DRAFT

Environmental Assessment

for

North Warning System (Alaska)

Department of the Air Force
Air Force Systems Command
Electronic Systems Division

HARTCROWSER

November, 1986

Air Force
Environmental Planning Division
(HQ USAF/CEVP)

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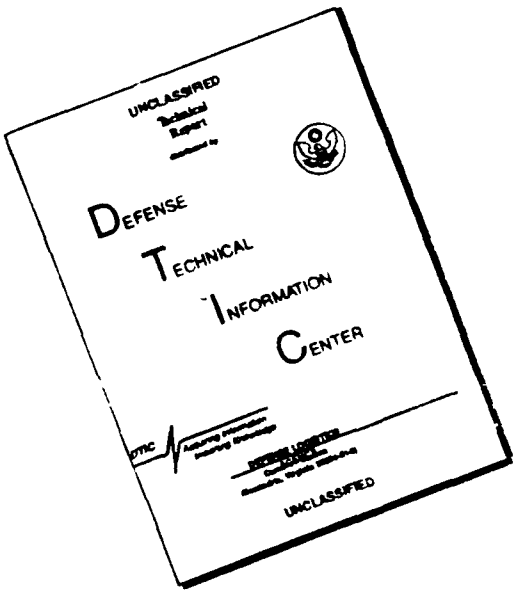

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PRELIMINARY ENVIRONMENTAL ASSESSMENT
NORTH WARNING SYSTEM

FOR INTERNAL REVIEW ONLY

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10 November 1986

COVER SHEET

(a) Responsible Agency: U.S. Air Force

(b) Proposed Action: Construction and operation of the North Warning System in Alaska.

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(d) Designation: Environmental Assessment

(e) Abstract:

To replace the aging Distant Early Warning (DEW) Line System and to reduce annual operating costs, the U.S. and Canadian governments have agreed to install and operate an improved, updated radar capability. This program, termed the North Warning System (NWS), includes 15 minimally attended Long Range Radar (LRR) Stations, 39 unattended Short Range Radar (SRR) Stations, 6 Forward Supply Points (FSP), and 3 Central Maintenance Facilities (CMF).

Earlier NWS configurations included the construction of new radar facilities in remote locations in Alaska and the decommissioning of two DEW Line Stations which provided essential services to adjacent native villages; thus, an Environmental Impact Statement (EIS) on the Alaskan portion of the NWS was judged necessary. A recent reconfiguration of the program, however, has eliminated these actions and their attendant environmental impacts; consequently, the Air Force has determined that an Environmental Assessment (EA), rather than an EIS, is the appropriate document for assessing impacts.

This EA addresses the following NWS activities on the North Slope of Alaska: installation and operation of LRR equipment at four active DEW Line Stations; construction and operation of SRR facilities at three sites, two active and one inactive DEW Line Stations; and development of a communications network linking all NWS sites in Alaska to the Regional Operations Control Center at Elmendorf Air Force Base in Anchorage. Construction activities are planned to occur between 1987 and 1990, with the system in operation in Alaska by 1991.

(f) Released to the Public: _____, 1986.

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GLOSSARY

DEFINITIONS

Alluvium - A general term for clay, silt, sand, gravel, or similar unconsolidated material deposited during comparatively recent geologic time.

Anadromous - Fish, such as salmon and steelhead trout, that ascend rivers from the sea to spawn.

Azimuth - The horizontal angular distance from a fixed reference direction to a position or object, usually measured clockwise in degrees along the horizon from a point due south.

Brackish water - A term for water with a salinity intermediate between that of normal seawater and that of normal freshwater.

Decibels (db) - A numerical expression of the relative loudness of a sound.

Electromagnetic radiation - Energy emitted as particles or waves.

Fluvial - Related to or produced by a stream or river.

Hummock - A rounded or irregular knoll, mound, hillock or other small elevation.

Ionosphere - That part of the earth's atmosphere beginning at an altitude of about 25 miles and extending upward 250 miles or more.

Inupiat - Eskimo people of the North Slope of Alaska who share a common language.

Karst - A type of topography that is formed over rock by dissolution and is characterized by sinkholes, caves, and underground drainage.

Lacustrine - Pertaining to, produced by, or formed in a lake.

Lead - Channels of water that open up in the pack ice during the spring and fall.

Passerine - Birds of the order Passeriformes, which include perching birds and songbirds.

Perennial - Present at all seasons of the year or persisting for several years.

Permafrost - Permanently frozen subsoil.

Pingo - A relatively large conical mound of soil-covered ice raised in part by water pressure within or below the permafrost of Arctic regions.

Polygon - A form of patterned ground produced by frost action and marked by multi-sided arrangements of rocks, soil and vegetation.

Radiofrequency radiation - Emitted energy with a frequency range from several hundred kHz to several hundred GHz.

Radome - A domed-shaped housing for protecting a radar antenna.

Riparian - Perenially wetted zone associated with streams and rivers.

Rolligon - All terrain vehicle with large cargo capacity.

Saline - Containing dissolved salts.

Salinity - Measure of the total concentration of dissolved salts in water.

Subsistence - Customary and traditional use of wildlife, fish, minerals and vegetation for consumption, manufacture, and handicrafts by both Native and non-Native individuals.

Thaw lake - A lake or pond formed by localized thawing of permafrost.

Thermokarst - Refers to irregular topography in a permafrost region where localized melting of ground ice has occurred.

Tundra - Treeless area in arctic and alpine regions, supporting either no vegetation or such vegetation types as grass, sedges, forbs, dwarf shrubs, lichens, and mosses.

ACRONYMS

ACHP - Advisory Council on Historic Preservation
AFOSH - Air Force Occupational Safety and Health Standard
AFR - Air Force Regulation
AHRS - Alaska Heritage Resource Survey
ANCSA - Alaska Native Claims Settlement Act of 1971
ANILCA - Alaska National Interest Lands Conservation Act of 1980
ANSI - American National Standards Institute
ANWR - Arctic National Wildlife Refuge
ASRC - Arctic Slope Regional Corporation
AWACS - Airborne Warning and Control System
BIA - Bureau of Indian Affairs
BLM - Bureau of Land Management
B.P. - Before Present
CFR - Code of Federal Regulations
CIP - Capital Improvements Program
CMF - Central Maintenance Facilities
CRREL - Cold Region Research and Engineering Laboratory
DERA - Defense Environmental Restoration Account
DEW - Distant Early Warning
DOD - Department of Defense
EA - Environmental Assessment

EED - Electroexplosive Device
EIS - Environmental Impact Statement
EMI - Electromagnetic Interference
EPA - Environmental Protection Agency
ESD - Electronic Systems Division, U.S. Air Force
FAA - Federal Aviation Administration
FCC - Federal Communications Commission
FSP - Forward Supply Point
HF - High Frequency
ICAS - Inupiat Community of the Arctic Slope
IRP - Installation Restoration Program
ISC - Industrial Source Complex
LRR - Long Range Radar
MAR - Minimally Attended Radar
NARL - Naval Arctic Research Laboratory
NATO - North Atlantic Treaty Organization
NEPA - National Environmental Policy Act of 1969
NORAD - North American Aerospace Defense Command
NPRA - National Petroleum Reserve in Alaska
NSB - North Slope Borough
NTIA - National Telecommunications and Information Administration
NWS - North Warning System
OTH-B - Over-The-Horizon Backscatter
PCB - Polychlorinated Biphenyl
PEL - Permissible Exposure Limit
POL - Petroleum, Oil, Lubricants
PSD - Prevention of Significant Deterioration
RFR - Radiofrequency Radiation
ROCC - Regional Operations Control Center
SAR - Specific Absorption Rate
SHPO - State Historic Preservation Office
SPCC - Spill Prevention Control and Countermeasure
SRR - Short Range Radar
TSP - Total Suspended Particulate Matter
TAC - Tactical Air Command
UHF - Ultra High Frequency
VABM - Vertical Angle Benchmark
VHF - Very High Frequency

EXECUTIVE SUMMARY

BACKGROUND

After World War II, the United States Department of Defense (DOD) initiated planning of a comprehensive radar system to monitor aircraft movements near the northern approaches to North America. The Canadian government joined the project, and, in the early 1950s, the Distant Early Earning (DEW) Line was installed across Alaska and Canada to provide early warning of an airborne attack from the north.

Increasing sophistication in offensive weapons systems, such as cruise missiles, requires comparable improvements to the DEW Line to provide adequate coverage and ensure the security of North America. The present DEW Line system is also expensive to maintain due to the age of the equipment.

To remedy these twin problems of equipment obsolescence and system costs, the U.S. and Canadian governments reached an agreement on March 17, 1986 to install and operate an improved, updated radar capability. This program, termed the North Warning System (NWS), will provide better radar and communications equipment and automated transmission of radar data to central processing facilities. The NWS will extend across Alaska and Canada and include 15 minimally attended Long Range Radar (LRR) stations, 39 unattended Short Range Radar (SRR) stations, 6 Forward Supply Points (FSP), and 3 Central Maintenance Facilities (CMF), most of which will be installed at existing facilities. This document addresses the Alaska portion of the NWS.

ENVIRONMENTAL IMPACT ANALYSIS PROCESS

Initial NWS plans included a number of alternative radar locations in undeveloped, interior areas of Alaska, including national wildlife refuges and other environmentally sensitive areas. These plans also included the decommissioning of two DEW Line Stations, each of which was currently providing an airstrip and other essential services for use by an adjacent Native village. Because those actions could have resulted in significant environmental effects, it was determined in 1984 that an Environmental Impact Statement (EIS) would be required for the NWS program.

Changes in the NWS program in Alaska over the last two years have resulted in the elimination of all activities which were likely to have significantly affected the environment. All currently proposed activities will occur at seven existing DEW Line Stations (six active, one previously decommissioned) on the North Slope of Alaska. Also, no active DEW Line Stations will be decommissioned. Thus, in accordance with Air Force Regulation 19-2 ("Environmental Impact Analysis Process", 10 August 1982), the Air Force has decided to prepare this comprehensive Environmental Assessment (EA) rather than an EIS.

PROPOSED ACTION

The proposed action addressed in this EA includes the following elements:

- o Installation and operation of replacement Long Range Radar (LRR) equipment at four existing DEW Line stations on the North Slope of Alaska (LIZ-2, POW-M, POW-2, and BAR-M).

- o Construction and operation of three unattended Short Range Radar (SRR) stations on the North Slope of Alaska, two at existing DEW Line stations (LIZ-3 and POW-1) and one at an inactive DEW Line station (POW-3).

- o Disassembly of a prototype SRR at BAR-M.

- o Installation and operation of a Forward Supply Point (FSP) at one of four existing DEW Line stations in Alaska (LIZ-2, POW-M, POW-2, or BAR-M).

- o Development of a communications network linking all NWS sites in Alaska to the existing Regional Operations Control Center (ROCC) at Elmendorf Air Force Base in Anchorage. The Central Maintenance Facility (CMF) at Elmendorf Air Force Base would also provide logistics support to the Alaskan segment of the NWS.

The LRR Stations, which provide mid- to high-altitude surveillance coverage, will serve as the primary system for identification of approaching aircraft. The LRR equipment, called the AN/FPS-117, is capable of determining the range, altitude, and azimuth of targets at a range of 200 nautical miles at altitudes up to 100,000 feet. Because this radar requires fewer people to operate and maintain, it is described by the manufacturer as a minimally attended radar (MAR).

The unattended SRR Stations, presently in the prototype development stage, will be designed to provide surveillance coverage at a range of 65 nautical miles and altitudes up to 15,000 feet. The SRR equipment will be completely automated and will monitor and isolate malfunctions so that they can be corrected remotely from the ROCC.

LRR equipment will be retrofitted into active DEW Line stations between 1987 and 1991, and existing facilities will generally remain in place to be used to support LRR construction and operation. From 8 to 12 personnel will be required to operate each LRR Station. SRR Stations, which will occupy approximately 0.6 acres and be constructed in 1990-91, include the following components: radar support tower and radome, two satellite communication antennas, generators and fuel storage facilities, equipment and personnel shelters, and monitoring systems for equipment performance, security and fire. The SRR Stations will be unattended except during maintenance visits once every 4 to 6 weeks. During operations, radar data from the LRRs and SRRs will be transmitted automatically through satellites to the ROCC and from there to the North American Aerospace Defense Command (NORAD) control center in Colorado.

ENVIRONMENT EFFECTS

All NWS activities will take place on federal land under Air Force control. No additional land will have to be acquired, although development of a SRR at POW-3 could limit any future plans by the North Slope Borough or other

potential users to develop that site. If the POW-3 airstrip was closed to public use, sportfishing charters by Audi Air would not continue, resulting in a loss of revenue and recreational opportunities.

Construction of the NWS facilities will result in a temporary increase of air traffic, equipment use, fuel and water consumption, dust, noise, turbidity and general human activity in the vicinity of each site. Less than one acre of tundra habitat may be lost and some wildlife and subsistence activities may be displaced from the POW-3 area.

Operation of the NWS facilities will result in continued emissions of radiofrequency radiation, air pollutants and noise, although predicted levels are not expected to adversely affect human health or welfare. Because fewer personnel would be required to operate the NWS than now operate the DEW Line stations, water and fueld consumptions and the level of human activity would decline.

Facility demolition and removal during NWS decommissioning actions would produce temporary effects similar to those occurring during construction. Decommissioning of LIZ-2 and BAR-M could also result in a loss of certain DEW Line services, including the airstrip, presently being shared with the villages of Point Lay and Kaktovik. Over time, any unmaintained gravel pads or roads will be eroded by natural forces.

For reasons discussed in the EA, these effects are not expected to significaly degrade the physical, biological, or sociocultural environment, either individually or cumulatively.

ALTERNATIVES

In addition to the alternate sites and the No Action Alternative, the Air Force has evaluated two other alternatives to the NWS -- Airborne Warning and Control Systems (AWACS) aircraft and satellite detection. AWACS aircraft could be used to complement the ground-based system; as the primary means of surveillance; however, they would be costly to purchase and operate, and they would not be compatible with the NWS facilities proposed for Canada. Satellite detection is likewise not considered a feasible alternative at this time; the technology required for both surveillance equipment on the satellites and for computer systems used to analyze and transmit the data is unavailable.

1.0 PURPOSE OF AND NEED FOR ACTION

Technological advances in military aircraft after World War II, combined with the increasing potential for a military attack by hostile nations, prompted the U.S. Department of Defense (DOD) to evaluate methods for monitoring aircraft movements near the northern approaches to the U.S. The Canadian government also expressed concern for its national security. As a result of these concerns, the DOD and Canadian defense authorities undertook a cooperative effort to establish the Distant Early Warning (DEW) Line along the northern borders of North America. The DEW Line, which was installed in the mid-1950's, has remained the primary means of detecting aircraft approaching the continent from the north.

Recent studies by the DOD have shown that improvements to the DEW Line are necessary to adequately ensure national security as well as the security of North America. Improvements would also materially reduce the cost of operating the aging DEW Line. The following sections provide further information on the existing DEW Line system, the purpose of and need for the improvements (termed the North Warning System), and the studies undertaken to evaluate environmental impacts of the proposed action.

1.1 EXISTING DEW LINE SYSTEM

In the summer of 1952, the DOD enlisted a group of the nation's foremost scientists to study the problems of defense against polar attack. As the solution to providing early warning data for defense of the U.S. and Canada against air attack, these scientists recommended the development, installation, and maintenance of a radar and communication system to be positioned as close as possible to the threat from Soviet air bases. This system, termed the Distant Early Warning (DEW) Line Defense Plan, was approved by DOD in late 1952.

An experimental test segment was installed across Alaska and began operating in 1953. The success of this segment proved the practicality of stretching the DEW Line across the remaining 2,000 miles (3,218 kilometers) to Cape Dyer on the east coast of Canada. The line across Canada was completed in March of 1956. In August of 1957, the U.S. and Canada jointly announced their agreement to integrate air defense forces and set up the North American Air Defense Command (NORAD). Between 1959 and 1961, the DEW Line was extended east into Greenland.

Until 1963, when a number of intermediate DEW Line Stations were deactivated, there were 61 active radar stations. In 1986, the DEW Line consisted of 31 active radar stations--4 in Greenland, 21 in Canada, and 6 in Alaska. The locations of these DEW Line Stations are shown on Figure 1-1. The first three letters of each Station code is an abbreviation of its general geographic location, while the last variable indicates either a Main (-M) or an Auxiliary (-1 to -5) Station. Main Stations generally consist of two 25-module building trains, rotating antenna, and facilities for providing full service and logistics support for Auxiliary Stations within its "sector". Auxiliary Stations consist of a single 25-module train, rotating antennae, and fewer support facilities. Figure 1-2 is an aerial photograph of a typical Main DEW Line Station.

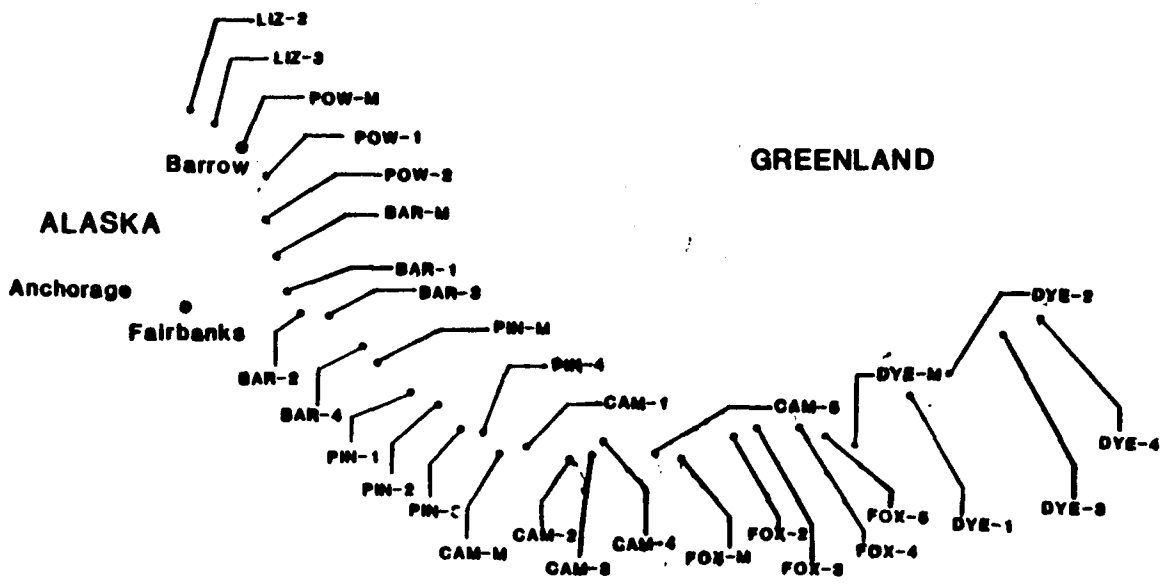


Figure 1-1. DEW Line Station Locations

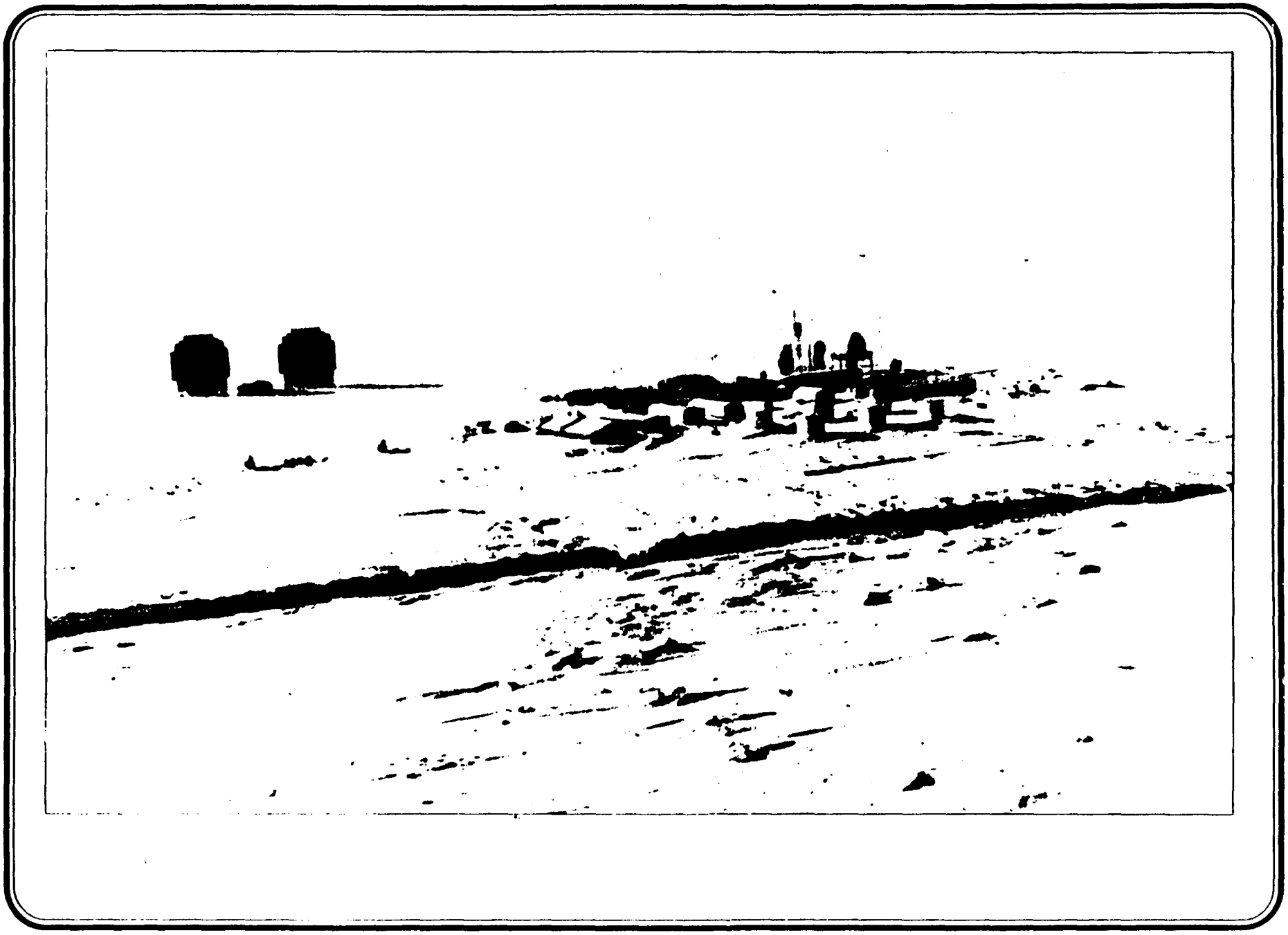


Figure 1-2. Typical DEW Line Station

1.2 PURPOSE AND NEED

The DOD has determined that the DEW Line is no longer completely adequate for its task. Replacement of the system is needed for two main reasons. First, the relatively large distance between the DEW Line Stations results in gaps in low-level coverage and deficiencies in overall detection capabilities. Secondly, the cost of operating and maintaining the DEW Line is rapidly increasing due to the age of the equipment.

To remedy these problems, the U.S. and Canadian governments plan to install and operate an improved, updated radar capability. This program, termed the North Warning System (NWS), will provide improved radar and communications equipment and automated transmission of radar data to central processing facilities. As a result, the NWS will provide improvements to the early warning system that are considered vital to the defense of the North American continent.

The NWS will extend across Alaska and Canada and consist of 15 minimally attended Long Range Radar (LRR) Stations, 39 unattended Short Range Radar (SRR) Stations, 6 Forward Supply Points (FSP), and 3 Central Maintenance Facilities (CMF). The SRR Stations are designed to fill the existing coverage gaps noted above. This mix of equipment and facilities has been determined to be the most cost-effective means for providing the radar coverage required for early warning.

The facilities to be located in Canada will be constructed by the Canadian government. The U.S. Air Force will construct the U.S. portion of the proposed NWS, which includes 3 SRR Stations and 4 LRR Stations in Alaska. The U.S. facilities in Alaska will be operated and maintained by the Canadian Armed Forces.

In addition to providing for defense of the North American continent, the NWS will provide a more direct command and control capability in Alaska. Further, the operation and maintenance costs of the NWS will be substantially lower than those of the DEW Line while providing other military and civilian activities with benefits from an improved system. For example, NWS equipment and data will assist in communications, dissemination of weather data, and in-flight surveillance for civilian aviation.

1.3 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

Initial configurations of NWS sites and alternatives included a number of new radar locations in undeveloped, interior areas of Alaska. Some associated with sites were situated within wildlife refuges and other environmentally sensitive areas. Initial plans also included decommissioning of two DEW Line stations, including their airstrips and other facilities on which adjacent Native villages had come to depend. Because environmental impacts associated with remote sites and decommissioning actions could have been significant, it was determined that an Environmental Impact Statement (EIS) would be required for the NWS program. The EIS scoping process was initiated in September 1984, with public meetings in Anchorage, Fairbanks, Fort Yukon, and Barrow.

During the past two years, the NWS program has been reconfigured substantially, and sensitive site locations and decommissioning plans have been eliminated. All currently proposed activities will occur at active DEW Line Stations on Air Force controlled property, except for one of the SRR Stations, which will be constructed at an inactive DEW Line Station. No active DEW Line Stations will be decommissioned and no currently manned sites which provide essential services to adjacent native villages will be converted to unmanned sites. Thus, in accordance with procedures of the National Environmental Policy Act (NEPA), as contained in 40 CFR, Parts 1500 through 1508, and Air Force Regulation 19-2 ("Environmental Impact Analysis Process", 10 August 1982), this Environmental Assessment (EA) has been prepared. The intent of the Air Force to issue an EA rather than an EIS on this project was announced in a Federal Register notice dated _____ (FR _____).

Because a number of environmental studies had previously been completed for the EIS, this EA is comprehensive. Environmental information was obtained through literature reviews, field surveys, and interviews with DEW Line personnel, government agencies, village leaders, and individuals. The field surveys, conducted between 1984 and 1986, concentrated on existing geological, biological, and cultural resources at the specific project locations and in the general vicinity of each site. Throughout the data gathering and impact analysis phases, the Air Force and its contractors coordinated their activities with a number of federal, state, and local agencies.

Environmental documents prepared previously on the NWS project include: (1) a Request for Environmental Impact Analysis (AF Form 813) and Categorical Exclusion for modifications of existing radar towers at the POW-M and POW-2 DEW Line Stations; and (2) an EA for construction and testing of a prototype SRR at the BAR-M DEW Line Station. Because all the proposed tower modifications are within existing developed sites and most of the actions are equivalent to standard maintenance and repair procedures, there was judged to be little potential for impact. The EA on the prototype SRR, which evaluated potential impacts in the areas of socioeconomics, air quality, radiofrequency radiation, site preparation and diesel fuel use, found no significant effects.

Upon completion and review of this EA, the Air Force will determine whether to prepare a Finding of No Significant Impact (FONSI) or an EIS. If the Air Force concludes that the NWS would not have a significant effect on the environment, a FONSI will be prepared; otherwise, an EIS will be issued. In either case, the decision and the appropriate document will be made available to the affected public.

Section 2.0 of this EA provides a description of the proposed NWS System in Alaska. It also includes information on construction and operation of the NWS Stations and the environmental consequences of alternative actions. The affected environment and the potential environmental consequences of construction and operation of the NWS are addressed in Sections 3.0 and 4.0, respectively. References cited are listed in Section 5.0, agencies and persons consulted during preparation of this EA are presented in Section 6.0, and the preparers of this EA are listed in Section 7.0. More detailed information on the proposed action and environmental conditions is provided in the Appendices (bound separately).

2.0 ALTERNATIVES INCLUDING PROPOSED ACTION

As described in Section 1.0, the Department of Defense (DOD) has determined that the radar coverage and reporting capability of the DEW Line do not meet current requirements for the timely and cost-effective detection of aircraft approaching the North American continent. Alternative methods of establishing an adequate surveillance system are addressed in this section of the EA. The proposed action is described in Section 2.1, other alternatives are presented in Section 2.2, and the environmental consequences of alternative actions are compared in Section 2.3.

2.1 PROPOSED ACTION

Based upon analyses of effectiveness, potential environmental concerns, time constraints, cost, and feasibility, the U.S. Air Force has determined that upgrading or replacing the equipment and facilities of the existing DEW Line system is the preferred means of providing an adequate early warning system. As a result, the Air Force developed the North Warning System (NWS), the Alaska portion of which is the proposed action. Figure 2-1 shows the locations of proposed and alternate NWS sites in Alaska. The basic elements of the proposed action are listed below:

- Installation and operation of replacement long range radar (LRR) equipment at four existing DEW Line Stations on the North Slope of Alaska (LIZ-2, POW-M, POW-2, and BAR-M).

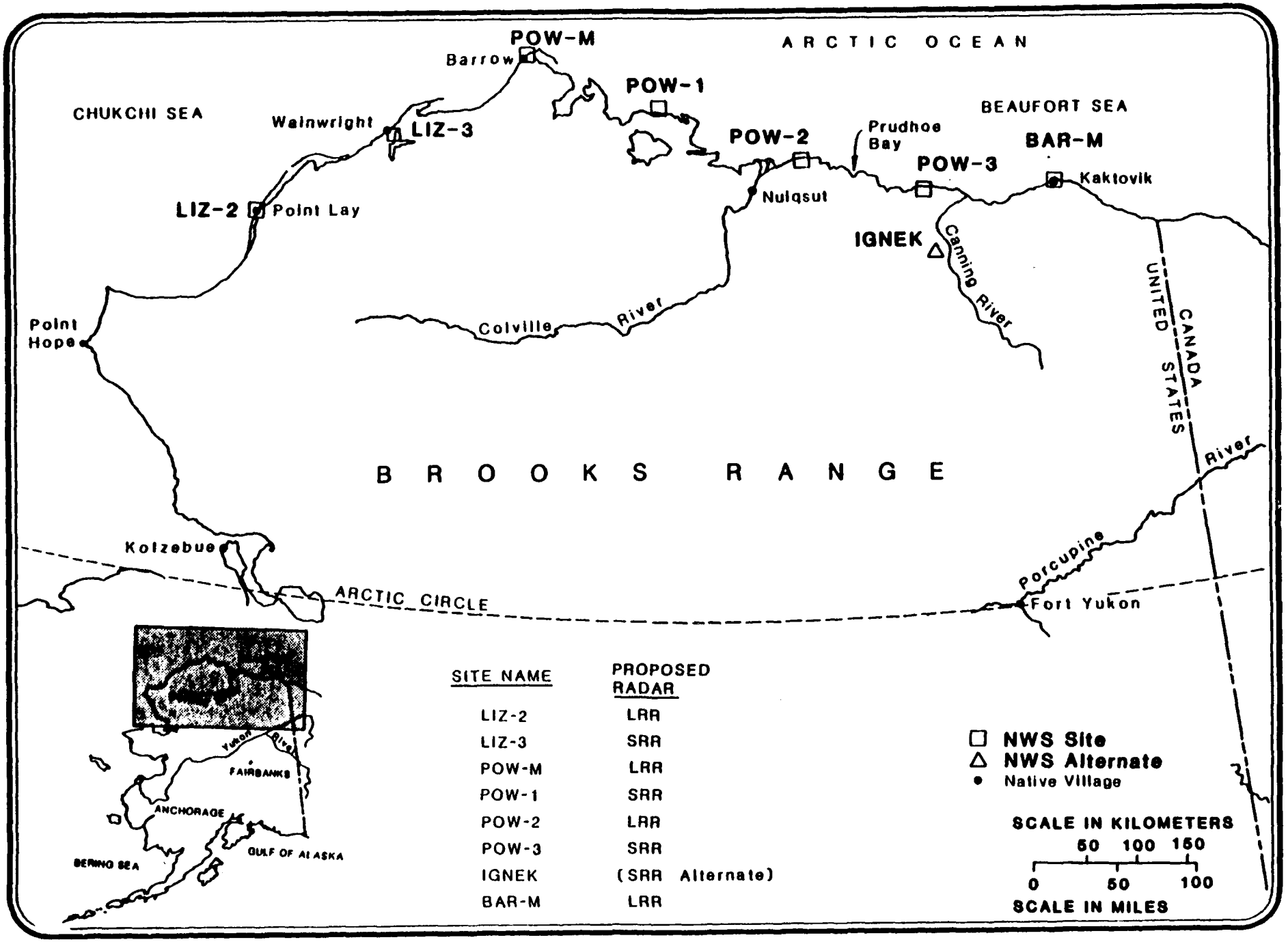
- Construction and operation of three unattended short-range radar (SRR) Stations on the North Slope of Alaska, two at existing DEW Line Stations (LIZ-3 and POW-1) and one at an inactive DEW Line Station (POW-3).

- Disassembly of a prototype SRR at BAR-M.

- Installation and operation of a Forward Supply Point (FSP) at one of four existing DEW Line stations in Alaska (LIZ-2, POW-M, POW-2, or BAR-M).

- Development of a communications network linking all NWS sites in Alaska to the existing Regional Operations Control Center (ROCC) at Elmendorf Air Force Base in Anchorage. The Central Maintenance Facility (CMF) at Elmendorf Air Force Base would also provide logistics support to the Alaskan segment of the NWS.

The remainder of this section provides information regarding the proposed action that is relevant to the assessment of potential impacts, including a system description, related programs, site locations, land acquisition activities, construction, operation, decommissioning, and project scheduling. Additional information on these matters is included in Appendix A (Detailed Project Description).



SITE NAME	PROPOSED RADAR
LIZ-2	LRR
LIZ-3	SRR
POW-M	LRR
POW-1	SRR
POW-2	LRR
POW-3	SRR
IGNEK	(SRR Alternate)
BAR-M	LRR

Figure 2-1. Site Locations

2.1.1 System and Facilities Description

The LRR Stations, which provide mid- to high-altitude surveillance coverage, will serve as the primary system for identification of approaching aircraft. The LRR equipment is manufactured by the General Electric Company and is called the AN/FPS-117. Because this radar requires fewer people to operate and maintain, it is described by the manufacturer as a minimally attended radar (MAR).

The LRR is computer controlled and is designed for long-range air surveillance. It is capable of determining the range, altitude, and azimuth of targets at distances up to 200 nautical miles (370 kilometers) at altitudes up to 100,000 feet (30,480 meters). The LRR uses automatic data processing to detect and report targets and an automatic monitoring and fault isolation system to aid in operations and maintenance. Since the LRR Stations will be established by replacing existing radar equipment at active DEW Line Stations, most facilities at these sites will remain in place and will be used to support construction and operation of the station. The radar tower, buildings, tanks, roads, and utilities will generally remain unchanged; changes in the external appearance of a station will be limited primarily to the new radome and communication antenna.

The unattended SRR Station--termed the "gapfiller radar"--will provide low- to mid-altitude surveillance coverage. The Air Force is presently completing development of the SRR to be used in the NWS based on the Canadian SRR design. Design criteria require that the SRR be highly reliable, easily maintained, and completely automated, with an instrumented range of 65 nautical miles (120 kilometers) and surveillance coverage to an altitude of 15,000 feet (4,572 meters). In addition, the SRR equipment will detect and report targets, monitor the station's status, and isolate equipment failures. With the proposed system, CMF and ROCC personnel will be able to detect and isolate SRR surveillance malfunctions remotely and adjust the SRR as needed.

Each SRR installation, to be situated on an approximately 0.6-acre (0.2-hectare) site, will include the following equipment and facilities: radar support tower, radome, two satellite communication antennas within domes, facilities building, emergency personnel shelter, a fuel storage and distribution system, weather measuring equipment, performance monitoring and security system, and fire protection system. Figure 2-2 presents a conceptual drawing of an SRR installation. The SRR Stations will be unattended, except during maintenance visits approximately once every four to six months. The existing DEW Line airfields will be maintained for these visits, but most of the other existing facilities will not be used during SRR operations.

A satellite communications network will be installed to link the various components of the NWS. Radar data from the LRR's and SRR's will be automatically transmitted through satellites to the CMF and ROCC at Elmendorf Air Force Base. Data will be transmitted from the ROCC to the North American Aerospace Defense Command (NORAD) control center in Colorado. The CMF will provide maintenance and logistics support of the LRR Stations, the SRR Stations, and the communications network.

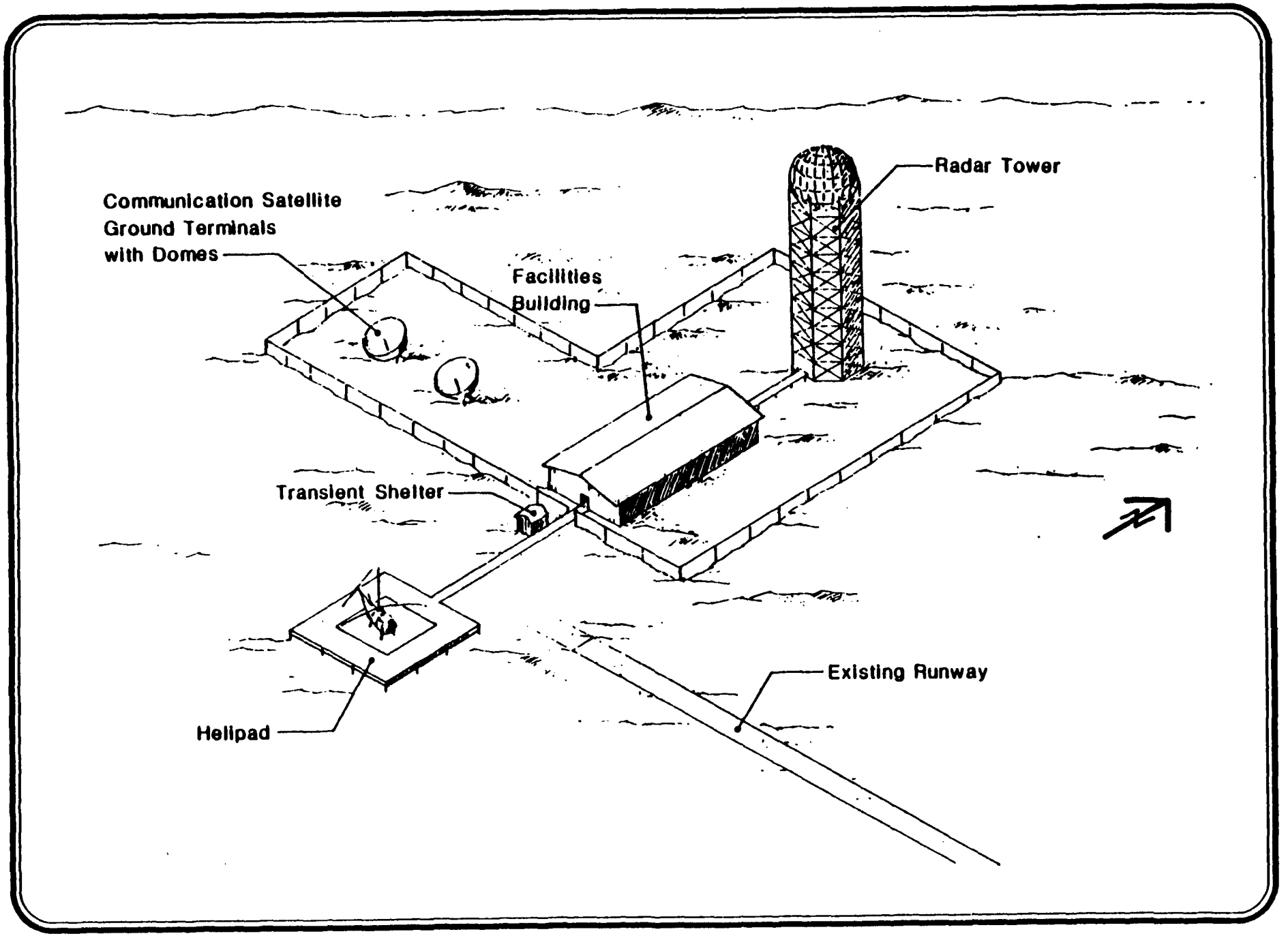


Figure 2-2. Typical SRR Station

2.1.2 Related Department of Defense Programs

2.1.2.1 OTH-B Radar System

The Over-The-Horizon-Backscatter (OTH-B) System is a surveillance and tracking radar system for early warning of aircraft at greater distances than are possible with DEW Line or other line-of-sight radar. This system is able to detect aircraft at distances from 500 to 1,800 nautical miles (930 to 2,400 kilometers) from the transmitter site. As proposed, the West Coast OTH-B system will provide coverage as far north as the Alaska Range in Alaska. However, the OTH-B system is not capable of providing coverage farther to the north, and thus cannot fulfill the NWS mission, because of ionospheric interference caused by the aurora borealis (the northern lights). Coverage provided by the proposed OTH-B system would overlap the proposed NWS coverage in areas east of Canada and west of Alaska.

2.1.2.2 Seek Igloo Radar System

The Seek Igloo radar system provides radar coverage in central and western Alaska. The system consists of 13 radar stations situated at widely separated sites in Alaska. The Seek Igloo system, which uses the same AN/FPS-117 radar equipment proposed for the NWS project, is operated and maintained by the Alaska Air Command.

2.1.2.3 Installation Restoration Program

In response to passage of the Resource Conservation and Recovery Act (RCRA), and in anticipation of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund), the DOD developed the Installation Restoration Program (IRP). The purpose of the IRP is to identify, report, and correct environmental problems from past waste disposal actions at active military installations.

An IRP Phase I records search of all six active Alaskan DEW Line Stations, plus the inactive POW-3 Station, was completed in 1981 (CH2M Hill, 1981). The two-fold purpose of this search was to identify the potential for contamination resulting from past disposal of hazardous and toxic wastes and to assess the possibility of contaminant migration beyond the installation boundaries. The Phase I report contained the following conclusions:

- o In general, the DEW Line sites are well-maintained and present no serious problems.
- o Current disposal practices at DEW Line sites do not significantly cause or contribute to environmental problems.
- o An ongoing Air Force environmental cleanup program has resulted in the removal and proper disposal of most wastes which were improperly dumped in the past.

- o Where hazardous wastes are present in existing or closed dump sites, there is a low potential for migration of pollutants beyond the station boundaries.

Subsequent study and cleanup phases of the IRP are ongoing.

2.1.2.4 Defense Environmental Restoration Account

In 1983, the DOD initiated the Defense Environmental Restoration Account (DERA), a multi-million-dollar program that requires the military to clean up land that it occupies and restore land that was previously occupied. The Army Corps of Engineers is coordinating cleanup of military debris on public land no longer under active military control.

Early DERA program efforts began in Alaska, where about 300 sites were identified. Included in this list are approximately 20 sites associated with DEW Line activities, such as barge landing and unloading areas, staging areas, and abandoned sites. The former POW-3 DEW Line Station is on this list. Beginning in 1987, the Corps of Engineers will prepare Environmental Assessments for sites requiring cleanup and restoration.

2.1.3 Site Locations

The following sections provide information on the location of each proposed NWS site. The candidate site locations were identified after an extensive analysis of potential sites. Initial site evaluation criteria included site topography, radar coverage for each site, and the total radar surveillance requirements of the system.

Environmental effects were considered in the siting process wherever there was sufficient flexibility in radar coverage requirements. For example, a preliminary list of candidate sites included some within Denali National Park boundaries. Because the siting of a radar station within the park would have presented very serious environmental and permitting problems, these sites were rejected. Candidate sites in the Arctic and Yukon Flats National Wildlife Refuges have also been eliminated from further consideration. The only alternate site addressed in this EA is Ignek, an alternate to POW-3 (see Sections 2.2 and 2.3).

Preliminary alternatives also considered the decommissioning of the LIZ-2 DEW Line Station (near the village of Point Lay) and the BAR-M DEW Line Station (near the village of Kaktovik). Initial environmental studies found that both Point Lay and Kaktovik depend to a large extent on DEW Station facilities and operations. For example, both villages rely on the DEW Station airstrips for transportation of people, equipment, and supplies; no other airstrips or other year-round modes of transportation occur near these communities. Also, both villages utilize the DEW Station sanitary landfill and water supply facilities. Because decommissioning of the existing DEW Line facilities at both stations could have caused significant adverse impacts on Native lifestyles and socioeconomic conditions, the Air Force reconfigured the NWS program so that both locations would be converted to LRR Stations, which will result in the continued manned operation and maintenance of existing facilities at each station.

Of the seven sites discussed below, six are active DEW Line Stations. These stations are situated on federal land ranging in size from approximately 170 acres (70 hectares) at POW-M to 1,800 acres (730 hectares) at POW-1. A typical DEW Line Station includes the following facilities: garage, warehouse, gravel airstrip, radar tower and radome, communications facilities, diesel electric generators, fuel storage tanks, living quarters (usually for about 20 personnel), operations building, water supply and treatment system, wastewater treatment system, and garbage incinerator.

2.1.3.1 LIZ-2 (Point Lay): LRR Retrofit

The active LIZ-2 DEW Line Station at Point Lay will remain in operation after being retrofitted with LRR equipment and upgraded for use in the NWS program. The LIZ-2 Station is located at the southern perimeter of Point Lay, a small Inupiat Eskimo village situated midway between Cape Lisburne and Icy Cape (Figure 2-3). This site is about 95 miles (153 kilometers) southwest of Wainwright and 185 miles (298 kilometers) southwest of Barrow.

2.1.3.2 LIZ-3 (Wainwright): SRR

An unattended SRR Station will be constructed at the active LIZ-3 DEW Line Station. This station is located approximately 0.5 mile (0.8 kilometer) west of Wainwright Inlet and 1.5 miles (2.4 kilometers) north of the Kuk River. The village of Wainwright is located approximately 4.5 miles (7.2 kilometers) northeast of the site (Figure 2-4).

2.1.3.3 POW-M (Barrow): LRR Retrofit

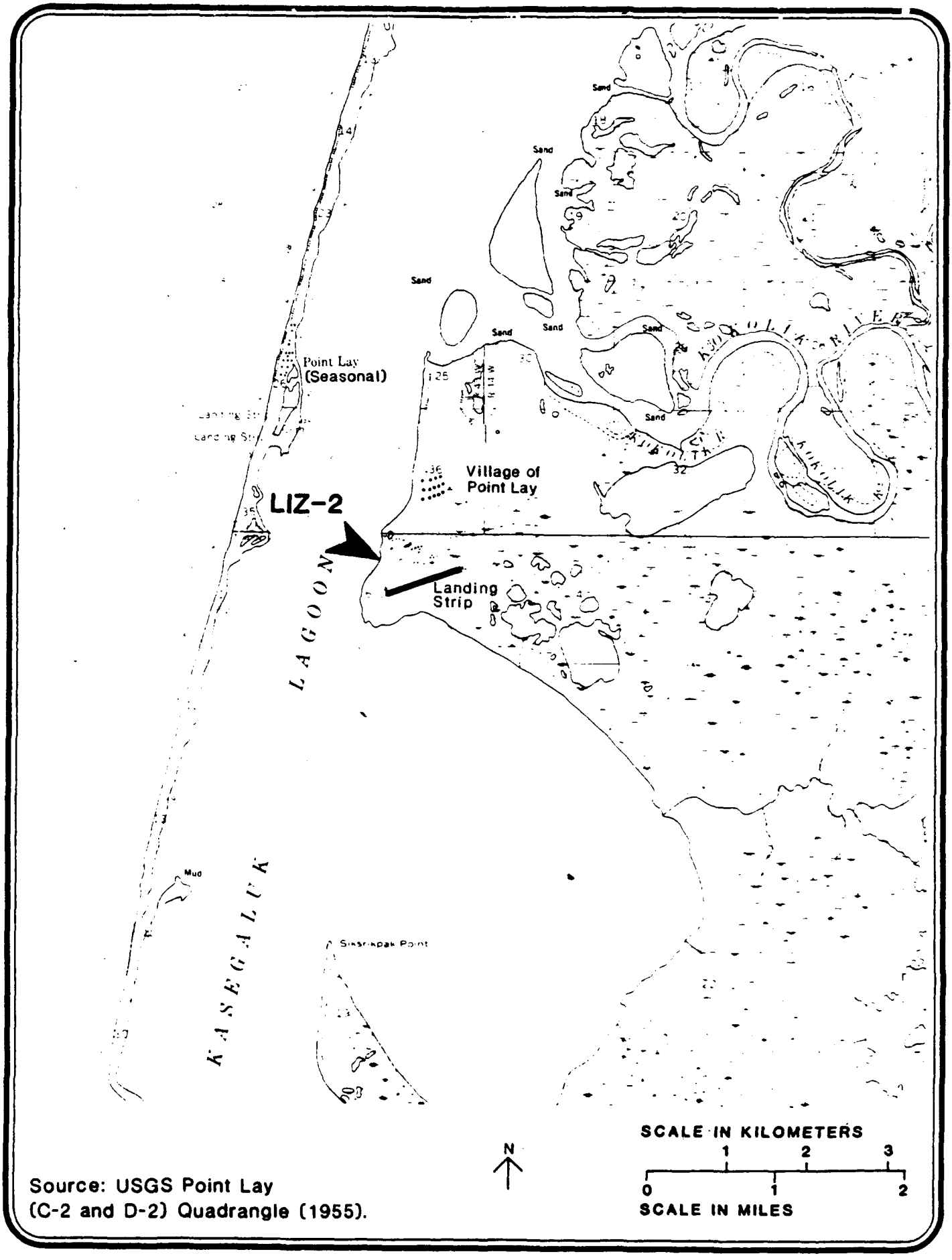
The active POW-M DEW Line Station will remain in operation after being retrofitted with LRR equipment and upgraded for use in the NWS. This radar station is located at Point Barrow on the Arctic Coast about 1 mile (1.6 kilometers) east of the former Naval Arctic Research Laboratory (NARL) and 4 miles (6.4 kilometers) northeast of the village of Barrow (Figure 2-5).

2.1.3.4 POW-1 (Lonely): SRR

An unattended SRR Station will be constructed at the active POW-1 DEW Line Station located at Lonely on the shore of the Beaufort Sea (Figure 2-6). Smith Bay is situated west of the site, and Harrison Bay is southeast of the site.

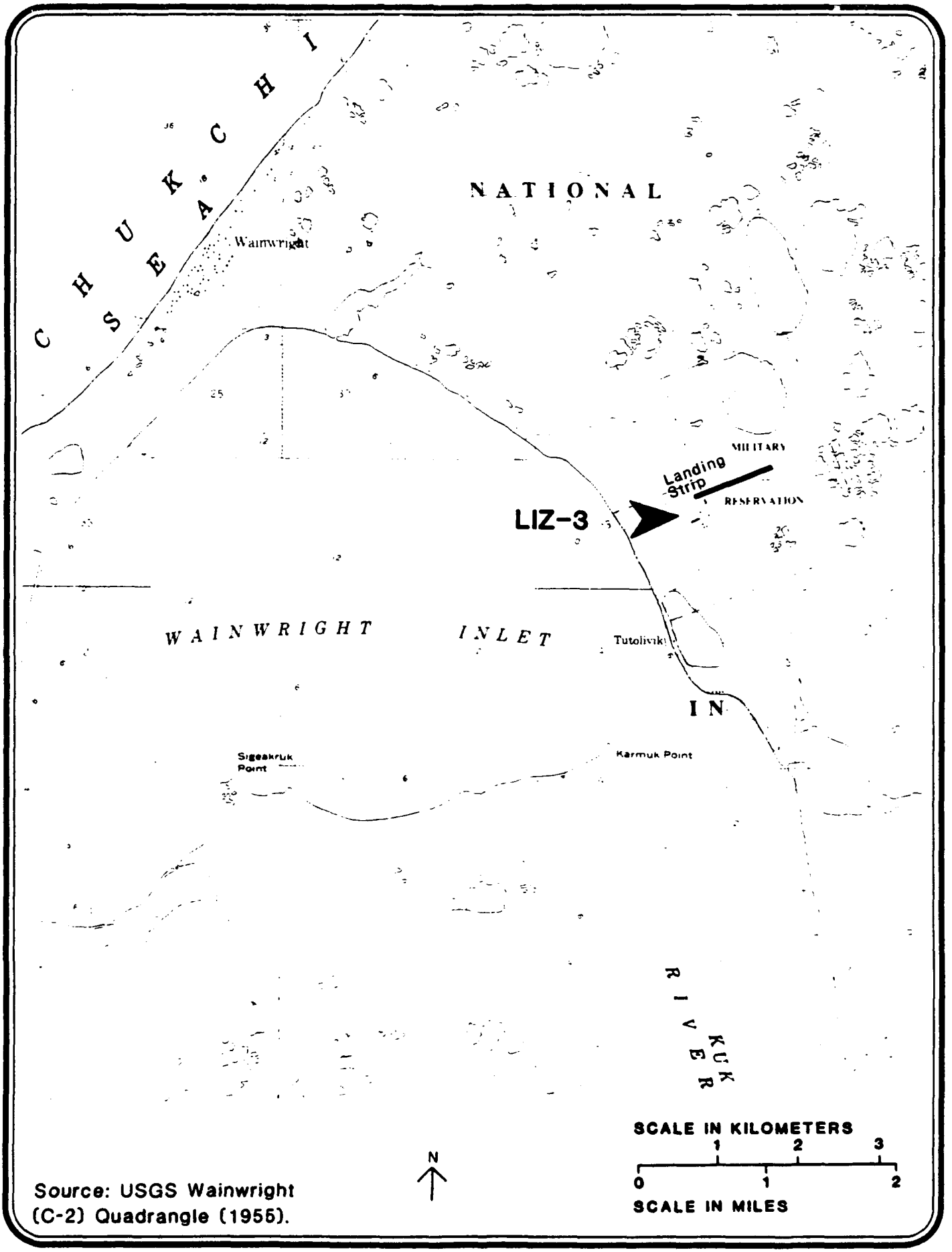
2.1.3.5 POW-2 (Oliktok): LRR Retrofit

The active POW-2 DEW Line Station will be retrofitted with LRR equipment and upgraded for use in the NWS program. As shown on Figure 2-7, POW-2 is located on the Beaufort Sea coastline near Oliktok Point. Nuiqsut, the nearest village, is located about 30 miles (48 kilometers) southwest, and the Prudhoe Bay/Deadhorse/Kuparuk oil industry developments are located about 35 miles (56 kilometers) east-southeast of the site.



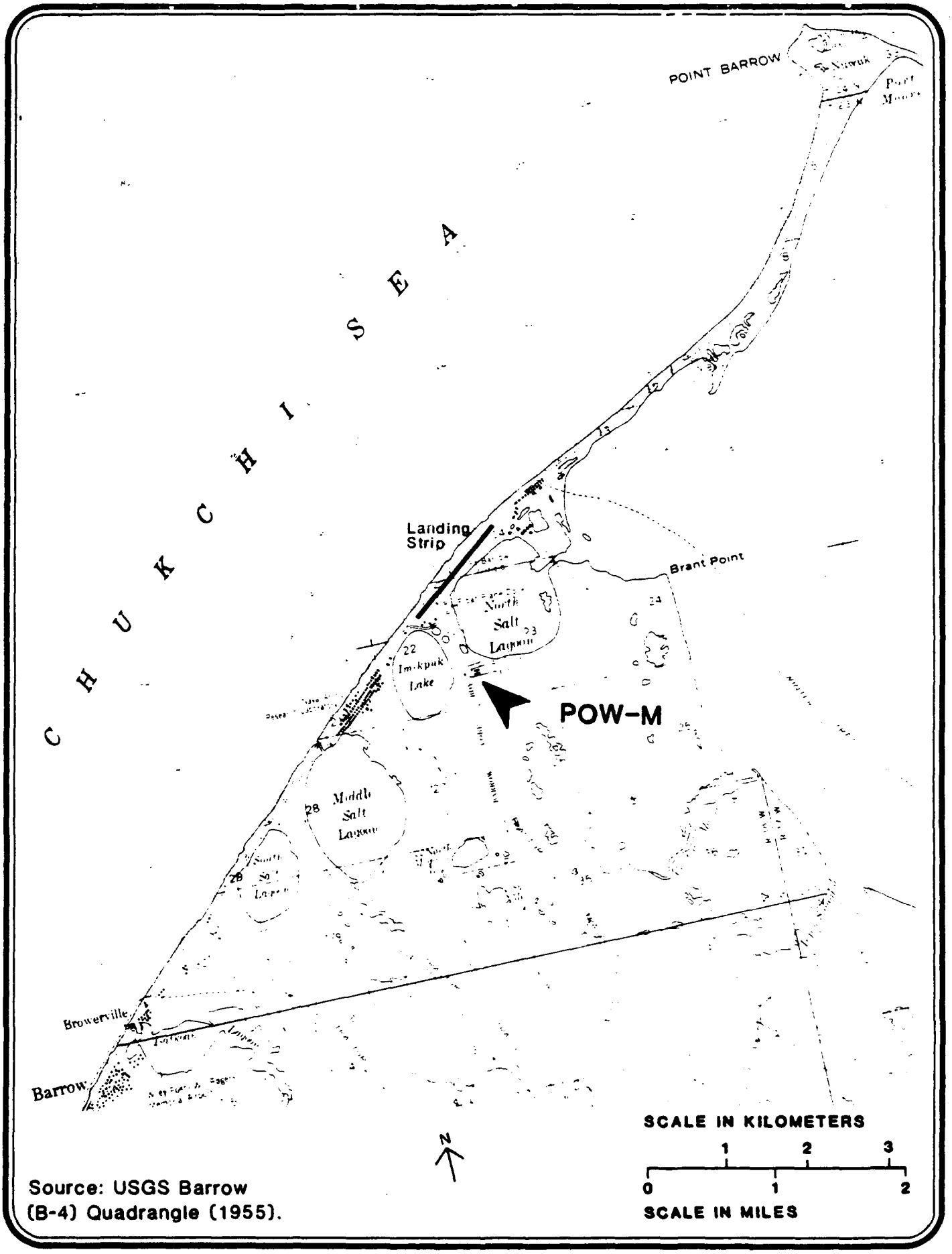
Source: USGS Point Lay
(C-2 and D-2) Quadrangle (1955).

Figure 2-3. LIZ-2 Site



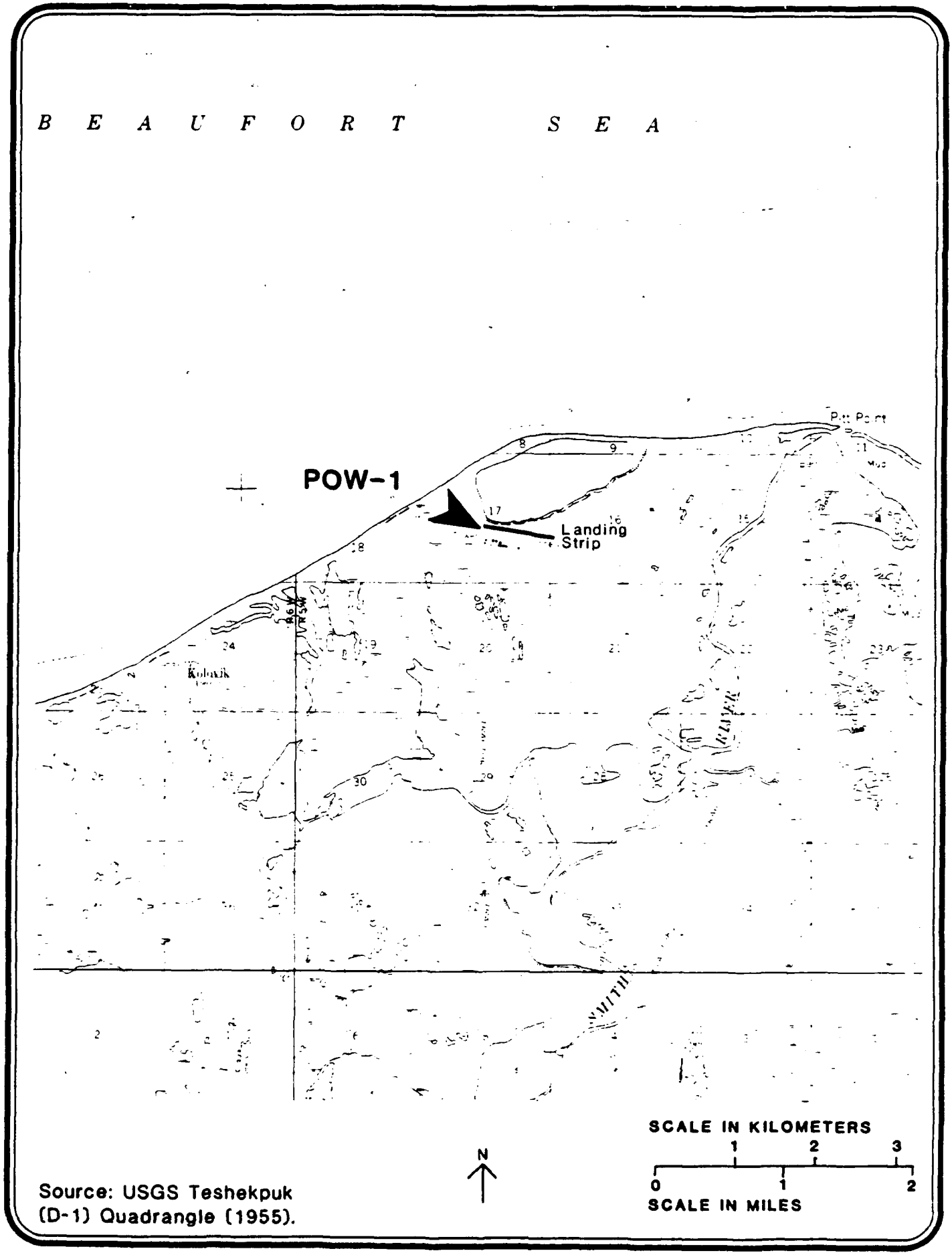
Source: USGS Wainwright (C-2) Quadrangle (1956).

Figure 2-4. LIZ-3 Site



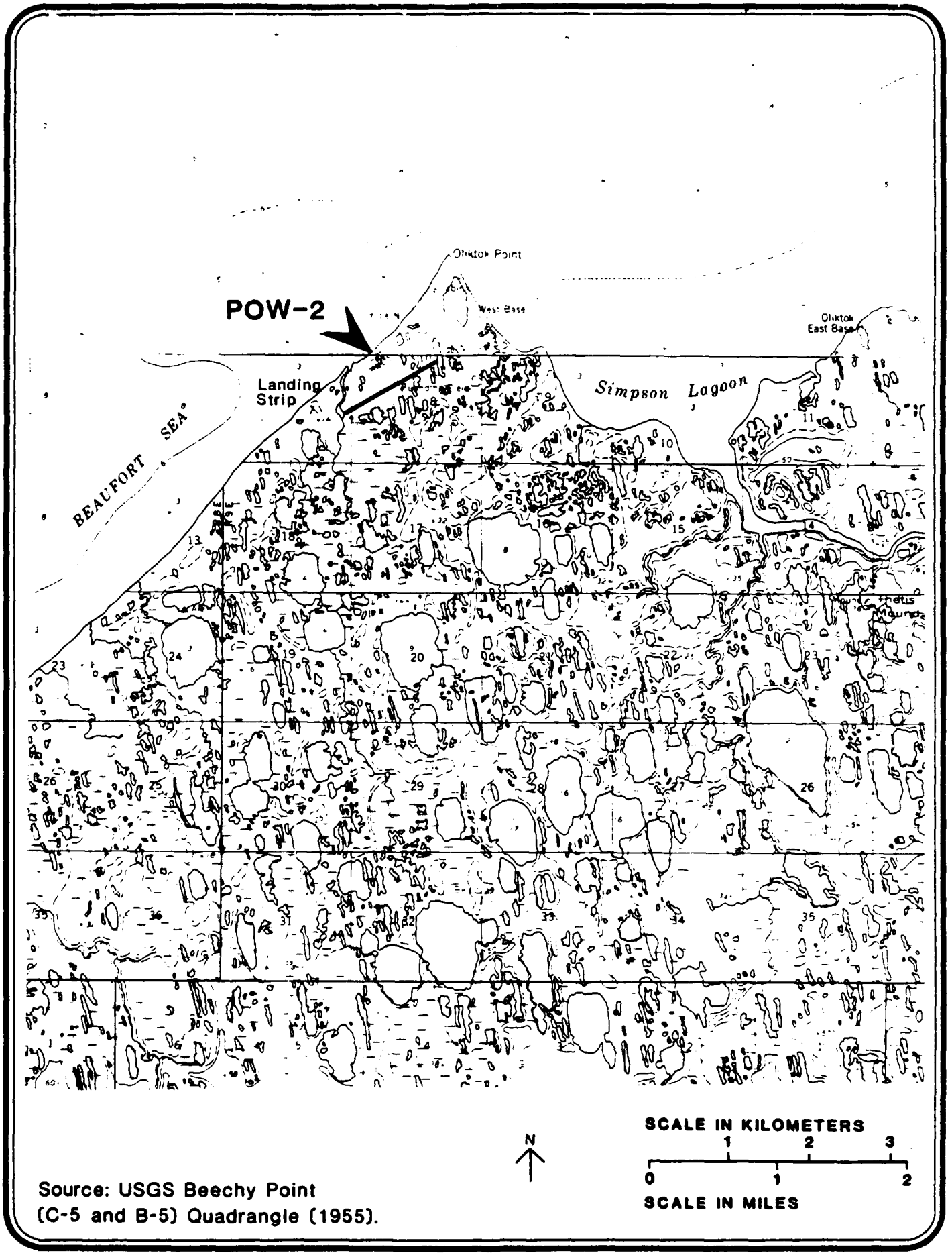
Source: USGS Barrow (B-4) Quadrangle (1955).

Figure 2-5. POW-M Site



Source: USGS Teshekpuk (D-1) Quadrangle (1955).

Figure 2-6. POW-1 Site



Source: USGS Beechy Point (C-5 and B-5) Quadrangle (1955).

Figure 2-7. POW-2 Site

2.1.3.6 POW-3 (Bullen Point): SRR

An SRR Station will be constructed at POW-3, an inactive DEW Line facility decommissioned in 1968 and located on the Beaufort Sea coastline on Mikkelsen Bay (Figure 2-8). The delta of the Canning River lies 20 miles (32 kilometers) to the east, and Prudhoe Bay is 35 miles (56 kilometers) to the west. The site includes a large gravel pad, a usable gravel airstrip, and a number of buildings and other structures remaining from former DEW Line operations. The Air Force has leased the property to the North Slope Borough until July 1987.

2.1.3.7 BAR-M (Barter Island): LRR Retrofit

An LRR Station will be retrofitted at the active BAR-M DEW Line Station located on Barter Island (see Figure 2-9), one of the larger barrier islands in the Beaufort Sea. This island is approximately 70 miles (113 kilometers) northwest of the Canadian border and about 110 miles (177 kilometers) east of Prudhoe Bay. The DEW Line Station is located on the northeast shore of Barter Island, which lies between Arey and Kaktovik lagoons, and is adjacent to the Inupiat Eskimo Village of Kaktovik. The prototype SRR Station at BAR-M will be disassembled after testing is completed.

2.1.4 Land Acquisition

As shown in Table 2-1, all NWS sites are currently controlled by the U.S. Air Force. Implementation of the proposed action at sites currently under Air Force control will not require any additional land acquisition activities. As noted previously, the North Slope Borough holds a lease on the POW-3 site until July 1987.

2.1.5 Construction

The proposed NWS will entail two primary construction activities: (1) conversion of four existing DEW Line Stations to LRR Stations, and (2) construction of facilities associated with the three SRR Stations, including the installation of radar and communications equipment.

2.1.5.1 LRR Retrofit

The LRR and associated communications equipment will be installed at four presently operating DEW Line Sites--LIZ-2, POW-M, POW-2, and BAR-M. Installation activities will include:

- Air or barge transport of equipment to the site
- Installation of new guy cables and anchors and of additional steel on radar towers
- Installation of temporary power and lighting on the radome deck
- Relocation of the platform deck hatch
- Enlargement of the radar room train module
- Removal of existing radar electronics
- Installation of new cable trays and conduits
- Installation of General Electric AN/FPS-117 Radar Set

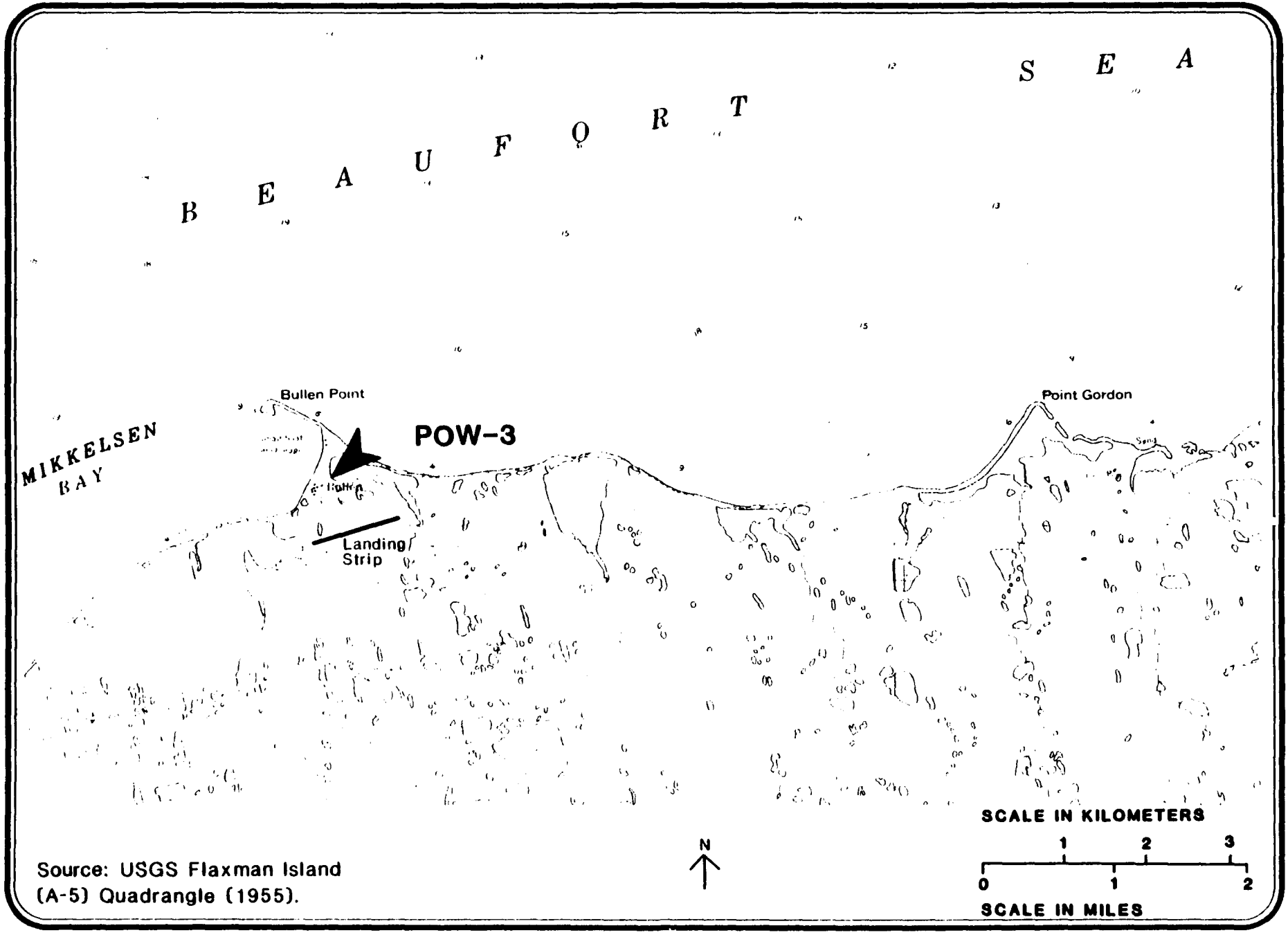
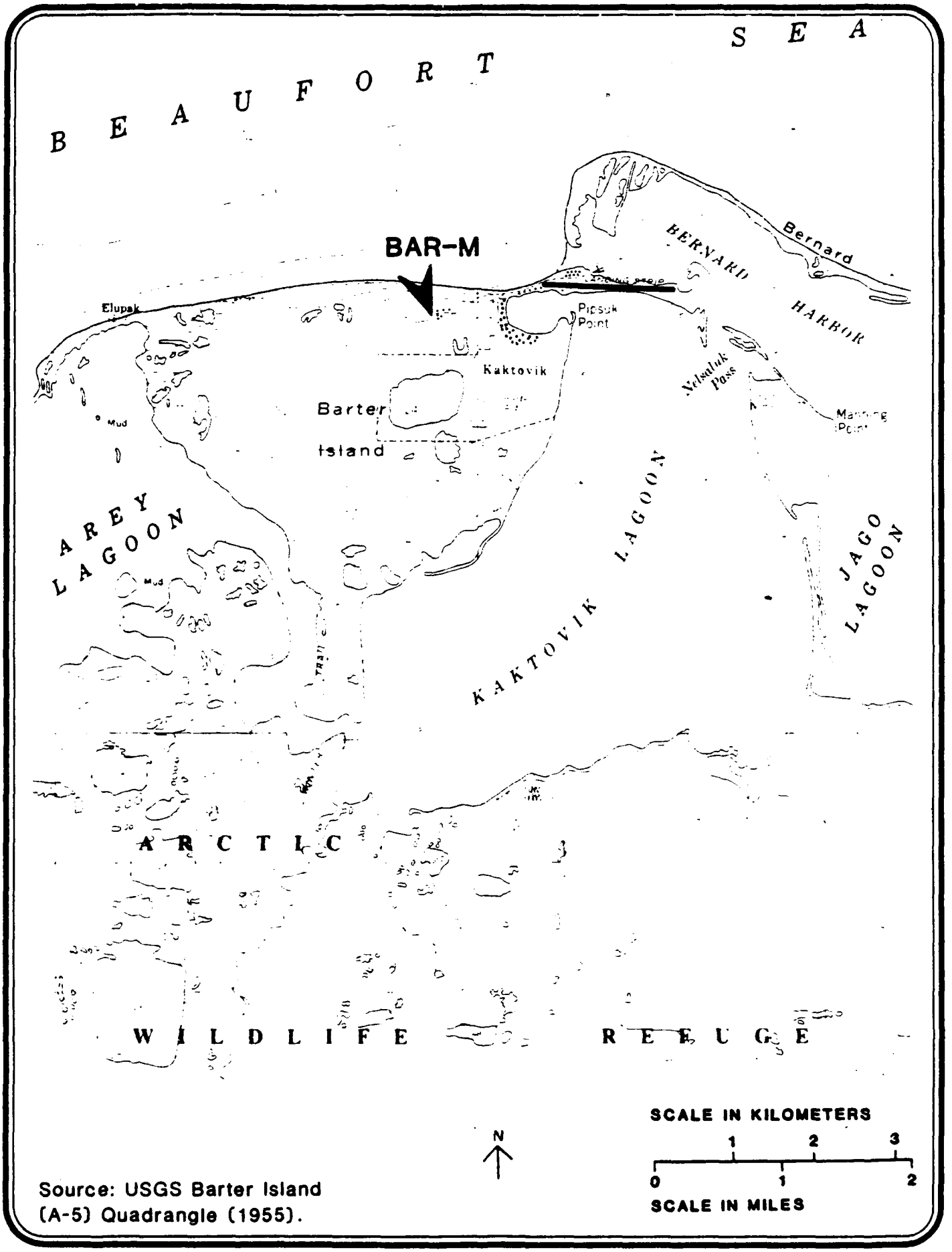


Figure 2-8. POW-3 Site



Source: USGS Barter Island (A-5) Quadrangle (1955).

Figure 2-9. BAR-M Site

TABLE 2-1
LAND STATUS OF NWS SITES

Proposed Site	Proposed Use	Controlling Agency	Lessee
LIZ-2	LRR	Air Force	None
LIZ-3	SRR	Air Force	None
POW-M	LRR	Air Force	None
POW-1	SRR	Air Force	None
POW-2	LRR	Air Force	None
POW-3	SRR	Air Force	NSB
BAR-M	LRR	Air Force	None

- o Power plant upgrade at LIZ-2, POW-M and POW-2
- o Increased fuel storage capacity at LIZ-2 and POW-2

Additional land is not required to convert any of the stations to an LRR facility. Most existing facilities (e.g., airstrip, storage facilities, personnel housing, and utility systems) will not be altered by NWS construction activities.

The installation and testing of each LRR will be accomplished by a crew of 6 to 10 individuals working 12 hours per day for approximately four months. Personnel and equipment will be transported to each site by barge, by winter ice road, or by air using the existing airstrips. During this conversion period, all personnel will reside in housing facilities presently available at the DEW Line Stations. Wastes will be handled in accordance with current waste management procedures of the DEW Line Stations.

Any hazardous wastes generated at the site will be disposed of in accordance with appropriate federal, state, and local regulations. Other solid wastes from construction activities, such as packing materials and scrap wood, will be disposed of either by burning or by transport to an existing landfill.

Since construction workers will use the existing housing facilities of the DEW Line Station, all sanitary wastes will be disposed of in accordance with current procedures. Sanitary, kitchen, and similar wastes are routed through a treatment facility, with treated water discharged on the ground surface in accordance with state requirements.

2.1.5.2 SRR Construction

2.1.5.2.1 LIZ-3 and POW-1. Construction of an SRR Station at the LIZ-3 and POW-1 DEW Line Stations will involve building an entirely new facility. Materials, supplies, equipment, and personnel will be transported to the sites by barge, by winter ice road, or by air using the existing landing strips. Land required for the SRR facility and construction areas is estimated to be about 3.5 acres (1.4 hectares), of which approximately 0.6 acres (0.2 hectares) would be occupied by the facilities themselves; the remaining

2.9 acres (1.2 hectares) is required only temporarily for the construction camp, laydown area, fabrication area, storage, and shop facility.

The SRR facility will be constructed on the existing gravel pad which would serve as both a structural support and as an insulator to retard thawing of permafrost. Structures will be supported on piles extending into the permafrost.

Because existing housing facilities at LIZ-3 and POW-1 are not expected to be able to accommodate all personnel required for SRR construction, temporary housing and associated facilities will probably be required. If so, a typical Arctic construction camp capable of housing 20-35 personnel will be mobilized to each site.

Water will be obtained from the freshwater sources currently used by the DEW Line Stations. Waste management during construction will be similar to that described above for LRR construction.

2.1.5.2.2 POW-3. The gravel pad area at POW-3 is large enough to support the SRR construction activities. The construction camp, materials, and equipment will be transported to POW-3 by barge or by air. Existing facilities will be used at POW-3 wherever feasible.

Water requirements for domestic use and construction activities are estimated to be 50 gallons (189 liters) per person per day. Potential water sources at POW-3 or Ignek will be evaluated during final design of the NWS project. The Air Force will consult with the State of Alaska regarding acceptable sources and requirements for water appropriation, health, and land use permits.

All sanitary facilities and wastewater from kitchen and personal use at the construction camp will be routed through a portable wastewater treatment module. This module consists of a sewage treatment plant that separates and treats the liquids and solids.

Fuel required for construction activities at POW-3 will be stored in bladders at the site. These bladders will be placed on impermeable synthetic liners located within temporary berms designed to accommodate at least 110 percent of the contents of the bladders. Any spilled fuel would be contained within the bermed area from which it would be transferred to an intact bladder or to steel drums.

2.1.6 Operation

2.1.6.1 LRR Stations

Activities associated with operation of LRR Stations will generally rely on use of existing facilities and currently functioning support systems at the DEW Line stations. For example, the DEW Line living quarters, security systems, and fire protection and suppression systems will be used during LRR operations. The existing diesel-electric generators will continue to be used at BAR-M, but new larger generators will be installed at the other LRR sites.

From 8 to 12 technicians and maintenance personnel will be housed at each LRR Station. The existing BAR-M DEW Line Station presently requires 28-30

personnel, POW-M requires 19 personnel, while LIZ-2 and POW-2 each require 17 personnel for operations and maintenance. Thus, all stations will experience a staff reduction. Personnel at these stations will be housed in existing DEW Line Station facilities.

The primary resource requirements of LRR operation will be water used for domestic purposes and fuel consumed for power generation, heating and cooling facilities, and transportation. Water consumption will range from 25 to 70 percent of the present rate. Diesel fuel consumption will be approximately 40 percent of the present rate.

Waste management procedures currently practiced at the active DEW Line Stations will continue to be used for LRR Station operations. Scrap metal and reusable equipment will continue to be shipped to Seattle. Most remaining solid wastes will be burned in the existing incinerators. All wastes that cannot be incinerated as well as the residue in the incinerators will be transported to existing landfills. Liquid chemical waste will continue to be stored in steel drums, shipped to Seattle, then transported to hazardous waste management sites for appropriate treatment or disposal. Sanitary wastes will continue to be treated in existing treatment facilities at the DEW Line Stations.

At each of the LRR Stations, electromagnetic energy in the form of radiofrequency radiation (RFR) will be emitted from radar and communication antennas. In addition to the radar antennas themselves, stations will have satellite, ultra high frequency (UHF), very high frequency (VHF), and high frequency (HF) communication antennas. Appendix D lists the characteristics of these antennas and describes the methods used to predict the total RFR power density at each site. Figure 2-10 shows the worst-case power density predicted at various vertical and horizontal distances from the radar and communications antennas at an LRR Station. A power density of 10 milliwatts per square centimeter (mW/cm^2) is predicted to be exceeded within 9 feet (2.7 meters) of the ground-based communication antennas and within 70 feet (21 meters) of the elevated radar antenna. The 1 mW/cm^2 level would be exceeded within 27 feet (8.2 meters) at ground level and within 220 feet at the elevation of the radar. (See Section 4.1.3.1 for a discussion of these values relative to safety standards.)

2.1.6.2 SRR Stations

The SRR Stations will be unattended, except during maintenance visits. Maintenance is expected to occur once every four to six months and will require one or two technicians, plus the aircraft crew, spending a few hours at each station. The existing DEW Line airstrip will be maintained to the extent necessary to allow these occasional maintenance visits.

Small quantities of water will be required by maintenance personnel. Potable water and water for washing will be carried in the aircraft.

The prime power supply for each SRR Station will be four 20 kW diesel engine generator units. Two generators will be operating during the maintenance visits, while only one generator is needed during normal operations. The two redundant generators are necessary to ensure continuous operations while units are being serviced and repaired.

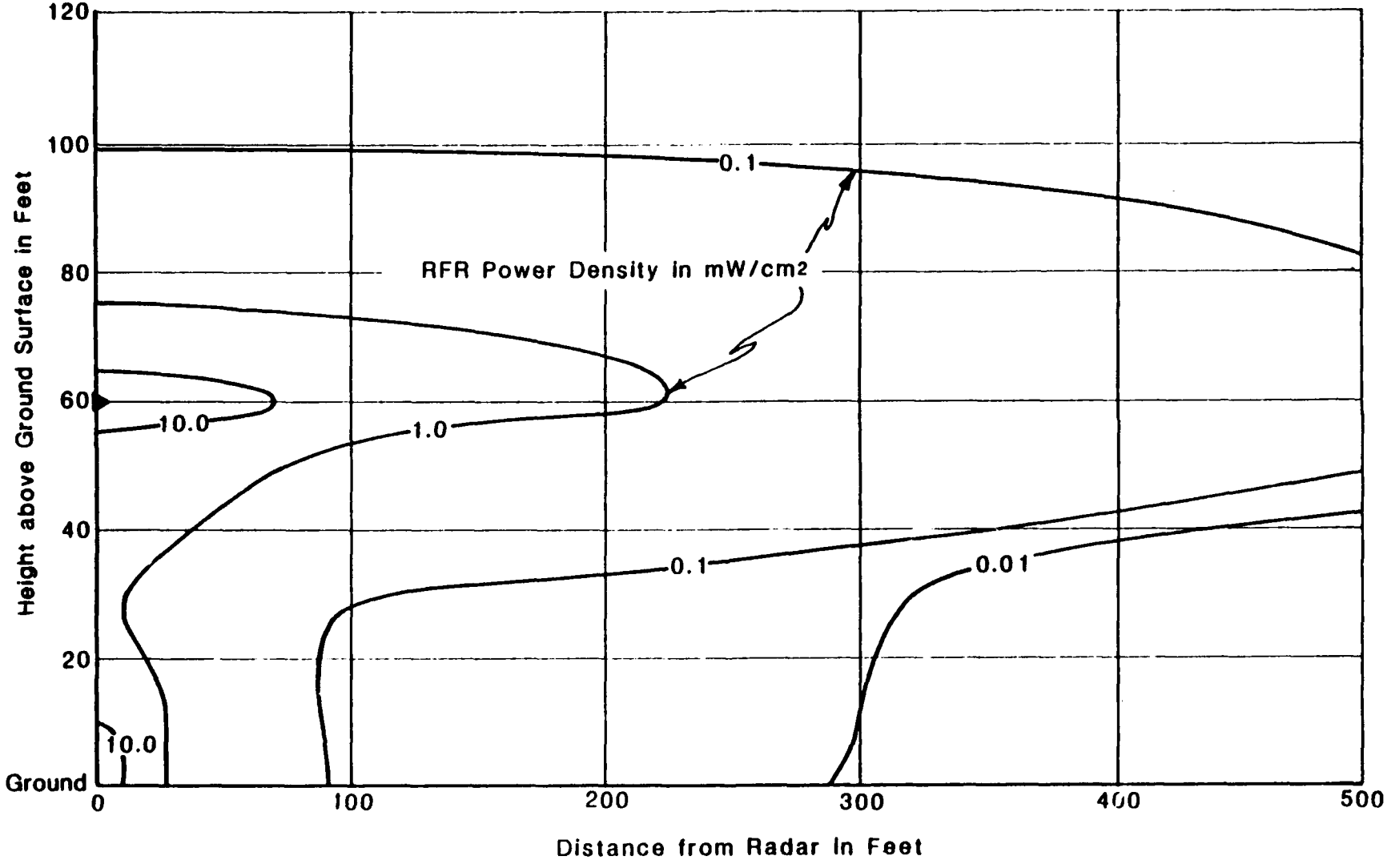


Figure 2-10. Worst-Case Radiofrequency Radiation from LRR Radar and Communication Antennas

A 24-month supply of diesel fuel, approximately 53,900 gallons (204,000 liters), will be stored at the site. Fuel will be delivered annually by sealift.

Each SRR Station will include a bermed fuel storage area with a total capacity of 59,300 gallons (224,400 liters), 10 percent greater than the maximum supply. Fuel will be stored in two 26,950-gallon (102,000-liter) tanks. Use of these fuel storage tanks will require preparation and implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan in accordance with the requirements of the EPA as published in 40 CFR 112. Further, several Air Force regulations apply to fuel use at these facilities, including AFR 19-7 ("Environmental Pollution Monitoring", 13 August 1981), AFR 19-1 ("Pollution Abatement and Environmental Quality", 9 January 1978), and AFR 19-8 ("Environmental Protection Committees and Environmental Reporting", 5 January 1982).

All wastes, including wastes from chemical toilets used by maintenance workers, will be removed from the SRR Stations during maintenance visits and transported to the CMF at Elmendorf Air Force Base. These wastes will be disposed of with maintenance base wastes using the system installed there.

A fire detection and suppression system will be provided at each SRR. This system typically consists of five basic components: detectors, controls, Halon cylinders, piping, and nozzles. The Halon cylinders will be pressurized with nitrogen for Arctic operations at -70 degrees F (-57 degrees C).

A 6-foot (1.8-meter) high security fence will be installed around the entire SRR Station. Each SRR facility will have a security system to provide additional protection against intrusion and vandalism and to monitor equipment operation. This system will include remote alarms on all interior and exterior doors and constant surveillance via interior and exterior closed circuit television cameras. The SRR facility will be monitored constantly by the CMF.

Appendix D describes the methods used to predict the total RFR power density from radar and communication antennas at each NWS Site. Figure 2-11 shows worst-case RFR values for a typical SRR Site, which are an order of magnitude below those for a typical LRR site (Figure 2-10). The 1 mW/cm^2 power density would be exceeded only within 23 feet (7 meters) from the ground-based communication antennas.

2.1.7 Decommissioning

When the SRR facilities are operational, active DEW Line facilities at LIZ-3 and POW-1 would no longer be needed. The Air Force has several options for handling these facilities. They can be inactivated and kept under a caretaker/maintenance program awaiting reactivation providing a valid military need is identified for future use. AFR 85-9 ("Inactive Installations-Inactivation and Maintenance", 1 March 1976) outlines the procedures required to place an active installation or facility in an inactive or caretaker status pending its reactivation for Air Force use.

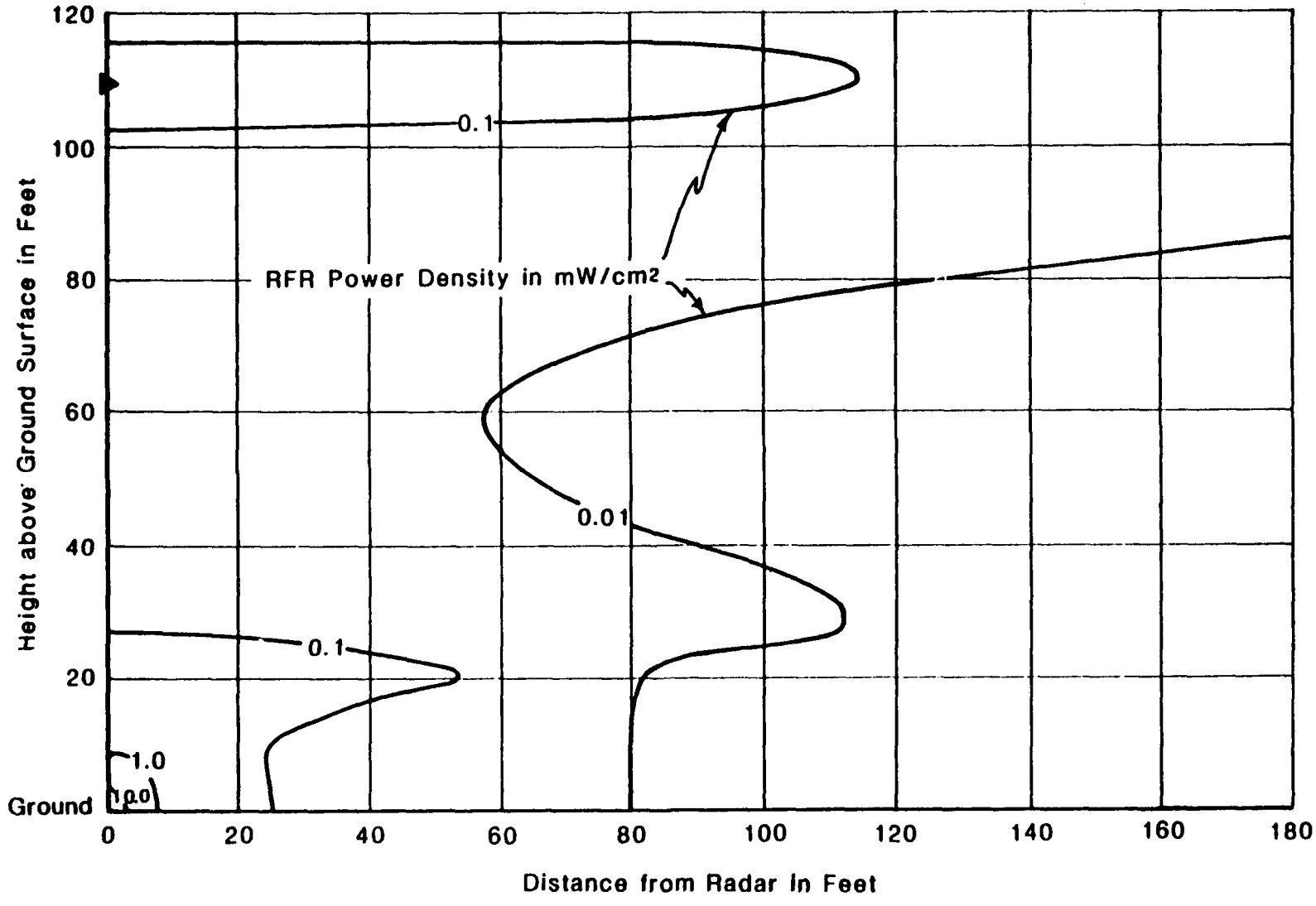


Figure 2-11. Worst-Case Radiofrequency Radiation from SRR Radar and Communication Antennas

According to AFR 87-4 ("Disposal of Real Property", 23 April 1971), if the Air Force decides the facilities will not be needed at a later date, they will be classified as "unneeded". If the excess facility is not required by another major command, another military department, a defense agency, or the U.S. Coast Guard, the property will be offered first to other federal agencies, followed by state and local agencies. All disposal activities will be conducted in accordance with provisions of the Alaska Native Claims Settlement Act.

If facility demolition is necessary, the Air Force will undertake these activities in compliance with appropriate federal, state, and local regulations. The DOD's Installation Restoration Program (IRP) is in process at all DEW Line sites, and it is expected that any required site cleanup actions will be completed prior to property disposal actions.

2.1.8 Project Schedule

Construction is presently scheduled to begin in March-April, 1987, when LRR equipment will be installed at POW-M and POW-2. The LRR at LIZ-2 will be installed in September 1987. The BAR-M LRR will be installed after testing of the SRR prototype at that site, probably in 1991. SRR facilities will be constructed in the summers of 1990 and 1991. By late 1991, all stations will be operating and the Alaska portion of the NWS will be functional.

2.2 ALTERNATIVE ACTIONS

A very limited number of potential alternatives to the proposed NWS can be considered, due to the unique needs of the Air Force in establishing a satisfactory surveillance system and in merging the U.S. portion of the system with the planned facilities in Canada. The three alternatives addressed below include: the No Action Alternative, the use of airborne radar surveillance (AWACS), and the use of satellites for surveillance. Early in the planning of this proposed action, alternative NWS sites were considered but eventually rejected because of environmental and socioeconomic concerns.

2.2.1 No Action

With the No Action alternative, the existing DEW Line system would be used, along with the OTH-B systems, to provide early warning of an airborne military attack on North America from across the polar region. As discussed in Section 1.2, the Air Force has identified deficiencies in the DEW Line System's surveillance coverage and detection capabilities, particularly for low-altitude flights, and the costs of operating this aging system are high and increasing rapidly.

The No Action alternative has a number of disadvantages. First, continued reliance on the DEW Line System would not provide the degree of surveillance and detection capabilities necessary for national security. Further, the cost savings associated with the NWS could not be achieved with the existing system. Finally, this alternative would not allow for integration with the Canadian portion of the NWS, which will be upgraded through the installation of facilities similar to those described for the NWS in Alaska. Without the NWS facilities in Alaska, the early warning system would not function as designed and the security of North America would be compromised.

2.2.2 Alternative SRR Sites

A preliminary list of possible SRR locations included a number of interior Alaska sites located in the Alaska Range, White Mountains, Brooks Range, and the inland coastal plain of the North Slope. All but one of these sites were rejected because of environmental unsuitability, inadequate coverage, or changes in the NWS configuration. The only remaining SRR alternate site was Ignek, which was subsequently rejected in favor of POW-3.

The Ignek site lies at an elevation of 1,734 feet (529 meters) and is located approximately 50 miles (80 kilometers) south of POW-3 and 4 miles (6 kilometers) west of the confluence of Ignek Creek and the Canning River. It is located on a low, broad ridge intermediate between the coastal plain and the Brooks Range foothills. The site occupies state-owned land, a portion of which is leased to the Exxon Corporation, and includes a gravel pad and a closed gravel airstrip (see Appendix B for additional information).

An SRR facility at Ignek would be constructed either on or adjacent to the existing gravel pad. If the construction schedule allows, materials and equipment would be mobilized to the site in the winter. Trucks would transport these materials north from Fairbanks on the Dalton Highway. After staging alongside this road, materials would be loaded onto Rolligons for overland transport to the site. Alternatively, materials could be flown into the Kavik airstrip and loaded onto Rolligons there. In either case, the materials would be unloaded and remain at Ignek until construction began the following summer.

2.2.3 Airborne Warning and Control Systems

In the early 1960s, work was begun on development of airborne radar surveillance equipment to improve low-level surveillance capabilities. As a result of continuing efforts, the Boeing Aerospace Company now manufactures an E-3A airplane that is equipped with a sophisticated radar and communications system used to monitor the movement of both aircraft and marine vessels. These Airborne Warning and Control Systems (AWACS) aircraft are used by the U.S. Air Force and several member nations of the North Atlantic Treaty Organization (NATO).

AWACS aircraft, which can be refueled in flight, have a cruising altitude of 29,000 feet (8,840 meters) and a radar surveillance range of over 250 miles (400 kilometers). With refueling they can remain aloft for up to about 22 hours. The cost of each aircraft is approximately $65 million.

Although the use of AWACS, perhaps based at Elmendorf Air Force Base in Anchorage, would provide much of the radar surveillance coveraged desired by the Air Force, there are several reasons why their use is not considered a reasonable alternative to the proposed NWS. One reason for rejecting the use of AWACS as an alternative is that the cost to purchase and operate the number of aircraft required for adequate surveillance coverage would be significantly higher than that of the proposed NWS; this additional cost would not provide greater coverage. Also, use of AWACS would not be compatible with the radar coverage and communications system provided by the existing Alaska DEW Line Stations or the proposed upgrading of the Canadian DEW Line System. Thus,

although AWACS could be used to complement the ground-based early warning system, or to fill gaps in coverage during facility downtimes, this system alone is not capable of meeting the long-term needs of the NWS program.

2.2.4 Satellite Detection

The use of surveillance satellites and defensive weapons in space is currently being explored as a part of the DOD's Strategic Defense Initiative. Although conceptually feasible, technical advances would be required to develop a system based on the use of satellites for the detection of aircraft and the timely communication of this information to NORAD or other appropriate defense agencies. New technology would be required for both surveillance equipment on the satellites and for computer systems used to analyze and transmit data received by the satellite. Because it is unknown when this technology may become available, the use of satellite detection systems is not presently considered a reasonable alternative to the NWS.

2.3 COMPARISON OF ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This EA addresses reasonable alternatives to the NWS for providing early warning of an atmospheric attack across polar regions. For the reasons presented in Section 2.2, neither AWACS nor a satellite system are considered by DOD to be reasonable alternatives and are not discussed further in this document.

2.3.1 No Action Alternative

If the NWS was not developed, existing DEW Line Station operations would continue indefinitely. As a result, improved radar coverage would not be provided, and gaps in low-level coverage and deficiencies in the system's overall detection capabilities would continue. The DEW Line System would also continue to require high levels of labor and resources, which would result in high operating costs.

Without the NWS, there would be no construction work and no temporary increase in air traffic, equipment use, noise, and general human activity at all sites. Over the long-term, there would not be a reduction in personnel and resource use at existing DEW Line Stations as a result of LRR or SRR operations.

2.3.2 Alternate SRR Sites

Because POW-3 would provide better coverage with fewer environmental effects during SRR construction and operation, it was selected over the alternate Ignek site. As a formerly active DEW Line Station, the POW-3 site includes a large gravel pad, various support structures and a functional airstrip. Development of this site is not expected to cause any significant environmental effects.

If the Ignek site was developed as an SRR Station, a lease from the State of Alaska would be required. Also, some tundra habitat would be lost as additional gravel was laid for construction activities and for a possible 3- to 5-mile (5- to 8-kilometer) extension of an existing gravel road from the Kavik airstrip. Approximately 100,000 cubic yards of gravel would be required

for this road, the extraction of which could affect local environments. Also, the radar tower would be noticeable from nearby viewpoints in the Arctic National Wildlife Refuge. Finally, operation of an SRR at Ignek could interfere with Exxon Company's Ignek Communications Facility. If this interference could not be filtered out and the Exxon facility was no longer functional, the petroleum industry in the area could experience significant adverse operational and economic impacts. If the Exxon facility were relocated, the economic and environmental effects could also be significant.

3.0 AFFECTED ENVIRONMENT

Summary information on the existing environmental conditions of the NWS region and each NWS site is presented in this section. Appendix B (Volume II of this EA) contains more detailed information on the environmental conditions, along with references to information sources used. Appendix C contains lists of plant, fish, bird and mammal species in the region.

3.1 REGIONAL OVERVIEW

The NWS sites are located within the Arctic Coastal Plain, a tundra-covered region that is essentially flat. The Arctic Coastal Plain extends north from the Arctic Foothills of the Brooks Range to the Arctic Ocean. All of the sites are located on the coast, and all are within the area defined by the Joint Federal-State Land Use Commission for Alaska as the Arctic Planning Region (Selkregg, 1975).

3.1.1 Physical Environment

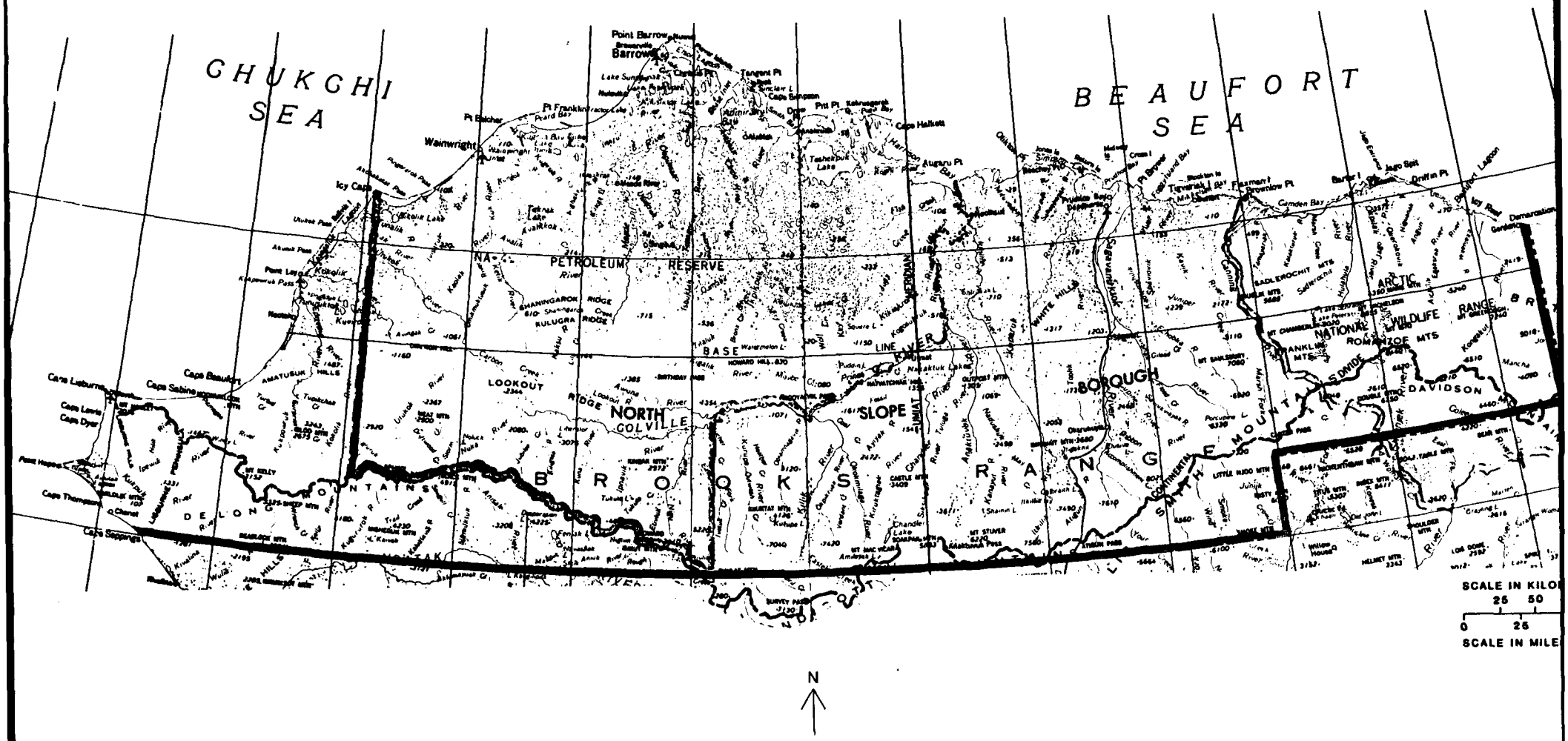
The Arctic Coastal Plain, one of the most remote and sparsely populated areas of the nation, is characterized by a tundra environment with very little topographic relief (Figure 3-1). Temperatures are generally below freezing for most of the year, resulting in permanently frozen ground (continuous permafrost) near the surface to depths greater than 2,000 feet (610 meters). Precipitation is light and the area may be classified as semi-arid; however, low evaporation rates and minimal runoff result in the formation of numerous small ponds, thaw lakes, and marshy areas. Thus, water is plentiful in the region.

Natural resources of the region include coal, oil, gas, and gravel. Coal occurs in sedimentary rocks that underlie approximately 60 percent of northern Alaska. The region contains significant oil reserves, including the Prudhoe Bay Oilfield, the largest known oil reservoir in North America. Natural gas is also abundant and is used as a primary heating source by some villages. Gravel deposits are an important source of construction materials, which are common in upland areas east of the Colville River, but are relatively rare to the west.

The Arctic Coastal Plain is bordered on the north and northwest by the Beaufort and Chukchi Seas, both of which are part of the Arctic Ocean. The tidal range is small, with an amplitude of 0.4 feet (0.12 meters) at Barrow. Summer storms produce waves as high as 13 feet. Ice is typically present in the nearshore waters for 6 to 10 months of the year, depending on location.

3.1.2 Biological Environment

A short growing season (June through mid-September) and the flat topography limit the diversity of plant habitats and plant types on the Arctic Coastal Plain. Tundra is the predominant vegetative life form with the dominant plant species being tussock-forming cottongrass. The visual character of the Arctic Coastal Plain is one of generally flat tundra lowland with little perceptible change in elevation, although color and textures change dramatically through the seasons.



urce: USGS Alaska Map E (1973).

Figure 3-1. Geography of Ar

The coastal area is a major migratory corridor for a variety of waterfowl and other birds. As many as 180 bird species may be seasonally associated with habitats of the Arctic Coastal Plain.

A total of 38 species of mammals commonly occur in the Arctic with 11 of these being strictly marine. The marine fauna consists of six species of whales and five species of seals and walrus with the most common being Beluga, bowhead, and gray whales and ringed and bearded seals. The inland tussock tundra supports a diverse mammalian population where principal species include shrews, ground squirrels, voles, wolves, fox, wolverine, muskox, and caribou. Caribou are the principal large-bodied mammals in the region, and the Arctic is of prime importance to caribou during the calving period when the cottongrass sedge tussocks provide their major food supply.

Threatened or endangered species in the Arctic Coastal Plain include five species of whale, the Eskimo curlew, the Arctic peregrine falcon, and three plant species.

3.1.3 Sociocultural Environment

The earliest archeological sites found along the Arctic coastline date from about 4,500 years before present (B.P.), and the cultural ancestors of the current Native residents appeared about 1,400 years B.P. The first Euroamerican exploration of the Arctic Coast began in the late 1770s. Commercial whaling flourished along the coast beginning about 1850 and was replaced by fur trading by the turn of the century. During the last 50 years, oil and gas discoveries and development of production facilities have introduced industrial activity to the region.

The 1980 population of the Arctic Coastal Plain totaled 3,827, most of whom are Inupiat Eskimo. There are eight traditional Inupiat communities in the coastal area with the largest being Barrow (population 2,882), which forms the center of government, transportation, and services for the region. Transportation facilities within the Arctic Coastal Plain are limited, and the area depends greatly on air transport for both passenger and freight movement. Other than the Dalton Highway, which runs between Fairbanks and Prudhoe Bay, the only all-season roads that exist in the region occur within villages and industrial areas.

The economy of the Arctic Coastal Plain is dominated by oil and gas development, while the major employer in Native villages is local government. Average wages are among the highest in the state but are considerably offset by a 30 percent higher cost of living. As a result, many North Slope families must supplement wage incomes with subsistence activities or some form of public assistance.

Subsistence activities include hunting, fishing, and trapping and emphasize sharing and a close cultural interrelationship with natural resources. The primary biotic resources are whale, caribou, seal, walrus, and a variety of small game, fish, and waterfowl.

Over 50 percent of the Arctic Coastal Plain is within the federally-controlled National Petroleum Reserve in Alaska (NPRA) and Arctic National Wildlife Refuge (ANWR) (Figure 3-2). The state owns approximately 3.5 million acres

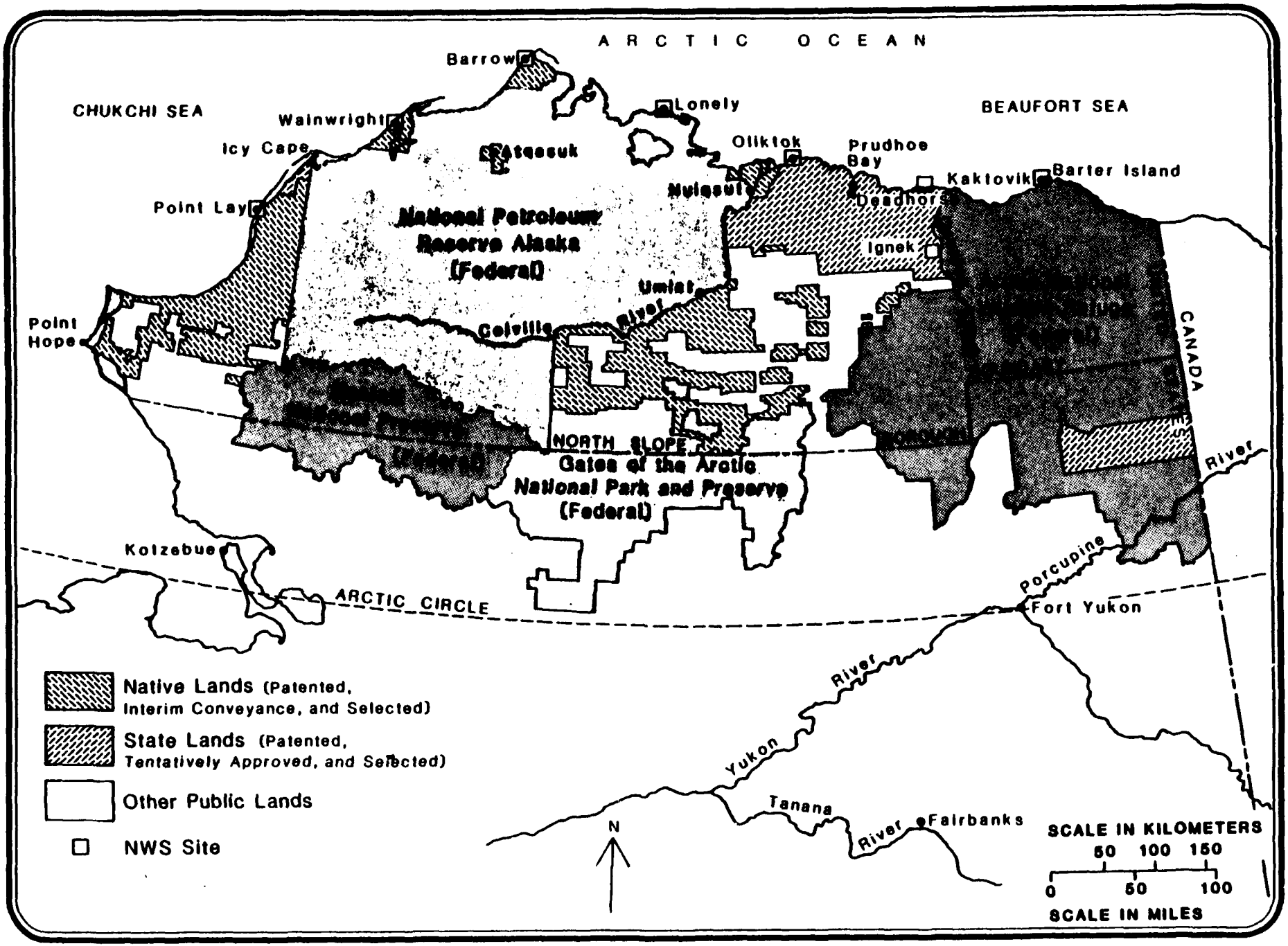


Figure 3-2. Arctic Region Land Status

(1.4 million hectares), most of which lie in the central portion of the Coastal Plain. In addition, over 4.4 million acres (1.8 million hectares) are controlled by Native and village corporations and individuals. The North Slope Borough (NSB) is the main governing body in the region and administers and operates the majority of community services and facilities. The Arctic Slope Regional Corporation is the dominant Native regional corporation in the area.

3.2 SITE DESCRIPTIONS

The following sections summarize the physical, biological, and sociocultural conditions in the vicinity of each NWS site. Table 3-1 summarizes selected environmental characteristics of the sites.

3.2.1 LIZ-2 (Point Lay): LRR Retrofit

The LIZ-2 DEW Line Station is located in the western portion of the Arctic Coastal Plain, near the shorelines of Kasegaluk Lagoon and the Chukchi Sea, and immediately south of the village of Point Lay. The area is characterized by low relief with numerous small thaw lakes and swampy areas. The lack of relief often has led to local flooding after spring breakup.

The vegetation of the Point Lay site consists predominantly of wet sedge meadows with tussock tundra and some wetland species. Terrestrial mammals include such wet tundra species as shrews, lemmings, microtine rodents, Arctic fox, and weasels. Caribou from the Western Arctic Herd pass through the area.

Locally important fish include salmon, flounder, smelt, herring, whitefish, grayling, and char associated with habitats of the lagoon and the Kukpowruk and Kokolik Rivers. The Kasegaluk Lagoon system is considered to provide excellent habitat for migratory and nesting waterfowl and shorebirds, including loons, terns, sandpipers, phalaropes, eider ducks, and brant. Important marine mammals include walrus, bearded seals, spotted seals, and Beluga whale. Except for bowhead and gray whales which pass offshore, threatened or endangered species have not been observed in the area.

Subsistence resources in the area include ground squirrel, lemmings, caribou, fox, and wolverine; the area adjacent to the LIZ-2 site is not used extensively for subsistence due to its restricted status. Five cultural resources sites are known in the vicinity of LIZ-2 (see Appendix B); none has been evaluated for listing in the National Register of Historic Places.

The village of Point Lay was originally established in 1930 and has varied in population size, with approximately 68 persons, primarily young Eskimos, present in 1981. Most employment comes from NSB capital improvement projects, as well as government administration. The village uses the DEW Line Station airstrip and water and solid waste disposal systems.

Little recreational use is made of the area due to the lack of accommodations and facilities, as well as access. Air travel is the only year-round means of access to the area, and most air traffic is handled by the DEW airstrip. An annual barge shipment delivers fuel and other cargo to the village.

TABLE 3-1
SELECTED ENVIRONMENTAL CHARACTERISTICS OF POTENTIAL NWS SITES WITHIN THE ARCTIC COASTAL PLAIN

DEW Site	Site Name	Elevation In Feet	Topography	Soils	Dominant Vegetation Type	Average Annual Precipitation In Inches	Average Annual Temp. In Degrees (F)	Distance To Nearest Fresh Water In Miles	Nearest Community (Distance In Miles)	Direction To Coast (Distance In Miles)	Jurisdiction	Land Use
LIZ-2	Point Lay	8	Low Coastal Bluff	Silty Loam/ Tundra Mat	Wet Sedge Meadow	4.9	9.3	1.5	Point Lay (Adjacent)	West (Adjacent)	U.S. Air Force	Active DEW Line Station
LIZ-3	Wainwright	55	Low Coastal Bluff	Silty Loam/ Tundra Mat	Wet Sedge Meadow	6.0	10.7	0.8	Wainwright (4.5)	West (4.3)	U.S. Air Force	Active DEW Line Station
POW-M	Barrow	8	Thaw Lake Polygons	Silty Loam/ Tundra Mat	Wet Sedge Meadow	4.4	9.5	1.0	Barrow (4)	West (0.7)	U.S. Air Force	Active DEW Line Station
POW-1	Lonely	23	Low-Broad Hill/ Terrace	Silty Loam/ Tundra Mat	Wet Sedge/ Aquatic Tundra	4.0	9.5	0.8	Nuiqsut (40)	Northwest (0.6)	U.S. Air Force	Active DEW Line Station
POW-2	Oliktok	10	Polygonal Ground	Silty Loam/ Tundra Mat	Marine Tundra	4.9	10.1	0.4	Nuiqsut (30)	Northwest (Adjacent)	U.S. Air Force	Active DEW Line Station
POW-3	Bullen Point	6	Thaw Lake Polygons	Tundra Mat/ Silt	Wet Sedge Meadow	4.9	9.4	1.5	Prudhoe Bay (40)	North (Adjacent)	U.S. Air Force	Inactive DEW Line Station
BAR-M	Kaktovik	42	Low Costal Bluff	Tundra Mat/ Sand	Tussock Tundra	4.9	10.1	1.1	Kaktovik (Adjacent)	North (Adjacent)	U.S. Air Force	Active DEW Line Station

3.2.2 LIZ-3 (Wainwright): SRR

The LIZ-3 DEW Line Station is located near the Chukchi Sea shoreline on a bluff east of Wainwright Inlet and the Kuk River. The site is 4.5 miles (7.2 kilometers) from the village of Wainwright. Coal deposits underlie the site, and Natives have used coal from riverbank exposures south of the DEW Line Station. Sand and gravel are mined in the area.

The vegetation of the Wainwright site is dominated by wet sedge meadow with sedges and grasses. Terrestrial mammals include the moist-wet tundra species of shrews, lemmings, microtine rodents, ground squirrels, Arctic fox, and weasels. Caribou use the area during post-calving movements and dispersal.

Fish species in the Kuk River include salmon, cisco, whitefish, and smelt. Ninespine stickleback and blackfish may be present in nearby thaw lakes. Wainwright is located along the migratory corridor for shorebirds and waterfowl; ducks and geese are important to subsistence. Marine mammals occurring off Wainwright include bowhead and Beluga whales, walrus, and bearded and spotted seals. Except for bowhead and gray whales, which pass offshore, threatened or endangered species are not known in the area.

Subsistence resources in the area include caribou, ground squirrels, lemmings, grizzly bear, and polar bear. Seal, walrus, and Beluga whale are hunted occasionally in the Wainwright Inlet, but current policy prohibits the hunting of land mammals on Air Force property. Ten cultural resources sites are known in the vicinity of LIZ-3; none has been evaluated for listing in the National Register of Historical Places.

The present town of Wainwright was established in the early 1900's; the 1980 population was 405. The major source of employment and income is the NSB, which also provides most municipal services. Wainwright has its own airstrip and does not rely on DEW Line facilities.

Relatively little recreational use is made of the LIZ-3 area due to limited facilities, accommodations, and transportation. Air travel is the only year-round means of access to the Wainwright area. An annual barge shipment delivers fuel and other cargo to the town.

3.2.3 POW-M (Barrow): LRR Retrofit

The POW-M DEW Line Station is located between Imikpuk Lake and North Salt Lagoon near the Chukchi Sea between the City of Barrow and Point Barrow. The area is influenced by coastal and thaw lake processes, with relatively high coastal beach erosion due to gravel removal from barrier islands.

The vegetation of Point Barrow is characteristic of wet sedge meadow complexes with sedges, grasses, and mosses predominating; other complexes are present in local pond systems and beach areas. Terrestrial mammals include brown lemmings, masked shrews, Arctic fox, and polar bears. Caribou from the Western Arctic Herd may reach the area during summer dispersal.

Marine, anadromous, and freshwater fish, including boreal smelt, Arctic cod, cisco, char, whitefish, grayling, fourhorn sculpin, Alaska blackfish, and ninespine stickleback, seasonally utilize North Salt Lagoon, Imikpuk Lake, and

wetlands surrounding the site. Point Barrow is situated along a major migration corridor for shorebirds and waterfowl. Numerous species breed in the area, and nearshore lagoons and coastal lake systems are important during molting and pre-migratory staging. A few non-migratory species are resident. Marine mammals include Beluga, bowhead, and gray whales and ringed seals.

Except for bowhead and gray whales, threatened or endangered animal species are not known to occur in the area. While Arctic peregrine falcon do not nest in coastal areas, they may occasionally hunt there. The willow, Salix ovalifolia var. glacialis, is a candidate threatened species which reportedly grows in sandy soils at Point Barrow, but its occurrence in the site vicinity is not known.

Subsistence activities near POW-M focus on resources associated with the sea and shore-ice environments, including fish, seals, walrus, and waterfowl. Eight cultural resources sites are known in the general vicinity of POW-M, four of which are listed in or eligible for the National Register of Historic Places.

Barrow became the dominant community on the North Slope after World War II when oil and gas exploration began, and the Naval Arctic Research Laboratory and the DEW Line Station were constructed. The 1980 census counted 2,207 individuals, and most employment results from government activities. Offices of the North Slope Borough are located in Barrow.

The principal recreational facilities along the Arctic Coast are located near Barrow, which is the center of tourism for the North Slope. Barrow also serves as the region's center for air and marine transportation. Both regularly scheduled and charter air service is available at the Wiley Post-Will Rogers Memorial Airport, and summer barge service is available for heavy or bulky goods. Barrow also has the most extensive gravel road system on the North Slope.

3.2.4 POW-1 (Lonely): SRR

The POW-1 DEW Line Station is located on Pitt Point between Smith and Harrison Bays of the Beaufort Sea. The site is on a low, broad hill. Swampy, ponded areas lie to the west and south, while the Smith River flows north of the site.

The vegetation of the Lonely site is dominated by forms associated with wet sedge and aquatic tundra, particularly sedges and grasses. Terrestrial mammals include masked shrew, brown and collared lemmings, microtine rodents, weasels, and Arctic fox. Caribou of the Teshekpuk Lake Herd range throughout the area, and polar bears may visit during winter.

Freshwater and anadromous fish, such as Arctic and least cisco, Arctic char, broad and humpback whitefish, grayling, ninespine stickleback, and Alaska blackfish likely use the connected lakes and ponds of the Smith River system. The area around Teshekpuk Lake, located 15 miles (24 kilometers) southwest of the site, is considered to contain excellent waterbird habitat. Principal marine mammals that occur offshore include Beluga whale and ringed seal. While threatened or endangered species have not been observed in the area of the POW-1 site, this site falls within the ranges of the Arctic peregrine

falcon, Eskimo curlew, the mustard Thlaspi Arcticum, and the willow Salix ovalifolia var. glacialis.

No Native settlements are located in the vicinity of the POW-1 site, although the area is located at the eastern edge of the identified subsistence use area for Barrow. Primary subsistence resources in the Pitt Point area include fish, waterfowl, and caribou. Five cultural resources sites have been identified in the vicinity of POW-1, all of which relate to traditional land use; none has been evaluated for listing in the National Register of Historic Places.

POW-1 lies approximately 0.5 mile (0.8 kilometer) east of Camp Lonely, a large base camp previously used to support oil and gas exploration in the NPRA. Because demand for the use of its facilities has been low during the last few years, the camp is presently being maintained by its owner, Cook Inlet Regional, Inc., in "caretaker" status.

Little recreational use is made of the area due to the lack of accommodations and facilities, as well as the difficult access. Air travel is the only year-round means of access to the area, although private or commercial access of the DEW Line Station's airstrip is rare. During the summer months, marine barges transport cargo to the area.

3.2.5 POW-2 (Oliktok): LRR Retrofit

The POW-2 DEW Line Station is located on Oliktok Point, east of the Colville River and west of Simpson Lagoon along the Beaufort Sea. The DEW Line Station is located on a slight rise within a swampy area that contains small ponds. An ARCO dock and camp occur just north of the POW-2 Station.

The vegetation of the Oliktok Point site is characteristic of wet tundra and coastal wetlands and beaches, primarily sedges, grasses, and mosses. Terrestrial mammals include masked shrew, brown and collared lemmings, short-tailed and least weasels, and Arctic fox. Polar bear may be present in winter, and wolves and grizzly bears are seen occasionally. Caribou of the Central Arctic Herd range throughout the area, and Oliktok Point falls within their principal calving grounds. Marine mammals that occur off Oliktok Point include Beluga, bowhead, and gray whales and ringed and bearded seals.

The Oliktok Point area is considered to be important for seasonal rearing and feeding activities of most Arctic fish species, including Arctic char, Arctic and least cisco, broad and humpback whitefish, and grayling. Small runs of salmon occur in the Colville and Sagavanirktok Rivers, and chinook and sockeye salmon have been reported in Simpson Lagoon. Numerous species of shorebirds, waterfowl, geese, and other birds use the wetlands and aquatic habitats adjacent to Oliktok Point in their annual migration. Principal species include eider ducks, oldsquaw, brant, geese, loons, and numerous shorebirds. Although threatened or endangered species have not been reported in the area, habitat for the mustard Thlaspi articum and the willow Salix ovalifolia var. glacialis may exist there.

The site area lies 30 miles (48 kilometers) northwest of Nuiqsut and is within the village's subsistence use area. Available subsistence resources include sea mammals, caribou, fish, and migratory waterfowl. Four cultural resources sites have been reported in the area, all of which relate to traditional land use; none has been evaluated for listing in the National Register of Historic Places.

Although the ARCO dock and camp support exploration activities in the Kuparuk Oil Field, most drilling near the station has been suspended. Very little recreational activity takes place in the area around POW-2 because of its isolated location. Air taxis and charter service, based primarily in Barrow, are available to the Oliktok Point area. The area contains a shore facility to load gravel and goods on barges in support of offshore oil exploration. While Oliktok Point is connected to the Prudhoe Bay gravel road system and, through it, to the Dalton Highway (North Slope Haul Road), no all-season road connects it to the village of Nuiqsut, although winter ice roads are occasionally developed.

3.2.6 POW-3 (Bullen Point): SRR

The inactive POW-3 DEW Line Station (decommissioned in 1968) is located on Mikkelsen Bay on the east central shore of the Beaufort Sea. Two shallow lagoons border the site, which contains numerous thaw lakes, polygonal ground, and an upland area of relatively flat tundra mat.

The vegetation of the Bullen Point site consists predominantly of species associated with wet sedge meadow, flooded tundra and associated wetlands, and beaches. Terrestrial mammals include least and short-tailed weasels, red fox and Arctic fox, Arctic ground squirrel, wolverine, wolf, moose, and grizzly bear. Polar bear occur in the vicinity in winter. Summer range for caribou is considered excellent, and Bullen Point lies at the edge of the range of the Canning Delta muskox herd.

Fish include fourhorn sculpin, Arctic cisco, Arctic char, and ninespine stickleback. Numerous species of birds, predominantly waterfowl and shorebirds, are found in the Bullen Point area. Marine mammals reported to pass offshore include Beluga and bowhead whales and ringed and bearded seals. The only threatened or endangered species reported from the area is the Arctic peregrine falcon. A young peregrine falcon, believed to be migrating south after fledging at a nest on the Colville or Sagavanirktok Rivers, was sighted during a late August reconnaissance at Bullen Point in 1981.

A few Inupiat families occupied the POW-3 area between about 1910 and 1925, but no settlements presently exist there. The site lies within the subsistence use areas of Nuiqsut and Kaktovik. Subsistence resources occasionally obtained in the area include seal, caribou, whale, fish, wildfowl, and furbearers. Four cultural resources sites, primarily traditional land use sites, have been reported from the Bullen Point area; none has been evaluated for listing in the National Register of Historic Places.

The POW-3 property has been leased to the North Slope Borough until July, 1987. The Borough has indicated that they would be interested in an extension of the lease. They have undertaken site cleanup and are in the process of

evaluating its potential for future use; however, no recommendations or specific development plans have been prepared. Recreational use of the area is limited due to the lack of accommodations and facilities, as well as access. Air travel is the only year-round means of access to the area. Air taxis and charter service based primarily in Kaktovik and Deadhorse/Prudhoe Bay occasionally use the POW-3 airstrip for sport fishing trips and other purposes. During the peak Arctic char season in July, Audi Air provides nearly daily charter service for four to six sportsfishermen from the Deadhorse/Prudhoe Bay area.

3.2.7 BAR-M (Barter Island): LRR Retrofit at Existing Station

The BAR-M DEW Line Station is located on the northeastern end of Barter Island in the eastern Beaufort Sea. The island is fairly flat and contains only small lakes, a few incised streams, and swampy areas to the south and west of the station. The town of Kaktovik and portions of the DEW Line facilities have experienced flooding from storms.

The vegetation of the BAR-M site consists of species associated with beach and spit, tidal salt marsh, and wet and moist tundra habitats. Terrestrial mammals include collared and brown lemmings, voles, ground squirrels, and Arctic fox. Wolves, brown bear, and polar bear are occasionally seen in the area, but are considered rare there. Caribou from the Central Arctic and Porcupine Herds range seasonally near Barter Island. Three muskox herds utilize riparian habitats south of Barter Island.

Most marine and anadromous fish of the Beaufort Sea are likely to be present seasonally in the lagoons and rivers around Barter Island. The lack of appropriate habitat limits the presence of freshwater fish, although grayling may use nearshore waters during spring runoff. Barter Island is important to migratory birds, with numerous species using the area for breeding, molting, and pre-migratory staging. No threatened or endangered species are known to occur on the island.

Subsistence resources available in the area include fish, migratory waterfowl, and caribou. Polar bear occasionally are shot near the village. When conditions permit, caribou range onto Barter Island and are hunted. Bowhead whales are beached for butchering between the airfield and the station. Six cultural resources sites, including traditional land use and prehistoric sites, are known in the vicinity of BAR-M; none has been evaluated for listing in the National Register of Historic Places.

Located adjacent to the DEW Line Station, the village of Kaktovik was established in 1923 when a fur trading post was built on Barter Island. The town has relocated three times to accommodate construction and expansion of the DEW station. Approximately 90 percent of the 165 residents are Alaska Natives, and most employment is associated with government administration, particularly that of the North Slope Borough. While NSB provides most of the municipal services, solid wastes are hauled to the DEW Line Station's disposal site located west of the facilities.

The area around BAR-M offers more opportunity for recreation than most of the Arctic Coast. While access is limited to commercial and chartered air travel, the station lies near the northern edge of the Arctic National Wildlife Refuge, where camping, hiking, kayaking, cross-country skiing, snowshoeing, and wildlife viewing take place. Air travel provides the only year-round access to the station area. Because Kaktovik has no public airstrip, civilian air traffic uses the airstrip at the BAR-M Station. Barges deliver goods to the area during the summer months.

4.0 ENVIRONMENTAL EFFECTS AND MITIGATION

The potential effects of construction and operation of the proposed NWS project on the existing environment are addressed in this section. The significance of these effects has been assessed according to the guidance provided in AFR 19-2 ("Environmental Impact Analysis Process", 10 August 1982). Where effects were judged to be potentially significant, mitigation measures to alleviate or eliminate such effects are described.

Section 4.1 discusses effects and mitigation measures associated with each major project activity. Section 4.2 summarizes unavoidable adverse effects, Section 4.3 addresses irreversible and irretrievable commitments of resources, and Section 4.4 describes the relationship between local, short-term effects and long-term environmental productivity.

4.1 EFFECTS AND MITIGATION

The following sections address environmental effects and mitigation during land acquisition, construction, operation, and decommissioning phases of the NWS project. Only those effects considered potentially significant are discussed.

4.1.1 Land Acquisition

All active DEW Line Stations and the inactive POW-3 site are under the control of the U.S. Air Force. Thus, no additional land will be acquired.

In anticipation of the need for an oil field service base at Bullen Point, the North Slope Borough (NSB) executed a five-year lease on POW-3 in 1982. Expected oil development did not materialize, and NSB improvements to the site have been limited to a cleanup of hazardous materials and solid waste. NSB has no specific plans to develop the site prior to expiration of the lease in 1987, although they are presently evaluating long-term options. If future oil discoveries require a service base in the POW-3 vicinity, a portion of the existing site may be available for lease to NSB or other public or private interests for such purposes. If this land was not available, another coastal site in the vicinity would probably be developed.

4.1.2 Construction

NWS construction activities will include site surveys, mobilization of construction camps and support facilities, site preparation, facility installation, and demolition of unneeded structures. The potential effects of such activities are described below.

4.1.2.1 Geological Conditions

At the active DEW Line Stations, no significant change in topography or geological conditions will occur as a result of LRR or SRR construction. SRR development at POW-3 may require some reworking of the gravel already available on site. The only other minor land modification will be reconstruction or new construction of berms around fuel tanks.

No adverse effects on the NWS facilities due to seismic conditions or geohazards are expected at any of the LRR or SRR Sites. Using standard Arctic and seismic design and construction practices, potential effects can be mitigated. Examples of such mitigation measures include the following: laying gravel work pads and placing structures on thermal piles to minimize settling due to thawing of permafrost; designing foundations and station components to withstand shaking from possible earthquakes; leaving buffer zones between the facilities and beach bluff to allow natural coastal erosion to occur; locating facilities above expected flood elevations and ice flows; and using relief valves and gas ventilation equipment during drilling and pile driving to mitigate any hazards associated with striking gas pockets.

4.1.2.2 Hydrology and Water Quality

At active DEW Line Stations, water required for NWS construction would be drawn from existing sources, all of which are capable of supplying the increased demand. At POW-3, water would likely be pumped from lakes or streams in the site vicinity, possibly the stream to the southwest of the site, which was dammed when the DEW Line Station was operating. The daily water consumption rate during SRR construction will be 1,750 gallons (6,624 liters), which is very small relative to the 42 million gallons (159 million liters) of water used each day by the oil industry on the North Slope (NSB, 1983). Water withdrawal during SRR construction is not expected to stress any water supplies or cause other environmental problems.

At the LRR sites, existing structural steel will be sandblasted in preparation for painting. Uncontrolled disposal of sand and the removed lead paint could contaminate water or land in the vicinity; however, all feasible means of capturing this material -- such as curtains and vacuum equipment -- will be used, and the captured waste will be packaged, labeled, and shipped to Elmendorf Air Force Base for disposal according to the applicable requirements.

At POW-3, site preparation activities are expected to occur on the existing gravel pad. Any site preparation activity beyond the gravel pad would possibly result in the transport of fine-grained materials to water bodies in the area. However, only minor increases in turbidity would result since the maximum area of disturbance is small (approximately 0.6 acre [0.2 hectares]). Where appropriate, standard construction methods will be used to mitigate effects of turbidity. Examples of such methods include the placement of polyethylene sheets on disturbed soil and the construction of small berms to prevent runoff from leaving the construction site. As a result, construction will not result in a significant adverse impact on water quality.

4.1.2.3 Air Quality

During construction in the summer, fugitive dust will be released from the construction sites due primarily to the operation of vehicles and heavy equipment. Emissions of fugitive dust can contribute to an increase in the level of total suspended particulate matter (TSP), a pollutant regulated by both the Environmental Protection Agency and the State of Alaska. Based on a worst-case emissions inventory for NWS construction activities, the total dust emissions at each site are estimated to be 280 pounds (127 kilograms) per day during the peak construction period.

Impacts were analyzed using an air quality model designed for fugitive dust impact analysis. Meteorological conditions were addressed by assuming a worst case scenario of 6 hours of persistent stable winds with a speed of 8.2 feet (2.5 meters) per second. A plot of the downwind concentration as a function of distance from the construction site is shown on Figure 4-1. As the figure shows, concentrations may exceed the 24-hour TSP secondary standard (150 mg/m^3) at distances of 1,640 feet (500 meters) from the construction site. At a distance of about 2,460 feet (750 meters) the concentration is approximately one-half the standard. The concentrations fall to very low levels at distances of a few kilometers. Since fugitive dust tends to be composed of large particles (over 75 percent of the total emissions are particles larger than 10 micrometers), it poses little threat to human health and produces no visibility degradation. Thus, the fugitive dust impact during construction can be characterized as nothing more than a localized annoyance. As necessary, the release of fugitive dust can be reduced by about 50 percent by applying water to the dust source.

4.1.2.4 Noise

The primary sources of noise during construction will be the operation of transportation and construction equipment. At active DEW Line Stations, aircraft movements will increase during the construction period, but noise patterns are not expected to differ significantly from present conditions. Noise increases associated with facility erection and demolition will be temporary and will not be significant beyond the DEW Line Station boundaries. At POW-3, the increase in noise will be considerable, but it will be localized, short in duration, and occur in areas generally uninhabited by humans. The effects of this temporary increase in noise will be limited to a minor influence on wildlife behavior.

4.1.2.5 Vegetation

Because the NWS facilities will be constructed on existing gravel pads, no disturbance of tundra vegetation is expected at any of the active DEW Line sites, although reworking of the gravel pad at POW-3 may result in a minor loss of vegetation.

4.1.2.6. Fish and Wildlife

Construction activities at all NWS sites will result in increased sound levels and human activity which could affect wildlife behavior in the immediate site vicinity or along transportation routes. Wildlife resources of potential concern include: waterfowl molting and premigratory staging near POW-M (e.g., Elson Lagoon); the Teshekpuk Caribou Herd and the Teshekpuk Lake waterfowl habitat, located about 15 miles (24 kilometers) from POW-1; and calving grounds of the Central Arctic Caribou Herd and the abundant waterfowl and shorebird habitat at Oliktok Point, located about 1 mile (1.6 kilometers) from POW-2.

No adverse effects are expected to result from construction at the active DEW Line Stations, because aircraft movements, noise and general human activity are common characteristics to which local wildlife populations are presently accustomed. Although physical structures and human activity also occur at POW-3, the increase in noise and activity during construction will be

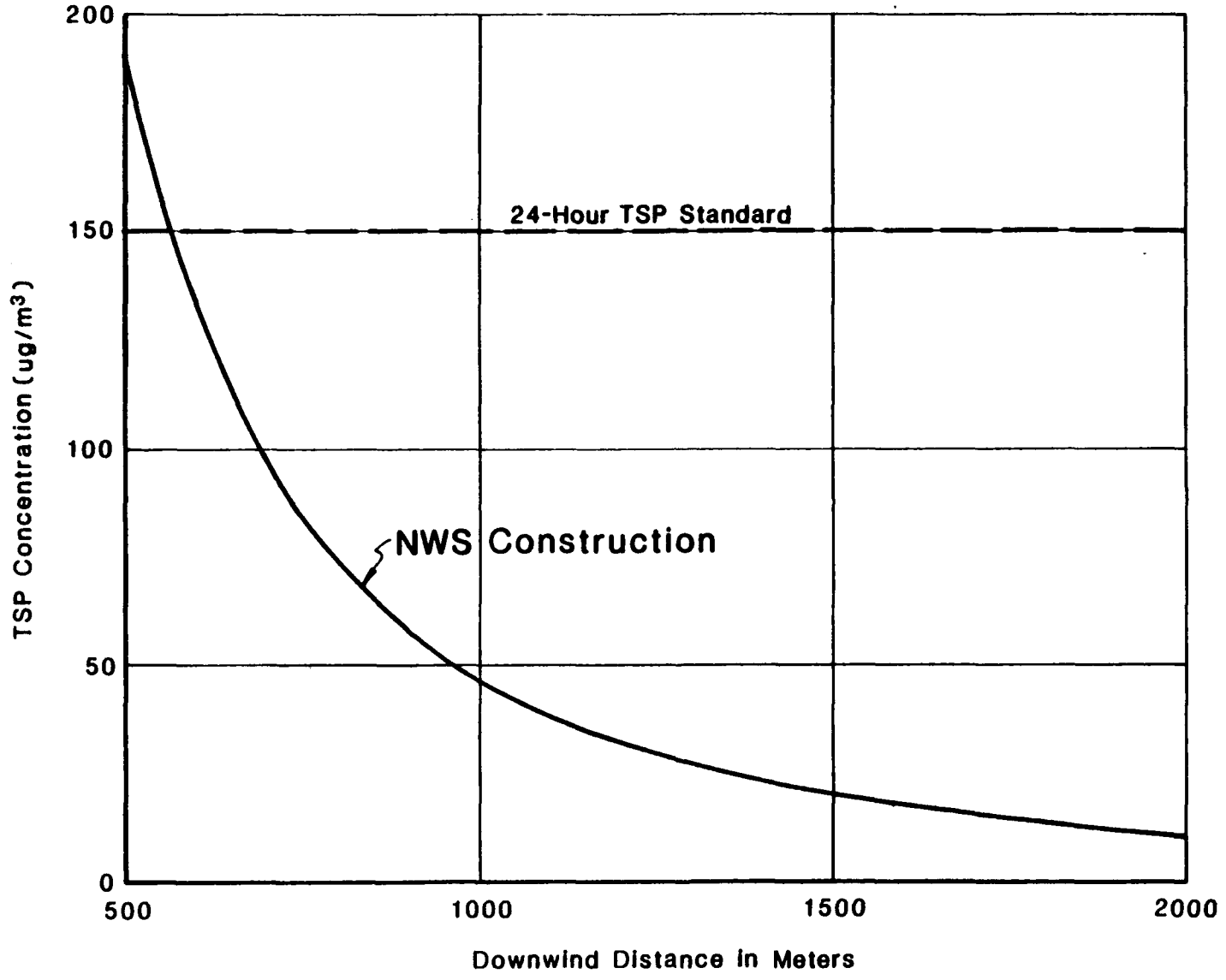


Figure 4-1. Worst-Case 24-Hour Concentration of Total Suspended Particulates (TSP)

pronounced; wildlife which presently approaches this site will tend to avoid it during construction. Even at this location, however, any disturbance of wildlife populations will be local and short-term. To minimize the potential for adverse impacts on wildlife, the Air Force will require contractor personnel to remain in construction camps and, as necessary, will schedule mobilization and demobilization activities to avoid sensitive time periods for important species.

Water will be required during the summer construction season. Given the low rate of demand (0.020 gallons [0.076 liters] per second), there will be little, if any, impact upon aquatic habitats. Existing water supply systems will continue to be used at the active DEW Line Stations. While adverse impacts are considered highly unlikely at POW-3, withdrawals will be made in consideration of the volume or discharge of the source and its importance to aquatic species. Primary consideration will be given to maintaining the integrity of the source during the period of withdrawal. These issues will be addressed by public resource agencies (e.g. Alaska Department of Fish and Game) during the permitting process for water withdrawal rights.

Except for the sighting of a single Arctic peregrine falcon at POW-3, no threatened or endangered species are known to occur in the immediate vicinity of any of the NWS sites. Peregrines may avoid the NWS site areas during construction and, less likely, during operations; however, project activities would not limit access to habitats important for their growth or survival. Thus, no adverse effects on this biological resource are expected.

4.1.2.7 Land Use

Existing land use patterns will not be affected significantly at any of the proposed or alternate NWS sites. The active DEW Line Stations have been dedicated to radar surveillance operations for approximately 30 years, and the inactive POW-3 site contains most of the original DEW Line structures and has not been converted to other uses.

During construction of the SRR facility at POW-3, public access to the site may be limited. If the peak construction period overlaps with the Arctic char fishing season, the number of chartered fishing trips to POW-3 could be substantially lower than current rates. However, any loss of recreational opportunities or revenues are expected to be temporary and minor.

Installation of LRR equipment at four active DEW Line Stations will not alter their visual appearance. The SRR facility at LIZ-3, POW-1, and POW-3 will be much more compact and possibly taller than the existing DEW Line facilities. Otherwise, their visual appearance will remain unchanged--namely, a prominent and unique cluster of man-made structures located in the midst of a flat and harsh Arctic coastal environment.

4.1.2.8 Cultural Resources

Almost all NWS construction activities will occur on existing gravel pads. However, any previously unsurveyed and undisturbed ground surfaces that could be affected by site preparation or demolition activities will be surveyed prior to construction for the presence of archeological and historical resources. If any sites are determined significant, mitigation plans--which

could entail avoidance or scientific investigation--will be developed in conjunction with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP). Plans will also be developed for protecting any unknown sites encountered during construction and for alerting construction personnel to policies and regulations prohibiting collection or disturbance of cultural resources on state and federal lands.

Development of the NWS at active or inactive DEW Line Stations could affect the configuration or status of those facilities. DEW Line facilities may qualify for listing in the National Register of Historic Places because of their association with Cold War defensive systems. Consequently, the Air Force, in consultation with the Alaska SHPO, will determine the National Register eligibility of DEW Line facilities prior to any actions which would materially alter these facilities. If determined eligible, appropriate mitigative measures will be developed in consultation with the SHPO and the ACHP.

4.1.2.9 Subsistence

In accordance with Section 810 of the Alaska National Interest Lands Conservation Act of 1980 (Public Law 96-487), a subsistence evaluation of the NWS project was conducted. The evaluation found that no significant restriction of subsistence use is reasonably foreseeable from the construction or operation of NWS facilities at any of the sites. While subsistence use has been restricted in the vicinity of the active DEW Line Stations, use of a variety of subsistence resources occurs near the inactive POW-3 Station. Because the construction site will be small and construction activities will take place over a short time, impacts to subsistence resources and users are expected to be minimal.

4.1.2.10 Socioeconomics

The impact of NWS construction on regional employment will depend in part on the hiring practices of the contractor and subcontractors, all of which have not yet been selected. Although experienced Native and non-Native construction workers are available on the North Slope, the construction work will require some specialized skills, which are only available outside the region. Nevertheless, it is reasonable to expect that portions of the NWS construction work will be contracted to local firms and that local transportation and supply services will be utilized. Although the magnitude of this effect cannot be determined at this time, construction of the NWS project is expected to directly and indirectly benefit the local economy.

4.1.3 Operation

During NWS operations, the following activities could potentially result in environmental impacts: radiation of electromagnetic energy from radar and communications equipment; operation of diesel generators; waste management; employment; resource consumption; and emergencies related to spills or vandalism. These impacts and the proposed mitigation measures are described below.

4.1.3.1 Radiofrequency Radiation

Radiofrequency radiation (RFR) is generally identified as nonionizing electromagnetic energy in the frequency range from 10 kilohertz (kHz) to 300,000 megahertz (MHz). Systems and devices that emit such radiation include a vast assortment of radar and communications systems, microwave ovens, radio and television broadcast transmitters, and medical devices for diagnostic and therapeutic purposes.

A detailed assessment of potential RFR effects from NWS operations is presented in Appendix E. The following summarizes those findings in the areas of electromagnetic hazards, electromagnetic interference, and biological effects.

4.1.3.1.1 Electromagnetic Hazards. Facilities which emit RFR could potentially interfere with cardiac pacemakers, trigger electro-explosive devices (EEDs) or create hazardous fuel handling situations. However, as summarized below, no such hazards are expected as a result of NWS operations.

NWS power densities could exceed recommended safe levels for cardiac pacemakers within 9 feet (3 meters) in front of an LRR and 3 feet (1 meter) in front of an SRR.

EED's are devices used to activate explosive charges, to ignite propellant systems, and to trigger electroexplosive switches. It is expected that EED's will not occur within safe separation distances from the NWS radar systems, as determined from AFR 127-100 ("Explosive Safety Standards", 20 May 1983). Military aircraft equipped with EED's would normally not approach closer than these distances to the NWS facilities. The general public will be prevented from approaching LRR Stations by security personnel. At the unattended SRR Station, warning signs will be posted around the site to alert the public to potential EED hazards.

Predicted worst case RFR power densities from the NWS facilities are greater than 100 times lower than the Air Force standard for fuel handling operations. Thus, NWS operations are not expected to create hazardous fuel handling situations.

4.1.3.1.2 Electromagnetic Interference. Electromagnetic interference (EMI) refers to the potential interference with other users of the same portion of the electromagnetic spectrum, particularly telecommunication and air navigation systems. EMI effects of the NWS radar and communication antennas are expected to be insignificant because of the low peak power outputs. The National Telecommunications and Information Administration will consider EMI effects when reviewing NWS project specifications prior to operation. In the event that EMI is reported after NWS operations have begun, the Air Force will consult with the Federal Communications Commission to develop means to mitigate such effects in accordance with AFR 100-6 ("Electromagnetic Interference and Radiation Hazards", 14 May 1976).

As noted in Section 4.1.1, operation of an SRR Station at Ignek could interfere with Exxon's microwave communications facility and could result in significant effects in terms of costs and service interruptions.

4.1.3.1.3 Biological Effects. RFR-induced biological effects are related to the absorption of energy in the tissues of biological systems. RFR energy absorption is conditional upon the wavelength and frequency of incident radiation, the characteristics of the absorber, and its orientation with respect to the electrical field component of the RFR wave (Elder, 1984; Weil and Rabinowitz, 1984). Literature reviews and evaluations of the biological effects of RFR have been reported by a number of highly qualified interdisciplinary scientific groups and organizations, including the American National Standards Institute (ANSI, 1982), the U.S. Air force (Heynick and Polson, 1983), the Environmental Protection Agency (Elder, 1984), and the National Council on Radiation Protection and Measurements (NCRP, 1986).

Air Force Occupational Safety and Health (AFOSH) standard 161-9 ("Exposure to Radiofrequency Radiation", 12 October 1984) defines policies and procedures for protecting Air Force and contractor personnel from RFR hazards. It also establishes permissible exposure limits (PEL's) for both workers and the general public. Based on the frequency of the RFR source, these PEL's range from 1.0 to 36 microwatts per square centimeter (mW/cm^2).

The potential biological effects of RFR from NWS operations were assessed by comparing the predicted worst case RFR power densities from LRR and SRR Stations (see Figures 2-11 and 2-12) with the applicable exposure limits. At ground level, LRR power densities will not exceed 1.0 mW/cm^2 (the lowest PEL and the minimum ANSI guideline) beyond a distance of 28 feet (8.5 meters) from the source. For an SRR Station, this distance was found to be 8 feet (2.4 meters).

At POW-M, the nearest public use areas are the NARL facility and a coastal road, both located about 3,500 feet (1,067 meters) from the LRR radome. At this distance, RFR power densities will range from 0.001 to 0.01 mW/cm^2, which are two to three orders of magnitude below the PELs. At LIZ-2 and BAR-M, public access roads occur within approximately 100 to 200 feet (30 to 60 meters) from the LRR radome sites. At this distance, RFR power densities will range from 0.01 to 0.1 mW/cm^2, which are also well below the lowest PELs. At all other sites, RFR power densities at locations accessible to the general public will be at least an order of magnitude below the lowest exposure limit. Consequently, no adverse health effects associated with RFR from NWS operations are anticipated.

Birds in flight may enter regions where they would be exposed to RFR. Because maximum absorption will occur only when a bird passes through the ground-based UHF and VHF communications beams, the duration of exposure will be short and effects on these animals will be of no consequence. Existing military and civilian radar systems have been operating continuously for many years without causing any evident ecological damage. Thus, no adverse effects of RFR on airborne organisms are expected to result from NWS operations.

4.1.3.2 Air Quality

The only stationary source of emissions during NWS operations will be the diesel generators located at the LRR and SRR Stations. Worst-case estimates of the air emissions from these generators are presented in Table 4-1.

TABLE 4-1
AIR POLLUTANT EMISSIONS FROM DIESEL
GENERATORS DURING NWS OPERATIONS

Pollutant	Emission Rate (lb/hr) LRR	SRR (Unattended)	SRR (Attended)
Carbon Monoxide	3.1	0.18	0.36
Hydrocarbons	1.2	0.07	0.13
Nitrogen Oxide	14.5	0.82	1.66
Sulfur Oxide	1.0	0.05	0.11
Particulate Matter	1.0	0.06	0.12

The air quality impact of these emissions was evaluated using the Industrial Source Complex (ISC) model. A stack height of 25 feet (7.6 meters) and a stack diameter of 6 inches (15.2 centimeters) were assumed for the LRR, while a stack height of 10 feet (3.0 meters) and a stack diameter of 2 inches (5.1 centimeters) were used for the SRR calculations. An exit temperature of 355 degrees F (179 degrees C) and an exit velocity of 51.8 feet (15.8 meters) per second were used for both the LRR and SRR. The SRR generators will operate in two modes: unattended (normal mode) and attended (during maintenance visits). A total of 18 separate meteorological scenarios were analyzed, and concentrations were calculated at 20 downwind distances in increments of 164 feet (50 meters).

The peak calculated air quality concentrations are compared with the Alaska Ambient Air Quality Standards and the allowable PSD increments in Table 4-2. This type of comparison generally entails the addition of a background concentration representative of current conditions. Although background concentrations are unknown, the absence of other emissions sources at the NWS locations supports the conclusion that such concentrations are quite low. Even when assumed worst-case background concentrations are added to the predicted NWS emissions, the totals are well below applicable standards.

4.1.3.3 Noise

Except at POW-3, noise generated during NWS operations will not differ significantly from present noise levels at the active DEW Line Stations. The sound from the LRR Station generators, which may be audible at distances up to about 328 feet (100 meters) from the generators, is not expected to exceed 65 decibels.

At POW-3, the diesel generators will introduce an additional source of sound to a generally quiet environment. The sound level contribution of an SRR Station will be lower than that of an LRR Station and is not expected to be noticeable beyond the site boundaries. During maintenance visits every

TABLE 4-2
COMPARISON OF LRR AND SRR POLLUTANT
CONCENTRATIONS WITH AIR QUALITY STANDARDS

Pollutant	Averaging Period	Pollutant Concentration (ug/m^3) LRR Worst Case	SRR Worst Case	Alaska Standard	PSD Increment
Carbon Monoxide	1-hour	167.0	254.0	40,000	--
	8-hour	126.0	190.8	10,000	--
Nitrogen Dioxide	Annual	78.3	57.5	100	--
Sulfur	3-hour	54.0	77.7	1,300	512
	24-hour	13.5	19.4	365	91
	Annual	5.4	3.8	80	20
Total Suspended Particulate	24-hour	13.5	21.2	150	37
	Annual	5.4	4.2	60	19

4 to 6 months, helicopter noise will be audible to those in the general vicinity of the site. In summary, sound level increases during operation will be minor and will not significantly impact any noise-sensitive receptors in the vicinity.

4.1.3.4 Biological Environment

As discussed in Section 4.1.3.1.3, RFR generated by operation of the radar and communications equipment is not expected to result in any adverse effects on wildlife. Because operation of the LRR Stations will be similar to current DEW Line operations at LIZ-2, POW-M, POW-2 and BAR-M, there will be no additional impacts on biota at or near these sites.

Operation of the SRR Station at POW-3 may result in minor increases in sound levels; however, the increases are not expected to be detectable beyond the site boundaries and no significant impact on wildlife will result. The use of helicopters to transport a maintenance crew to the site every 3 months will temporarily increase sound levels and could alter the behavioral pattern of nearby wildlife. However, the effect will be minor, localized, and short term. Although a minor increase in air emissions will occur at these sites (see Section 4.1.3.2), even under worst-case conditions there will be no significant adverse effect on vegetation or wildlife near the site.

At LIZ-3 and POW-1, the operation of an unattended SRR Station will generate less noise and human activity than presently occurs at the attended DEW Line Station. Over time, plants and wildlife may tend to recolonize presently disturbed areas in the immediate DEW Line Station vicinity. Because of the long time required for Arctic tundra ecosystem to become restored, however, the benefits of this change may not be realized for many years.

4.1.3.5 Subsistence

As noted in Section 4.1.2.9, construction of the NWS will not adversely affect subsistence activities that presently occur in the site vicinities. The reduction in personnel at LRR sites (see below) and the operation of unattended SRR Stations at LIZ-3 and POW-1 will reduce the level of human activity and increase wildlife use of these sites; these effects may benefit subsistence activities, although the overall effect is not expected to be significant. Operation of an SRR Station at POW-3 could displace some subsistence activities but is not likely to have a significant effect on overall subsistence patterns.

4.1.3.6 Sociocultural Environment

At LIZ-2 and BAR-M, certain DEW Line facilities are shared with the adjacent Native villages of Point Lay and Kaktovik, respectively. Each village uses the DEW Line airstrip and has come to depend upon air service to transport people and material goods. Each village also shares portions of the DEW Line water supply and solid waste disposal system. These facilities will continue to be available for village use, under the terms and conditions of shared-use agreements, after the NWS is in operation.

As DEW Line Stations are converted for NWS operations, the number of permanent operations personnel will decline substantially. As shown in Table 4-3, this reduction in personnel will range from approximately 60 to 70 percent. Because there are no significant social or economic ties between DEW Line personnel and local native villages, this reduction will not cause significant socioeconomic effects. At present, three local residents are employed part-time or full-time at DEW Line Stations; this magnitude of local employment is expected to continue with the NWS in operation. The Canadian request for proposals to operate and maintain the facilities will recommend that contractors include plans to employ local residents.

No adverse effects on cultural resources, aesthetics, recreation or transportation are expected during NWS operations. The POW-3 Dew Line airstrip will continue to be available for charter fishing trips and other occasional public uses.

4.1.3.7 Resource Consumption

Water requirements during NWS operations will decrease in proportion to the reduction in personnel (Table 4-3). At SRR Stations, water will be required only during maintenance visits and will be transported with the maintenance crews. At LRR Stations, the existing DEW Line water supply and distribution systems will continue to be used.

TABLE 4-3

CHANGE IN ON-SITE OPERATIONS PERSONNEL

Site	DEW Line Personnel	NWS Personnel	Percent Reduction
LIZ-2	17	8-12	30-53
LIZ-3	17	0	100
POW-M	19	8-12	37-58
POW-1	17	0	100
POW-2	17	8-12	30-53
POW-3/Ignek	0	0	--
BAR-M	28	8-12	57-71
TOTAL	115	32-48	58-72

The projected changes in fuel consumption are shown in Table 4-4. Diesel fuel requirements will decline substantially, from approximately 75,000 gallons per month for DEW Line operations to approximately 27,000 gallons per month for NWS operations. This 63 percent reduction represents a beneficial impact on other users of this resource.

4.1.3.8 Waste Management

Wastes generated at the LRR Stations will continue to be handled according to present DEW Line practices. The types of wastes will be the same as those currently generated (see Section 2.1.6.1); because of the decrease in the number of operating personnel, however, the waste quantities will be lower. Thus, no significant adverse effects associated with waste management at the LRR Stations are expected.

At the SRR Stations, small quantities of sanitary waste will be generated during maintenance visits. These wastes will be removed from chemical toilets at the stations, returned to the maintenance crew's base, and disposed of in an approved manner. Other wastes, such as worn equipment or packing materials, will also be returned to the base and disposed of in accordance with existing procedures and regulations. As a result, no adverse effects are expected from waste generation at the SRR Stations.

4.1.3.9 Security

The routine security measures presently in use at LIZ-2, POW-M, POW-2, and BAR-M will be continued, and no problems in detecting or responding to NWS security breaches are anticipated.

TABLE 4-4
FUEL CONSUMPTION RATES

Type of Proposed Facility	Site	Diesel (Gal/month) DEW (a)	Diesel (Gal/month) NWS (b)	Mogas (Gal/month) DEW (a)	Mogas (Gal/month) NWS (b)
LRR Station	LIZ-2	10,000	4,800	200	140
	POW-M	5,800	9,400	400	580
	POW-2	10,200	4,800	400	280
	BAR-M	30,000	4,800	600	360
SRR Station	LIZ-3	9,090	1,200	157	0
	POW-1	9,500	1,200	290	0
	POW-3 or Ignek	0	1,200	0	0
TOTAL		74,590	27,400	2,047	1,360

(a) Existing DEW Line fuel consumption rates are average for the period October 1, 1983 - September 30, 1984.

(b) NWS fuel consumption estimates may be revised as additional test results are obtained.

Special security measures have been included in the design of the unattended SRR Stations to prevent, detect, and respond to potential unauthorized intrusion or vandalism. A 6-foot (1.8-meter) high fence with posted warning signs will surround the facility, remote alarms will be installed on all doors, and constant surveillance via interior and exterior closed circuit television cameras will alert crews at the CMF at Elmendorf Air Force Base of the presence of unauthorized persons. If security or operational problems are identified, malfunctions will be corrected remotely from the CMF or an emergency response crew will be dispatched immediately from the FSP to the site. These measures are expected to prevent or limit adverse impacts associated with any breach in security.

4.1.3.10 Spill Prevention and Control

At the LRR Stations at LIZ-2, POW-M, POW-2 and BAR-M, fuel spills from storage and distribution systems will be prevented, contained, or cleaned up according to existing DEW Line procedures. For the SRR Stations, a Spill Prevention Control and Countermeasure (SPCC) Plan will be prepared and implemented within 12 months of SRR Station operations (see Section 2.1.6.2). The fuel tanks will be contained within a bermed area lined with an impermeable synthetic liner and designed to hold 110 percent of the total tank storage volume. If a tank spill were to occur, it would be detected by the maintenance crew or via remote electronic monitoring of fuel levels. Also, a monitoring and alarm system will be installed to shut down the fuel pump should a leak occur in the above-ground fuel line from the storage tank. The maintenance crew or emergency response crew would follow cleanup procedures specified in the SPCC Plan, including the repair or replacement of the faulty system. Because any spilled fuel would be contained and cleaned up, no significant adverse effects on the environment are expected due to the storage and use of diesel fuel in remote areas.

4.1.4 Decommissioning

At some time in the future, it is expected that the NWS facilities will become obsolete. At that time, the Air Force will decommission the facilities and dispose of any unneeded land.

The land disposal process itself will not have any adverse environmental effects, although beneficial effects could occur if this land were acquired for other uses. If the land and facilities were converted to some other use, the variety of effects that could occur would be addressed in a separate environmental review process and are considered beyond the scope of this Environmental Assessment. If facilities are demolished and removed from a site, there would be a temporary and localized increase in personnel, equipment use, and general human activity at the site. Because these activities would be short-term in nature, would not stress natural resource supplies, and would not conflict with existing uses of the site, they are not expected to cause significant effects.

If Point Lay and Kaktovik continue to rely on the military airstrip and other NWS services for municipal purposes, decommissioning of the NWS facilities could result in the loss of these services. If the Air Force and Village leaders develop contingency plans in advance of decommissioning, then adverse

effects would be minimized and plans could be developed for native or other organizations to acquire or operate the essential facilities.

It is expected that any required site cleanup actions will be conducted prior to or concurrent with site decommissioning. Consequently, the only potential hazardous waste problem during decommissioning would be associated with the identification, transport, and disposal of chemical wastes (such as solvents, thinners, and fuels) or operating equipment containing toxic substances. Because these materials would be handled in accordance with appropriate regulations in place at the time of decommissioning, no significant adverse effects associated with removal of contaminated material are expected.

If the gravel pad and roads remain in place but are not maintained, they would deteriorate. Eventually, they would be incised by gullies, and fine-grained material could be washed into adjacent water bodies causing slight and temporary increases in turbidity. The pads and roadways would also develop depressions that would contain meltwater during the thawing season. However, none of these conditions are expected to result in significant adverse impacts to the local physical, biological or sociocultural environments.

4.2 UNAVOIDABLE ADVERSE EFFECTS

Adverse effects which cannot be avoided are summarized below according to land acquisition, construction, operation and decommissioning phases of the NWS project.

Land Acquisition

- At POW-3, possible restriction on future North Slope Borough development plans.

Construction

- Increased air traffic, equipment use, dust, noise, turbidity and general human activity in the vicinity of each site during the construction period.
- Increased use of fuel, water, and other resources.
- Some disturbance of wildlife in the vicinity of each site, especially at POW-3 where human activity is presently low.
- Slight displacement of some subsistence activities at POW-3.
- Possible loss of approximately 0.6 acre (0.2 hectare) of tundra habitat at POW-3.
- Possible disruption of sportfishing charter trips to POW-3 during the peak construction period.

Operation

- Continued emissions of radiofrequency radiation, air pollutants, and noise.

Decommissioning

- o Possible loss of certain military services, including the airstrip, which are presently used by the villages of Point Lay and Kaktovik.
- o Increased air traffic, noise, fuel use, and general human activity during demolition and removal of facilities.
- o Erosion of unmaintained gravel pads and roads.

For the reasons provided in Section 4.1, these adverse effects are not expected to significantly degrade the physical, biological or sociocultural environment, either individually or cumulatively.

4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The commitments of natural resources that will occur over the life of the NWS project are summarized below.

Land: The land currently dedicated to DEW Line operations in Alaska will continue to be used for NWS operations, although unneeded portions of the real property may be declared excess and made available for other uses.

Ecosystems: Small areas of tundra habitat may be lost during site preparation at POW-3, although it is expected that the existing gravel pads will be sufficient for the SRR facilities.

Fuel: Diesel fuel will be required during construction. During operation, approximately 27,000 gallons (102,000 liters) of diesel fuel and 2,000 gallons (7,600 liters) of Mogas will be consumed monthly, approximately 60 percent less than the current fuel use rate at the DEW Line Stations in Alaska.

Water: In comparison to current consumption rates at the DEW Line Stations, water consumption will increase temporarily during NWS construction but will decrease by over 50 percent once the facilities are in operation.

Materials: Steel, concrete, lumber, and other building materials will be committed to the NWS project. Some building materials may be made available for other uses if unneeded DEW Line facilities are dismantled or demolished.

4.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The purpose of this section is to compare adverse and beneficial effects during the short-term (the life of the NWS project) with such effects over the long-term (after the NWS program is completed and facilities have been removed).

Short-term effects have been described in previous sections. In summary, the adverse effects include a temporary increase in air traffic, equipment use, noise, dust, and general human activity, the possible loss of small acreages of tundra habitat, and the possible disruption of an existing communications facility. The major beneficial short-term effect is an improved capability to

provide early warning of atmospheric attack. Other benefits include local economic gains during construction, reduced operational costs, reduced fuel and water consumption, reduced number of operations personnel and overall human activity at all sites, and the possible availability of unneeded DEW Line property and facilities for other uses.

No long-term adverse effects are expected. A long-term benefit may result if land-based radar surveillance systems eventually become obsolete and all DEW Line and NWS property is disposed of and made available to other North Slope users.

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(See also References Cited in Appendices B, D, and E.)

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