskox and reindeer could occur on the vicinity at almost any time of the year. One concern regarding these mammals is the potential to get tangled in ground plane wires or to damage these while they travel through the site. Animals may also use the anchor structures and wires to scrape against, but there appears to be no potential for animals to harm themselves. To prevent damage to ground plane wires and potential leg entanglements to large mammals, these wires should be installed below the mat of tundra vegetation and into the soil. Because the site would include electrical power, there would be no need to store large amounts of fuel for generators. Thus, the risk of an oil spill and the ensuing effect to waterfowl would be eliminated.

There is a potential for birds to collide with the tower guywires, but it is reduced because of the tower configuration and location. The new tower would be about 700 feet tall, only about half as tall as the existing Port Clarence tower. Sites 11A and 11B are about 2.5 miles inland from the coast and not located near any large open water habitat. The Alaska Department of Fish and Game (ADFG) (ROC, Bente, 2003) and USFWS (ROC, Swem, 2003) indicate that placement of the tower inland would substantially reduce the risk of avian collisions.

4.1.6.3 Action Alternative B

Effects to wildlife would be similar to those described under Action Alternative A, but a greater amount of tundra wetland would be disturbed (10.5 acres). Some ground-nesting birds could be displaced from construction of the road and the tower site. There is a greater chance that muskox could use the Army Peak site compared to Sites 11A or 11B. Muskox seek out wind-blown ridges in the winter where snow accumulation is minimal and seek higher ground from relief from bugs in the summer (ROC, Gorn, 2003). The animals may travel through the proposed site on their way to higher ground on Army Peak. Reindeer can also occur in the vicinity. To prevent any damage to ground plane wires and entanglements by muskox and reindeer, the wires should be placed below the mat of tundra vegetation and not laid atop the vegetation.

There is the possibility of bird collisions with the tower guy wires, but the impact would be less as the tower would be almost half as tall as the existing tower at LORSTA Port Clarence. In addition, the site is 4 miles inland and near a larger terrain feature that would likely aid birds in avoiding the tower (ROC, Bente, 2003).

4.1.6.4 Action Alternative C

Ground-nesting birds that use the vicinity would avoid the area of construction activity. There would still be a risk of bird collisions with the tower guy wires because of the site's location between the Bering Sea and Port Clarence Bay. The risk would be somewhat reduced because the new tower would be about half as tall (700 feet) as the existing 1,350-foot tower. Anecdotal information does not suggest that the tower is a risk for migrating birds, but no formal study of the site has been conducted.

As large mammals such as moose, bear, and reindeer are infrequent visitors and are unlikely to be affected. However, the site infrequently, it would be advisable to place the ground plane wires beneath the mat of vegetation to prevent any damage to the wires or conflicts with the large mammals.

Because diesel oil deliveries would continue to this isolated station, there would be the risk of an oil spill during the transfer from the barge to the storage tanks. While this risk is minimal and the safety measures provided by USCG staff ensure a prompt response, a spill could have significant adverse effects to wildlife, particularly waterfowl and seabirds. This risk is not present in Action Alternatives A or B because electrical power would be supplied to these sites.

4.1.6.5 Mitigation Measures

No mitigation measures are needed, as no significant impacts are identified.

4.1.7 Endangered Species

4.1.7.1 No Action Alternative

Steller sealions occur in the waters around Port Clarence, but the only ongoing shoreline activity is the minor disturbance caused by limited barge landings, which have no effect to this species. Spectacled and king eiders likely migrate through the vicinity and may use the waters of Port Clarence Bay for resting. There is a minor risk that eiders or other waterfowl could collide with the tower guy wires, but there is no evidence to indicate that this is occurring; therefore, the risk appears to be extremely low. Maintaining current operations at LORSTA Port Clarence would have no effects to Federally listed or proposed threatened or endangered species.

4.1.7.2 Action Alternative A

There would be no effect to any listed or proposed threatened or endangered species from construction or operation of the LORAN station at Sites 11A or 11B. The USFWS indicates that the relocation of the tower from Port Clarence would benefit listed eiders by eliminating the current minor risk of in-flight collisions (ROC, Swem, 2003).

4.1.7.3 Action Alternative B

No listed or proposed threatened or endangered plants or wildlife species occur on Army Peak site (ROC, Swem, 2003; ROC, Lipkin, 2003; ROC, Lenz, 2003). Spectacled and king eiders migrate along the coast, but the Army Peak site is about 4 miles inland, and collision by eiders is an extremely low risk. There would be no effect to listed or species proposed for listing from implementation of Action Alternative B.

4.1.7.4 Action Alternative C

The project would have no effect to Steller sealions that may occur in the general vicinity. The risk of collisions with the tower guy wires by spectacled or Steller's eiders would be reduced from the current conditions because the new tower would be substantially shorter.

4.1.7.5 Mitigation Measures

No mitigation measures are needed, as no significant impacts are identified.

4.1.8 Land Use

4.1.8.1 No Action Alternative

There is no anticipated impact to land use under this alternative. Current land use would remain the same.

4.1.8.2 Action Alternative A

Change to land use would be minimal. The antenna use has been approved by the SNC Council. The only current human use on the sites is for transit on a mapped but lightly traveled winter trail. The winter trail would need to be relocated south. Use for open range grazing by semi-domesticated reindeer used to occur in this area, but no longer does. A small cabin is located upslope about ¼ mile to the north.

4.1.8.3 Action Alternative B

Change to land use would be minimal. The only current human use in the area is occasional use of open range grazing by semi-domesticated reindeer. This currently occurs without the necessary permits from SNC. The antenna use has been approved by the SNC Council.

4.1.8.4 Action Alternative C

There is no anticipated impact to land use under this alternative. Current land use would remain the same.

4.1.8.5 Mitigation Measures

Use of Site 11A or Site 11B would require that the winter trail be shifted south, and new maps and trail markers be prepared and installed.

4.1.9 Coastal Zone Resources

4.1.9.1 No Action Alternative
The current siting and operation of LORSTA Port Clarence is consistent the Bering Straits CSRA CMP. It is a water-related use, in that its function is to provide an aid to navigation to ocean-going vessels and over-water aircraft.

4.1.9.2 Action Alternative A
This action alternative would be consistent with the Bering Straits CSRA CMP. The proposed facility is a water-related use, in that its function is to provide navigational aid to ocean-going vessels and over-water aircraft. The proposed antenna field would be over 2½ miles from the shore of Norton Sound for both Sites 11A and 11B. While Site 11B would be over 1 mile from the Penny River, Site 11A would come with 1,500 to 2,000 feet of the Penny River.

4.1.9.3 Action Alternative B
The Army Peak site is located at 325 feet above sea level and, consequently, is outside of the jurisdiction of the Bering Straits CSRA CMP.

4.1.9.4 Action Alternative C
This alternative remains consistent with the Bering Straits CSRA CMP.

4.1.9.5 Mitigation Measures
A Coastal Consistency Determination would be needed prior to the issuing of any development permits for Site 11A or 11B within Alternative A.

4.1.10 Transportation

4.1.10.1 No Action Alternative
Transportation in the vicinity to Port Clarence is typically limited to air and water travel, as there are no connecting roads. In the winter months, travel over snow and ice by snow machine is common. Maintaining the existing LORAN station at Port Clarence would require continued ongoing year-round maintenance of a large cleared runway. While this runway is typically used only for logistics flights related to Port Clarence operations, it can provide an additional safe landing area for airplanes in distress in the area. There are no records of it being used this way, however, according to LORSTA personnel (ROC, Kennedy, 2003). Under the No Action Alternative, the LORAN tower would be used to propagate a LORAN signal in its current configuration. There would be no interruption to the existing LORAN signal used for navigation by both ships and airplanes. However, there is a very real risk that this tower will suffer sudden catastrophic structural failure, as has every other LORAN tower structure of its generation and type ever built. It is estimated that it would take from 6 months to a year or even longer to replace this tower were it to suddenly fail, leaving the navigation community without a navigation signal. At the same time, there is substantial evidence that GPS has largely supplanted LORAN as a preferred navigation method, at least within the boating community. While continuing use of the current LORAN station at Port Clarence is expected to have no impact on transportation, this alternative represents the least secure option for providing a continuous signal from this 4th member of the Gulf of Alaska chain of LORAN Stations.

4.1.10.2 Action Alternative A

Development of either Site 11A or 11B will have little impact on local surface transportation. The Nome-Teller Road would experience some additional construction-related traffic, particularly for trucks delivering gravel for road and foundation construction. Existing traffic on this road is very light, however, and levels-of-service would not be affected. There are adequate lines of sight at potential intersections of the service drive with the Nome-Teller Road to ensure safety. Post-construction traffic would be very light, generating a maximum of 8 trips a day, with a maximum initial level of 4 personnel stationed at the transmitter, a level that would drop in the future as the station becomes remotely monitored.

A designated winter trail appears on maps provided by the SNC that leads through both of these sites running in an east-west direction parallel to the Nome-Teller Road. Inquiries to Sitnasuak revealed that this trail did indeed exist but that it received a low level of winter traffic. No trail markers were apparent during the site visit. If this site were developed for the antenna, the trail site would be relocated to the south and any markers moved. Little or no infrastructure is involved in such relocation.

The new tower at Milepost 11 would impact flight operations at the Nome Airport. The FAA identified that there would be a need to raise the minimum descent altitude (MDA) on the Nome Runway 9 instrument approach from the present 480 feet to 960 feet above mean sea level (MSL) at Milepost 11A, and to 1,020 feet MSL at Milepost B, based on FAA analysis of an 850-foot tower (FAA 2003). Presumably the new minimums would be 810 feet MSL and 870 feet MSL at Sites 11A and 11B, respectively, for a 700-foot tower, and even lower for a 600-foot tower. These instrument minimums could potentially be brought down to the present 480 feet MSL by amending the procedure and adding a step-down fix to the configuration of the approach zone. This would affect predominantly commercial flights (ROC, Stoner, 2003). The FAA does not look favorably at either the Milepost 11A or 11B site (ROC, Stoner, 2003) because the long-range plans for the airport involve extending the main runway west away from town. Choice of either of the Milepost 11 sites would impose greater limitations to flight operations from that extended runway.

Because the proposed antenna is within 5 miles of an airport and rises to a height more than 200 feet above ground level, a "Notice of Proposed Construction" would have to be filed with the FAA and circulated among all of the aviation community for comments by that agency, as required by Federal Aviation Regulations Part 77 (14 CFR 77). The Coast Guard has not filed this notice to date. It is expected that the FAA will determine that the proposed antenna is "hazardous" and require more than the minimum in terms of marking and lighting, given location and size. It should be noted that when conflicts arise out of construction proposals, the FAA emphasizes the need for conserving navigable airspace (FAA 2000). The Nome region is a very active area for VFR aviation activity, and any tower of this nature will be viewed as a serious hazard by the aviation community. Small airplanes are frequently flying with a cloud ceiling of only 100 feet AGL and visibility of ¼ mile or less (Girard 2003). Most accidents involving collisions with towers in Alaska occur with the airplane at a height of above 100 to 150 feet AGL. A typical scenario involves a pilot flying in snow or reduced visibility who is attempting to maintain visual contact with the ground below him, and is not able to look around

or see potential obstacles (Girard 1003). Sites 11A and 11B are within ¼ mile of the south side of the Penn-Teller Road. This is the side that any inbound flights to Nome following the Teller Road would be flying on, as by convention VFR flights following roads stay to the right to avoid oncoming aviation traffic, just as automobiles do on the ground. Thus, inbound flights following the Nome-Teller Road in low visibility conditions would be placed at risk by an antenna at this location.

4.1.10.3 Action Alternative B

The impact of this alternative would be somewhat similar to that of Action Alternative A, although this site is favored by the FAA. It would have less effect on the approach zones to the Nome Airport, raising the procedure turn altitudes for the Nome Runway 27 instrument approach from the present 1,700 feet to 2,100 feet MSL for a 700-foot tall tower, presumably slightly less for a shorter tower (FAA 2003). This is regarded by the FAA as less of an impact to flight procedures than the changes required by the Milepost 11 sites.

The Army Peak site would also impact VFR flights. Although no roads run near the site, it is situated such that flights to and from Nome from communities along Norton Sound to the east often fly over it. Although typically following the coast, these flights will cross over the back of Nome Cape rather than going around it, thus shortening the travel distance. Due to the mountains, they stay south of Army Peak, which brings them near or over the proposed Army Peak site. Two light planes were observed flying over the site during a recent site visit in October 2003. The potential for collision between VFR aircraft and the proposed antenna would be present. The FAA believes that the decision to site an antenna at the Army Peak site would have less of an impact to the aviation community of Nome than would choice of the Milepost 11 sites (ROC, Stoner, 2003; ROC, Girard, 2003).

4.1.10.4 Action Alternative C

Implementation of this alternative would imply continuation of full operations at Port Clarence, including continued use and availability of the airfield in case of emergencies. Although the LORAN signal would be lost for up to 6 months for the construction period, during the summer months, the signal would eventually resume from the exact location of the current signal. Consequently, all existing LORAN receivers would continue to operate as before, and there would be no impact to navigators, other than the unavoidable downtime during tower replacement.

4.1.10.5 Mitigation Measures

Any antenna tower constructed in the Nome area will have to follow requirements of the FAA regarding lighting and markings. While Federal Aviation Regulations (FAR) identify standard procedures for designation lighting for towers, it is recommended that the most visible type of lighting available be used for this tower. In this case, that means the use of high intensity white strobes located so as to be visible in all directions. Red lighting is not recommended, as it does not penetrate obscuring weather as well. These strobes should be located at multiple heights on the tower, starting at 150 feet above the ground, the height at which risk of strike by airplane is greatest. In addition, the guy wires should be constructed with identifying markers on them, such as the plastic balls that are frequently installed on high tension power lines for this purpose.

This will allow aviators to better perceive the structural guy wires stretching out at some distance from the tower.

4.1.11 Cultural Resources

4.1.11.1 No Action Alternative

LORSTA Point Clarence would continue to be operated as usual. Ongoing protections to known cultural sites at Point Clarence would continue to be in place. Use of the beach for traditional hunting and fishing activities by Native Alaskans would continue as usual.

4.1.11.2 Action Alternative A

There is no evidence of archeological or cultural resources at the Milepost 11 sites, including resources associated with historical mining operations. Vegetation is undisturbed throughout the site and in the surrounding vicinity. The site is far away from any important body of water that might be predictive of potential archeological sites. No impacts to cultural resources are anticipated.

This alternative would presumably involve the decommissioning of the LORSTA Port Clarence. The USCG believes that the LORSTA is not eligible for inclusion in the National Register of Historic Places, and the Alaska Historic Preservation Officer is in concurrence with that finding (USCG 1997; ROC, Bittner, 1997).

4.1.11.3 Action Alternative B

There is no evidence of archeological or cultural resources at the Army Peak site, including mining. Vegetation is undisturbed throughout the site and in the surrounding vicinity. The site is far away from any important body of water that might be predictive of potential archeological sites. No impacts to cultural resources are anticipated.

Evidence of minor levels of old mining activity was observed above Cunningham Creek, during a site visit in October 2003, in the vicinity of the potential route of the access road from the Nome-to-Council Road. These are old tailings piles about 2 miles from the road, at the topographic level known as “Third Beach” (ROC, Anderson, 2003). No mine shafts were found, and mining activity clearly did not involve dredging. It is a simple matter to route any site access road around this small former mine site.

4.1.11.4 Action Alternative C

Construction activity to implement Alternative C would be limited to the already disturbed area in the immediate vicinity of the existing tower. No impacts to cultural resources are expected.

4.1.11.5 Mitigation Measures

Any restoration of Point Spencer following the decommissioning of LORSTA Port Clarence, should that occur, should respect all known archeological sites in the vicinity. Decommissioning plans will need to specifically address treatment of archeological sites.

Any alignment of a future access road to Army Peak, if Alternative B is chosen, should avoid the former “Third Beach” mining site.

4.1.12 Visual Resources

4.1.12.1 No Action Alternative

This alternative would result in no visual change to the environment.

4.1.12.2 Action Alternative A

Under this alternative, a 600- to 675-foot tall antenna would be constructed within 1,500 feet of the Nome-Teller Road in an area of undisturbed tundra. In good weather, it would be clearly visible to all passersby along the road. The character of the coastal plain would be altered in the vicinity of the antenna. The antenna would intrude into the view from the upslope cabin, about 1/4 mile away. At night, the tower would be very well lit, possibly including white strobe lighting, as a safety precaution due to the high volumes of small civilian aviation activity in the vicinity of Nome. This tower would be visible from the City of Nome.

In western Alaska, attitudes towards such visual intrusions often vary widely from attitudes encountered elsewhere in the United States. These features can be seen as functioning as significant landmarks and orientation devices in an otherwise featureless landscape. They are especially important in a region that relies heavily on VFR aviation for transportation, or for people who must frequently navigate during winter when other common landmarks are obscured by snow. For example, residents here and elsewhere in Western Alaska have resisted efforts by the U.S. Air Force to remove the large Cold War era "White Alice" radar installations, including the ones on top of nearby Anvil Mountain, for that very reason (ROC, Anderson, 2003). Therefore, it is difficult to conclude that construction of this tower constitutes an adverse visual impact.

LORSTA Port Clarence would be decommissioned, and some of the existing improvements be removed. This would likely include the most visible object on Point Spencer, the existing tall tower, removing a local landmark.

4.1.12.3 Action Alternative B

This alternative would result in the construction of a 600- to 675-foot tall antenna just south of Army Peak. This tower would be located on a high ridge 325 feet above sea level, and the top of the tower would be 200 to 300 hundred feet taller than the adjacent Army Peak. No other man-made structures are within several miles, and it would be a useful landmark, particularly for VFR aviators. This tower would be visible from most locations in the vicinity of Nome, including the Nome-to-Council Road and Beam Road, and the surrounding residences during times of clear weather. The top of the tower may possibly be visible from east of Cape Nome in the Safety Sound area, although that may require computer modeling to verify. At night, the tower would be well lit, and it would be visible for great distances under clear weather conditions.

Impacts due to decommissioning of LORSTA Port Clarence would be the same as for Action Alternative A.

4.1.12.4 Action Alternative C

Under this alternative, the tower would be reduced in height by half, from 1,350 feet to an estimated 600 to 675 feet tall. The number of night-time safety lights visible would be reduced by at least half. A new transmitting building would be constructed near the base of the tower adjacent to the existing structures, but this building would be less than 20 feet in height and would have a minimal visual intrusion into the environment (Tryck Nyman Hayes 2003). No visual impacts would be expected to result from this alternative.

4.1.12.5 Mitigation Measures

No mitigations due to visual impacts are proposed.

4.1.13 Hazardous Materials

4.1.13.1 No Action Alternative

The potential for the release of hazardous materials is higher with this Action Alternative than if the LORSTA were relocated at a location with access to public power. This is due to the need to maintain a large fuel supply at Port Clarence, and the need to deliver that fuel supply by barge. Average annual fuel consumption at Port Clarence was recently placed at 307,000 gallons (Alaska Engineering and Energy Consultants 2001). Eight hundred gallons of diesel fuel were released into the environment in 2000 by overfilling the above-ground storage tank for the boiler, due to a combination of human error and equipment failure (USCG 2001). Numerous past releases have occurred due to overfilling of the station day tanks, although these are no longer in place, eliminating that hazard. Nonetheless, extensive subsoil contamination remains on top of the permafrost layer. The necessity of handling small amounts of other hazardous materials, such as solvents and lubricants, during typical operations associated with maintaining a remote facility also increases the potential of the release of a hazardous material.

An evaluation of the existing fuel supply system at Port Clarence was made in 2001 (Alaska Engineering and Energy Consultants 2001). This report identified numerous shortcomings in the overall fuel supply system, which at 40 years of age is nearing the end of its lifespan, and recommended the system be replaced. Among the deficiencies were: ageing tanks lacking capability for internal inspection; lack of external cover to protect tanks from flying debris in high winds and to protect secondary containment from filling with snow and water and freezing; multiple underground fuel lines, several of which were single-wall and lacked secondary containment; and numerous other deficiencies. A recapitalization cost of $4.15M was identified in 2001 by the USCG to bring the four existing 100,000-gallon fuel tanks into compliance with environmental regulations. This action has not yet been taken.

4.1.13.2 Action Alternative A

This alternative would require that adequate fuel supplies be available for the backup power generators in case of loss of power. This would likely be supplied by an aboveground fuel storage tank.

4.1.13.3 Action Alternative B

Impacts would be the same as those described under Action Alternative A.

4.1.13.4 Action Alternative C

Impacts would be the same as those described under the No Action Alternative.

4.1.13.5 Mitigation Measures

If the Coast Guard chooses to remain at Port Clarence, the existing fuel tanks will need to be brought into compliance with regulations. If the LORSTA is relocated to the vicinity of Nome, site design for the LORSTA will need to include adequate secondary containment for the tank storing fuel for the backup emergency generators.

4.1.14 Socioeconomic Impacts

4.1.14.2 No Action Alternative

Under this alternative, the Coast Guard would continue to spend $3M in annual operations cost at LORSTA Port Clarence (USCG 2002). This represents the second highest cost for any LORAN station in Alaska, and as such represents a significant opportunity cost to the Coast Guard in this era of declining operations budgets. These are funds that could help the organization provide other public services elsewhere if a way could be found to eliminate the cost at Port Clarence while continuing to provide the desired LORAN signal. While no figures are available, less of this operations money finds its way into the local economy than might be expected. In general, the Coast Guard dollar appears to have a fairly minor impact on the economy of Nome, and very little on that of the local villages.

The LORSTA water treatment plant has a modest indoor swimming pool that is occasionally used to teach children from Teller and Brevig Mission how to swim. This is a positive benefit, which could potentially save lives. The use of boats in subsistence activity is wide-spread in Native culture, but water temperatures and climate are not often conducive to outdoor swimming, which would allow children to acquire swimming skills. Use of the Port Clarence pool allows them to do so.

4.1.14.2 Action Alternative A

The local Nome economy would benefit in the short-term from the cost of construction of the proposed PALS III remote operated LORAN station, estimated to be approximately $18 million (much of which will be spent elsewhere to purchase materials and vital systems). Once the station is in operation, the Nome economy would realize benefits from the 3 to 4 workers who would be based in Nome. Initially, these would be Coast Guard employees, and later would transition to contract employees. The economy would also benefit from lease payments made locally for the site lease.

The local villages would lose the minor benefits they may have gained from having LORSTA Port Clarence nearby. It is possible that another organization, such as a branch of the State or Federal government, would choose to take over operations at Port Clarence and redirect it with another mission. LORSTA Port Clarence represents a considerable investment - it is a stand-alone facility capable of making its own power and water, and treating and disposing of its own waste. There are facilities in place for both air and water access. However, the annual operations costs, estimated at over $3 million, and the required backlogged maintenance costs, estimated at $19.2 million, make such a takeover very unlikely, especially given the site's

remoteness. It would seem that only a very specialized mission - for example, an Arctic research station - would be suited for this location, and the costs are prohibitive. The village of Brevig Mission has previously requested transfer of this land to the village under the ANCS Act.

4.1.14.3 Action Alternative B

The impacts would be the same as those described for Action Alternative A.

4.1.14.4 Action Alternative C

The impacts would be very similar to those described for the No Action Alternative. Additional short-term benefits may be realized by local construction firms from contracts related to the replacement of the tower and the new transmission building. However, much of this work may require specialized construction experience that would come from elsewhere in the United States.

4.1.15 Public Services, Including Communications

4.1.15.1 No Action Alternative

Adoption of this alternative as a course of action would have no impact on public services. However, continued reliance on the original tall antenna for the LORAN signal transmission places the Coast Guard at risk of being unable to provide a signal should the tower suffer sudden catastrophic failure.

4.1.15.2 Action Alternative A

Implementation of a remote LORAN-C Station at either Site 11A or 11B would require the extension of 3-phase power along the Nome-Teller Road to either site from Milepost 4, a distance of 7 miles. Of this, 3 miles would be a power upgrade. The power line would be placed on wooden poles adjacent to the road. Telecommunications would need to be provided as well, either in the form of a telephone cable mounted to the power pole, or as a microwave data link. Either can be provided by TelAlaska.

Winter snowplowing of the Nome-Teller Road stops at Milepost 4. However, it is assumed that occasional winter travel to the site would be by snow machine, and snowplowing is not an issue.

Although the antenna would be built as a LORAN tower, eventually the Coast Guard anticipates mounting High Frequency and Very High Frequency radio transmitting equipment on it, which would act as line-of-sight communications tools for maritime communications, thus improving radio performance in Norton Sound.

A LORAN-C tower at either location is expected to have negligible interference effects on the operations of AM towers in the Nome vicinity, given the distances involved (Hatfield and Dawson 2003).

4.1.15.3 Action Alternative B

Construction of a remote LORAN-C station at Army Peak would require the extension of 3-phase power along the Nome-to-Council Road from Beam Road, and then up to the site, a distance of approximately 8 miles. The power line would be placed on wooden poles adjacent to

the road. Telecommunications would need to be provided as well, either in the form of a telephone cable mounted to the power pole, or as a microwave data link. Either can be provided by TelAlaska.

Winter snowplowing of the Nome-to-Council Road stops at the Nome River. However, it is assumed that occasional winter travel to the site would be by snow machine, and snowplowing is not an issue.

Although the antenna would be built as a LORAN tower, eventually the Coast Guard anticipates mounting High Frequency and Very High Frequency radio transmitting equipment on it, which would act as line-of-sight communications tools for maritime communications, thus improving radio performance in Norton Sound.

Concerns were raised during the scoping period by the operators of the two AM radio stations in Nome (i.e., KICY and KNOM) that the LORAN-C Tower would interfere with their signal. Both of these towers are located east of Nome along Beam Road just inland of Norton Sound. Although the commercial stations broadcast at 850 and 780 kHz, whereas the LORAN-C broadcasts at 100 kHz, there is still concern over the potential for various types of signal interference. For this reason, direct measurements were made of radio frequency field strength at existing LORAN stations in Searchlight, NV and Boise City, OK for use in modeling the potential for radio frequency interference of a LORAN station in Nome. The Nevada site has transmitting equipment similar to the Tok, AK site, while the Oklahoma site has transmitting equipment similar to that proposed for relocation to Nome. Army Peak was judged the most likely location to cause radio frequency interference effects, as it is the proposed site nearest to the KICY and KNOM towers. The KICY tower is approximately 8 km from the Army Peak site, and the KNOM tower is approximately 7.5 km distant. Based on the computer modeled results, using the actual field measurements of existing LORAN transmitters to calibrate the model, the potential effects were projected to be negligible. These findings are summarized in Table 4.1-2.

4.1.15.4 Action Alternative C

Adoption of this alternative would result in the loss of the LORAN signal for a period of approximately 6 months, as the old antenna is brought down and replaced with a shorter solid state antenna.

4.1.15.5 Mitigation Measures

Construction of any new power line to the LORAN site must meet all Federal, State, and local permit requirements.

Once LORAN transmission begins at the new site, signal monitoring should occur to verify that radio interference with commercial AM transmission is not occurring. The USCG should be prepared to take such measures, such as installing necessary filters, as necessary to prevent such interference.

Table 4.1-2: Summary of potential radio-interference effects of modeled LORAN transmissions at Army Peak site.

Impact on KICY Tower (Distance = 8 km)	Impact on KNOM Tower (Distance = 7.5 km)
▪ The worst-case perturbation of the directional radiation pattern would be less than 2.3% in any direction - considered to be insignificant.	▪ The worst-case perturbation of the non-directional pattern would be less than 2% - considered to be insignificant.
▪ The effects on future field measurements or monitoring of the KICY directional pattern would be insignificant.	▪ The non-directional radiation pattern requires no monitoring. The effects on future field measurements would be insignificant.
▪ The expected radiation exposure of KICY personnel from the Army Peak site would be an insignificant 0.13% of allowable field exposure limit applicable to members of the general public.	▪ The expected radiation exposure of KNOM personnel from the Army Peak site would be an insignificant 0.13% of allowable field exposure limit applicable to members of the general public.
▪ The LORAN station-induced voltage on the KICY tower would be far less than that induced by the KNOM AM station.	▪ The LORAN station-induced voltage on the KNOM tower would be far less than that induced by the KICY AM station.
▪ The LORAN station-induced contact current on the KICY tower would be far less than that induced by the KNOM AM station.	▪ The LORAN station-induced contact current on the KNOM tower would be far less that induced by the KICY AM station.
▪ The LORAN station-induced voltage on the KICY tower may interfere with antenna impedance measurements. If such proves to be the case following construction, a readily available filter can be installed to prevent the LORAN signal from interfering with the impedance measurement equipment.	▪ The LORAN station-induced voltage on the KNOM tower may interfere with antenna impedance measurements. If such proves to be the case following construction, a readily available filter can be installed to prevent the LORAN signal from interfering with the impedance measurement.

Source: Hatfield and Dawson, 2003

4.1.16 Environmental Justice

4.1.16.1 No Action Alternative

Under the No Action Alternative, LORSTA Point Clarence operations would continue as usual. No disproportional impacts to low income or minority populations are anticipated.

4.1.16.2 Action Alternative A

No disproportional impacts to low income or minority populations are anticipated under Action Alternative A. The SNC and its shareholders would benefit from the added revenue provided by the long-term lease of SNC property by the USCG.

4.1.16.3 Action Alternative B

Potential impacts related to environmental justice under Action Alternative B would be the same as under Action Alternative A.

4.1.16.4 Action Alternative C

Potential impacts related to environmental justice under Action Alternative C would be the same as under the No Action Alternative.

4.1.16.5 Mitigation Measures

No mitigation measures are proposed, as no impacts are identified.

4.1.17 Children's Health and Safety

None of the alternatives under consideration would have a disproportional impact to the health and safety of children. A minor indirect effect of relocating LORSTA Port Clarence would be the loss of the pool as a potential regional asset for instructing local children in how to swim.

4.1.17.1 Mitigation Measures

None are required as no significant impacts are identified.

4.2 Cumulative Effects

The Proposed Action is part of a major recapitalization program under consideration for the LORAN-C program throughout the United States. Funded by the FAA, several new stand-alone remote monitored LORAN navigation stations have already been built in the lower 48 states, most recently one at George in Washington state. This program, begun in 1997, assumes that LORAN will remain viable as a program for aviation navigation at least through 2008. There are a total of 29 LORAN-C stations, six of them in Alaska, that work in partnership with Russian and Canadian stations to provide navigation guidance service. Under this program, all of the LORAN stations will be recapitalized for replacement and/or upgrade of the electronics systems. Between 1997 and 1999, more than $10.2M in funding was provided for 21 LORAN "modernization and upgrade" projects. Additional funding was provided in FY 00. Ultimately, the LORAN Recapitalization Program as developed by the FAA is planned to receive $122M in funding (USCG 2002)

In general, these stations are widely distributed, typically in remote locations. In Alaska, that includes sites such as Port Clarence; St Paul in the Pribiloff Islands; Attu at the western end of the Aleutians; and Narrow Cape on Kodiak Island. Port Clarence and Attu are the most isolated and demanding in terms of needed logistic support. Only Port Clarence is being proposed for relocation – the others would be recapitalized at their current location. The funding provided by the FAA will pay only a portion of the Port Clarence relocation costs, including $7.3M for the tower replacement, $3.4M for the transmitter building, and $4M for the transmitter equipment upgrade. It is estimated that the USCG will need to provide an additional $3.1M for infrastructure links, access roads, and site improvements.

The cumulative effect of the project would be to make the LORAN navigation system more robust and dependable throughout the entire service area across North America and beyond. Outdated vacuum tube technologies would be replaced with more dependable, higher quality solid-state systems. In the case of Port Clarence, replacement of the high tower would remove a weak point in the system well known to be susceptible to sudden failure. Such failure would remove the station from operation for an undetermined period of time, perhaps as much as 1 year or more. Direct construction impacts related to station recapitalization would be highly localized for each station, with a limited construction footprint. Recapitalization would have the effect of reducing the net overall environmental "footprint" for the LORAN program, as the new designs call for unmanned, remotely monitored stations. Manpower requirements will fall, as will fuel consumption and risk of environmental contamination.

Indirect impacts of recapitalization include the need to develop a new LORAN navigation electronic receiving device for the end-user. There would be some navigational impact on existing LORAN users, both nautical and aeronautical, who continue to rely on the LORAN for navigation purposes. Relocation of the LORAN antenna anywhere but on the exact location of the current tower, for any station, renders the signal generated by that station unusable by the current generation of LORAN receivers. LORAN receivers will no longer be able to use the Port Clarence signal to locate position. Existing LORAN receivers cannot be reprogrammed to use a new signal, and there are currently no manufacturers of LORAN receivers anywhere in the world, so the likelihood of new LORAN receivers entering the market capable of using the Nome signal for navigational purposes is very small. Users in general locations needing the Port Clarence signal to pinpoint their position accurately will no longer be able to do so. However, most parties agree that the navigational community has largely shifted to GPS as the system of choice for purposes of navigation. The only remaining retailer of LORAN systems in the world, FURUNO of Japan, has reported no new sales of LORAN receivers for the past year, only replacements for systems under warranty (ROC, Parker, 2003). It is difficult to quantify the number of users who would be affected. LORAN users would not be able to take advantage of the new signal until new receiving units have been designed and manufactured. This number is low, and they have access to relatively low-cost alternatives, such as GPS.

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Appendix A

Public Scoping Letters