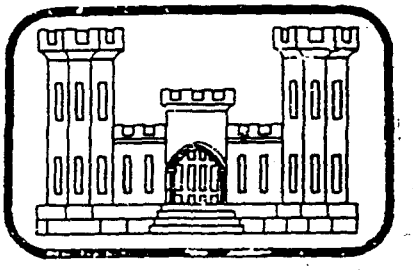
US Army Corps
Of Engineers

Alaska District



Defense Environmental Restoration Account

City of Gambell and Northeast Cape,
St. Lawrence Island, Alaska

Contract No. DACA85-85-C-0036

Volume II

Part VIII
Final
Environmental Assessment

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PREFACE

This document is part of a three volume set developed for the U.S. Army Corps of Engineers, Alaska District, for the implementation of the cleanup of former military sites in the City of Gambell and Northeast Cape, St. Lawrence Island, Alaska. This work is being conducted under the Defense Environmental Restoration Account, as authorized under the Department of Defense Appropriations Act of 1984 (Public Law 98-212). The three volumes, each representing a major task, are organized as follows:

Volume 1

Part I	Land Ownership Report
Part II	Field Inspection Safety Plan
Part III	Debris/Materials Inventory
Part IV	P.O.L. and Hazardous Material Inventory
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Environmental Assessment

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1.0 SUMMARY OF FINDINGS

Through the Defense Environmental Restoration Account (DERA) the U.S. Army Corps of Engineers will clean-up and dispose of debris and buildings left from former military activities at Gambell and Northeast Cape on St. Lawrence Island, Alaska. With implementation of standard mitigation measures, particularly with regards to cultural resources, this project will have no significant short or long-term negative impacts. The project will have several significant short and long-term positive impacts. These impacts include: 1) stimulus of the Island's economy because of local costs (housing, food, other support) incurred by the clean-up contractor; 2) health and safety improvements due to removal of dangerous debris and potentially hazardous materials; and 3) considerable improvement of the aesthetic quality of the Island upon removal of unsightly debris scattered about the landscape and dilapidated buildings and other structures.

2.0 PROJECT DESCRIPTION

The Corps of Engineers is authorized to implement the Department of Defense Environmental Restoration Defense Account, Public Law 98-212, which provides for the clean-up of hazardous substances and wastes and removal of unsafe or unsightly buildings and debris from areas formerly used by the Department of Defense (DOD). Two such areas exist on St. Lawrence Island, Alaska, at Gambell and Northeast Cape. Figure 2-1 shows the locations of St. Lawrence Island, Gambell, Northeast Cape, and the specific locations of the former military areas identified for clean-up and restoration. The former military areas are depicted in more detail in Figures 2-2 and 2-3. Note that the former military site at Northeast Cape is not located directly at Northeast Cape, but approximately 8 miles west.

Through the DERA, the Alaska District of the Corps of Engineers is initiating clean-up activities in these areas. The Existing Conditions at the former DOD sites on St. Lawrence Island, the Purpose and Need for the Proposed Action, and the Project Description are presented below.

2.1 Existing Conditions

2.1.1 General Description

The former military area in Gambell consists of sites within the City of Gambell and a number of selected locations in the surrounding area. The area has been utilized for a variety of activities in the past by the Army, Navy, and Air Force; limited activities occurred during World War II, and the major impacts occurred from Army and Air Force camps operated during the 1950's. The facilities have been abandoned since that time and have subsequently undergone general deterioration under the forces of weather, salvage, and vandalism.

The Northeast Cape project area consists of four main areas which were utilized for military activities as recently as 1972. These areas include the terminal and runway area, housing/operations area, cargo beach, landing strip, and antenna areas. The sites contain a wide range of debris in varying condition.

Plates 1-16 illustrates typical project sites and debris.

2.1.2 Debris Inventory

In general terms, the military debris on St. Lawrence Island includes wood products, metals, concrete, and petroleum products, oils, and lubricants (POL's), asbestos containing materials, chemical wastes, electronics, sanitary wastes, hazardous wastes, and ordnance. During field investigations conducted in July 1985 a detailed debris inventory was conducted. Table 2-1 identifies the debris at the various locations in the Gambell and Northeast Cape project areas. The debris locations are identified on Figures 2-2 and 2-3. Numbers in triangles refer to debris sites discussed in detail in Appendix A. Part III of Volume 1 of this report identifies all debris, waste, and other material found on-site, and describes the type and approximate volume of materials.

Sampling of suspected contaminated materials was also conducted during the field investigations in July 1985. Dielectric oil, water, soil, insulation and river sediment samples were taken at selected locations in the Gambell and Northeast Cape project areas and tested for PCB's, asbestos or diesel oil. The results of the sampling are summarized in Appendix B.

2.2 Purpose and Need for Proposed Action

The purpose of the proposed action is to remove and dispose of abandoned buildings, machinery, and other materials remaining from military use of sites on St. Lawrence Island. The abandoned buildings and debris located at the Gambell and Northeast Cape sites present an environmental, safety, and possibly a public health hazard to the residents of St. Lawrence Island. Since the two sites were formerly used by the Department of Defense (DOD), and the debris resulted from DOD use of the sites, it is DOD's responsibility to clean-up and restore the sites, to the extent practical, to their former condition.

2.3 Project Description

2.3.1 Proposed Action

The proposed action involves the clean-up and disposal of the buildings and debris at the former military sites at Gambell and Northeast Cape, St. Lawrence Island, Alaska. The specific project locations are identified in Section 2.3.2, below. Alternative clean-up and disposal methods are described in Section 3.1.2. This action does not include the disposal and removal of ordnance from the sites. Ordnance removal is the responsibility of a specialized military Explosives and Ordnance Disposal (EOD) team.

2.3.2 Geographic Location

The former military sites identified for restoration are located at Gambell and Northeast Cape, St. Lawrence Island, Alaska. St. Lawrence Island is located in the Bering Sea, 130 miles west of mainland Alaska, just south of Bering Strait and southwest of the Seward Peninsula, approximately within the quadrangle enclosed by latitudes 63° and 64°N and longitudes 169° and 172°W. The Island is approximately 100 miles long and averages about 20 miles in width.

Gambell, one of the two communities on the Island, is located on a gravel spit on Northwest Cape. It is approximately 200 miles southwest of Nome, and 40 miles east of the Chukotsk Peninsula, Siberia. Northeast Cape is located at the opposite end of the Island, approximately 100 miles east of Gambell.

3.0 ALTERNATIVES

This Environmental Assessment considers three alternatives for the former military sites on St. Lawrence Island: (1) No Action, (2) Clean-up and Disposal of Debris, and (3) Partial Clean-up and Disposal of Debris. These alternatives, along with various clean-up and disposal options are described in Section 3.1. Section 3.2 summarizes and compares the environmental consequences of the three alternatives.

3.1 Description of Alternatives

3.1.1 Alternative 1: No Action Alternative

Under the No Action Alternative, the former military sites on St. Lawrence Island would remain as they are, and no clean-up, disposal, and restoration activities would occur. Existing environmental, safety, and public health hazards would remain.

3.1.2 Alternative 2: Clean-up and Disposal of Debris

This alternative involves the clean-up and disposal of military debris at the Gambell and Northeast Cape project areas. Clean-up and disposal options are identified below. This alternative would restore the sites to their condition prior to DOD use.

Partial clean-up and disposal of debris involves removing selected debris, and leaving some debris undisturbed. The emphasis would be on removal of safety hazards, possible pollutants and unsightly, scattered debris. Materials will be left undisturbed as designated by Gambell and Savoonga natives. The type of debris that would not be removed includes materials that would create more physical and biological impacts through their disturbance than by leaving them undisturbed. For example, removal of buried cable would affect delicate tundra vegetation and destroy habitat; leaving it undisturbed would not cause any adverse impacts.

3.1.2.1 Clean-up Methods

3.1.2.1.1 Gambell Project Area

Inert military debris scattered on the surface of the ground about the Gambell townsite, around the airstrip and along the beach, and in the area around Troutman and Nayvaghaq Lakes will be picked-up and removed to a solid waste landfill site south of Troutman Lake. The precise location of this landfill will be subject to approval by the City of Gambell, the two native corporations, and the Alaska Department of Environmental Conservation (DEC). Soil borings have been taken and, when available, results will be used to define suitable landfill locations based on soils and groundwater depth. Of particular importance will be the location of this landfill to avoid any effect upon the winter watering area south of Troutman Lake. In addition, surface and groundwater samples have been taken and analyzed for compliance with EPA drinking water standards. The results will indicate any contamination. If the waters are contaminated, appropriate mitigation measures will be implemented based on EPA & DEC criteria. In areas of the townsite where it is suspected that military debris is buried, the soil will be excavated to a depth of six feet and any garbage/debris found will be removed to the landfill south of Troutman Lake.

Inert debris (primarily 55 gallon POL drums and wire and cable) on the tundra east of Troutman Lake and north to the bluffs overlooking Gambell and the Bering Sea will also be removed to the solid waste landfill south of Troutman Lake. This material will be transported by low surface pressure vehicles to minimize tundra damage. Communication wire and cable will be cut and removed where it surfaces above ground, along with spools and connectors.

Communication wire and cable running from the Gambell townsite upslope to the mountaintop will be hand removed by a small crew. On the mountain top, where the Army and Air Force had small communication and radar installations, the small quantities of miscellaneous metal debris will be hauled to the landfill with a low surface pressure vehicle. Combustible debris may be burned on-site to consolidate landfill requirements.

All hazardous (and non-hazardous) materials will be handled and disposed of according to State and Federal regulations. This also includes POL's (petroleum, oil and lubricants) and hazardous materials. Workers in proximity to hazardous or toxic materials will comply with OSHA regulations.

Debris in and along the shoreline of Troutman and Nayvaghaq Lakes will be removed by hand whenever possible to minimize lake, soil, and vegetation disturbance.

3.1.2.1.2 Northeast Cape Project Area

All inert military debris will be removed using heavy equipment on the gravel pads and low surface pressure vehicles on the tundra. Heavy equipment will be necessary to demolish the large structures. Hand labor will be used extensively to pick-up scattered debris, 55 gallon barrels, and to cut down transmission line poles. Again, all clean-up and disposal will comply with applicable State and Federal regulations. Generally, debris in the cargo beach area will be loaded onto trucks and hauled to the abandoned landfill site on the cargo beach road. Exposed debris in the vicinity of this landfill will be consolidated and disposed in the cargo beach road landfill. Debris from the other areas will be moved to a landfill at the Housing and Operations Area or the gravel borrow area immediately to the south. Structures in the Housing and Operations Area will be demolished and landfilled in-place. Debris removal from pond/lake edges, or the small stream at the cargo beach will be by hand to minimize any disturbance of the water bodies.

Combustible debris may be burned on-site to consolidate landfill and hauling requirements. Waterwells will be abandoned, sealed and capped. Underground tanks and utilidors will be collapsed and filled.

Two solid waste landfills will be located at the Northeast Cape Project Area. One will be an abandoned landfill along the cargo beach road that was used by the military. This is an elevated area where the inert debris can be landfilled away from ponds/lakes, or streams. The second landfill site will be the Housing and Operations Area itself. This is an elevated, dry site where the many large structures can be efficiently disposed of by demolishing and landfilling them in-place. As an alternative landfill site would be the gravel borrow area immediately south of the Housing and Operations Area. This upland site is also an elevated, dry site.

All combustible debris will be buried, consolidated with non-combustible debris and landfilled. Upon closure, the landfills will be graded to match the surrounding topography and given a final layer of cover material and restored according to standard specifications.

Asbestos, POL's, asphalt and any hazardous or toxic materials will be disposed of according to State and Federal regulations. Prior to clean-up (construction) there will be additional sampling to further quantify PCB

levels and limits, the extent of oil spills and free oil on the surface or in the groundwater, and to further identify any hazardous or toxic materials remaining at the Northeast Cape project area. Prior to closure, the wells will be tested for water quality.

Free surface oils will be removed using sorbant materials. Whenever possible, non-toxic and/or hazardous oil spills will not be excavated and removed. Removal could cause more environmental damage than simply allowing the oils to decay naturally, the vegetation to continue recovery, and the soils to remain intact.

3.2 Summary of Environmental Consequences

Some adverse environmental impacts would occur with each of the three alternatives; these impacts are discussed further in Section 5.0.

Under Alternatives 2 and 3, several significant positive impacts would result. These include: removal of safety hazards and existing or potential pollutants; visual aesthetic enhancement of the environment; long term improvement of surface and groundwater quality; and stimulus to the local economy.

4.0 EXISTING ENVIRONMENTAL SETTING

This section discusses the physical, biological and cultural features that exist at the two former military areas proposed for debris removal and restoration under DERA: Gambell and Northeast Cape. Where appropriate, the existing physical, biological, and cultural features on St. Lawrence Island as a whole are described.

4.1 Physical Characteristics

In this section, the existing non-living, non-cultural characteristics of St. Lawrence Island are described. Related impacts and recommended mitigating measures are discussed in Section 5.0.

4.1.1 Geology/Soils

Western St. Lawrence Island is underlain by a wide variety of volcanic, plutonic, and sedimentary rocks ranging in age from middle Paleozoic to late Cenozoic. In the Gambell area, the area to the north, west, and south of Troutman Lake is quarternary surficial deposits consisting of a thin cover of beach, bar, and alluvial deposits overlaying a wave cut bedrock platform. In the area northeast, east, and southeast of Troutman Lake around and including Sevuokuk Mountain, the geology is typified by cretaceous granite rocks, specifically quartz monzonite (Patten et.al., 1950 and Patten et.al., 1971).

Soils in the Gambell area consist of loose, well-rounded, medium coarse granitic sand and gravel. Some silty organic soils are found in swales to the east and west of the Village (Environmental Services Limited, 1980).

Similar to the Gambell area, surficial deposits including gravel, sand, silt and peat are found at Northeast Cape in the lower elevations and along the coast. In the higher elevations around the Kangukhsam and Kinipaghulghat Mountains, quartz monzonite is present. A small area of undifferentiated volcanic rocks (Tertiary and/or Cretaceous) exists around Seevookhan Mountain. Because of the sparce vegetation on the mountains, the rock is highly exposed and weathered, with expansive talus slopes.

In an inventory of soil resources in Alaska, the soils throughout St. Lawrence Island are identified as range soils suitable to support range land for grazing reindeer (Department of Geological and Geophysical Surveys, 1984).

St. Lawrence Island is underlain by discontinuous permafrost. In Gambell, discontinuous permafrost underlies most areas at depths of four to seven feet. The depth of permafrost in the Northeast Cape area is unknown.

Geophysical hazards in the Gambell area include coastal flooding and erosion caused by the wind driven waves of the Bering Sea; the flood hazard potential is average. No known flooding or erosion hazards exist at or near the Northeast Cape project area. St. Lawrence Island is in an area with limited potential for earthquakes (Barnwell, and Pearson, 1984).

Several oil spills have contaminated soils in the project area. See Section 3.1.2.1 for the clean-up and disposal approach to these areas.

4.1.2 Topography

Gambell lies on a flat sand and gravel spit that is composed of accreting beach ridges. The community has very little relief; maximum elevation is approximately 20 feet above sea level. Sevuokuk Mountain is an eroded headland immediately east of Gambell that rises abruptly to an elevation of approximately 619 feet.

Northeast Cape is an essentially flat coastal plain. West of Northeast Cape, approximately eight miles along the coastal plain, lies Kitnagak Bay where the project area begins. The project site extends south from the Bay across the flat plain and into the Kinipaghulghat Mountains. In the rolling terrain at the base of the higher mountains, the various military sites mostly range in elevations from 80 to 400 feet, with the highest site, the upper tram terminal at approximately 1,800 feet. (This is Navy property and not part of this project.) The highest local elevation is the peak of Kangukhsam Mountain at 1,820 feet.

4.1.3 Water Resources

Fresh water resources at Gambell consist of Troutman Lake (approximately 10,000 x 2,500 feet) and Nayvaghaq Lake (approximately 2,700 x 1,500 feet). The two primary freshwater sources include an infiltration gallery on the west slope of Sevoukuk Mountain and a well in the old town site near the west end of town. The gravelly sandy beach soils are well-drained. East of Gambell the terrain is wet tundra, with standing water and sheet flow. Only the highest elevations do not have extensive standing water. Rivulets are formed on the steeper slopes by snow melt runoff.

Several soil borings have been taken in the Gambell area to determine groundwater depth for landfill siting, and to determine if the groundwater has been contaminated by military debris. See Section 3.1.2.1.1.

The Northeast Cape Project Area is typical of a subarctic coastal plain where flat topography, frozen soils, and wet tundra have created many shallow thaw lake basins and peat in-filled thaw lake basins. These lakes are clear and tannic in appearance. In addition, there are several streams running through the area. They have vegetated, incised banks, sandy gravelly streambeds, and the water is clear. The streams range in size from a few feet to 10 to 20 feet in width immediately east of the terminal building. Streams are beaded in the flatter areas. In contrast, the stream running from the lower tram terminal to where it crosses the road north of the White Alice Site exhibits high water velocity because of its relatively steep gradient.

A relatively large oil spill (affecting approximately seven acres) occurred immediately north/northwest of the three large fuel storage tanks at the Northeast Cape Housing and Operations Area. This spill has contaminated the drainage flowing north into the largest stream on the project area (See Figure 2-3, Appendix B and Section 3.1.2.1.).

4.1.4 Climate

St. Lawrence Island has a cool, moist, subarctic maritime climate with some continental influences during winter, when much of the Bering Sea freezes. Winds and fog are common and precipitation is persistent, occurring approximately 300 days per year in Gambell. Precipitation is light rain, mist, or snow, with an annual total of only 10-15 inches. Annual snowfall is 60-80 inches, usually distributed evenly November to May. With an extreme low of -30°F (-34°C), winter temperatures average between 10°F (-12°C) and -2°F (-19°C). Summer temperatures average between 48°F (9°C) and 34°F (1°C), with a record high of 65°F (18°C). The Island's most complete wind data is taken from the Northeast Cape area. Here the mean wind speed is approximately 10 knots, with winds exceeding 22 knots approximately 10% of the year. Calm weather occurs only about 10% of the year. The Island, in general, has constant winds.

4.1.5 Air Quality

The vast majority of Alaska, including St. Lawrence Island, exceeds the air quality requirements set by the 1977 Clean Air Act Amendments. The two areas in Alaska that have shown past violations of the National Air Quality Standard for carbon monoxide are a portion of the Anchorage Bowl and areas in and around Fairbanks. These areas are designated as being in non-attainment of the carbon monoxide standard.

4.1.6 Minerals

St. Lawrence Island's mineral resources are not well known, and to date, no commercial deposits have been identified. The Island contains some copper, molybdenum, lead, zinc, silver and chromium. No gold lode deposits have been reported on the Island (Jones and Forbes, 1976), but tin, tungsten, uranium and thorium may be present. Although none of the known mineral deposits are considered mineable at this time, continued exploration is recommended (Jones

and Forbes, 1976). Molybdenum and copper are identified as the most promising mineral deposits, and the area east of Gambell around Sevuokuk Mountain is identified as a primary target area for molybdenum exploration. The target area for copper exploration is in the southwest portion of the Island, far removed from the former military sites (Jones and Forbes, 1976).

The Island's coal reserves include deposits of lignitic coal in the Northwest Cape area with low development potential (Department of Geological and Geophysical Surveys, 1984). The coal deposits have minor potential for local use, but no plans exist for extracting it.

4.2 Biological Resources

This section discusses the various types of vegetation and wildlife that exist at the former military areas or on St. Lawrence Island as a whole.

4.2.1 Vegetation

Vegetation in the Gambell area is classified as moist or wet tundra. Gambell's vegetation is dominated by heaths, sedges, mosses, and lichen. Where microrelief provides drier sites, shrubs such as dwarf birch (Betula nana), willow (Salix sp.), cranberry (Vaccinium sp.) and narrow leaf Labrador-tea (Ledum decumbens) are found. Although wet tundra is dominant in the low marshy/bog areas, alpine tundra can be found on the slopes and exposed ridges immediately south of the community, particularly on Sevuokuk Mountain. The vegetation on the coarse sands around Gambell and around Troutman Lake is non-existent to sparce. Military, all terrain vehicles, and other general community activities have denuded large areas. Also, the coarse, well washed sand/gravel, along with the harsh climate, hinders vegetation production and dispersal.

Vegetation in the Northeast Cape area is classified as alpine tundra. This type of vegetation is predominately white mountain avens, mat forming herbs, grasses, and sedges. Shrubs include alpine bearberry (Arctostaphylos alpina), dwarf birch (Betula nana), narrow leaf Labrador tea (Ledum decumbens), willow (Salix sp.), heaths (Phyllodoce sp.) and cassiopes (Cassiope sp.). Northeast Cape also has many lowlying areas with lakes, bogs, and generally poorly drained soils. In these areas, vegetation is typified by the wet tundra classification, similar to the area around Gambell. In the low lying areas vegetation is primarily lichens, mosses, sedge and cotton grass, with few woody plants.

Vegetation in the higher, drier areas, south of Housing and Operations Area becomes sparse to almost non-existent. Plant cover is marginal. Steep slopes, lack of soil (mostly talus) and nutrients, and harsh climate combine to reduce plant populations and density.

The lowlying areas, north of the Housing and Operations Area are boggy and contain many small lakes and ponds. These are mostly wetland areas that contain standing water, sheet flow and saturated soils. Development low lying areas (roads, buildings, airport) is built on gravel pads. Roads have culverts that effectively promote surface flow with minimal alteration of existing drainage patterns.

4.2.2 Wildlife

The U.S. Fish and Wildlife Service (USFWS) wrote an Environmental Assessment of Defense Environmental Restoration Account Activities on St. Lawrence Island (USFWS, 1985). This document provides an inventory of fish and wildlife resources on St. Lawrence Island, and this section of the Environmental Assessment utilizes the information in that document to discuss the Island's fish and wildlife resources.

4.2.2.1 Birds

St. Lawrence Island provides habitat for a majority of the seabirds in the northern Bering Sea. Murie (1936) recorded 20 species of seabirds on the Island. Seventeen breeding colonies of such species as auklets, murres, puffins, guillemots, gulls, and cormorants occur around the Island's perimeter. Local natives report that they hunt many bird species on the Island, including Emperor (Chen canagica), Canada (Branta canadensis) and Brant (B. bernicula) Geese, Olsquaw (Clangula hyemalis), Pintail (Anas acuta), Scaup (Aythya spp.), and Common Eider (Somateria mollissima).

Intensive studies, primarily concerned with seabird breeding biology and habitat selection, have been conducted at Sevuokuk Mountain near Gambell and at Kongkok Basin. Gambell's sea cliffs are of a "rock-pile" type which are characterized by great heaps and jumbles of boulders, ranging in size from a few to several hundred cubic feet. Occasional tall rock pinnacles or columnar shafts jut up from aggregates of small boulders. These sea cliffs are distinguished by the absence of escarpments. Sheer wall precipices frequently drop directly into the sea with little or no intervening beach.

Approximately 183,000 Crested (Aethia cristatella) and Least Auklet (A. pusilla) inhabit 400,000 square meters of nesting habitat on Sevuokok Mountain (Bedard, 1969). Parakeet Auklet (Cyclorrhynchus psittacula) (2,000), Horned Puffin (Fratercula corniculata) (1,500), and Tufted Puffin (F. cirrhata) (500) also breed on the mountain. Parakeet Auklets and Horned Puffin occupy the upper mountain's rim crevices and recesses. Least, Crested, and to a lesser degree Parakeet Auklets nest in jumbles of boulder burrows on the lower cliffs. Guillemots (Cepphus spp.) inhabit the lowest level burrows and crevices. Bedard (1969) reports that the avian biomass from Kittilngook Bay east around Sevuokuk Mountain to Dovelaivik Bay ranges from 1,000 to 10,000 kilograms per square mile, one of the largest concentrations on the Island. For comparison, Northeast Cape's avian biomass ranges from 0 to 10 kilograms per square mile.

In addition to those birds listed above, other avian species, observed in Gambell during July 1985, include Whistling Swans, Arctic Terns, Snow Buntings, Lapland Longspurs, and Sandpipers. Many thousands of seabirds were seen flying low over water directly offshore to and from feeding areas.

During the winter, common Ravens (Corvus corax) and stray Glaucous Gulls (Larus hyperboreus) occur around Gambell, and a few Oldsquaws (Clangula hyemalis) occur in open water in winter. During FWS's site investigation, puffin were observed flying east and west offshore from the Village.

In contrast to Gambell, seabird resources at Northeast Cape are limited. The only known breeding seabird colony consists of thirty Glaucous Gulls on Seevookhan Mountain. An active Common Raven nest was found in the lower tram building, and an active Snow Bunting nest was found in the garage of the weather station next to the runway. A pair of Whistling Swans as well as other unidentified waterfowl were observed and heard in ponds near the receiver building. Sea gulls and Lapland Longspurs were also observed. Because of the area's very low habitat value, relatively few birds were observed and the diversity appeared low.

4.2.2.2 Mammals

Large mammals are not generally abundant on St. Lawrence Island. Polar bear (Thalarctos maritimus) may occur on the Island year round. Their occurrence on the Island is relatively common when the ice pack is near shore. Some may become stranded on the Island from late spring to fall when the ice pack retreats from shore. Grizzly bear (Ursus arctos) have been reported on St. Lawrence Island, but are very rare. The last known grizzly bear was taken by a Savoonga hunter in the 1950's. A reindeer (Rangifer tarandus) herd which once numbered in the thousands has dwindled to a current population numbering several hundred. Pacific walrus (Odobenus rosmarus) may be found on or near portions of the Island year round; however, no haul out areas exist within the project area. Fur seal (Callorhinus ursinus) and Stellar's sea lion (Eumetopias jubata) rarely haul out on the Island.

Arctic fox (Alopex lagopus) are found throughout the Island and are trapped heavily by the Savoonga and Gambell people. Red fox (Vulpes fulva), which are less common than arctic fox, are occasionally taken by local natives.

Small mammals are numerous and provide the primary spring diet for migratory raptors, foxes, and jaegers when the snow first begins to leave the tundra. Small mammals include: the tundra shrew (Sorex tundrensis), the Arctic ground squirrel (Citellus parryi), the Greenland collared lemming (Dicrostonyx groenlandicus), the red-backed vole (Clethrionomys rutelus), and the most common inhabitants, tundra vole (Microtus oeconomus).

Walrus, seal, whale, polar bear, and seabirds are all hunted by the Island's native people, and are critical subsistence animals. The subsistence lifestyle of the Islanders is discussed in Section 4.3.8 with regard to socioeconomic conditions. Because St. Lawrence Island supports areas important for subsistence hunting, fishing, food gathering, and foraging, the area has been recommended for designation as a Special Use Area and as an Area Meriting Special Attention in the Bering Straits Coastal Management Program - Public Hearing Draft (Bering Straits CRSA Board, 1985). This is discussed in Section 4.3.3.

4.2.2.3 Fish

St. Lawrence Island's streams and tundra ponds are inhabited by predominantly four species of fish: blackfish (Dalia pectoralis), nine-spined stickleback (Pungitius pungitius), grayling (Thymallus arcticus), arctic char (Salvelinus alpinus), and perhaps whitefish (species unknown) (West, 1980). All five species of Pacific salmon occur around the Island; but, there are no anadromous fish streams in the project areas. Troutman Lake, the largest lake in northwest St. Lawrence Island, is located just south of Gambell, which in turn is located on a gravel spit. The Lake is about ten feet deep and the fishery resources are not yet known. A large storm last winter caused ocean

waves to overtop the sand sea swales along the coast, rendering the lake unpalatable because of saltwater contamination (Public Health Service, 1985). This rapid increase in salinity may have a significant effect upon the fish populations, if any, in Troutman Lake. Permafrost discontinuously underlies the gravel spit at depths of four to seven feet and may act as a barrier that otherwise separates Troutman Lake from seawater.

Natives from Savoonga and Gambell subsistence fish along the coast of the Island during the summer. They report that the stream immediately southeast of the runway of the Northeast Cape Project Site once supported fish populations, but the stream no longer supports fish due to a large diesel oil spill, from the storage tanks near the Housing and Operations Area, which entered one of its tributaries. However, fish fry were observed in this stream approximately 250 feet downstream of where it crosses the runway and weather station access road through culverts. At this point the stream is approximately 10 to 20 feet wide and 6 to 20 inches deep. The streambed is comprised of sand and gravel, the banks are vegetated and incised, and the water is clear. The stream narrows and deepens upstream. Bottom composition, water clarity, and streambanks in this region are similar to those in the lower reaches. Hence, with cleansing over time, this stream should again support fish populations.

4.2.3 Endangered Species

The American Peregrine Falcon (Falco peregrinus anatum), the Aleutian Canada Goose (Brauta canadensis leucopareia), and the Eskimo Curlew (Numenius borealis) are all Alaskan birds on the Federal Endangered Species List. In addition, the Short-tailed Albatross (Diomedea albatrus) is on the Foreign Endangered Species List. The Arctic Peregrine Falcon (Falco peregrinus tundrius) is listed on the Federal Threatened Species List. None of the above birds are present on St. Lawrence Island. (See Appendix C).

The Peregrine Falcon is listed as an irregular visitant and accidental on St. Lawrence Island (University of California, 1959; U.S. Fish and Wildlife Service, 1980). The U.S. Fish and Wildlife Service has observed a Peregrine Falcon on St. Lawrence Island during either May or June, 1980. This was probably an Arctic Peregrine Falcon. It is possible, although very unlikely, that Peregrine Falcons are nesting in or near the project areas. None were seen during a project site survey in July, 1985.

There are no known endangered species of plants on St. Lawrence Island.

4.3 Cultural Factors

4.3.1 Governmental Entities and Community Organizations

There have been a variety of governmental entities and community organizations (including native corporations) on St. Lawrence Island; many were created long before Statehood when the Island was a reindeer station. These entities include IRA (Indian Reorganization Act) Councils, City Councils and village corporations; each of these governing organizations is described briefly below.

4.3.1.1 IRA Councils

IRA Councils were formed during the period when Alaska was a territory under the Composite Indian Reorganization Act, which provided for the common welfare of the Alaskan native people. Until the time of statehood (1958), the IRA Councils were the only governmental entities on St. Lawrence Island. Currently, the Gambell and Savoonga native populations are represented by IRA Councils for non-municipal programs and services. The IRA Councils operate the native stores, run community programs, and administer a variety of federal social service programs.

4.3.1.2 City Governments

The two communities on St. Lawrence Island, Gambell and Savoonga, are second class cities incorporated in 1963 and 1969, respectively. Both city governments function under the authority of a mayor elected from 7 member city councils. The municipal responsibilities assumed by the city governments of Gambell and Savoonga are identified below.

TABLE 4-1

MUNICIPAL RESPONSIBILITIES

	GAMBELL	SAVOONGA
Streets and sidewalks		X
Health services and hospital facilities	X	X
Police protection and jail facilities	X	X
Cold storage plants	X	X
Light, power and heat	X	
Water	X	X
Community centers	X	X
Libraries	X	X
Recreation facilities	X	X
Solid waste collection and disposal	X	
Fire protection service and facilities	X	X

4.3.1.3 Village Corporations

After passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971, native village corporations were formed in Gambell and Savoonga; they are called Sivuqaq, Inc. and the Savoonga Native Corporation, respectively. As described below with regard to Land Ownership (Section 4.3.2), the two village corporations jointly own St. Lawrence Island, and control its resources.

Both village corporations are incorporated by the Alaska State Department of Commerce. Their purposes and powers, as filed with the Department of Commerce, are vague and non-restrictive, allowing the corporations all powers given or permitted by the laws of the State of Alaska so long as they are consistent with the acts of Congress and ANCSA.

4.3.1.4 Regional Corporations/Organizations

Kawerak Incorporated is a regional non-profit organization representing native villages in the Bering Straits area. Kawerak Incorporated is responsible for promoting the social and economic well-being of the region. Programs administered by Kawerak include CETA, adult basic education, and subsistence programs.

The Bering Straits Native Corporation (BSNC) is the regional profit native corporation. However, Gambell and Savoonga are not shareholders in the regional corporation, and BSNC plays no role in activities on St. Lawrence Island.

The Bering Straits Coastal Resource Service Area (CRSA) Board represents 17 communities in the Bering Straits area, including Gambell and Savoonga. The Board provides overall direction for the development of the area's coastal management plan, developed in accordance with the Federal Coastal Zone Management Act (1972) and the Alaska Coastal Management Act (1977). The management plan developed by the Bering Straits CRSA Board, presently in the Public Hearing Draft Stage, is discussed in Section 4.3.2.3 with regard to Regional Plans. When adopted, it will provide policies and implementation measures to help guide resource use and development on private and state land, and federal uses and activities must be consistent with the program.

4.3.2 Land Ownership

St. Lawrence Island is jointly owned by Sivuqaq and Savoonga native corporations. The private ownership of the Island by the native corporations resulted from the Alaska Native Claims Settlement Act (ANCSA) of 1971 which entitled native village corporations to select and receive specific amounts of federal land. Under Section 19(b) of ANCSA, Sivuqaq, Inc. and the Savoonga Native Corporation had the option of receiving title to the surface and subsurface estates of the land, or choosing to forego land selections and regional corporation stock or funds. This option was available to them because of the reservation status of the land; in 1903, through an Executive Order, St. Lawrence Island was reserved and set aside as a Reindeer Station. Sivuqaq, Inc. and Savoonga Native Corporation elected to take fee simple title, in joint ownership, of all but a few acres of St. Lawrence Island.

The non-native land on St. Lawrence Island consists of State land used for airstrips and related facilities in Gambell and Savoonga. The St. Lawrence Island native corporations are not subject to the 14(c) reconveyance provision of ANCSA, and there are no native allotments on St. Lawrence Island.

Between 1903, when the Island was established as a Reindeer Reserve by Executive Order, and 1971 when ANCSA was enacted, much occurred on St. Lawrence Island with regard to land ownership and the military presence and use of sites on the Island. In 1950, 1,700 acres and two rights-of-way near the Village of Gambell were withdrawn from the reservation for use by the U.S. Air Force (P.L.O. 671). This land was used by the military until 1960 when P.L.O. 2077 restored the withdrawn acreage to the reserve, revoking P.L.O. 671, and leaving no overriding military interest in that area. In 1952,

21,013 acres in the Northeast Cape area were withdrawn for use by the U.S. Air Force (P.L.O. 790). This withdrawal was partially revoked in 1958, when 16,213 acres were restored to the Reindeer Reserve; 4,800 acres remained withdrawn (P.L.O. 1602) and some of this land was eventually transferred to the Department of the Navy. It appears that this 4,800 acres was withdrawn in 1972 by P.L.O. 5187, which withdrew all unneeded military land for study and possible classification under section 17(d)(1) of ANCSA. Interim Conveyance #203 (June 27, 1979) conveyed unsurveyed lands of St. Lawrence Island to Sivuqaq, Inc. and Savoonga Native Corporation. Excepted from transfer were surveyed land, easements, and land use permits effective prior to conveyance.

4.3.3 Land Use

4.3.3.1 Land Use

Land use in the Villages of Gambell and Savoonga consists mainly of residential housing and community service facilities. Several seasonal hunting and fishing camps are located around the perimeter of the Island. An abandoned camp, Lietnik, exists just west of the Northeast Cape Project Area. Natives from both Gambell and Savoonga have been using old buildings at the military cargo loading beach at the Northeast Cape Project Area.

The majority of the Island is wilderness area consisting of tundra-covered flat land dotted with small lakes. Barren mountains rise out of the tundra, naturally dividing the Island into western, central, and eastern areas. This wilderness area provides habitat for a variety of seabirds, waterfowl, as well as several mammalian species. The soils and vegetation provide range suitable for reindeer. The Island and surrounding waters are used extensively for subsistence hunting. Subsistence use of the Island is detailed in Section 4.3.8 of this document.

4.3.3.2 Local Land Use Plans, Policies, and Controls

No city land use plans, policies or controls are currently in effect for the Villages of Gambell or Savoonga. However, the Alaska Department of Community and Regional Affairs, in conjunction with the City Councils of Gambell and Savoonga, is currently in the process of developing land use plans for the Villages. These plans will address land use within the municipal boundaries only. The Savoonga Land Use Plan is expected to be completed by December 1985; the Gambell Land Use Plan is in the initial stages of development and the completion date has not been projected.

Another land use planning project may also be undertaken within the next year. Kuskokwim Planning and Management Corporation, under contract with the Bureau of Indian Affairs (BIA), provides management assistance to several Bering Straits communities, including the Gambell and Savoonga native corporations. Problems have arisen because of the unique land ownership situation on the Island. All permits and lease agreements for use of the Island's land resources are developed on a case-by-case basis with no standard policies for guidance. As presently foreseen, Kuskokwim Planning and Management Corporation would develop the land use plan, ideally for the entire Island, based on policies and priorities identified by the native corporations. Once developed, the plan would be adopted by resolution by both native corporations.

4.3.3.3 Regional Plans

St. Lawrence Island is within the jurisdictional boundaries proposed by the Bering Straits CRSA Board. Some areas within the boundaries warrant special attention because they provide unusually productive wildlife habitat, sustain a large part of a villages' subsistence needs, contain unusual historic sites or large mineral deposits, or support commercial fisheries. St. Lawrence Island is one of 26 areas within the Bering Straits Region proposed for designation as a special use area based on the following reasons:

- o seabird and walrus habitat;
- o subsistence; and
- o historic sites.

Two specific actions recommended with regard to St. Lawrence Island are the protection of essential seabird, waterfowl, and walrus habitat from degradation or disturbance which would impede wildlife use, and the protection of archeological sites from improper excavation or looting (Bering Straits CRSA Board, 1984).

In addition to designating special use areas, the Bering Straits CRSA Board is responsible for designating Areas that Merit Special Attention (AMSA) because of unique aesthetic, ecological, recreational, geophysical or industrial values. St. Lawrence Island is one of eleven areas within the district that have been recommended for consideration as an AMSA. The basis for the designation is the Island's areas of high natural productivity or essential habitat for living resources and areas important for subsistence hunting, fishing, food gathering, and foraging (Bering Straits CRSA Board, 1984).

An overall economic development program for the Bering Straits Region was developed in 1980 by Kawerak, Inc. The program was developed under a joint economic development program with the Alaska Department of Commerce and Economic Development. The plan presents socioeconomic data on the Bering Straits region, people, and resources, and identifies long and short term goals and objectives. The goals of the plan are as follows:

- o to provide the people of the Bering Straits region opportunities, programs, and activities from which they may continue the enhancement and enjoy the values of their history, heritage, culture, and lifestyle;

- o to develop and enlarge the present economic base by participating in the rate and control of processes, and encouraging self-reliance in various exploratory, development, and management endeavors;

- o to plan for adequate, integrated, functional systems: land, sea, air - to be of benefit generally to the people of the region, and designed to be compatible with current and potential interests and values;

- o to develop on-going programs and initiate planning for needed community developments and improved infrastructures;

- o to increase employment potentials and opportunities of the work force to obtain higher incomes and to attain a higher standard of living. Emphasis will be placed on entry into economic development potentials; and

- o to develop an in-depth and detailed comprehensive land use plan for the Bering Straits region and its environs, the people and their communities to facilitate the attainment of objectives, project priorities, and to obtain a balance and control in development.

4.3.4 Historical and Archeological Resources

4.3.4.1 Historical Resources

Known historical resources within the project areas consist of buildings, machinery, and other debris formerly used by the DOD during the late 1940's through the early 1970's when St. Lawrence Island served as a site for part of Alaska's Air Defense Communication System. The Gambell area was used as early as 1948 as a temporary radar site to provide intelligence on Russian shipping activities in the area. It continued as such until 1953 or 1954 when it was transferred to Northeast Cape (J. Cloe, personnel communication 1985).

Remnants of past use of this area by the Army, Navy and Air Force that lay scattered throughout the Gambell and Northeast Cape project areas are identified in Table 2-1. In general, debris within the Gambell project area includes items of minimal historical value such as 55-gallon drums, miles of cables and wires, a few collapsed Army, Navy, and Air Force quonset huts, and a single concrete Navy communications building. Within the Northeast Cape project area, items include general debris plus numerous structures associated with operation of the existing White Alice installation. Some of these structures might be historically important.

Although references to military use of St. Lawrence Island during World War II are scarce, the area appears to have been the scene of only limited military activity during that time period. Its major role was as the birthplace of the Alaska Territorial Guard, which was authorized by the 77th Congress to protect the Territory in the absence of the Alaska National Guard. Some 150 volunteers from St. Lawrence Island became members (approximately 100 from Gambell) and were supplied with Army surplus guns and ammunition. Eventually, several thousand native people joined the Territorial Guard (Marston 1969).

The earlier history of St. Lawrence Island is detailed in Collin's Archeology of St. Lawrence Island (1937). Briefly, European contact was made as early as 1728 with Vitas Bering's visits, but steady contact began in the 1840's when American whalers often stopped at the Island to trade with the natives and probably enlisted their aid in whaling. Along with the whalers came metal objects, food and clothing, and liquor.

Between 1878 and 1879, an epidemic disease spread throughout the Island, and, along with other factors, led to the death of about 1,000 of the Island's 1500 inhabitants. Gambell was one of the two major villages to survive, and individuals that survived from smaller settlements went there to live. In

1894, a school was established, and Mr. and Mrs. Vene C. Gambell were the first school teachers sent by the U.S. Bureau of Education. In 1898, the village name of Sevuokuk was changed to Gambell in their honor (Holmes and Stern 1983).

Evidence of this early historic period within the project area is found in archeological sites that contain metal and glass objects amid native stone and bone tools. In the vicinity of Gambell, a number of wooden coffins that were placed there over 50 years ago prior to the use of an established cemetery dot the landscape. Older coffins and skeletal remains of individuals unknown to the local Gambell residents, can be seen eroding down the western slope of Sevuokuk Mountain.

4.3.4.2 Archeological Resources

As a result of archeological investigations on St. Lawrence Island over the past 50 years (e.g., Collins 1937; Guiddings 1960; Ackerman 1961; Bandi 1969; Bowers 1975; Yesner, 1976; Holmes and Stern 1983; Crowell 1985), five archeological sites (AHRS #'s XSL-001 through XSL-005) and a number of burial locations are recorded within the Gambell project area. One archeological site -- Qitnegat Bay I (AHRS # XSL-042) is recorded in the Northeast Cape project area. The five Gambell sites, which include Hillside, Myowagh, Ievoghiyoq, Sevoghiyog, Seklowaghyaget, and Old Gambell, have been designated as a National Historic Landmark.

The first known cultures on St. Lawrence Island, the Okvik and Old Bering Sea phases, represent the first indisputable evidence of Siberian Eskimo occupation on the Island and display an economic emphasis on walrus and seal hunting, with perhaps the beginnings of a whale-hunting complex. Land mammals, birds, and fish were used to supplement maritime resources in the diet. Date ranges for the combined phases are roughly A.D. 1-700 (Ackerman 1984; Bandi 1969). It is generally thought that evidence of a much earlier Paleo-Eskimo occupation on St. Lawrence Island may be present in upland areas. During the current study, native informants pointed out areas atop Sevoukak Mountain near Gambell that contain burials they believe date from about 10,000 years ago; however, this information has never been verified archeologically.

Within the project area, Okvik art styles are found at the Hillside site (A.D. 1-500) and old Bering Sea styles are known from both the Hillside site and the adjacent Myowagh site. These and the subsequent prehistoric cultures display close ties to the Siberian mainland (Giddings 1960).

The Punuk Phase succeeds Okvik/Old Bering Sea phases within the project area. Materials from an earlier Bornirk Phase have been located on St. Lawrence Island, but have not been noted within the study area to date. At the beginning of the Punuk Phase, influences from the Alaskan mainland are noted, and in the later Punuk (A.D. 1100), Western Thule tool types are found. This has led researchers to designate the Island's culture as Thule from about A.D. 1100 (Geist and Rainey 1937; Giddings 1960 in Crowell 1985); others designate it as Punuk up to the Late Prehistoric-Protohistoric phase (Collins 1937; Bandi 1969).

The hunting of large sea mammals was the major economic emphasis and is reflected in the settlement pattern and dominates the entire culture complex. Land-based resources also were exploited. Settlements were numerous and large, suggesting that population increased during this period. Whalebone is abundant at sites and was used in house construction and other structures. A series of new elements appear that demonstrate increased Siberian influence (Bandi 1969). Toward the end of the phase, art styles changed from the complex geometric designs characteristic of the preceding phases to simple linear designs (Ackerman 1961, 1984; Bandi 1969). Within the project area, the Punuk culture is represented at the Myowagh, Ievoghiyoq, and Seklowaghyaget sites. The latter site also contains more recent archeological materials. An extensive burial ground is situated between Troutman Lake and the Miyowagh site that also dates to the Punuk Phase (Bandi and Burgi 1972).

Following the late Punuk culture is a later prehistoric culture that survived into historic times (approximately A.D. 1500-1700). This period reflects increasing contact with other cultural groups (Ackerman 1961, 1984; Bandi 1969). At Seklowaghyaget (A.D. 1400-1700), the late Punuk Phase artifacts are replaced by recent prehistoric types, as are the upper levels of the site's deposits (Collins 1937). The adjacent site of Old Gambell is a Late Prehistoric-Protohistoric site that contains evidence of continuous occupation from approximately A.D. 1700 to the present. The Qitnegat Bay I site in the Northeast Cape project area also is recent prehistoric in age (Crowell 1985).

The five Gambell sites and one Northeast Cape site have been excavated by both archeologists and local people. The current condition of each of these sites is well documented in Aron Crowell's report of his 1984 survey of St. Lawrence Island (Crowell 1985). The sites are highly visible as large deeply pitted midden mounds with scattered back-dirt piles that are remnants of ongoing digging by local residents for saleable artifacts. Sea mammal bones, wooden and bone structural members, pottery fragments, ground stone tools, and historic metal and glass fragments lie scattered within and between back dirt piles. Military debris consisting of rusted barrels, cable, and miscellaneous pieces of metal, also occurs within the boundaries of the Myowagh, Old Gambell, and Seklowaghyaget mounds.

4.3.5 Aesthetics

The City of Gambell and the surrounding area are visually dominated by the Bering Sea, Troutman Lake, beach sand dunes and ridges, village buildings and especially, Sevoukuk Mountain. Old military debris left in and around the village, along the runway, in and around Troutman and Nayvaghaq Lakes, and on Sevoukuk Mountain consists of 55 gallon barrels, runway matting, cable, and miscellaneous items. This debris significantly detracts from the aesthetics of the area.

The Northeast Cape project site area is visually dominated by the Bering Sea and the coastal plain with Kinipaghulghat Mountains rising immediately to the south. Man-made elements that can be seen in the area include:

- the White Alice site,
- the Housing and Operations Area,
- long rows of telephone poles, cables, and wire,

- o the approximately 30 small structures at Cargo Beach,
- o dirt roads and the runway, and
- o debris along and near Cargo Beach, debris in a partially open landfill on the road to cargo beach, and debris along the perimeter of the receiver station pad.

Because of the large expanses of open and undisturbed land around the project area and the spread-out nature of the military facilities, the visual impact of the facilities as a whole is not striking. But, within proximity, all of the features listed above become visually dominant and detract significantly from the aesthetics of the area, particularly because of the decay, trash and contrast created by the design of the facilities.

4.3.6 Demographic Characteristics

The table below identifies the historic and projected population on St. Lawrence Island.

TABLE 4-2

ST. LAWRENCE ISLAND POPULATION DATA

		GAMBELL	SAVOONGA	TOTAL
Historic:	1903	261	-	261
	1910	221	-	221
	1930	250	139	389
	1940	296	209	505
	1950	309	249	558
	1960	358	299	657
	1970	372	264	636
	1980	445	491	936
	1984	432	477	909
Projected:	1990	461	501	962
	2000	484	527	986

The annual growth rate from 1960 to 1980 was 1.1% in Gambell and 3.9% in Savoonga; the annual growth rate from 1980 to 2000 is projected by considerably lower, at 0.42% in Gambell and 0.35% in Savoonga (Bering Straits CRSA Board, 1984).

The ethnic make up of the Island's population is approximately 95% native. Caucasians, Blacks and Indians comprise the remaining 5% of the population.

4.3.7 Housing

As of 1980, there were 105 single family dwellings in Gambell and 122 single family dwellings in Savoonga. Many of these dwellings were developed by BIA and the Department of Housing and Urban Development (HUD) in 1976, or by a joint HUD/Bering Straits Regional Housing Authority project in 1979 (Environmental Services Limited, 1980). In addition to the housing in the permanently established villages, some housing is also located in the seasonal hunting/fishing camps at various locations on the perimeter of the Island.

There is one abandoned fishing camp, Lietnik, that lies to the west of the Northeast Cape Project area. Camp Kulowiye, to the east is still actively used during the summer as a hunting/fishing camp. The abandoned Air Force cargo beach area on Kitnagak Bay now acts as a hunting/fishing camp for the Island's natives.

4.3.8 Socioeconomic Conditions

The indigenous socioeconomy of the Eskimos of St. Lawrence Island was based on a subsistence lifestyle. Although their socioeconomy is still largely based on subsistence, the Islanders' need for cash income has become important. Cash is needed for purchasing and maintaining the modern equipment used for subsistence hunting (i.e. outboard motors, all terrain vehicles (ATVs), high powered rifles) as well as for other amenities offered by the western culture, such as packaged foods, television, and appliances. Other costs include freight and personal transportation, fuel oil and housing.

In 1980, the average taxable income for the Islanders was approximately $4,034 (Magdanz, 1981), and the number of permanent jobs in the villages is low. Because of the scarcity of cash employment opportunities, the abundance of marine mammals, the residents' strong cultural values, and the Island's isolated location, St. Lawrence Island residents continue to depend on subsistence hunting (Bering Straits CRSA Board, 1981). It plays a major role in maintaining a comfortable standard of living. Over 97% of the residents are involved in subsistence hunting.

Table 4-3 identifies the species important to the Islanders with regard to subsistence hunting, and the season(s) in which the species are hunted.

Economically, socially, and culturally, walrus and bowhead whale are the most important species for subsistence hunting on St. Lawrence Island. Walrus are an important food source for the communities. In addition, walrus cow skins are used for covering the skinboats used by the Eskimos in both whale and walrus hunting. Bull walrus ivory is an important craft and cash resource. The harvest area of walrus is extensive, surrounding the entire Island (Bering Straits CRSA Board, 1984). Walrus winter in the waters surrounding the south, west, and east parts of the Island, and a prime harvest time is in the spring as they migrate north from their wintering areas. Walrus haulout areas are located on the northeast tip of Northwest Cape, at Northeast Cape, and in a small area west of the military site at Northeast Cape. However no haulout areas exist near either of the project areas.

Whaling has ceremonial and cultural significance to Island residents; harvested whales are shared by the community in a formal distribution of meat and parts. Bowhead hunting has been part of Eskimo life for thousands of years, and plays a particularly important role in the Natives' culture and subsistence lifestyle. Although bowhead whales are an endangered species, their harvest by Eskimos in Alaska and the Soviet Union is permitted. Typically, St. Lawrence Island residents harvest three to five bowhead whales in the spring during their northern migration. The major subsistence harvest area for bowhead whales extends from the area south of Southwest Cape along the west coast of the Island to the area north of Gambell.

TABLE 4-3

SEASONAL PATTERN OF SUBSISTENCE HUNTING BY
ST. LAWRENCE ISLAND VILLAGES*

Species	Season			
	Sp	Su	F	W
Sea Mammals:				
Pacific Walrus	X	X	X	X
Bearded Seal	X	X		
Bowhead Whale	X			
Gray Whale	X	X		
Beluga Whale	X			
Minke Whale	X	X		
Spotted Seal			X	
Sea Lions			X	
Ringed Seal	X	N/A	X	X
Fish and Shellfish:				
Salmon		X	X	
Crab	X			X
Sculpin				X
Tomcod	X			X
Dolly Varden **	X	X		
Birds:				
Migratory Waterfowl	X	X	X	
Seabirds **	X	X	X	

*Source: U.S. Department of the Interior, 1982.
**Source: July 1985 Environmental Assessment Field Study

Gray whales are occasionally hunted by the Islanders; the major harvest area is off the west coast of the Island. The other whales that range throughout the region, beluga and minke, are occasionally hunted. Beluga harvest areas are located off the west coast of the Island and in the area north of Savoonga.

Seals (ringed, bearded, spotted, and ribbon) are harvested by St. Lawrence Island residents for both food and raw materials (oil and skin). The subsistence harvest area for seals surrounds the entire Island.

Polar bear are harvested in the winter for their hides and meat, and products crafted from the hides produce supplementary income (Bering Straits CRSA Board, 1984). Polar bear harvest areas are located on the pack ice off the coast between Gambell and Savoonga, and off Southwest Cape, Southeast Cape, and Northeast Cape.

Subsistence harvest of waterfowl and seabirds also occurs on the Island. Waterfowl harvest areas are located in the Northwest Cape area and in areas surrounding Konzata and Sekinak Lagoon on the south side of the Island. Seabirds are harvested on the east side of Northwest Cape, around the Savoonga area and at Southwest Cape (DOI). Eggs are also gathered in some areas of the Island.

During the summer, Island residents fish, crab, gather tundra plants, and pick berries. Gambell residents gather edible plants in the areas of undisturbed beach vegetation south of town. Arctic fox is trapped as a secondary source of income, but there is no other commercial fishing or hunting.

Island employment opportunities are provided by the BIA grade schools, the REAA high schools, the Norton Sound Health Corporation, the city governments of Gambell and Savoonga, the native stores, the Village corporations, the IRA Councils, and the U.S. Postal Service.

Subsistence hunting also provides materials for a very important source of cash income for the Islanders. A part of the Eskimo cultural heritage is carving ivory and making crafts and clothing from seal skin and other animal hides. They use these skills to generate cash income, as quality Eskimo crafts have become popular in recent years. Many retail outlets throughout Alaska carry ivory carvings, crafts, clothing and the walrus "oosik" from St. Lawrence Island. In addition, some local residents sell old artifacts dug up at various Island locations for cash income.

Some tourist activities occur on St. Lawrence Island. The millions of seabirds on the Island attract bird watching tours, and the annual walrus festival in Savoonga also attracts tourists.

4.3.9 Transportation

St. Lawrence Island is accessible by sea or air. Barges deliver fuel and goods to the Island and fishing and crab boats occasionally stop at the villages. Two primary airlines have regularly scheduled flights to the Island from Nome; they are Ryan Air and Bering Sea Air. These and other airlines also provide charter service.

Intra-Island transportation is mostly by skiff, three-wheeler ATV, and snow machine. Skiffs are used between villages and hunting/fishing camps. Three-wheelers are common, with fewer snow machines and four-wheelers. A few trucks are used, primarily as service vehicles.

Transportation to and around St. Lawrence Island is commonly limited by the weather. High winds and low fog often delay flights and high seas hamper barge activities and restrict skiff travel.

4.3.10 Facilities and Services

Facilities and services on St. Lawrence Island are limited and exist only in the villages of Gambell and Savoonga. Each village provides the following facilities and/or services:

- o BIA Elementary school and a REAA high school;
- o Public Health Service clinic;
- o National Guard Armory;
- o U.S. Post Office;
- o Community building;
- o Washeteria;
- o Alaska Department of Transportation and Public Facilities air strip and related maintenance facilities;
- o Native store and other stores;
- o Lodge; and
- o Cold storage facility.

The Norton Sound Health Corporation provides health services to the two villages. These services include training, placement and compensation of primary and alternate health aides, annual visits by a pharmacist, dentist and eye technician, semi-annual doctor visits, mental health examinations, and family counselling services, and sanitarian visits as needed. Both villages are visited by a state public health nurse three or four times a year. Patients needing emergency hospitalization are sent to the Norton Sound Regional Hospital in Nome.

4.3.11 Utilities

The Village of Gambell obtains water from a spring and infiltration gallery in the hillside. The water is piped and stored in a 100,000 gallon storage tank located near the high school, a system that in the past has frozen in the winter. The Public Health Service is taking measures to correct this situation. A city-operated well and pumphouse near the store in the old part of Gambell provide a second water source. Waterlines serve the REAA school and the washeteria, a central watering point with showers. Individuals haul the water they need from the watering points to their homes.

For sewage disposal, Gambell residents use honey buckets and empty them at a honey bucket dumping station installed by the Public Health Service. Septic systems are provided at the health clinic, washeteria, schools and teacher's housing units.

Gambell residents haul their garbage to a solid waste disposal area located north of the Village. A city sanitation person also hauls some of the waste to the landfill, which is nearly filled to capacity. Villagers also discard waste on the sea ice or on the beach north of the Village.

The Alaska Village Electric Cooperative provides power to Gambell with a system powered by three diesel generators. As of 1980, 75 residential and 15 commercial buildings were connected to the system. Fuel oil is delivered by barge to the village annually and held in storage tanks. The fuel oil is used for heating producing electricity and cooking. Villagers buy their fuel at the village store. The washeteria and pumphouse are powered by wind generators located on the shore of Troutman Lake.

Utilities at the military sites in Gambell and Northeast Cape are no longer operational.

5.0 ENVIRONMENTAL ASSESSMENT/IMPACT MITIGATION RECOMMENDATIONS

5.1 Physical Characteristics

5.1.1 No Action Alternative

Implementation of the No Action Alternative will have a moderate negative impact on soils, water resources, and air quality. No effect is anticipated with regard to topography, climate, or minerals.

In several sites within the project areas, soils and water resources have become contaminated as metal drums containing petroleum, oil, and lubricants deteriorated, spilling their contents into the soil and water. Both rusted empty drums and full drums are located at various sites within the project areas. Under the No Action Alternative, the abandoned full drums would eventually decay, and residual petroleum products and/or toxic substances in the drums would discharge into and pollute the surrounding soil, streams, lakes, ponds, wet tundra, or groundwater.

One beneficial effect on soils exists under the No Action Alternative. Without clean-up activities, the soil will remain in its existing state without the possibility of an increase in erosion or damage to permafrost caused by equipment travelling on the undisturbed soils. This beneficial effect is outweighed by the negative impact of continued soil pollution by contaminants.

An adverse effect on air quality is also possible under this alternative. Many of the abandoned military structures were constructed with asbestos-containing exterior transite siding and contain asbestos insulated pipes. Under the No Action Alternative, the possibility exists that some asbestos material will become airborne as natives continue to scavenge the structures for building materials or the buildings continue to decay and collapse through natural erosive processes. Airborne asbestos would adversely affect both air quality and the health and safety of exposed natives.

5.1.2 Clean-up and Disposal of All Debris and Partial Clean-up and Disposal of Debris

Implementation of this alternative may result in a slight adverse impact on soils and topography. However, these impacts are mitigable and the overall effect is expected to be negligible. A minor, short-term adverse effect on air quality is possible. No impact on climate or minerals is anticipated. A significant beneficial impact on water resources is expected due to the avoidance of contamination from new or existing pollution sources.

With regard to soils, there is a potential for thermal and hydraulic soils erosion on tundra slopes due to denuding of the delicate tundra vegetation. The destruction of vegetative cover can expose the underlying soil to sunlight and water, which may result in erosion. The denuding may result from excavation. These impacts can be avoided or minimized through implementation of following mitigating measures:

- use vehicles with large diameter rubber tires with low surface pressure;

- o confine vehicular traffic to established roads when possible;
- o confine excavations to the active layer (seasonally thawed zone of soil) so as not to disturb permafrost;
- o minimize duration of exposure of unprotected soils;
- o grade and contour disturbed or excavated areas to prevent erosion; and
- o revegetate, as appropriate, disturbed areas upon completion of grading.

Impacts to topography will be twofold: (1) slightly higher elevations will be created in areas where debris will be landfilled, and (2) slightly lower elevations will be created in areas where debris is excavated or where barrow material is taken for debris cover. These minor impacts can be mitigated by grading and contouring disturbed areas to match the surrounding topography. The overall impact to topography is considered negligible.

The minor adverse effect on air quality will be localized and short term. Gaseous and particulate air pollution will result from open burning (where used as a disposal method) and from vehicle emissions. In addition, dust particles would enter the atmosphere during excavation and debris burial operations. Alaska Air Quality Standards are not expected to be exceeded.

5.2 Biological Resources

5.2.1 No Action Alternative

Under this alternative birds and small mammals will continue to become entangled in above-ground cable and wire and trapped in substances such as the spilled asphalt on the east side of the Gambell runway. In addition, barrels and other debris in the small lakes and streams may continue to contaminate them if not removed. This could negatively affect local fish and waterfowl productivity.

However, particularly in Northeast Cape, the debris and buildings provide nesting habitat in an otherwise barren area lacking habitat diversity.

5.2.2 Clean-up and Disposal of All Debris and Partial Clean-up and Disposal of Debris

There will be limited, localized vegetation disturbance resulting from the projects activities. The project areas have, for the most part, dirt roads connecting most sites; where debris must be removed in areas not adjacent to roads hand labor in combination with low surface pressure vehicles (Rolligons or equivalent) should be used to minimize disturbance to the wet or alpine tundra. In general, overland travel on the tundra should be minimized. All vegetated areas south of Troutman Lake should be avoided to the extent possible because these areas are an important subsistance resource for the local natives. Areas to be restored (such as landfill sites) should be graded and contoured with surrounding topography and fertilized and seeded, if appropriate. For example, the Gambell spit contains well-washed sands and gravels with little organic content and revegetation may not be appropriate; rather the soils could be graded and left to support natural plant succession. Revegetation should be used in areas where it is necessary to protect against hydraulic or thermal erosion, although neither of these were prominent in either project area.

Wildlife impacts will also be limited and localized and they will be short term. Short-term, negative impacts will be elimination of nest sites in buildings and debris and disturbance of birds and mammals by noise and movement from clean-up activities. Disturbance should be minimized around the bluff edges at the top of Sevoukuk Mountain because of the large populations of sea birds that nest on the bluffs. The use of overland vehicles and/or powered excavation equipment within 200 feet of the bluff edges at the top of Sevoukuk Mountain should be limited whenever possible to minimize the disturbance of nesting seabirds. Removal of barrels or communication wire on Sevoukuk Mountain slopes should be by hand, using small work crews.

Positive impacts to wildlife will occur from removal of entangling cable and wire and asphalt that entraps animals, with subsequent starvation. Fish and wildlife will benefit from removal of debris from the lakes and streams in the project area. When possible, debris in and along the shoreline and banks of lakes and streams (especially the small stream at Cargo Beach) should be removed by hand to minimize sedimentation, and soil and vegetation disturbance. All mitigation measures should be enforced by the Environmental Compliance Coordinator.

A significant long term beneficial impact with regard to water quality is anticipated under this alternative through the removal of existing and potential pollutants. Both surface water and groundwater quality are expected to improve. As discussed in Section 3.1.2.1.2, oil-contaminated soils, if non-toxic or hazardous, should not be excavated and removed, if possible, to avoid the greater negative impact of removing recovering native vegetation and intact soils.

5.3 Cultural Factors

5.3.1 No Action Alternative

Implementation of the No Action Alternative (Alternative 1) will have slight or moderate adverse impacts on aesthetics, historical and archeological resources, and socioeconomic conditions. With regard to land use, housing, and utilities, an adverse impact is anticipated in the Gambell project area, while a beneficial impact is anticipated in the Northeast Cape project area. No effect is anticipated with regard to governmental entities and community organizations, land ownership, demographic characteristics, transportation, and facilities and services.

The military debris in both the Gambell and Northeast Cape project areas is unsightly. The No Action Alternative would continue the adverse aesthetic (visual) impact of debris scattered over the landscape in both project areas.

The post World War II military constructions in the project areas may have some cultural or historical resource value, and should be assessed to determine the appropriate treatment for the resources. The existing post-World War II buildings at Northeast Cape currently are being scavenged for building materials by seasonal residents of the nearby hunting/fishing camp. In addition to this factor, natural decay and erosion will continue into the future at a fairly uniform rate and eventually will significantly diminish the scientific and humanistic value of these resources; however, the few concrete structures within the two project areas would remain well into the future.

With regard to socioeconomic conditions, the primary adverse impact is that there would be no stimulus to the local economy from the presence of the contractor and workers on the Island during clean-up, disposal and restoration activities. In addition, implementation of the No Action Alternative would continue the safety and health hazards in the project areas due to dilapidated structures, dangerous debris, and hazardous substances. It would also continue the negative feelings of the Gambell and Savoonga communities toward the military since the communities would like to see the debris removed. Implementation of the No Action Alternative is not expected to affect the subsistence lifestyle of the inhabitants of St. Lawrence Island.

In Gambell, a moderate adverse impact on land use, housing, utilities, and overall development potential is anticipated where land is scarce near the community center. The presence of military debris may preclude future development of these areas for housing, utility systems or community facilities. Conversely, at the Northeast Cape project area, a beneficial impact would result from implementation of Alternative 1. Natives from Gambell and Savoonga currently using the abandoned military buildings in the cargo beach area for a hunting/fishing camp would continue to be able to do so.

The No Action Alternative may have a slight adverse effect on the future development of a land use plan for Gambell by the Alaska Department of Community and Regional Affairs, since it might preclude more suitable uses of some land within the municipal boundaries on which military debris is located. This alternative will have a similar impact on the future development of an island-wide land use plan by the Kuskokwim Planning and Management Corporation. Implementation of this alternative will have no effect on the Coastal Management Plan under development by the Bering Straits CRSA Board of the overall economic development program for the Bering Straits region developed by Kawerak, Inc.

5.3.2 Clean-up and Disposal of All Debris and Partial Clean-up and Disposal of Debris

Implementation of Alternative 2 will have no effect on governmental entities and community organizations, land ownership, demographic characteristics, transportation, or utilities. Slight adverse impacts are expected with regard to historical and archeological resources and facilities and services. Beneficial effects are anticipated on aesthetics and socioeconomic conditions with regard to land use and housing, a beneficial impact is anticipated in the Gambell project area. Structures have been identified at the Northeast Cape cargo beach area for the contractor to leave standing. This will allow the continued benefit for use of the area as a hunting/fishing camp by the Island's natives.

Based on the results of literature review, a search of the Alaska Heritage Resource Survey (AHRS) file, interviews with local residents and knowledgeable professionals, and an on-site archeological survey within project impact areas, direct impacts to significant archeological and historical properties could result from the following planned activities:

- o removal of subsurface debris within areas known or reported to contain human burials;

- collection of surface debris, such as 55-gallon barrels and cable wire, within or adjacent to the boundaries of the archeological sites at Gambell that are part of the National Historic Landmark;
- extensive ground disturbance in areas that contain currently unknown archeological resources;
- demolition of post-World War II structures or objects that may have historical importance; and

In addition, indirect impacts to archeological resources would result if clean-up personnel collected artifacts from these highly visible resources at both Gambell and Northeast Cape sites.

The following mitigating measures are recommended to avoid or minimize potential adverse effects on archeological and historical resources:

- Debris within the boundaries of known archeological sites should either be left in place or removed by hand. Heavy equipment or vehicles should not be used within, or in close proximity to, archeological site boundaries.

- Subsurface debris within areas known or reported to contain burials should be left in place or removed with caution. To the extent possible, ground disturbance should be confined to areas that have been previously disturbed during original debris burial. An archeological monitor should be on-site during work in these areas.

- A Programmatic Memorandum of Agreement (PMOA) for the treatment of cultural resources that could be impacted by ERDA that was developed between the Corps of Engineers (Alaska District), the Alaska State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the National Park Service. As specified in this document, a representative work group should assess the post-World War II structures within the project areas to determine the appropriate treatment for these resources.

- Contractor activities should be confined to areas defined by work schedule, drawings, and specifications. Land-use permits should specify that no archeological materials are to be collected or disturbed.

- Off-road vehicular travel should be minimized; access routes should be delineated so as to avoid highly visible archeological sites to the maximum extent possible.

- Clean-up, removal, and demolition activities should be monitored by a professional archeologist.

- If currently unknown cultural resources are discovered during construction, activity should be halted in the immediate vicinity and procedures followed as outlined in the Corps of Engineers, Alaska District's Emergency Recovery Plan.

- o A burial ground policy for the treatment of human remains encountered during debris removal should be formulated in consultation with the Native Corporations prior to project initiation.

- o The project includes provisions for a new landfill site at Gambell and a borrow area at Northeast Cape. The areas selected for these purposes must receive cultural resources clearances prior to their use.

Existing facilities and services in Gambell are limited, and at Northeast Cape, they are non-existent. Clean-up and restoration activities may have a slight indirect adverse affect on these resources in Gambell as non-local workers stress the limited facilities and services to capacity.

Debris clean-up and restoration will provide a significant visual aesthetic improvement to the environment. Total clean-up of unsightly debris and restoration of the project areas to their condition prior to military use will result in significant aesthetic enhancement.

In the Gambell area, a beneficial impact would occur with regard to land use and housing. The removal of military debris, particularly the debris within the municipal boundaries, would increase the capacity for housing and commercial property development, ultimately providing a more suitable use of the land. In the Northeast Cape project area, however, some of the abandoned military structures that are currently being used by the natives would be removed, creating an adverse impact on existing land use and housing in that area.

A significant beneficial impact on socioeconomic conditions is anticipated under this alternative. This would occur through the removal of hazards to the health and welfare of the native population, and through the stimulus to the local economic due to expenditures by the contractor and workers on the Island, and potential hire of local natives.

6.0 Permitting

Authorization and permits necessary for this project would include, but not necessarily be limited to, the following:

Alaska Department of Environmental Conservation

- o Air Quality Control Permit to Open Burn. Applications should be submitted to the regional ADEC office five days prior to burning.

- o Air Quality Control Permit to Operate. Applications should be filed 30 days prior to commencement of operations.

- o Solid Waste Disposal Permit. Applications should be submitted at least 60 days prior to the commencement of operations.

Sivuqaq, Inc. and Savoonga Native Corporation

- o Right of Entry

U.S. Environmental Protection Agency

7.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusion of this Environmental Assessment is that the proposed action with recommended mitigation, would not have significant negative effect upon the quality of the human environment. The project would have several significant beneficial effects, particularly in the areas of local economy, aesthetics, and health and safety. Hence, a Finding of No Significant Impact (FONSI) will be prepared. The EA and the FONSI shall be distributed to the public and concerned agencies, and all comments received during the review period will be considered prior to completion of the NEPA process.

8.0 LIST OF AGENCIES AND PERSONS CONTACTED

The State and Federal agencies and regional and local organizations identified below were contacted concerning the Corp's proposed clean-up and restoration activities on St. Lawrence Island. Whenever possible, the specific agency representatives consulted and individuals present at meetings are identified.

FEDERAL AGENCIES

U.S. Air Force	John Cloe
U.S. Fish and Wildlife Service	Wayne Crayton Dennis Money
U.S. Environmental Protection Agency	Jack Gusmano
U.S. Public Health Service	
U.S. Geological Survey	Tim McEllione Pat Stielakos

STATE AGENCIES

Alaska Department of Environmental Conservation	Jeff Mach Dennis Ward Bruce Erickson Simon Mawson
Alaska Department of Fish and Game	Glenn Seaman Al Townsend Robert Nelson
Alaska Department of Community and Regional Affairs	Nelda Warkinten Elizabeth Beason
Alaska Department of Natural Resources Geological and Geophysical Services Division	Larry Dearborn
Parks and Outdoor Recreation Division History and Archeology	Tim Smith Paul Chattey Stephanie Stirling

REGIONAL AND LOCAL ORGANIZATIONS

Bering Straits Coastal Management Program	Bryan MacLean
Savoonga Native Corporation	Muffy Iya Joe Iya Bradley Holigryn

Sivuqaq, Inc.	Robert Tongiyan Morgan Apatiki Delbert Oozevaseuk Shirley Antoghame Edna Apatiki Merlin Koonooka Melvin Walunga
Native Guides	Winifred James Conrad Oovik Joe Noongwook

OTHER

Kuskokwim Management	Larry Kimball, Jr. Tom Black
University of Alaska, Fairbanks	Wendy Arundale Bud Fay

9.0 REFERENCES

Ackerman, R.E. 1984. "Prehistory of the Asian Eskimo Zone." Handbook of North American Indians, Volume 5: Arctic. Edited by David Damas, Smithsonian Institution, Washington.

Ackerman, R.E. 1961. "Archaeological Investigations Into the Prehistory of St. Lawrence Island, Alaska." Unpublished Ph.D. Dissertation, University of Pennsylvania. University Microfilms International, Ann Arbor, Michigan.

Bandi, H.-G. 1967. "Preliminary Report on the St. Lawrence Island Archaeological Field Project 1967 of the University of Berne/Switzerland and the University of Alaska." Ms. on file at the Office of History and Archaeology, Division of Parks and Outdoor Recreation, Anchorage, Alaska.

Bandi, H.G. 1969. "Eskimo Prehistory." University of Alaska Press, College.

Bandi, H.G. and J. Burgi. 1971/1972. "Graben der Punuk-Kaltur bei Gambell auf der St. Lorenz Insel, Alaska." Sonder druck aus dem Jahrbuch des Bernischen Historischen Museums, S1 und S2. Jahrgang 1971 and 1972.

Bedard, J. 1969. "The Nesting of the Least, Crested, & Parakeet Auklets Around St. Lawrence Island, Alaska." Condor 71(4): 386-398.

Bering Straits Coastal Resource Service Area Board. 1984. "Bering Straits Coastal Management Program, Volume I - Resource Inventory." Prepared by Northern Resource Management and Yeti Map Studio.

Bering Straits Coastal Resource Service Area Board. 1984. "Bering Straits Coastal Management Program, Volume II - Management Plan." Prepared by Northern Resource Management and Yeti Map Studio.

Bowers, P.M. 1975. "Preliminary Archaeological Survey of the Proposed State School at Gambell, St. Lawrence Island." Prepared for the Alaska Division of Buildings and the Gambell Village School Board.

Collins, H.B. 1937. "Archaeology of St. Lawrence Island, Alaska." Smithsonian Miscellaneous Collections 96 (1).

Cloe, J.H. with M.F. Monaghan. 1984. "Top Cover for America: The Air Force in Alaska 1920-1983." Anchorage Chapter - Air Force Association and Pictorial Histories Publishing Company.

Crowell, Aron L. 1985. "Archaeological Survey and Site Condition Assessment of Saint Lawrence Island, Alaska." Prepared for the Smithsonian Institution, Washington D.C., and Sivuqaq, Inc., Gambell, Alaska.

Environmental Services Limited. 1980. "Gambell Community Planning Profile." Prepared under contract with the Alaska Department of Community and Regional Affairs, Division of Community Planning.

Environmental Services Limited. 1980. "Savoonga Community Planning Profile." Prepared under contract with the Alaska Department of Community and Regional Affairs, Division of Community Planning.

Geist, C.W. and F.G. Rainey. 1936. "Archaeological Excavations at Kukulik, St. Lawrence Island, Alaska." Miscellaneous Publications of the University of Alaska. 2: 1-391.

Giddings, J.L. 1960. "The Archeology of Bering Strait." Current Anthropology. 1 (2): 121-138.

Holmes, C.E. and R.O. Stern. 1983. "Cultural Resources Survey: Gambell Evacuation Route, St. Lawrence Island." Prepared for Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, Anchorage, Alaska.

Jones, B.K. and R.B. Forbes. 1976. "Geology and Mineral Resources of the St. Lawrence Island Reserve, Alaska." Prepared for the Bureau of Indian Affairs, U.S. Department of the Interior. Geophysical Institute, University of Fairbanks, Alaska.

Magdanz, J.S. 1981. "Northern Bering Sea Subsistence Report." Technical Paper Number 4. Alaska Department of Fish and Game, Division of Subsistence.

Marston, Muktuk. 1969. "Men of the Tundra." October House Inc., New York.

Murie, O.J. 1936. "The Birds of St. Lawrence Island, Alaska." Alaska University Publications 2:359-376.

Overall Economic Development Committee of the Bering Straits Region. 1980. "Bering Straits: An Overall Economic Development Plan."

Patton, W.W., Jr. and B. Csejkey, Jr. 1980. Geological Map of St. Lawrence Island, Alaska. U.S.G.S. Miscellaneous Investigation. Map I-1203.

Patton, W.W., Jr. and B. Csejkey, Jr. 1971. "Preliminary Geologic Investigations of Western St. Lawrence Island, Alaska." U.S.G.S. Professional Paper 684-C.

Selkregg, L.L. 1974. "Alaska Regional Profiles: Northwest Region."

Starr, S.I., M.N. Kuwada, and L.L. Trasky. 1981. "Recommendations for Minimizing the Impacts of Hydrocarbon Development on the Fish, Wildlife, and Aquatic Plant Resources of the Northern Bering Sea and Norton Sound." Alaska Department of Fish and Game.

University of California. 1959. "An Ecological Analysis of the Avifauna of St. Lawrence Island Alaska." University of California Press, Berkeley and Los Angeles. Volume 63, No. 2, pp. 73-150.

U.S. Air Force. 1982. "The Aircraft Control and Warning System in Alaska." Ms. on file, Office of History, Alaska Air Command, Elmendorf AFB, Alaska.

U.S. Department of the Interior. 1977. "Gambell: It's History, Population, and Economy." Bureau of Indian Affairs, Planning Support Group. Report No. 243.

U.S. Department of the Interior. 1982. "Proposed Outer Continental Shelf Oil and Gas Lease Sale, Norton Sound: Final Environmental Impact Statement." Prepared by the Bureau of Land Management.

U.S. Department of the Interior. "Savoonga: It's History, Population, and Economy." Bureau of Indian Affairs, Planning Support Group. Report No. 242.

U.S. Fish & Wildlife Service. 1980. "Field Report for the Walrus Project at Savoonga, Alaska on St. Lawrence Island -- May to June, 1980.

U.S. Fish & Wildlife Service, 1985. "Environmental Assessment of Defense Environmental Restoration Program Activities on St. Lawrence Island."

U.S. Geological Survey. 1972. Metallic Mineral Resources Map of the St. Lawrence Quadrangle, Alaska. Compiled by Edward H. Cobb. Miscellaneous Field Studies Map. MF-465.

Waller, R.M. 1959. "Water Resources Reconnaissance of Gambell and Savoonga Villages St. Lawrence Island, Alaska." Prepared by the U.S. Geological Survey in Cooperation with the Alaska Department of Health and the Alaska Rural Development Board.

Yesner, D.R. 1976. "Archaeological Reconnaissance of the Proposed Public Health Service Water System at Gambell, St. Lawrence Island, Alaska, July - August 1976." Prepared for Office of Environmental Health, Public Health Service, Anchorage, Alaska.

PLATE #1 - OIL/FUEL SPILL ON TOP OF SEVOUKUK MOUNTAIN, APPROXIMATELY 100' X 150' IN SIZE. SOIL SAMPLE DESIGNATION SS 2 G (SEE FIG. 2-1)

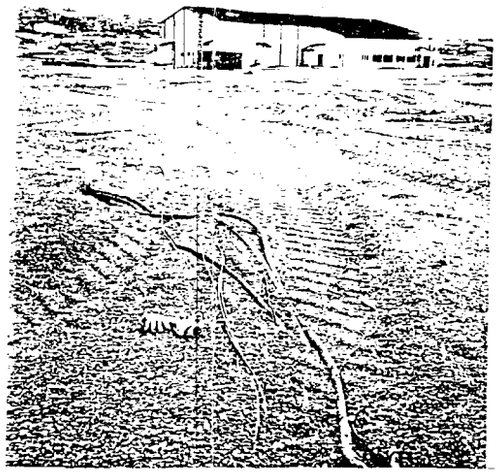


PLATE #2 - OLD MILITARY COMMUNICATION CABLE IN GAMBELL TOWNSITE, NORTH WEST OF PUBLIC HEALTH SERVICE PUMPHOUSE (BACKGROUND)

PLATE #3 - 55 GALLON BARRELS IN ARCHEOLOGICAL MIDDEN. NOTE GAMBELL TOWNSITE BUILDINGS IN BACK GROUND

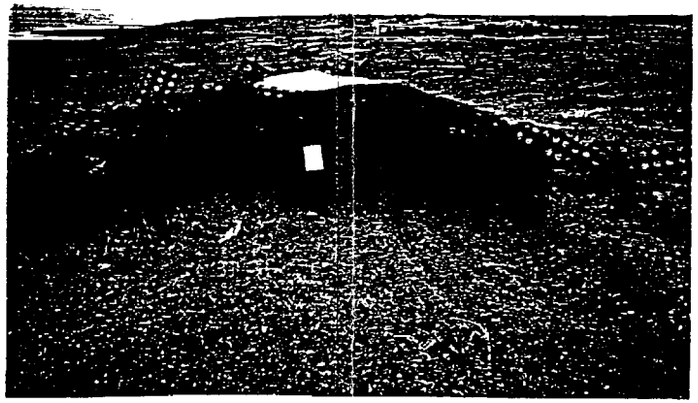


PLATE #4 - TYPICAL DEBRIS, METAL RUNWAY MATTING & 55 GALLON BARRELS (BACKGROUND). LOCATION IS EAST SIDE OF GAMBELL RUNWAY.

URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**Typical Gambell Project Area** **Plates #1, #2, #3 & #4**

PLATE #5 - DECAYING 55 GALLON BARRELS CONTAINING TAR ALONGSIDE GAMBELL RUNWAY. SEE "9" IN TRIANGLE, FIGURE 2-2.

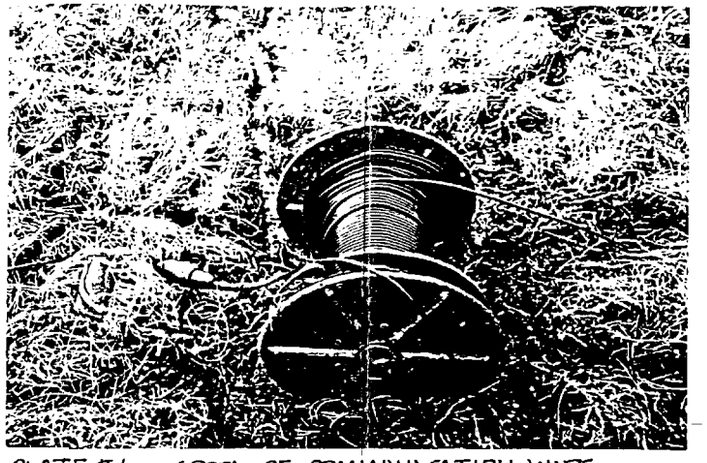


PLATE #6 - SPOOL OF COMMUNICATION WIRE, CONNECTING LINES THAT GO UNDERGROUND ON RIGHT & LEFT. ON LOWER SLOPES OF SEVOUKUK MOUNTAIN, SOUTHEAST OF TROUTMAN LAKE.

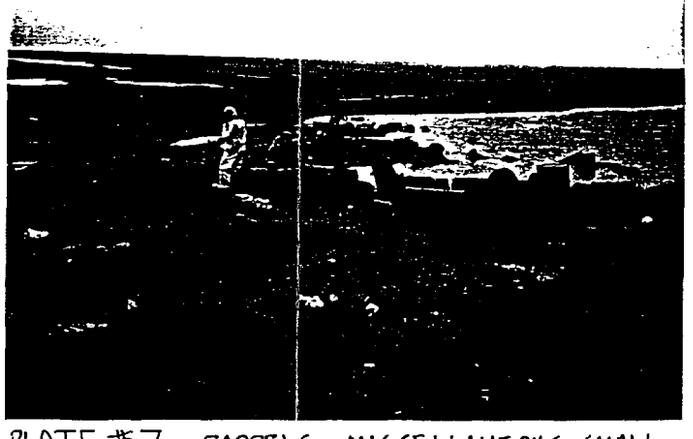


PLATE #7 - BARRELS, MISCELLANEOUS SMALL DEBRIS AT NORTHERN TIP OF NAYVAGHAG LAKE. (AT HIGH WATER LEVEL)

URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**Typical Gambell Project Area** **Plates #5, #6 &#7**

PLATE #8 - NORTHEAST CAPE HOUSING & OPERATIONS AREA.
THREE DIESEL STORAGE TANKS ON LEFT.

URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**Typical N.E. Cape Project Area** **Plate #8**

PLATE #9 - TYPICALLY DECAYED NORTHEAST CAPE HOUSING & OPERATIONS AREA BUILDING INTERIOR.

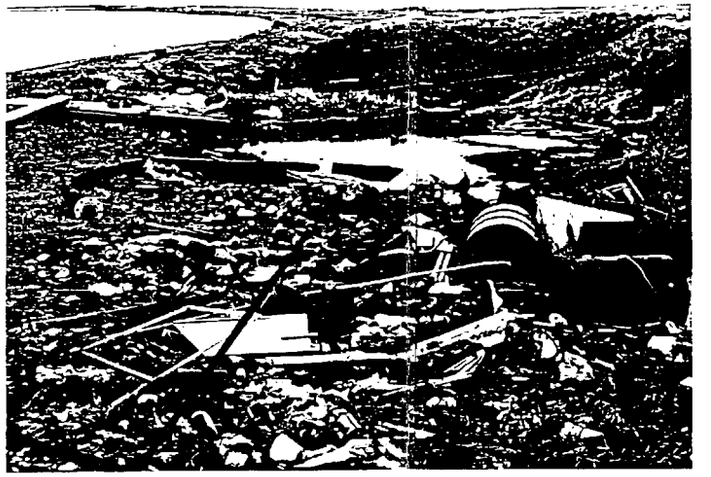


PLATE #10 - DEBRIS ALONG THE CARGO BEACH, NORTHEAST CAPE.

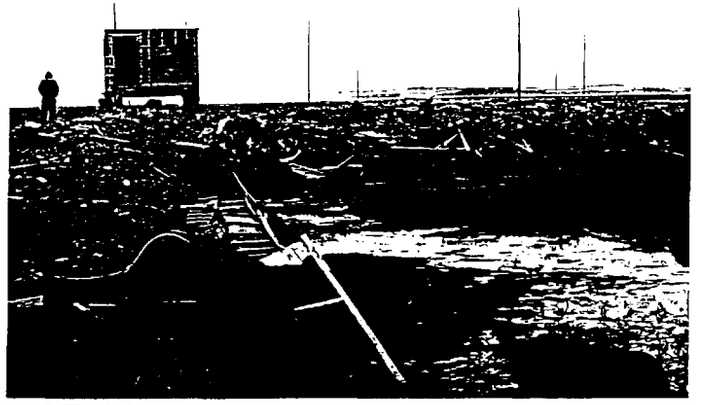


PLATE #11 - RECEIVER BUILDING REMAINS & DEBRIS AROUND PERIMETER OF PAD AT POND'S EDGE, N.E. CAPE.

PLATE #12 - AIRPORT TERMINAL & WEATHER STATION BUILDING, N.E. CAPE.

URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**Typical N.E. Cape Project Area** **Plates #9, #10, #11 & #12**

PLATE #13 - DEBRIS IN & NEAR SMALL STREAM AT CARGO BEACH, N.E. CAPE.

PLATE #14 - CARGO BEACH LOOKING WEST FROM WHERE ROAD THAT LEADS TO HOUSING & OPERATIONS AREA BEGINS.

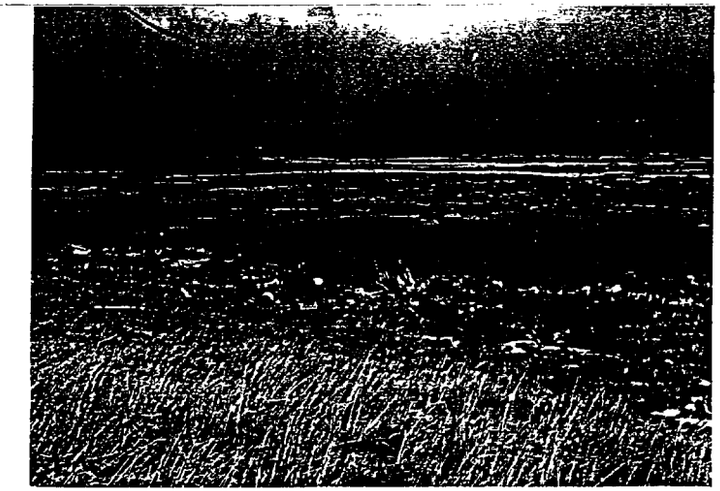
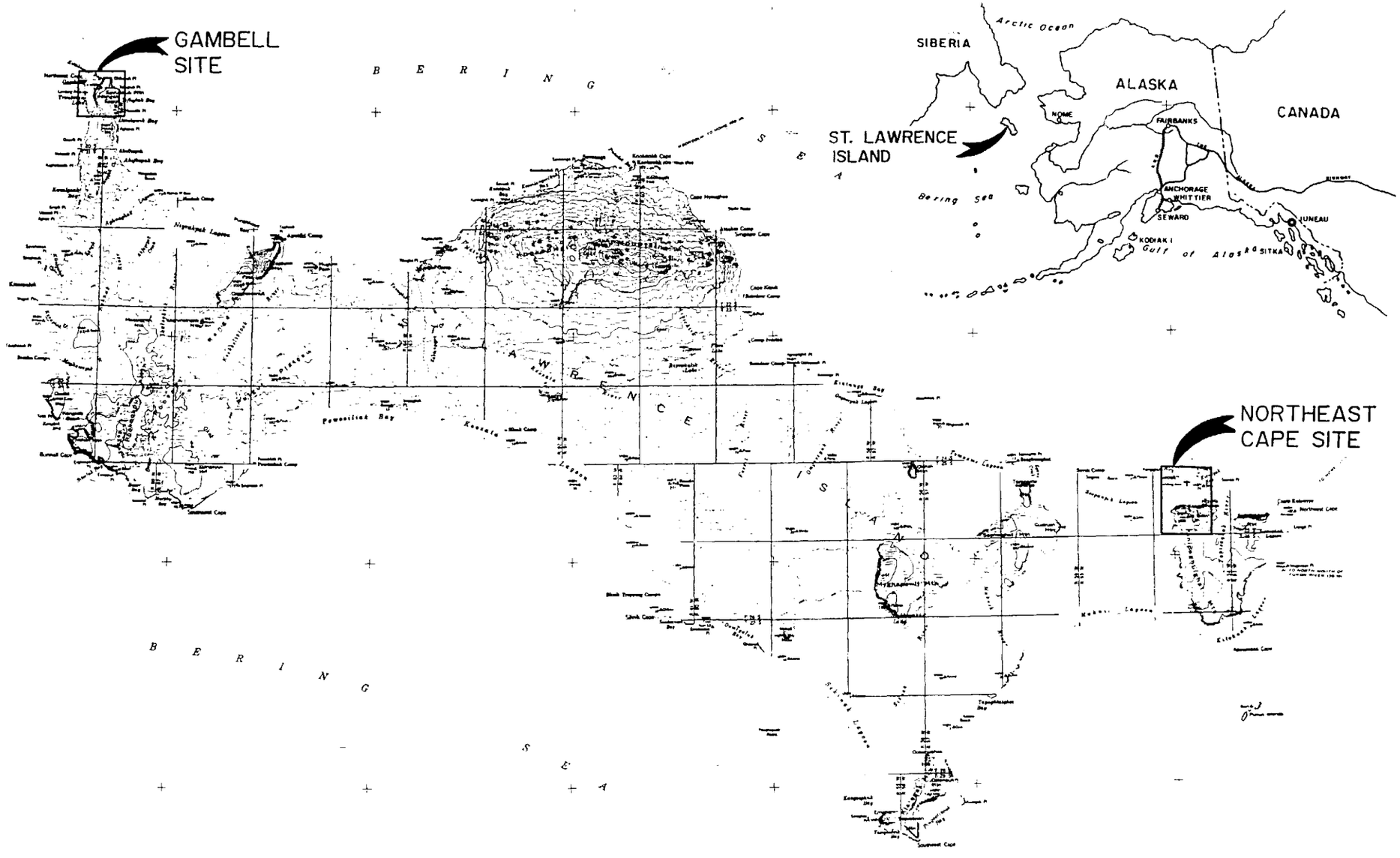


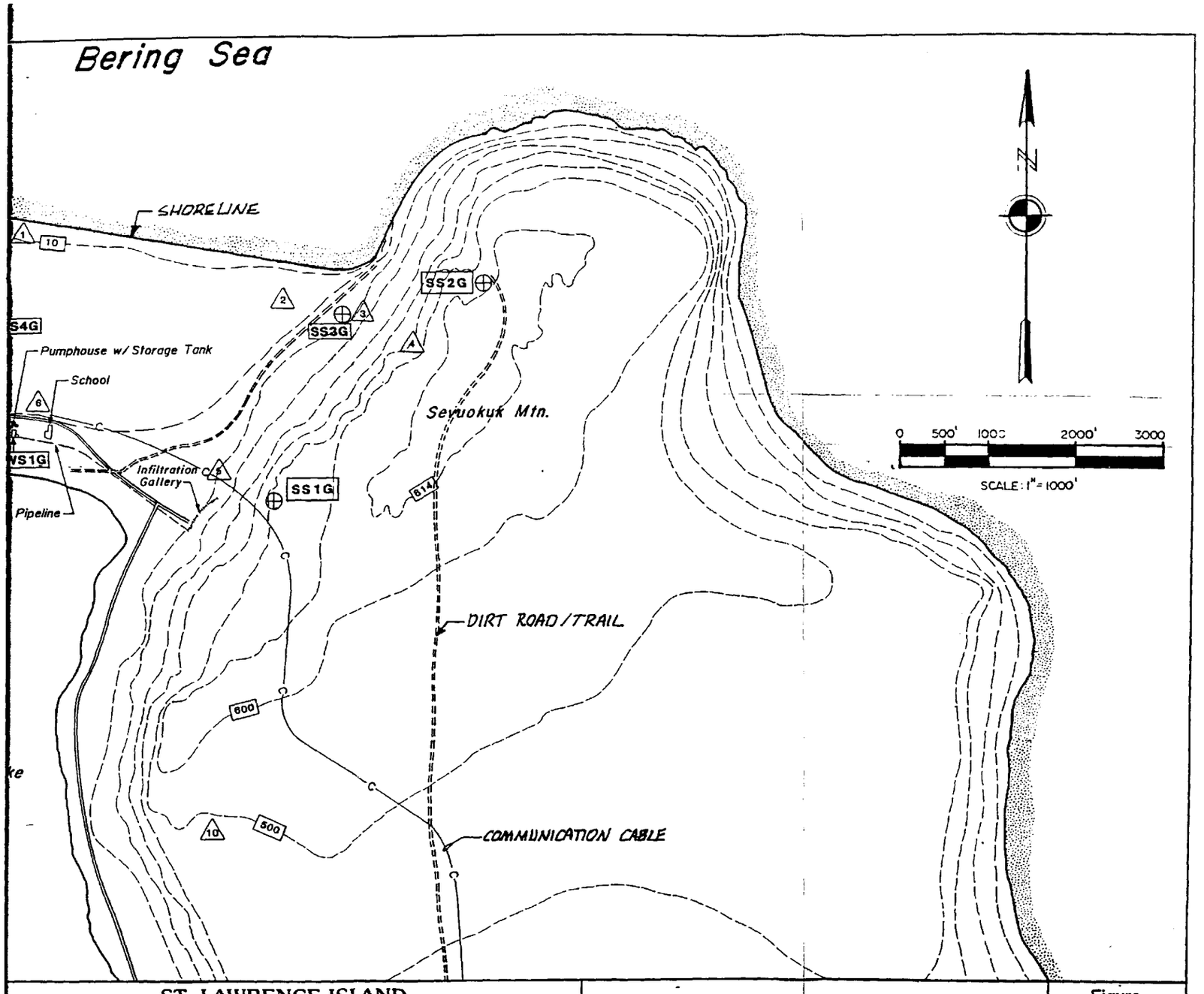
PLATE #15 - DEBRIS IN ABANDONED LANDFILL ALONG CARGO BEACH ROAD. NOTE DEBRIS AROUND POND'S EDGE & BARRELS IN THE WATER.

PLATE #16 - DEBRIS IN AN ABANDONED LANDFILL ALONG THE CARGO BEACH ROAD.

URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**Typical N.E. Cape Project Area** **Plates #13, #14, #15 & #16**



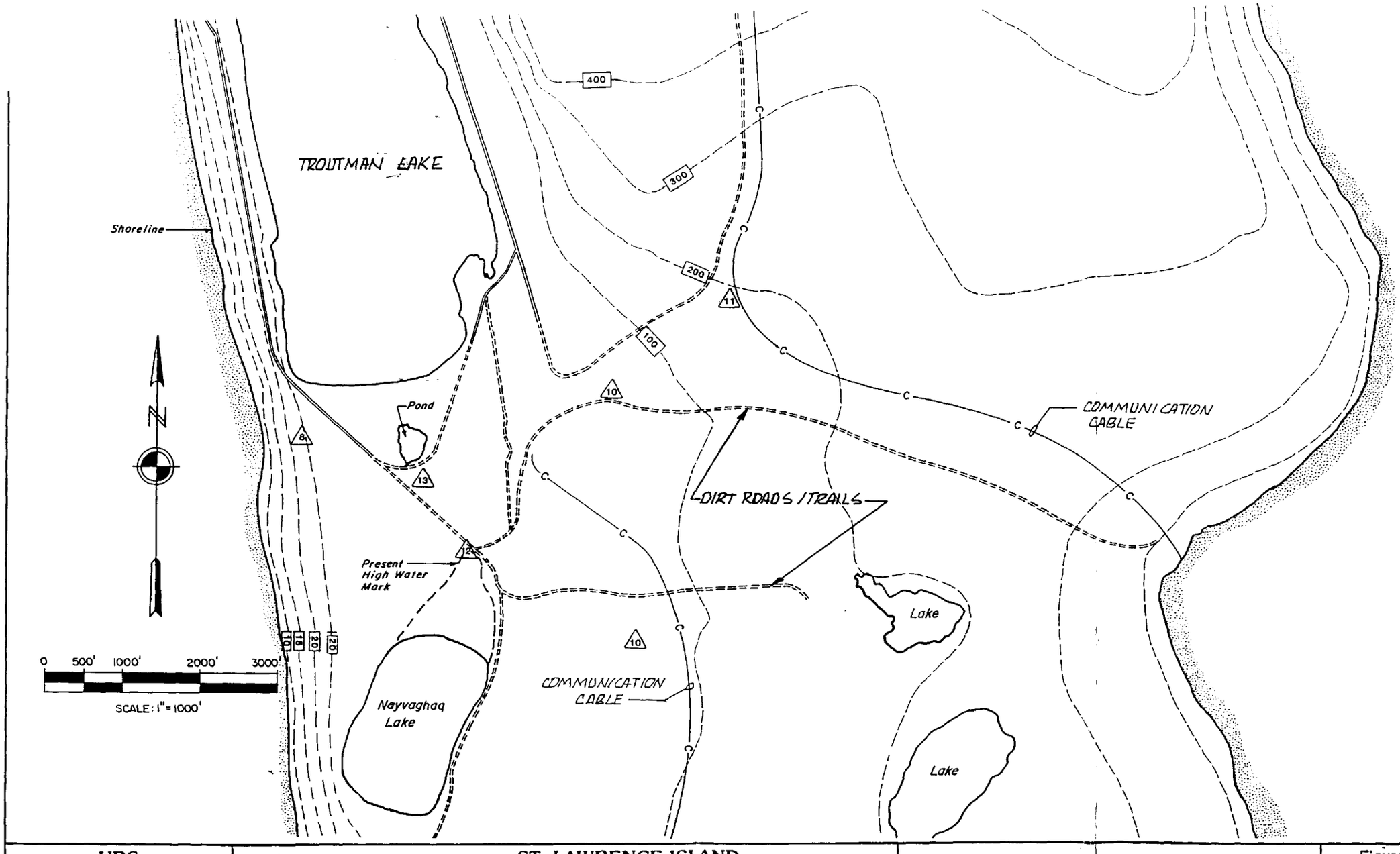
URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985		ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**LOCATION & REGIONAL MAP**	Figure **2-1**



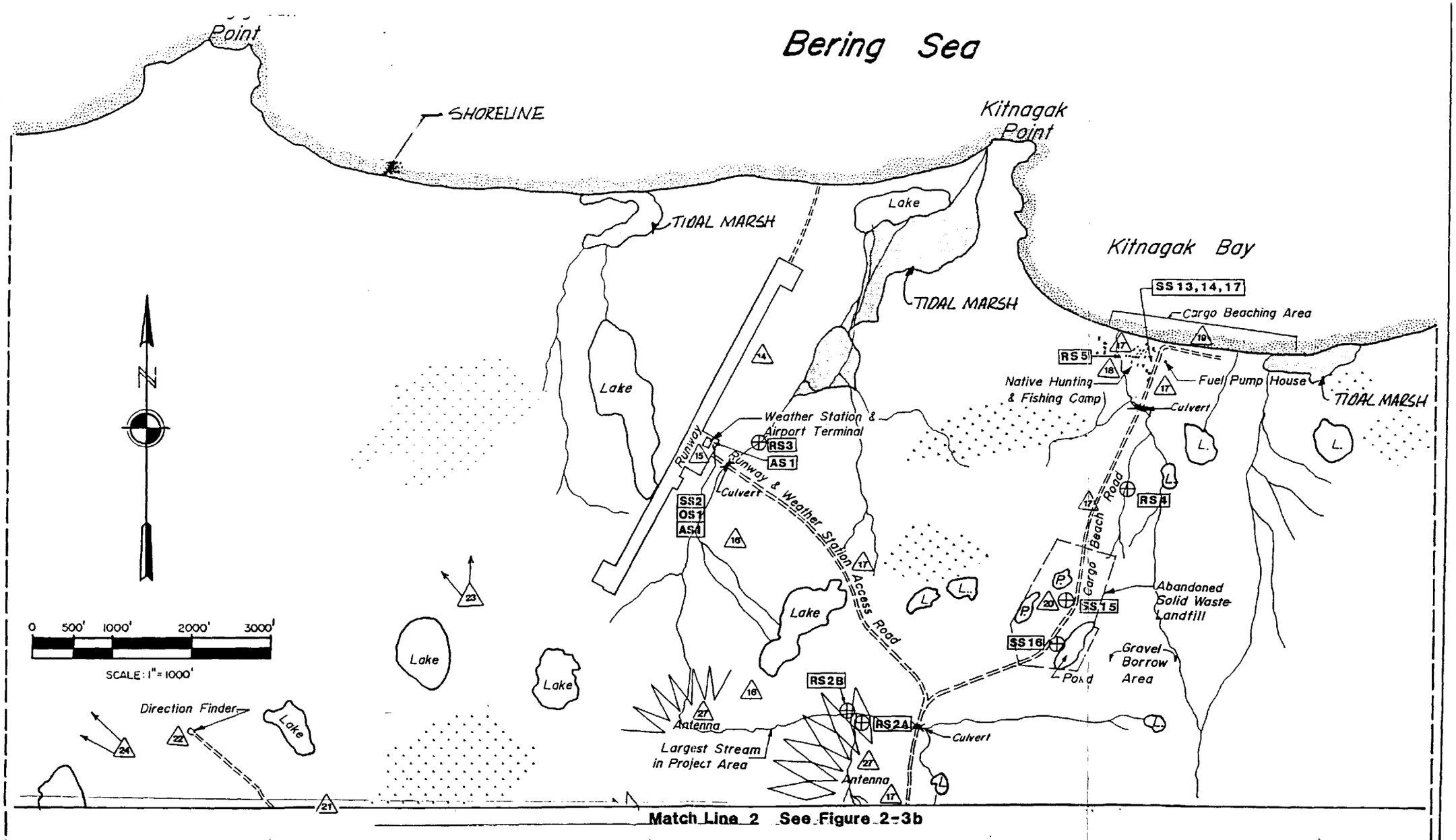
ST. LAWRENCE ISLAND
DEBRIS DISPOSAL & SITE RESTORATION
DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT
ALASKA DISTRICT—CORPS OF ENGINEERS

GAMBELL PROJECT Area

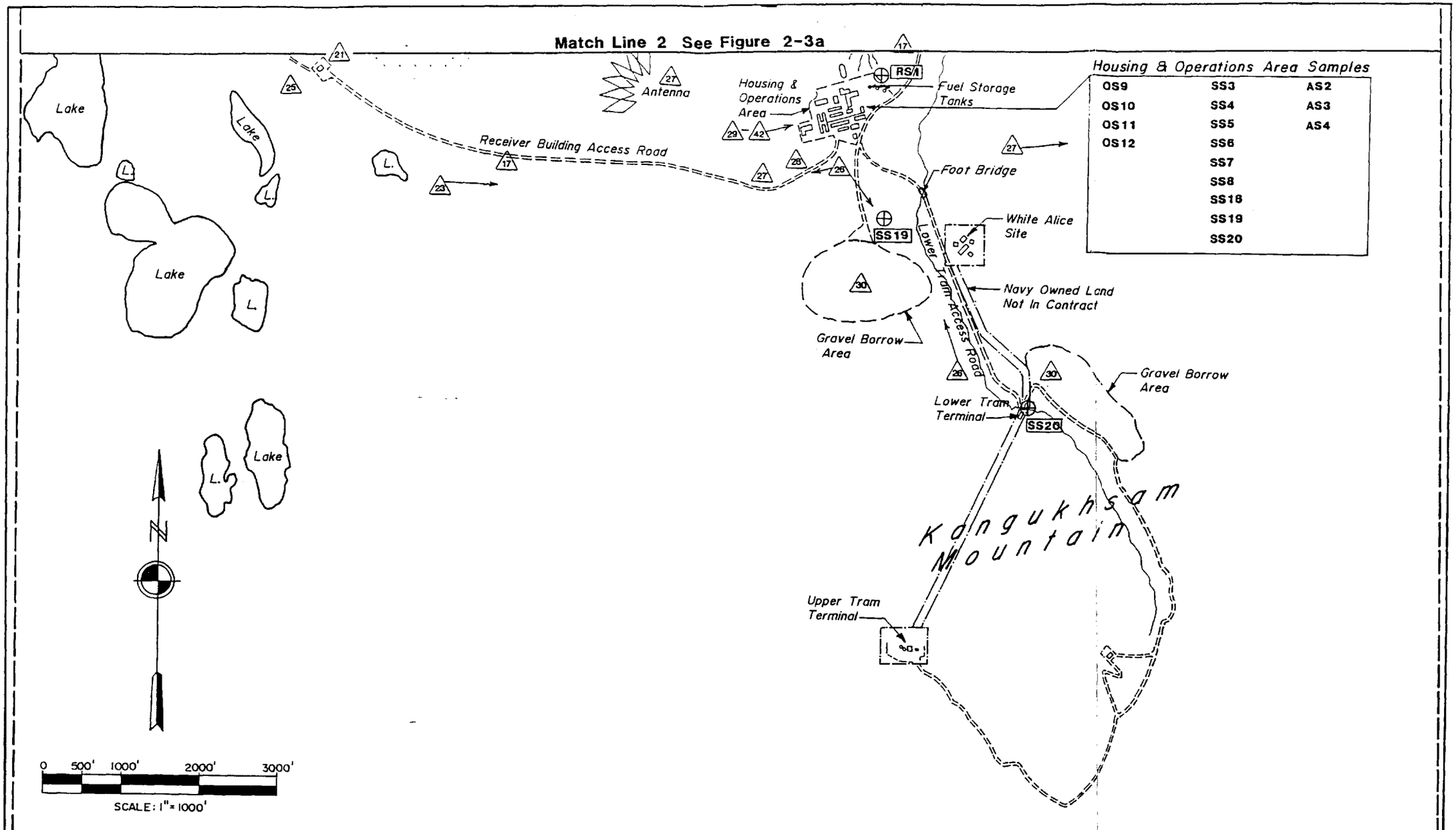
Figure
2-2a



URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**GAMBELL PROJECT Area**	Figure **2-2b**



URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**NORTHEAST CAPE PROJECT AREA**	Figure **2-3a**



URS CORPORATION ANCHORAGE, ALASKA AUGUST, 1985	ST. LAWRENCE ISLAND DEBRIS DISPOSAL & SITE RESTORATION DEFENSE ENVIRONMENTAL RESTORATION ACCOUNT ALASKA DISTRICT—CORPS OF ENGINEERS	**NORTHEAST CAPE PROJECT AREA**	Figure **2-3b**

Appendix A

Detailed Debris List

APPENDIX A

SITE #	DESCRIPTION
1	The north beach area contains primarily scattered metal debris, consisting of empty 55 gallon barrels and landing mat. A concentrated cache of debris lies adjacent to Gambell's existing landfill site, containing barrels, piping, landing mat, and miscellaneous metal debris.
2	This area is reported to have been the site of a former Army base, much of which was buried on-site when the military abandoned the site in the 1950's. The site is reported to contain several buried pieces of heavy equipment, and mounds of buried debris are visible over approximately ten acres. Miscellaneous debris is visible at the surface, including metal and concrete. Historical information indicates that ordnance was buried in the southern portion of this area, reported to be cases of carbine and machine gun ammunition; approximate location may be obtained from the Contracting Officer.
3	The northern portion of the site is reported to have been a base power station, utilizing large capacity storage batteries and little surface evidence remains. Several empty 300 gallon fuel storage tanks, empty 55 gallon barrels, and miscellaneous metal debris are visible at the surface and surrounding hillside.
4	The top of Sevuokuk Mountain was the site of a number of small Army, Navy, and Air Force installations, primarily used for communications activities. The site contains scattered debris consisting of metal, wood, cable (galvanized, power, and communication), concrete, and approximately twenty 55 gallon barrels. Major features include several collapsed quonset huts, a barb-wire encircled bunker area, a small wood frame building, and three small electrical transformer casings.
5	The site encompasses a former tramway site, the majority of which was removed by the military. Remnants of steel cable remain along the hillside, as well as miscellaneous metal debris. Six separate communication cables and two power cables extend from the City of Gambell to the top of Sevuokuk mountain, passing through a midden near the foot of the mountain.
6	Site 6 is reported to have been a refuse disposal site for the military, including the burial of approximately 3000 55 gallon barrels of human waste. Little surface evidence exists of the site, but metal deposits were identified by

SITE #	DESCRIPTION
	use of a magnetometer. Community concern exists over the proximity of the site to the city and the future intent to utilize that general area for expansion of the city.
7	The site is reported to be the location of a former power station operated by the military. Following demolition of the facility, electrical equipment, including transformers, are believed to have been buried on-site. Little surface evidence, other than a single screw anchor, exists; however, metal deposits were identified by use of a magnetometer. Exact nature of the debris is not known. A concrete slab, approximately 20' x 20'; is exposed at the surface.
8	The west beach area contains scattered debris consisting primarily of metal (barrels, landing mat), as well as small quantities of wood and concrete. The major concentrations of debris lie near and along the existing runway. Historical information indicates that ammunition and hand grenades were buried on site south of Troutman Lake. Approximate location may be obtained from the Contracting Officer.
9	This site contains a storage area with approximately 220 55-gallon barrels of asphalt, portions of which have formed a spill as the containers have deteriorated. Approximately 10% of the barrels are intact; the remainder vary in condition and are generally severely deteriorated. The containerized asphalt and spill area shall be cleaned and removed from the island for final disposal.
10	The trail systems indicated in the drawings are marked by empty 55 gallon barrels in varying conditions located approximately every 200 feet. Additional miscellaneous debris is scattered along the route.
11	The communication cable systems indicated on the plans extend across the top of Sevuokuk Mountain, lying upon the tundra surface. Metal spools lie approximately every 1000 feet along the cables.
12	This site was utilized as a surface refuse disposal area, containing approximately three hundred fifty 55 gallon garbage barrels and empty POL barrels, discarded automotive batteries and miscellaneous debris. About 35% of the barrels contain garbage. During high runoff periods, Nayvaghaq Lake extends to the edge of this disposal area. Garbage barrels range from full to nearly empty, with most containing an average of 35% of barrel volume.

SITE #	DESCRIPTION
13	Having once served as a radar installation for the military, the area south of Troutman Lake contains a number of buried towers and a former power station site. Little evidence of the installation remains; scattered surface debris and debris burial mounds are located in the area, as well as excavation scars from past military activities which will be graded during this project. During demolition of the power station, it is possible that electrical transformers were buried on-site.
14	Miscellaneous debris around and near airstrip. Mostly metal including a sled, landing mat, an old backhoe, and small amount of cable. Wood debris includes signs, windsock stands, a small shack, and approximately 16 wood poles.
15	Terminal building site consists of one two story building with overall dimension of approximately 20'x60'. This includes a two door garage and the main attached building. Garage has a full concrete slab floor and foundation. Main building has full concrete foundation. On the east side of terminal building is a 9'x6' transformer building with 3 Westinghouse transformers containing PCB contaminated dielectric oil. All buildings are of wood construction and the terminal building has transite (asbestos) siding. On the grounds around the site is one 6000 gallon fuel tank, one 80' steel antenna with a 3 yard concrete foundation, eight 50' power poles and assorted wire, wood and metal debris.
16	5400' power transmission line running from airstrip to Housing/Operations area. Line includes 3 - 1" power lines supported with a ½" galvanized cable on 20' wood poles at 150' intervals.
17	Miscellaneous debris alongside or near road system. Debris includes: 4" metal pipeline running from pumphouse at Cargo Beach to fuel tanks at Housing/Operations area; road marker barrels between Housing/Operations area, airstrip and Cargo Beach; 13-20' wood poles located north of White Alice site; miscellaneous debris and nearly one hundred 55 gallon barrels near roads, approximately 50 of these barrels lie between Receiver Building and Direction Finder Building.
18	This site is located where cargo was transferred on and off barges and boats. It was also used as a summer camp for employees of the base, and a fishing, hunting and trading camp for the local natives. There are 27 one story wood framed buildings in varying states of decay still on the site. Thirteen of these buildings are to be left on site

SITE #	DESCRIPTION
	for use by owners. All the buildings to be removed have mud sill foundations resting on tundra. There are an additional ten buildings on the site which have completely deteriorated. On site, there is also a 6000 gallon fuel tank, two old trucks, approximately 675 55 gallon barrels, and scattered miscellaneous debris. An extensive area of PCB contaminated soil exists at the site.
19	The site is a sandy and loose gravel beach stretching 1 mile to the east of the Cargo Beach access road and ½ mile to the west of the road. The beach area is littered with approximately three hundred 55 gallon barrels, landing mat, wood assorted debris and a D-6 CAT and blade. The beach area can be traveled with all terrain vehicles. PCB contaminated soils exist at the site. Nine 1-gallon cans of potentially PCB contaminated dielectric oil were found and marked.
20	Site of existing solid waste dump. Debris is scattered over an estimated 16 acres. The debris includes nearly 6,000 55 gallon barrels of which approximately 8% are suspected to contain POL's. The main dump site is in a 6 acre area in the south of the 16 acre site. PCB contaminated soils exist at the site.
21	The site has been burned and the debris pushed to the sides of the gravel pad which is bordered by tundra. The general site encompasses approximately 5 acres and the only remaining structure is approximately 12' x 20' one story reinforced concrete building with 10" thick walls, roof, and an 18" thick floor slab. The general area contains approximately 2,000 55 gallon barrels. Also, there is approximately 500 cubic yards of assorted metal, wood and miscellaneous partially buried debris on the site. The site is located 1.5 miles west of the Housing and Operations area.
22	The site has been burned and the debris pushed to the sides of the gravel pad which is bordered by tundra. The site encompasses approximately 3 acres. The only remaining structure is a 20'x30' concrete slab. The ground in the general area is scattered with 35 55 gallon barrels, metal, and wood debris. Amongst the buried debris is a transformer casing assumed to be PCB contaminated. The site is located approximately ½ mile west of receiver station and 1.9 miles west of the Housing and Operations area.

SITE #	DESCRIPTION
23	One 5000' and two 8000' single line antennas consisting of ¼" wire supported by 60' wood poles every 140' to 160'. The 5000' antenna is located south of Receiver Building road, and the 8000' antenna are located north of the Receiver Building.
24	Two 5000' single line antennas consisting of ¼" wire supported by 30' x 3" steel poles spaced at 100' intervals. Both antenna are located west of Direction Finder Building.
25	Antenna located south of Receiver Building and consisting of 6-60' guyed wood poles with ¼" wire strung between them.
26	Power and communications lines originating at Housing/ Operations area and running to Lower Tram building and receiver and direction finder buildings. Three transformers are located along this line near the White Alice site. One is leaking and all are suspected to be PCB contaminated. Housing/Operations to Lower Tram line consists of 1-3", 4-2" and 1-1½" line to near White Alice site, and 3-2" lines from near White Alice site to Lower Tram area. Total length has associated suspension cables and hardware, and is supported by 20' wood poles at 125' intervals. Housing/Operations to Receiver and Direction Finder Buildings line consists of 3-1", 1-3/4" conduit, and 2-½" coax lines with associated suspension cables. Support is given by 20' wood poles spaced 100' apart from Housing/Operations area to Receiver Building, and on 55 gallon barrels every 10' from Receiver Building to Direction Finder Building.
27	Assorted antennas include: o 14,000' antenna located northeast of White Alice site consisting of 3 strands ¼" wire and supported by 20' wood poles spaced every 200', of which 50% are on ground. The entire length of the antenna is on tundra. o 3 antennas in main antenna field north and west of Housing/Operations area. Each antenna includes ¼" wire strung between 13 to 19 poles ranging from 10' to 60' in height. Average pole is around 50' tall. All poles are guyed. 1½" cables run from antennas to Housing/Operations area, of which approximately 30% is above ground and 70% underground. All antennas are located on tundra. o Antenna located just southwest of Housing/Operations area. Consists of four 60' wood poles (guyed) with ¼" wire strung between them. o Remains of two antennas exist just west of Housing/Operations area. Each has eight 10' wood poles and small amounts of wood debris.

SITE #	DESCRIPTION
28	One 60' and a 40' steel truss antenna located just south of Housing/Operations area. Each has a small concrete footing, guy wires and ¼" wire extending away from each antenna in six places for about 50'.
29	Three sets of antenna footings located just west of Housing/Operations area.
30	Two developed 15 acre borrow areas. One is located south of Housing/Operations area and contains a small to moderate amount of wood and metal debris. The other is located on the east side of the road between the White Alice site and Lower Tram terminal and has little debris.
31	Sewer system located just west of Housing/Operations area. System includes 3' x 3' buried, partially collapsed utilidor running from buildings to settling tank. Settling tank and headworks building are cast-in-place concrete. Settling tank measures approximately 30'x45'. A 10" outfall is contained in a 3' x 3' wooden utilidor and extends 450' to the west.
32	16,000 square foot structural concrete building with slab on grade and metal truss roof. Asbestos blown ducting in blower room and asbestos insulated generator exhaust pipes. Three large transformers containing greater than 500 ppm PCB contaminated dielectric fluids. Three large spools of 1" diameter wire(15,000 lbs.), a 5000 gallon fuel storage tank, and other miscellaneous debris are present. An area of PCB contaminated soil lies just to the south of the building.
33	Transite sided wood frame warehouse buildings on raised slabs and cast concrete sills 2 to 3.5 feet above grade. Miscellaneous combustible and metal debris in and about buildings. Approximately 2260 linear feet of asbestos insulated pipes and stored asbestos pipe insulation is present in the area. Approximately 40% of the square footage of Building 107 has a wood frame floor over an I-beam/steel piling foundation 1.5 feet above grade; totally collapsed, mostly scavenged, steel support columns remain above the floor. The remainder of the building has a concrete slab and sill as described above, and contains 6" concrete wall refrigerators and storage rooms totaling approximately 2400 square feet, five small cooling compressors, approximately 4500 pounds of paints and solvents, and about 1000 pounds of oxidizers. Building 111 contains approximately 600 pounds cleaning chemicals (mostly powdered soap), about 200 pounds of intact and leaked corrosives, six metal upright storage bins, 3000 pounds paper debris, and 4000 pounds of miscellaneous metal debris.

SITE #	DESCRIPTION
34	Transite sided, wood frame buildings on concrete pads and concrete or wood post foundations. These include crawl spaces 2 to 3 feet below grade, wood skirting, and fill banked against the skirting. All buildings are one story with the exception of Building 100. Buildings contain small amounts of miscellaneous combustible metal and inert debris and collapsed sheetrock. Generally, buildings are empty of appliances, fixtures and housing furnishings. All buildings contain asbestos insulated pipe and pipe insulation totaling approximately 5850 linear feet. Building 100 consists of a two story north wing with roof 80% collapsed and a single story south wing with roof 15% collapsed. A connecting corridor has an attached valve room containing an asbestos insulated 2000 gallon pressure tank. Building 105 contains approximately 150 metal theater seats. Building 106 the compound dining facility, has steel post roof support columns. 35% of total roof area is collapsed. The building contains about 5500 pounds of stainless steel sheeting. Buildings T-125 and T-126 are I-Beam skid mounted, 90% to 100% collapsed and heavily scavenged.
35	Transite sided wood frame building on slab on grade containing about 1000 pounds miscellaneous paints and solvents. About 3000 square feet of Marston-matted outside storage area includes several thousand pounds of cable, and about 20,000 pounds blasting sand, 2500 pounds miscellaneous brick and 5500 pounds miscellaneous metal scrap, pipe and plate. Site also includes two deadweight filled compaction rollers and a 500 gallon hot tar trailer. One gallon dielectric fluid containers are present and are assumed to be PCB contaminated. An area of PCB contaminated soil exists about the building.
36	Building 110 is a two story wood frame building with steel web ceiling joists, a 24 inch concrete sill foundation and 10 inch slab floor. A wing houses 4 Cummins diesel generators, overhead ducts and blowers. An approximately 30' x 50' room contains two Ray oil burners and boilers set on 4'x10'x5' foot brick bases, a Cleaver Brooks skid mounted standby boiler, and a 500 gallon pressure tank. Burner stacks extend about 15 feet above the roof. The main water supply pumphouse room contains a 24 foot diameter 20 foot high water storage tank. The building contains miscellaneous valving, piping, small water tanks, pressure tanks and switching banks. Friable asbestos was used to insulate the diesel generator exhaust pipes, pressure tank and boilers. Building 110 houses three banks of three large transformers all with PCB contaminated dielectric fluids with contamination levels exceeding 500 ppm. An oil spill

SITE #	DESCRIPTION
	site with a sampled PCB concentration of 5 ppm is present near the southwest transformer bank. The southwest transformer bank is housed in a partially collapsed wood frame addition to Building 110.
37	Transite sided wood frame multiple bay garages with steel web roof joists founded on slab on grade. Contains asbestos insulated piping. Miscellaneous scattered combustible and metal debris within and near buildings. Building 108 includes an adjacent gas pump and 150 gallon antifreeze tank. Building 109 includes an attached 32x25 foot 2-story wood frame office building.
38	Transite sided wood frame building generally with steel web roof joists founded on a concrete sill and slab approximately 1 foot above grade. 60% roof collapse. Contains asbestos insulated pipe. 8x8x10 foot concrete block vault located at southeast building corner.
39	A heavy steel arch truss gymnasium with Z-section girders and aluminum siding and roofing (70% of roof missing). 2"x3" wood furring, plywood paneling and parquet floor on concrete sill and slab about 1 foot above grade. Building includes a 1650 square foot structural steel and wood frame bowling alley and locker room addition on a concrete slab with 25% of aluminum wall sheathing missing. Building contains asbestos insulated pipe.
40	Transite sided wood frame building set on 8 inch thick concrete walls extending from 3 foot above grade to tank house floor 7 feet below grade. Contains 4 welded steel tanks 20 foot diameter by 26 foot high, and miscellaneous piping. Building contains asbestos insulated piping, about 1000 pounds asbestos cement, 150 gallons fire brick paint, and about 1,500 pounds stored galvanized pipe. Well Number 1 is in an attached well house on south side of the storage tank building.
41	This site consists of three wells. Well Number 2 is contained in Building 112, a transite sided, wood frame building set on a concrete slab on grade. It contains a 15 HP Fairbanks morse pump and a standby diesel motor pump drive. A transite sided wood frame valve house supplies access to a concrete water supply utilidor approximately 30 feet north of Well Number 2. Well Number 3 is an abandoned 6 inch well with a 10 inch surface casing still in place and extending about 2.5 feet above grade. It is located about 20 feet north of the water storage tank house. Well Number 4 is a 6 inch well located about 500 feet southeast of the water storage tanks. It is covered by a 10x14 foot wood building on a concrete slab on grade.

SITE #	DESCRIPTION
42	This site consists of 3 welded steel fuel storage tanks, 50 feet in diameter and 24 feet high, including miscellaneous piping and valving. Spiral hatch ladders provide access to tank tops. Tanks are founded on concrete ring foundations. About 200 feet to the south, diesel and gas day tanks are wedged on grade with gravel fill. Twenty 55 gallon POL drums are scattered to the north of the main tanks. A soil sample taken in an oil spill north of the main tanks showed a PCB contamination of 3.7 ppm.

July 26, 1986

RECEIVED
JUL 29 1985
URS ENGINEERS - ANCH.

URS Corporation
825 W. 8th Avenue
Anchorage, Alaska 99501

ATTN: Rich McManis

RESULTS OF ANALYSES FOR
POLYCHLORINATED BIPHENYL MIXTURES IN OIL SAMPLES

METHOD OF ANALYSIS. A portion of each sample was diluted with 5% ethyl ether/ iso-octane and treated with acid and Florisil. The resulting extract was examined using an electron capture detector.

Any of the following mixtures of polychlorinated biphenyls would have been detected had they been present at or above the limit of detection.

AROCLORS: 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262 and 1268

trace = less than the detection limit
nd = none detected

Lab Number	Sample Identification	Date Received	RESULTS POLYCHLORINATED BIPHENYLS Aroclor Mixtures Detected	Parts per Million	MAP I.D
30257	N.E. Cape #1, Transformer oil sample airport terminal building	7/16/85	1260	5.0	OS1
30258	N.E. Cape #9, Building #98	7/16/85	1260	590,000.	OS9
30259	N.E. Cape #10, Bldg. #110, North	7/16/85	1260	620,000.	OS10
30260	N.E. Cape #11, Bldg. 110, West	7/16/85	1260	630,000.	OS11
30261	N.E. Cape #12, Bldg. #110, South	7/16/85	1260	730,000.	OS12

Craig Unverferth

CU/jd

July 26, 1985

RECEIVED

JUL 29 1985

URS ENGINEERS - ANCH.

URS Corporation
825 W. 8th Avenue
Anchorage, Alaska 99501

ATTN: Rich McManis

Following are the results of our analysis for polychlorinated biphenyl mixtures in nineteen samples of soil received on July 16, 1985.

The method of analysis involved extracting the samples with acetone and partitioning an aliquot of the acetone with 5% ethyl ether in hexane. Portions of the resulting extracts were cleaned-up with acid and Florisil. Final detection was by gas chromatography using an electron capture detector.

Any of the following mixtures of polychlorinated biphenyls would have been detected had they been present at or above its limit of detection: Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262 and 1268.

nd = none detected

Lab Number	Sample Identification	Results: Polychlorinated Biphenyls — Aroclor Mixtures	Results: Polychlorinated Biphenyls — Parts per Million (samples as received)	MAP I.D.
30238	Gambel #1, RWM1SW 7/4/85	None	nd	SS1G
30239	Gambel #2, RWM1SW 7/4/85	None	nd	SS2G
30240	Gambel #3, HE1RWM Site B4, 7/5/85	None	nd	SS3G
30241	Gambel #4, HE1RWM Site B11, 7/5/85	None	nd	SS4G
30242	N.E. Cape #2, Bld. 6 Airport Terminal	None	nd	SS2
30243	N.E. Cape #3 North of Tank 2 oil spill	1254	3.7	SS3

trace = less than the detection limit
nd = none detected

Lab Number	Sample Identification	Results: Polychlorinated Biphenyls — Aroclor Mixtures	Results: Polychlorinated Biphenyls — Parts per Million (samples as received)	MAP I.D.
30255	N.E. Cape #19, PCB soil sample under transformer, between main camp & lower TRAM	None	nd	SS19
30256	N.E. Cape #20, PCB soil sample of transformer building lower Tram	None	nd	SS20
30263	RS #1, N.E. Cape Oil tanks	1254/1260	1.0	RS1
30264	RS #2a, N.E. Cape Tank Str. mouth	None	nd	RS2A
30265	RS #2b, N.E. Cape Down Str. Junk -y	None	nd	RS2B
30266	RS #3, N.E. Cape Down Str. A.P. Bridge	None	nd	RS3
30267	RS #4, N.E. Cape Down Stream Main Dump	None	nd	RS4
30268	RS #5, N.E. Cape, CB	None	nd	RS5
Detection Limit			0.5	

Craig Unverferth

CU/jd

July 31, 1985

RECEIVED

AUG 07 1985

URS ENGINEERS - ANCH.

URS Corporation
825 W. 8th Avenue
Anchorage, Alaska 99501

ATTN: Rich McManis

Following are the results of our analysis for the presence of fuel hydrocarbons in the diesel range in six samples received on July 16, 1985.

The samples were extracted with acetone. A portion of the extracts were partitioned with distilled hexane. Final detection was by gas chromatography using a flame ionization detector and a 10m SPB-1/WCOT column. The detection limits for samples 30265-68 are higher than normal due to the presence of unidentified components with characteristics of hydrocarbons with higher boiling points than "diesel" in the sample extracts.

nd = none detected

Lab. #	Sample Identification	Results Parts per Million (dry soil basis) Diesel Range	MAP I.D.
	Proj. # 4988 Proj. Name: D.E.R.P.		
30263	RS #1, N.E. Cape oil tanks	10,000.	RS1
30264	RS #2a,N.E. Cape tank str. mouth	2,200.	RS2A
30265	RS #2b, N.E. Cape down stream junky	nd *	RS2B
30266	RS #3, N.E. Cape down stream A.P. Bridge	nd	RS3
30267	RS #4, N.E. Cape down stream main pump	nd *	RS4
30268	RS #5, N.E. Cape CB	nd *	RS5
Detection Limits		10. 100.*	

Patricia L. Murphy

Patricia L. Murphy

PLM/jd

Appendix C

U.S. Fish & Wildlife Service Threatened Or Endangered Species Determination

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1011 E. TUDOR RD.
ANCHORAGE, ALASKA 99503

IN REPLY REFER TO:

SE

JUN 26 1985

Neil E. Saling
Colonel, Corps of Engineers
District Engineer
Department of the Army
U.S. Army Engineer District, Alaska
P.O. Box 898
Anchorage, Alaska 99506-0898

RECEIVED
JUL 18 1985
URS ENGINEERS - ANCH.

Dear Colonel Saling:

Thank you for your June 5, 1985, inquiry concerning the occurrence of threatened or endangered species at sites under consideration for cleanup of Department of Defense debris. Based on information available to us, no candidate, proposed or listed, threatened or endangered species are present at the following sites:

1. Passage Canal, Whittier, Alaska
2. St. Lawrence Island
3. Kodiak Island
   - Chirikof Island
   - Sitkinak Island
   - Afognak Island
   - Long Island
   - Spruce Island
   - Puffin Island
   - Woody Island
   - Kodiak Island (Monashka Bay, Bell Flats, Womens Bay, Cape Chiniak, Cape Greville, Lazy Bay, Kaslin Bay, Entrance Point)
4. St. George and St. Paul Islands, Pribilof Islands
5. Unimak Island
6. Port Moller
7. Port Heiden
8. Bethel
9. Nome
10. North Slope Dewline sites (Cape Savin, Cape Simpson, Peard Bay, Kogru River, Point McIntyre, Brownlow Point, Demarcation Bay)
11. Annette Island

TABLE 2-1

DEBRIS INVENTORY *

Site	Location	Debris
Gambell	Village of Gambell	-Buried miscellaneous equipment, i.e. POL's, supplies, heavy equipment, and reported 5-gallon carboys of buried H_2SO_4 reported by local natives
		-Buried transformers equipment reported by local natives
		-Miscellaneous military excavation scars
		-Troutman Lake Ordnance and two other suspected ordnance areas near the lake.
		-2 concrete pads at grade, 25x10' and 25x36'
		-Miscellaneous metal debris, barrels landing mat, piping, concrete
		-Empty 300 gallon fuel tanks
		-6 communication cables and electrical cables extending from Village of Gambell to top of Sevuokuk Mt.
		-Reported military burial site including 55 gallon barrels of human waste-all completely composted (assumed).
	Sevuokuk Mountain	-Communications and electric cables and spools
		-55 gallon barrels of asphalt
		-Miscellaneous piping, cable, and generator debris
		-Scattered 55 gallon drums
		-Small concrete pad
		-Barbed wire bunker pad
		-4 small electrical transformers, casings empty
		-Oil spill (approximately 50' x 50')
		-3 quonset hut frames
		-Approximately 200 empty 55 gallon barrels marking military trail
		-Communication cable system and metal spools (approximately every 1000')

	Runway-East and West (Beach) Sides	-Miscellaneous metal (barrels, landing mat) wood, and concrete -55 gallon barrels of asphalt (approximately 70% intact) and spill area (100' x 35')
	Nayvaghaq Lake	-350 55 gallon barrels, 65% intact, 35% full -Garbage, refuse, and empty burn barrels -55 gallon barrels at 200' intervals, east side of Lake -Empty battery casings
Northeast Cape	Terminal Area**	-Headquarters Building -Radio Tower -Tram Buildings -Generator -5,600' Coax Cable -2,000' Powerline -3,500' Tram and Towers -Fuel Storage Tank (6000 gallon) -Substation -Water Wells -Transformer building with 3 transformers containing PCB contaminated dielectric oil. -80' steel antenna with concrete foundation -50' power poles (eight) -Assorted wood, metal and wire debris
	Housing Ops Area	-Fuel Storage Tanks -Antennas -Water wells -Personnel support buildings -Oil and gasoline pipeline -Miscellaneous Storage Area -Water storage tanks -Base physical plant and garages -12 transformers -Friable asbestos insulated piping -Miscellaneous chemicals
	Cargo Beach Area	-Transfer Pumphouse -Solid waste disposal area (approximately 16 acres) nearly 1 mile S.W. of shoreline. -POL Pipeline (4" metal) from pumphouse to fuel tanks at Housing/Operations area -Culvert -Road marker barrels and miscellaneous debris near roads -6,000 gallon fuel tank -Approximately 47 one story wood frame buildings in varying states of decay with mud sill foundations

Landing Strip Area	-Borrow Site -Wind Measuring Set -Small Arms Firing Range -Weather Station Building -Transformer Leanto, 3 transformers -Instrument Shelter -LF Marker Beacon -Antenna at Power Line Terminus -Power line (900')
East Antenna Area	-3,200' power line -3,200' coax cable -Buildings -15,000' beverage antennas

*Generalized
**Outside scope of this project