

PRELIMINARY ASSESSMENT REPORT

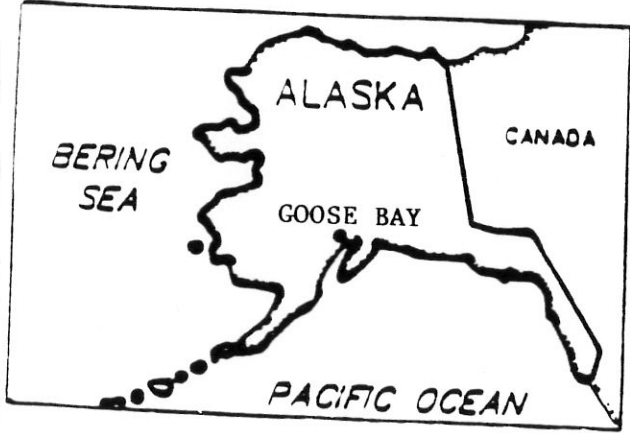
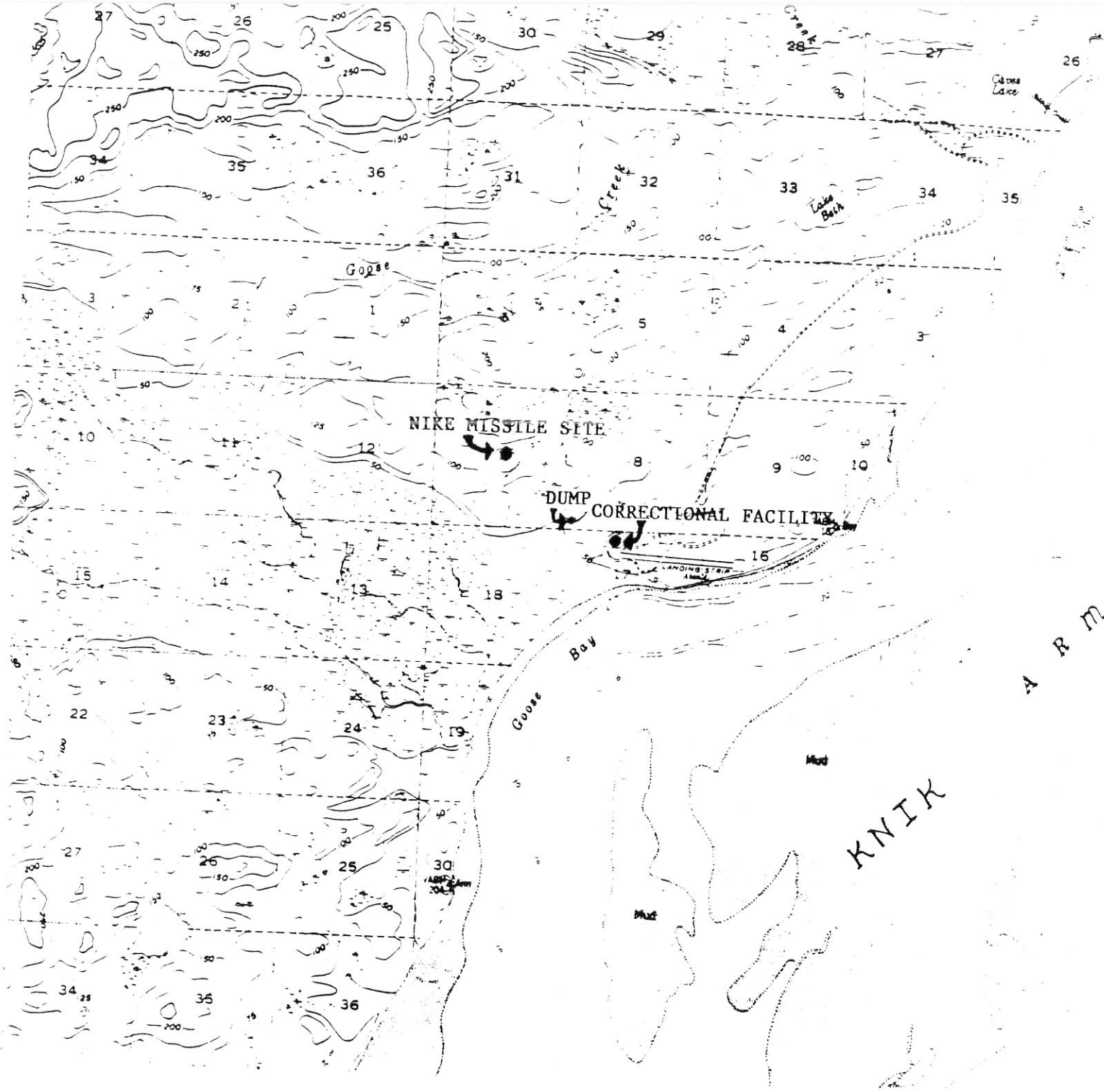
FOR

GOOSE BAY SITE

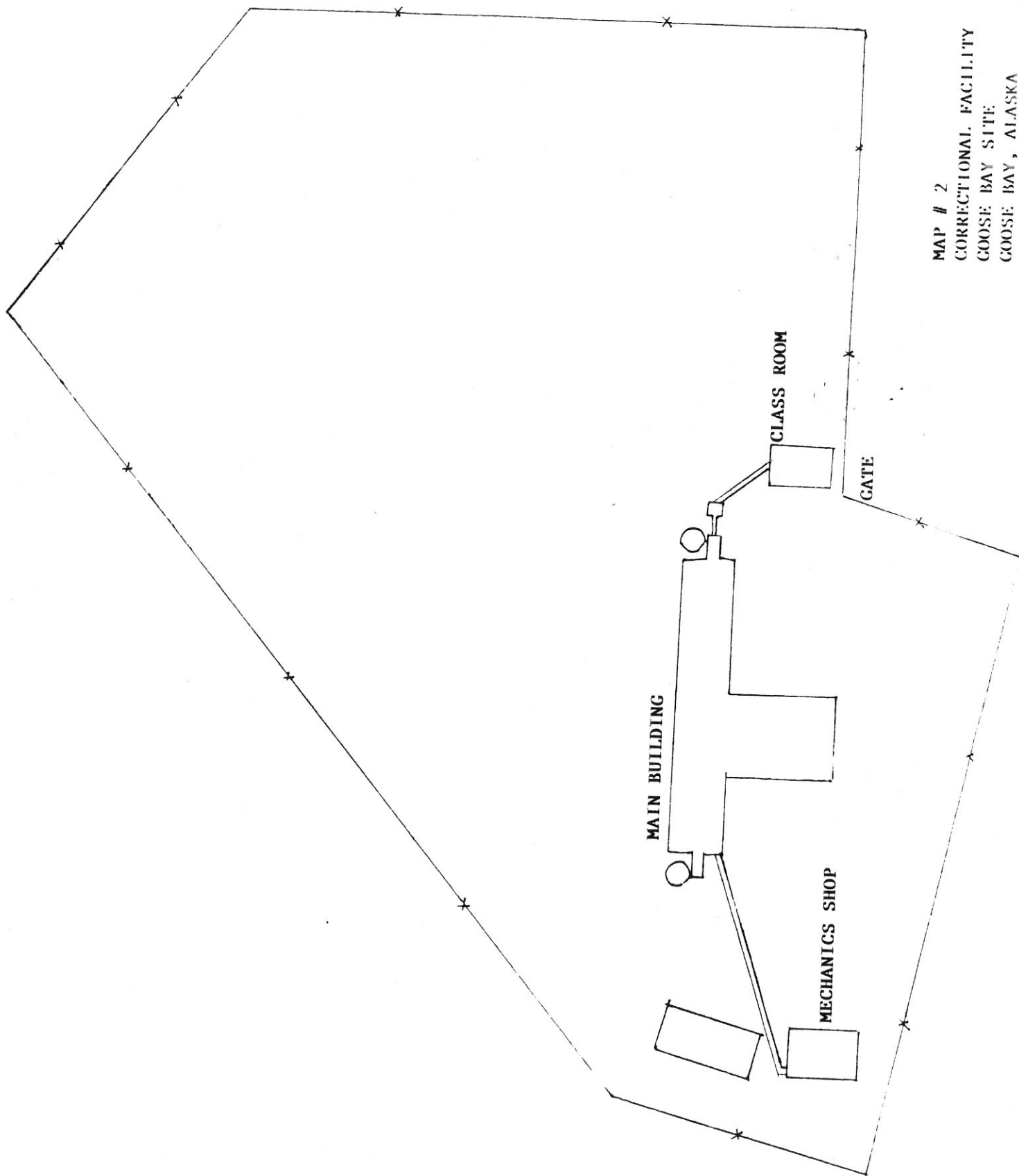
GOOSE BAY, ALASKA

DECEMBER, 1992

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
410 WILLOUGHBY AVE.  
JUNEAU, ALASKA 99801-1795



MAP # 1  
 SITE LOCATION MAP  
 GOOSE BAY SITE  
 GOOSE BAY, ALASKA



MAP # 2  
CORRECTIONAL FACILITY  
GOOSE BAY SITE  
GOOSE BAY, ALASKA

Guard Tower

Warhead Storage Bunker # 2

Launch Pad No. 2

Launch Pad No. 1

Warhead Storage Bunker # 1

Guard Tower

weapons Storage Building

Maintenance Building

Acid Storage Bldg

fire water tank

underground storage tank

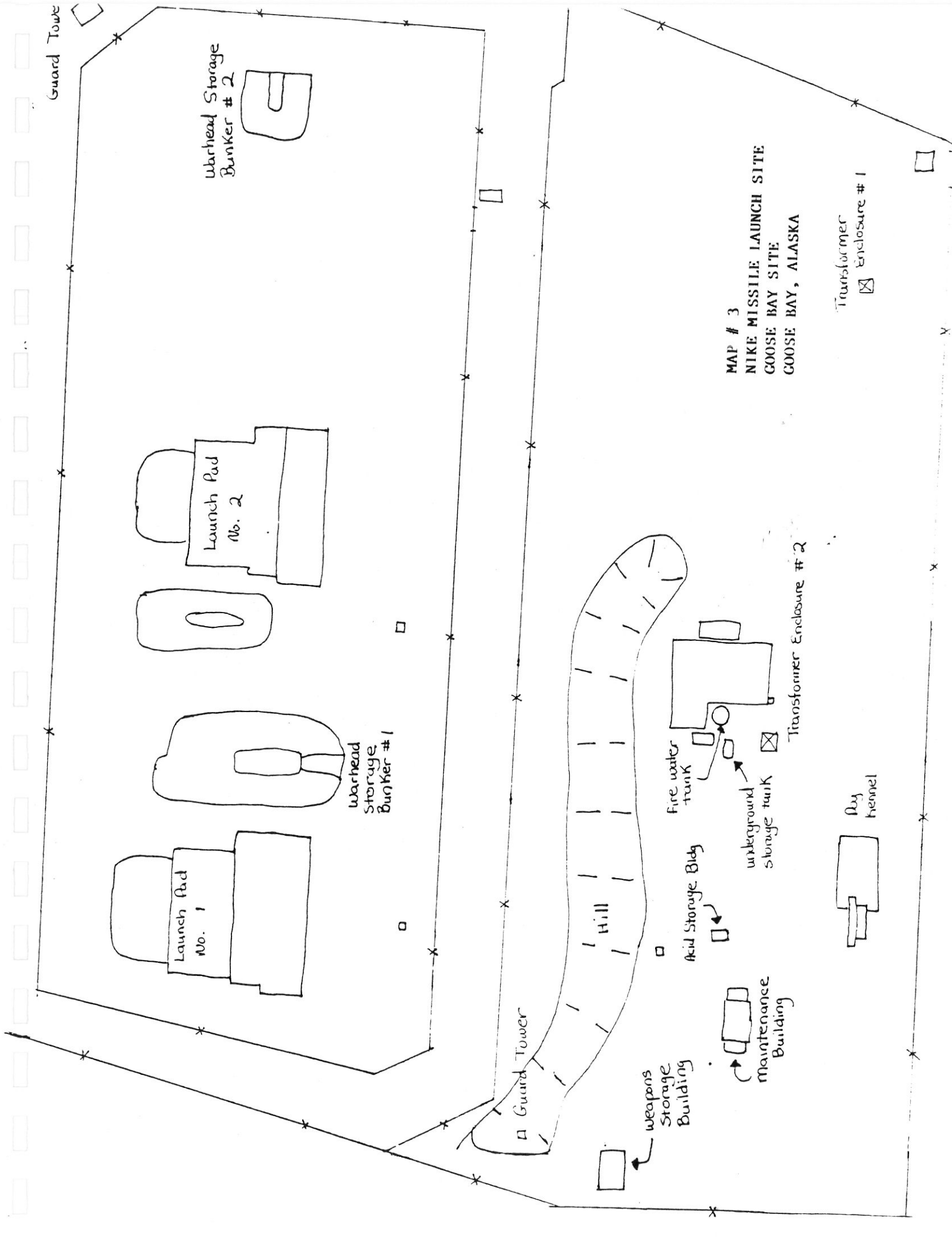
Hill

Transformer Enclosure # 2

MAP # 3  
NIKE MISSILE LAUNCH SITE  
GOOSE BAY SITE  
GOOSE BAY, ALASKA

Transformer Enclosure # 1

Air hannel



## 1.0 Introduction and Purpose of the Preliminary Assessment:

The Alaska Department of Environmental Conservation (DEC) conducted a Preliminary Assessment (PA) of the Goose Bay Site, Goose Bay, Alaska. The PA is the second of a three-step assessment process which begins with the Site Discovery and concludes, if necessary, with a Screening Site Inspection. The assessment process is intended to identify potential hazardous sites and compare and rank them relative to other sites across the nation. It is not intended to be an extensive or complete site characterization, contaminant fate determination, or quantitative risk assessment.

The Goose Bay Site PA was conducted to identify potential public health and/or environmental hazards related to the site and, if present, identify the need for further investigative action. The PA is based on information derived from available files and literature pertaining to the site, and a site visit.

## 2.0 Information Obtained During the Site Visit and File Review:

**2.1 Site Location and Description** - The site is located adjacent to Goose Bay, in the Matanuska-Susitna Borough in Section 7, Township 15 North, Range 3 West of the Anchorage (B-8) NW Quadrangle. Access to the site is via the Point MacKenzie Road approximately 15 miles southwest of Wasilla.

**2.2 Site History/Potential Problem(s) at the Site** - The site was originally the Goose Bay Air Force Auxiliary Field, which was a Nike Missile Launch Complex. The missile launch site was constructed between 1958 and 1960, and was in operation until 1980 when it was deactivated. The complex consisted of a launch site, administrative facilities, and two weapons storage bunkers. The launch site is located approximately one mile to the northwest of the administrative facilities (R&M, 1991).

In 1980 the ownership of the administrative facilities and weapons bunkers was transferred over to the State of Alaska, Department of Corrections and was subsequently used as a low security prison facility. The ownership of the launch site was transferred to the University of Alaska. The correctional facility was operational between 1983 and 1986 when they converted it into a training facility due to concerns over asbestos materials present in the prison living quarters. The site was vacated in 1989 and has not been maintained since then (R&M, 1991).

A dump site is located between the administrative facilities and the launch site, approximately 1/4 of a mile northwest of the administrative facilities. This was used by the military during the life of the Nike Missile site. An area directly adjacent to the dump was used for dumping asbestos materials removed from the

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correctional facility during a renovation of the facility in 1984. It has been alleged that there are transformers buried in the dump (Kessler, 1987).

**2.3 Physical Environment** - The site is located adjacent to Knik Arm, which is an estuary in the Upper Cook Inlet Basin. The area is characterized by 150 to 250 foot bluffs which rise from steep sand and gravel beaches. Silt and clay mudflats predominate seaward with gentle hills mostly below 500 feet above sea level occurring inland (Mat-Su, 1987).

The bedrock in the area consists of poorly consolidated, coal and oil bearing rocks of the Tertiary age. This is covered by Quaternary glacial and post-glacial deposits. The surface and shallow subsurface soils consists of glacial till which is a mix of gravel, sand and silt with a thickness of 6 to 10 feet. The permeability of the till is characterized as fair to poor (Mat-Su, 1987).

Goose Bay is in a highly tectonic setting, resulting in seismic and volcanic activity. Mt. Spurr, an active volcano due to the subducting plate beneath the area, is located approximately 60 miles east of the site (Mat-Su, 1987).

Surface drainage in the vicinity of the site is to the south and west at a gradient of approximately 50 ft. This is primarily by way of drainage ditches that parallel the road system at the site. The nearest significant drainage in the area is Goose Creek which flows south from Stephen Lake, located approximately 12 miles northeast of the site. The drainage meanders through flat, marshy areas. There are several unnamed drainages in the Goose Bay wetlands area. Numerous unnamed ponds are located throughout the area (ADEC, 1992).

Based on a drilling log for a well installed at the site in 1985, the groundwater table appears to be between 150 to 200 feet below ground surface. This aquifer has a relatively high yield and presumably flows in a southerly direction towards Cook Inlet (R&M, 1991).

Vegetation in the area consists of intertidal marshes consisting mainly of sedges and wetlands grasses, muskeg areas of sphagnum moss and sedge peat, lowland woody plants, and upland areas of mainly spruce, poplar and birch trees (Mat-Su, 1987).

The mean annual precipitation is approximately 17 inches, with mean annual snow at approximately 60 inches. The temperatures range from a mean of 4-42°F in the winter to 46-68°F in the summer. Prevailing winds are from the north-northeast at 7-11 knots in the winter, and out of the south at 5-9 knots in the summer (R&M, 1991).

**2.4 Waste Types, Quantities, and Characteristics** - The main contaminant of concern in the correctional facility is asbestos. A report entitled "Survey for Asbestos Containing Material Goose Bay Correctional Center" was prepared for the State of Alaska, Department of Transportation and Public Facilities by Ocean Technology, Ltd. in 1987.

Asbestos was found in all of the buildings except the bunkers. It was mostly in a non-friable state, however some of it is considered friable and therefore unsafe. Both Chrysotile and Amosite were identified. Concentrations as high as 85% were noted in the mechanical room. The estimated amounts of asbestos identified in the correctional facility is 23,549 square feet plus 2,267 linear feet of utilidor casing. Air samples were within the appropriate Federal guidelines. However, the survey found asbestos fibers dust samples taken in three locations, in the gym, the boiler room, and the day room access (Oceantech, 1987).

Both the launch site and the correctional facility are fenced, but both areas have been vandalized indicating that those wanting to gain access to the site seem to have no problem doing so. Due to the remote nature of the area, security is limited. A truck was driven through the gate of the launch site in a 1991 break in.

In a 1985 the Corps of Engineers conducted an investigation of the launch site and the landfill to determine if the soils and/or surface water have been contaminated by environmental releases of various chemicals in common usage at Nike Sites, as well as PCB's and heavy metals commonly found in transformers, and waste motor oil. 4,4'DDT was detected in a soil sample collected at the landfill at a level of 8 ppb. High levels of petroleum hydrocarbons were detected in 2 soil samples taken by the acid storage building (see map #3) at the launch site (17,850 and 15,000 mg/kg). Trichloroethylene was also detected in samples collected by the acid storage building at 164 mg/kg. PCBs (Aroclor 1248) were detected in one soil sample from the landfill area at a level of 0.2 ug/gm dry soil.

In a previous study conducted by the Corps in 1983, 30 samples were collected from transformer oil. PCB levels as high as 7,930 ppm were detected. It was noted in the 1985 sample plan that electric transformers were sampled previously and PCB containing units were removed by the U.S. Army, Fort Richardson, Facilities Engineers Electric Shop. Figure 1 shows the high results of volatile organic compounds and heavy metals analyses of soil samples in the 1985 Corps study.

Figure 1

<u>Volatile Organic Compounds</u>	<u>mg/kg</u>
Benzene	2
Chloroform	2
Methylene Chloride	27

Toluene	5
Trichloroethylene	164
dy-1,2-Dichloroethane	49
d8-Toluene	64
p-BFB	53
Tetrachloroethane	4
<b><u>Heavy Metals</u></b>	<b>mg/l</b>
Arsenic	50
Barium	1,519
Chromium	36
Lead	106
Mercury	1
Selenium	5
Zinc	402
Silver	< 1

In another study of the launch site, samples were taken on August 2, 1991 by Dave Moll, Manager of Environmental Health & Safety at the University of Alaska. Results showed total petroleum hydrocarbons concentrations of 44,000 mg/dry kg in a soil sample taken near the Launch Control building. PCBs (Aroclor 1260) were detected in transformer oil collected from two transformers at the launch site at concentrations of 3.5 mg/kg and 2 mg/kg.

A site inspection of both the launch site and the correctional facility was conducted by ADEC personnel and a representative of the University of Alaska on May 7, 1992. The buildings at the correctional facility have been heavily vandalized. Asbestos is present for the most part in the form of pipe insulation which was noted in all of the buildings. The pipe insulation is mostly in a deteriorated state. Asbestos wall board and flooring is also present. Underground storage tanks which have been emptied, are present at the site. In the mechanic's shop (See map 2) there is spilled oil in a mechanic's well (ADEC, 1992).

In the spring of 1992, vandals broke into the generator building at the launch site and took parts from the generator causing an oil spill on the cement floor and outside the door in the soil. The spill was reported to the ADEC Mat-Su District Office. Evidence of the spill was still present at the time of the site visit (ADEC, 1992).

**2.5 Pollutants, Mobilization, Pathways, and Risks - Groundwater:** No groundwater contamination has been detected. Drinking water in the area is generally from drinking water wells. Based on well logs from a well drilled at the facility, the water table is between 150 to 200 feet below ground surface. The well at the



facility is no longer being used for drinking water purposes. Judging from aerial photographs, the closest residence is approximately .6 miles from the site.

**Surface Water:** There are several unnamed drainages in the vicinity of the site that drain into the Goose Bay wetlands. They tend to meander through the marshy areas leaving an undefined drainage pattern. The site is within 1/4 mile of Knik Arm which supports a fishery and is considered an estuary. Although surface water contamination has not been documented, the potential exists due to the documented soil contamination at the site. The overland flow at the sites is via a series of ditches in connection with the roads through the sites.

**Soil Exposure:** There are no residents or workers on site, however, as evidenced by the vandalism, the site is accessible, in spite of the fences, and used by a few locals for recreational purposes. There is documented soil contamination of petroleum hydrocarbons, and 4,4'DDT. PCBs have been detected in transformer oil on site and in soil in the landfill area.

**Air Exposure:** The air exposure pathway is not considered a pathway of major concern due to the fact that the winds in the area are generally light and the population is relatively sparse. However, the potential for friable asbestos being released to the air pathway exists.

The population for a four mile radius of the site is estimated as follows:

<u>Distance From Site</u>	<u>Population</u>
1/4 mile	0
1/2 mile	20
1 mile	50
2 miles	97
3 miles	120
4 miles	187

**Sensitive Environments:** The site is located within 1/4 mile of the Knik Arm, which is a branch of the Cook Inlet and is considered an estuary. An estuary is technically defined as a waterbody with a free connection to the sea in which sea water becomes considerably diluted by fresh water.

The site is within the Goose Bay State Game Refuge, which encompasses 13,262 acres. The primary purpose of the game refuge is to protect, maintain and enhance fish and wildlife populations and habitats in agreement with other components of the ecosystem (F&G, 1992).

The State of Alaska is designated as a Game Management area, therefore the Goose Bay site is in a Game Management area.

Extensive wetlands occur within four miles of the site. These wetlands are important waterfowl and shorebird habitat for both breeding and migration. Nesting occurs at the interface of the marsh and shrub habitats. Key areas for duck staging and brood rearing include the Goose Bay wetlands. Approximately 75% of the ducks utilizing these wetlands are dabblers, including pintails, mallards, and green-winged teals. The primary diving ducks found in the area are scaups. Trumpeter swans have been found in the area during spring and fall migrations. Canada, white-fronted, and snow geese also utilize the area. The duck and goose harvest in the area is substantial although access to the Goose Bay State Game Refuge is limited to roads along the northern and western boundaries (Mat-Su, 1987).

3.0 Priority Assessment: The priority for further action under the CERCLA program is medium low.

4.0 Recommendations: The following recommendations are made.

1. Removal of all friable asbestos that began in the 80s should be completed.
2. Areas of Petroleum Hydrocarbon contamination should be remediated.
3. The contents of the dump site should be investigated.
4. Transformers remaining on site should be removed.

## REFERENCES

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- Alaska Department of Environmental Conservation, (ADEC), 1992  
Site observations during inspection of the Goose Bay Site.
- OceanTech, Survey for Asbestos Containing Material, Goose Bay Correctional Center, September, 1987.
- Matanuska-Susitna (Mat-Su) Borough Planning Department, Matanuska-Susitna Borough Coastal Management Plan, August, 1983.
- Matanuska-Susitna (Mat-Su) Borough Planning Department, Appendices - Matanuska-Susitna Borough Coastal Management Plan, September, 1987
- R&M Consultants, Inc., Level 1 Environmental Property Assessment, Former Nike Missile Launch Site, Goose Bay, Alaska, December, 1991
- Alaska Department of Fish & Game (ADF&G), D. Clausen, personal communications with B. Potter, 1992



PHOTO # 1  
GOOSE BAY CORRECTIONAL FACILITY



PHOTO # 2  
INSIDE MAIN BUILDING



PHOTO # 3  
OIL SPILL IN SHOP - GOOSE BAY CORRECTIONAL FACILITY



PHOTO # 4  
GOOSE BAY NIKE MISSILE SITE



PHOTO # 5  
GOOSE BAY NIKE MISSILE SITE  
OUTSIDE DOOR TO GENERATOR BUILDING-OIL SPILL

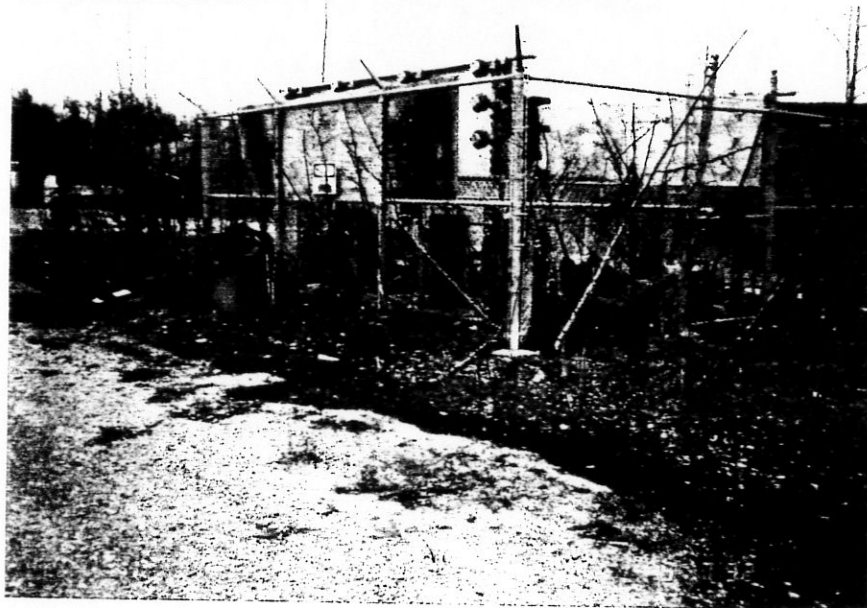


PHOTO # 6  
GOOSE BAY NIKE MISSILE SITE  
OIL SPILL AREA-TRANSFORMERS