



EARECKSON AIR STATION

Shemya Island, Alaska

March 2002

Introduction

The United States Air Force (Air Force) and the **Alaska Department of Environmental Conservation (ADEC)** request your comments on this **Proposed Plan** for six areas of environmental contamination at Eareckson Air Station (AS), Alaska. The sites are shown on Figure 1 and listed below:

- North Beach Landfill (LF18)
- Barrel Bay and Scrap Metal Disposal Area (LF24/LF26)
- Scrap Metal Landfill (LF28)
- Water Gallery (OT48)
- Base Operations Spill (SS14)
- Underground Storage Tanks (USTs) at Building 110 (ST39)

This Proposed Plan discusses the environmental investigations that were performed

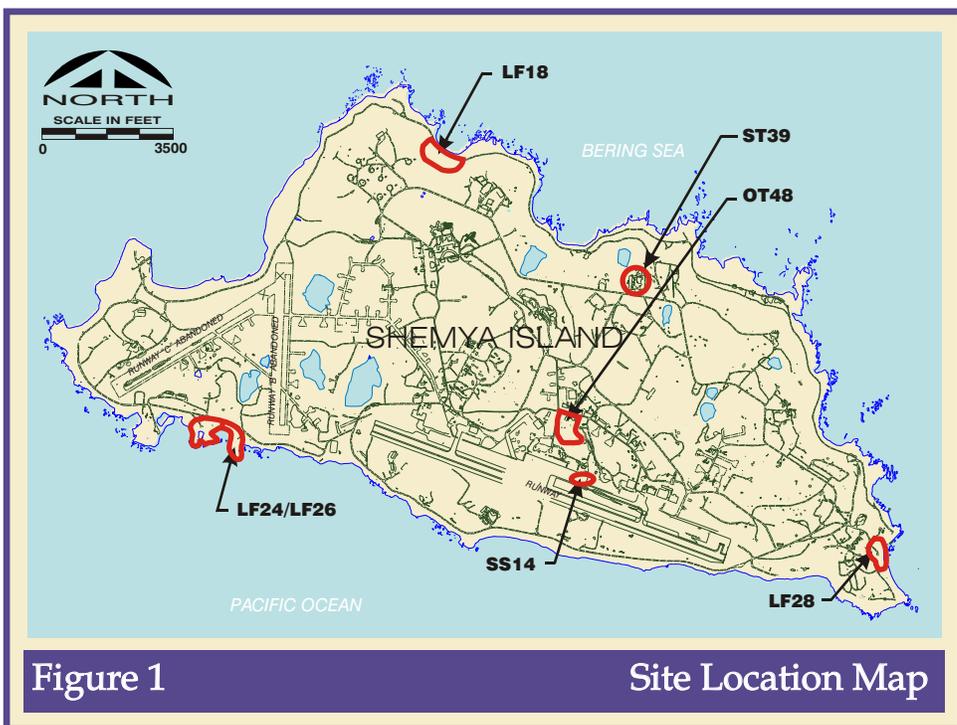
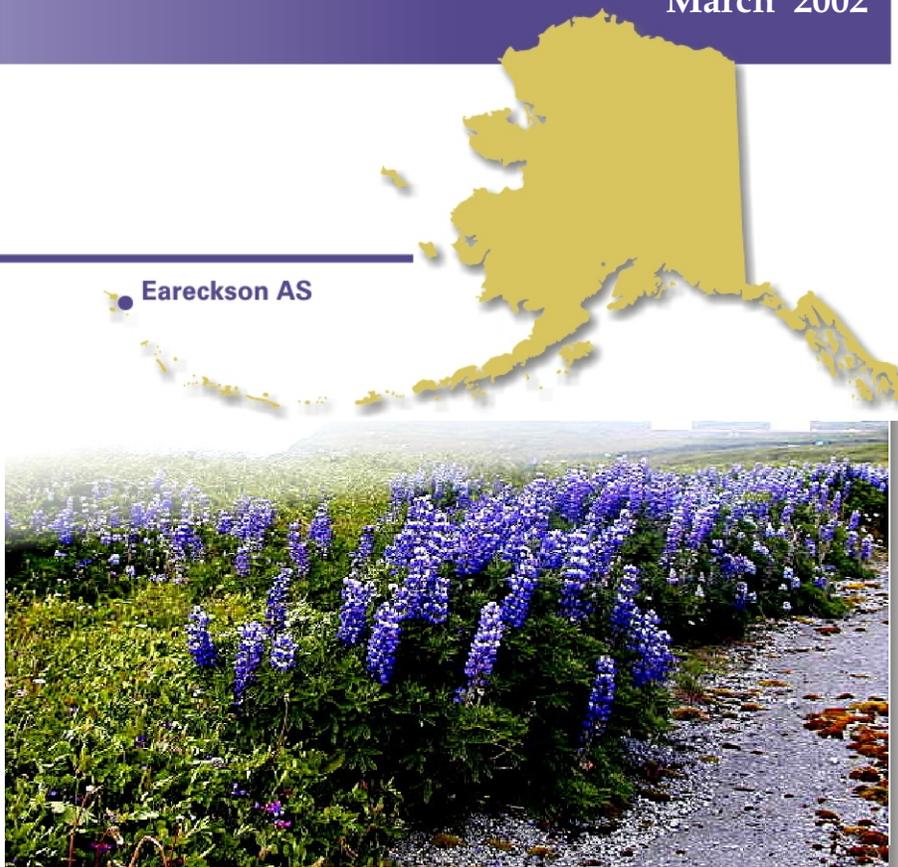


Figure 1

Site Location Map

Alaska Department of Environmental Conservation (ADEC): the state agency responsible for protecting public health, safety, and welfare, and the environment from adverse effects of environmental contamination.

Proposed Plan: a document informing Alaska Tribes, community leaders, and the public about contaminated sites, alternatives that were considered for cleaning up the sites, and which alternatives were identified as the preferred alternatives.

Alternatives: appropriate waste management options that ensure the protection of human health and the environment.

Public Comment Period: You are encouraged to comment on this Proposed Plan. The public comment period begins on May 1, 2002, and ends on May 31, 2002. Public comments postmarked by May 31, 2002 will be addressed. Send your comments to:

611 CES/CEVR Mr. Steve Wilhelmi
Community Relations Coordinator
10471 20th Street, Suite 347
Elmendorf AFB, AK 99506-2200
(907) 552-8166
(800) 222-4137

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): a federal law established in 1980, modified in 1986, also known as "Superfund." CERCLA established a nationwide process for cleaning up hazardous waste sites that potentially endanger public health and the environment.

Preliminary Assessment (PA): the initial site survey which usually consists of a site visit, records review, and interviews with current and former site workers.

at the six sites and describes the recommended cleanup alternatives for each site. Additional Proposed Plans will be prepared for other sites at Eareckson AS. More detailed information about these sites can be found in reports located at the information repository detailed on page 10 of this document.

The purpose of this Proposed Plan is to:

- Describe environmental conditions at each site.
- Describe cleanup alternatives that were considered.
- Present the recommended cleanup alternative for each site and explain why it is preferred.
- Request public comment on the preferred alternatives.
- Provide information on how the public can be involved in final cleanup decisions.

This Proposed Plan has been reviewed and approved by the Air Force and ADEC; however, final decisions on the preferred **alternatives** will not be made until all comments submitted by the end of the **public comment period** have been reviewed and considered. Changes to the preferred alternatives may be made if public comments or additional data indicate that such changes would result in more appropriate solutions.

Preparation of this Proposed Plan and the associated public comment period are required under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**, also known as the "Superfund" Program. Although the sites described in this Proposed Plan are not Superfund sites, the Air Force cleanup program follows CERCLA guidance.

Station History And Background

Eareckson AS occupies all of Shemya Island, which is located at the westernmost tip of the Aleutian Islands. Shemya Island is part of the Near Islands group of the Aleutian Archipelago. The island is approximately 4.5 miles

long and 2 miles wide. The landscape consists of rolling hills of hummocky tundra, dotted with small lakes and low-lying marshy areas. The topography of the island generally slopes upward toward the north, with approximately 300-foot high bluffs along the entire northern coastline.

Shemya Air Force Station was first developed by the United States Army in 1943 during the World War II campaign against Japanese occupation forces on nearby Attu, Agattu, and Kiska Islands. Activities were reduced following World War II, but the installation served as a refueling and staging point during the Korean conflict. The station



was declared surplus and deactivated in 1954; it was then leased to Northwest Airlines for a few years. The Air Force returned to Shemya in 1958 in support of various strategic intelligence collection activities. The station was designated as an Air Force Base in 1968 and in 1993 it was redesignated as Eareckson AS. In 1995, the station was downsized and reverted to caretaker status. The current plan is for the installation to be operated and maintained by a contractor. Shemya Island is part of the Aleutian Island National Wildlife Refuge and is owned by the United States.

Investigation And Remediation Process

The steps involved in evaluation and cleanup of the six sites discussed in this Proposed Plan are shown on Figure 2 and summarized below.

Preliminary Assessment (PA) - In this first phase of the **Installation Restoration Program (IRP)**, conducted in 1984, investigators reviewed records and interviewed former site workers. The investigators were looking for information about waste handling and fuels management to identify areas that may have been contaminated. Potentially contaminated sites were identified for field investigation.

Site Investigation (SI) - In 1988 and 1989, as a follow-up to the PA, investigators inspected the potentially contaminated sites and collected environmental samples at Eareckson AS. The purpose of the SI was to determine if contamination was present and if further investigations were needed.

Remedial Investigation (RI) - Based on the results of the SI, the sites discussed in this Proposed Plan were targeted for further investigation. These RIs were conducted from 1992 through 1995. During these investigations, environmental field crews collected soil, **sediment**, and water samples. The purpose of the RIs was to evaluate which contaminants were present and where the contaminants were located at these sites. A basewide monitoring program was started in 1998 and includes biennial collection of environmental samples to evaluate if contaminants are still present and whether their concentrations are increasing or decreasing.

Risk Screening - As part of the 1996 RI, risk screening was conducted to evaluate potential risks to human health and the environment for each site. In 2001, the risk screening criteria were updated with current ADEC regulations and guidance. This information is being used to help guide the selection of cleanup alternatives. Two primary factors were considered in risk screening:

- 1) Whether significant levels of contaminants were present at the site, determined by comparing sample results with appropriate **cleanup criteria**.
- 2) The likelihood of an exposure occurring, determined by the proximity of **receptors** to the site, the persistence of contaminants, and whether the **toxicity thresholds** for any chemical were exceeded.

Risk was considered significant when exposure was likely to occur and toxicity thresholds were exceeded.

Current risks were considered acceptable for all of the sites addressed in this Proposed Plan; therefore, human health and environmental effects are not anticipated. This finding does not mean that cleanup should not occur; rather, it indicates that receptors (i.e., people and wildlife) conducting typical activities at these sites are not likely to be harmed by exposure to site contamination.

Installation Restoration Program (IRP): the federal program initiated in the early 1980s to investigate and clean up old military facilities.

Site Investigation (SI): an investigation where samples are collected to identify if contamination is present or not.

Remedial Investigation (RI): a study conducted to identify the types, amounts, and locations of contamination at a facility.

Sediment: Loose particles of sand or mud that are transported from their place of origin by moving water and deposited in unconsolidated layers.

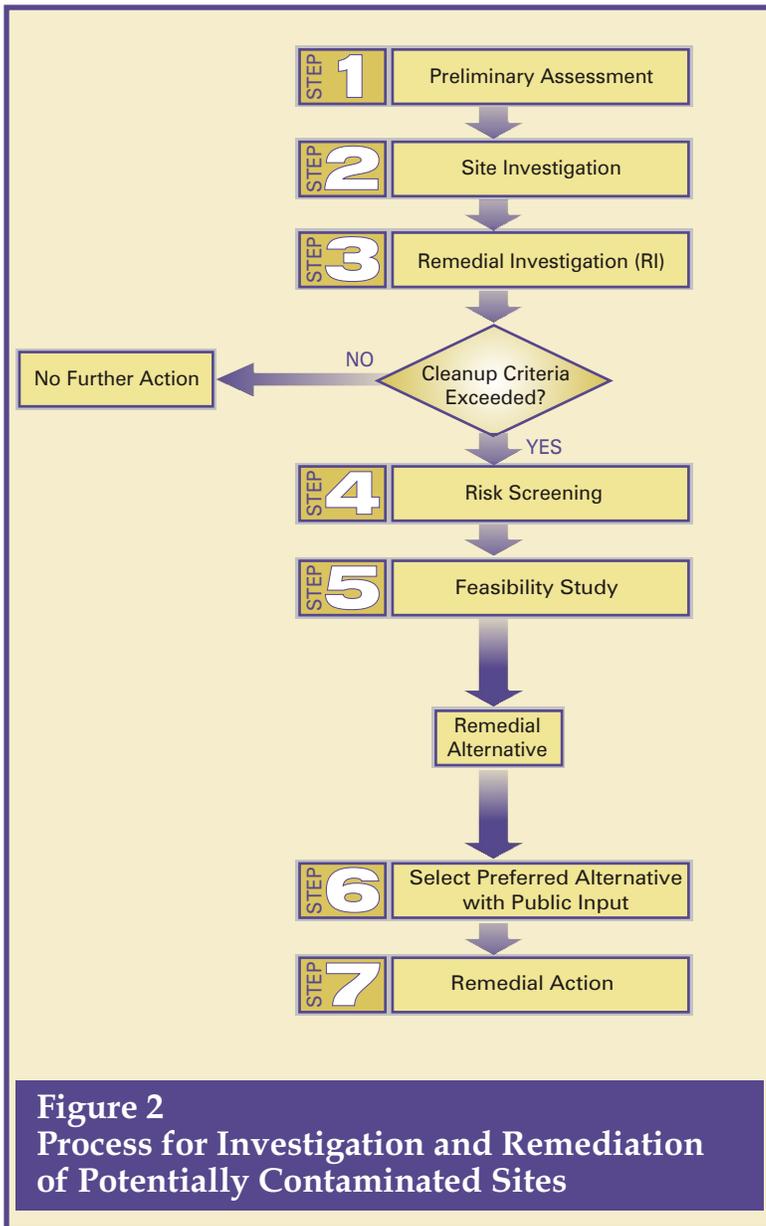
Risk Screening: an evaluation of the risks posed to human health and the environment from site contaminants. Risks are site-specific and involve evaluation of the chemical(s) of concern and exposure pathways from the source of contaminants (such as soil, sediment, surface water, and groundwater) to potential receptors (humans and wildlife).

Cleanup Criteria: these are the concentrations or amounts of chemicals prescribed by state and federal regulations that have been determined protective of human health and the environment.

Receptors: living organisms that may be affected by site contamination. Human receptors may include residents, workers, subsistence users, and site visitors. Potential ecological receptors consist of terrestrial and aquatic animal and plant species.

Toxicity Threshold: a criterion used in risk screening to evaluate how toxic a potential exposure to a contaminant could be. The toxicity threshold are exceeded when:

- The duration or frequency of exposure is sufficient to cause adverse health or environmental effects, AND
- One of the following conditions is met:
 - The measured concentration of at least one contaminant exceeded the ADEC cleanup level or other appropriate criteria, OR
 - One or more contaminants exhibit high toxicity to ecological receptors



Feasibility Study (FS) - Following the determination of risk, a range of possible response actions was considered for each site. Response actions were evaluated according to their ability to achieve all of the following:

- Protect human health and the environment by ensuring that potential levels of risk are within established guidelines.
- Meet state and federal environmental laws and regulations for specific contaminants.
- Include treatment to the greatest extent practical.
- Ensure actions are cost-effective.

Remedial Actions - The selection of remedial actions was based on the nature (types of chemicals and media - soil and/or water) and extent of contamination present in the environment. Various cleanup projects have already been conducted to reduce immediate threats to the environment at the six sites described in this Proposed Plan. Detailed reports about these investigations and actions can be found in the information repository located at Elmendorf Air Force Base in Anchorage, Alaska (see the end of this document for details). Past actions included:

Removal of contaminated soils, debris, and drums
 Installation of soil caps to prevent humans and the environment from being exposed to contaminants

Additional cleanup alternatives are being considered for the six sites discussed in this Proposed Plan. These alternatives were selected based on the best ways to accommodate the severe climatic, logistical, and environmental conditions at Eareckson AS. Each cleanup alternative was evaluated against nine criteria established under CERCLA (Table 1). A remedial alternative for each site will be selected and implemented after input is received from interested parties or stakeholders.

FIELD CREW COLLECTING GROUNDWATER SAMPLES FROM MONITORING WELLS.



Table 1 **Nine Remedial Alternative Evaluation Criteria Under CERCLA**

Evaluation Criteria	Definition
Overall Protection of Human Health and the Environment	How well does the alternative protect human health and the environment through elimination, reduction, or control of contaminated areas?
Compliance with Applicable or Relevant and Appropriate Requirements	Does the alternative meet cleanup standards and comply with applicable government laws and regulations?
Short-term Effectiveness	Are there potential adverse effects to either human health or the environment during construction or implementation of the alternative?
Long-term Effectiveness and Permanence	How well does the alternative protect human health and the environment after cleanup, and are there any risks remaining at the site?
Reduction of Toxicity, Mobility and Volume through Treatment	Does the alternative effectively treat the contamination to significantly reduce the toxicity, mobility, and volume of the hazardous substances?
Implementability	Is the alternative both technically and administratively feasible?
Cost	What are the capital and operating and maintenance costs of the alternative?
Community Acceptance	Is the alternative acceptable to community members?
State Acceptance	Is the alternative acceptable to the state (ADEC)?

Remedial Alternatives

The Air Force considered the following remedial alternatives for each site:

- 1) No further action.
- 2) Monitored natural attenuation.
- 3) Institutional controls.

No Further Action. No further action (NFA) is a response action selected when no additional remedial actions are necessary to protect human health and the environment. NFA is also used as a baseline for other responses.

Monitored Natural Attenuation. Monitored natural attenuation includes biological, chemical, or physical processes that reduce the mass or concentration of contaminants over time or distance from the source. For example, bacteria that normally live in soil can break down contaminants by digestion. Natural attenuation processes occur in almost all environments. The monitored natural attenuation remedial alternative includes collecting samples to monitor the natural processes. Samples of soil, surface water, sediment, and groundwater are collected and analyzed to ensure that contaminant levels are decreasing as expected. In addition, natural attenuation parameters are collected and evaluated. If the monitoring shows that natural attenuation is not occurring quickly enough to reduce contaminant levels below the cleanup criteria, then other remedial options are considered.

Institutional Controls. Institutional controls make use of restrictions to minimize exposure to contaminants at a site. The restrictions can be physical, such as erecting a fence around the site or take the form of land management practices, such as not allowing anyone to put a drinking water well at the site. Institutional controls are maintained even if the site is transferred to another owner or occupant by adding notice in the state land records.

Feasibility Study (FS): a study that identifies, screens, and evaluates different alternatives for cleaning up or managing contaminated sites.

Remedial Actions: cleanup activities performed at a site to reduce levels of contaminants or risk to acceptable levels.

Site Summaries

Polychlorinated Biphenyls (PCBs): a chemical that was commonly used in certain electrical equipment such as transformers.

Geophysical Survey: an investigative technique using radar and magnetic technologies to identify objects underground.

Petroleum Hydrocarbons: a group of chemicals commonly found in fuel products. Petroleum hydrocarbons include total petroleum hydrocarbons (TPH) an older problematic method used to detect full range hydrocarbons, diesel range organics (DRO) which are chemicals found in diesel, and gasoline range organics (GRO) and benzene, toluene, ethylbenzene, and xylenes (BTEX) which are chemicals found in gasoline.

Volatile Organic Compounds (VOCs): a group of chemicals with relatively low boiling points. VOCs, such as trichloroethylene (TCE), were commonly used as degreasers in the maintenance of equipment and machinery.

Semi-Volatile Organic Compounds (SVOCs): a group of chemicals with higher boiling points generally found in diesel or fuel oil.

Pesticides: chemicals used to eliminate or control populations of insects such as mosquitoes.

The following sections provide physical descriptions and investigative histories for the sites included in this Proposed Plan. The same remedial alternatives were considered for each site.

North Beach Landfill (LF18)

LF18 covers an area of about 15 acres, bordered on the south by 230-foot high, grass-covered slopes, and on the north by North Beach Road and the Bering Sea (Figure 3). Groundwater flows northeast toward the Bering Sea. This area was formerly used for the disposal of scrap metal, wood debris, and thousands of empty drums. The drums were removed in the early 1980s; these drums likely contained liquids that were shipped to the island, including but not limited to cooking oils, petroleum, oils, lubricants, **polychlorinated biphenyls (PCBs)**, solvents, antifreeze, etc. A **geophysical survey** conducted in 1992 indicated the presence of large areas of buried metal debris. The landfill area is currently capped by peat; however, small amounts of metal, wood, and plastic debris were noted on the surface during the 1993 and 1994 investigations.

Since 1992, environmental studies have been conducted at LF18 to characterize the nature and extent of contaminants. The studies included collecting samples of soil, groundwater, and surface water (Figure 3). The samples were analyzed for **petroleum hydrocarbons, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, and metals**. The findings are summarized below and in Table 2.

Soils. Thirteen soil samples were collected in 1992 and 1993. Ten of these samples were collected from ten surface soil sample locations; three additional samples were collected from depths of 3 to 22 feet below ground surface in three soil borings. Low levels of magnesium, potassium, and sodium, near **background levels**, were found in these samples; however, these are probably attributed to background metal concentrations and not anthropogenic activities. Thallium was also found in the soil, however thallium was not used by the Air Force and is most likely representative of the background concentration for Shemya Island.

Groundwater. Three groundwater monitoring wells were installed at LF18 in 1992. Groundwater was sampled in 1992, 1993, 1994, 1998, 1999, and 2000. This site qualifies for a groundwater cleanup level equal to 10 times the Table C cleanup level under 18 AAC 75.345(b)(2) ("10X Rule") since the groundwater, as determined under 18 AAC 75.350, is not a current or reasonably expected future drinking water source due to potential seawater intrusion. Low levels of metals, near the background or cleanup level, were detected; however, these are probably attributed to background metal concentrations and not anthropogenic activities. Low levels of diesel range organics (DRO) were detected in a groundwater sample in 1993; however, a sample collected in 2000 was well below cleanup criteria. No analytes exceeded cleanup criteria in the 2000 sampling event. One more groundwater sample will be collected to confirm that DRO and SVOCs are less than ADEC regulatory criteria.

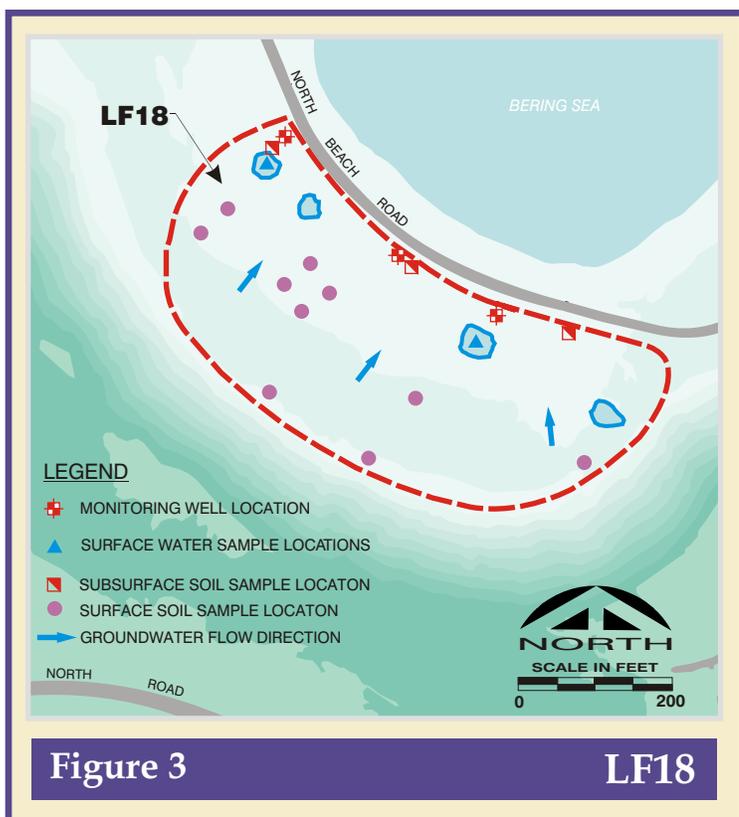


Figure 3

LF18

Surface Water. In 1993, surface water samples were collected from two ponds. No contaminants were detected in concentrations above background levels or cleanup criteria except for low levels of three metals in one surface water sample. These values are near the background metal concentrations and are probably attributed to background metal concentrations and not anthropogenic activities. Low levels of gasoline range organics (GRO) and DRO were detected in the surface water samples; however, it is highly likely that these are biogenic since other petroleum constituents (such as VOCs and SVOCs) were not detected.

Sediment. Sediment samples for the intertidal area have not been evaluated. Samples from seeps (if present) and sediments from the intertidal area will be collected to assess downgradient receptor points.

Preferred Remedial Alternative

The preferred remedial alternative for LF18 is no further action and institutional controls. Since the exceedences in the surface water at the ponds pose no unacceptable risk to human health or the environment, the selected remedy for the ponds is no further action. If the intertidal area sediment sampling event reveals there are no analytical results that exceed sediment cleanup criteria, then the selected remedy for the intertidal area will be no further action. To restrict present and future access or exposure to contaminants at the landfill, several institutional controls would be implemented.

- Signs would be posted warning of land use restrictions (restricting excavation of soil and use of groundwater as drinking water).
- Because waste at the landfill at LF18 would remain in place above ADEC cleanup criteria, institutional notice of waste left in place would be developed by the Air Force with ADEC concurrence. This would be noted in state land records. The Eareckson AS comprehensive map and master plan would be updated. In addition, a **5-year review** to evaluate the implementation of institutional controls would be completed.

In addition to the institutional controls, the following activities would be conducted in accordance with ADEC solid waste regulations.

- A land survey will be conducted at the landfill site to identify site boundaries and determine the extent of buried debris. This information would be used to update land records and the Eareckson AS comprehensive map.
- Any uncovered debris encountered during landfill survey activities would be covered or removed and properly disposed of.
- A visual inspection of the landfill cap would be conducted concurrently with biennial monitoring activities. The inspections will determine if the landfill cap is thick and extensive enough to properly cover debris, if significant erosion has occurred or may occur, and if the vegetative cover is well established. If the landfill cap were deemed inadequate for any of the above reasons it would be repaired. If the cap remain in good condition, biennial landfill cap inspections would be discontinued.

Table 2 Chemicals Detected Above Cleanup Criteria at LF18

Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria
Soil:			
Metals (mg/Kg)			
Magnesium	11,816 ^a	15,500	2
Potassium	1,200 ^a	1,860	3
Sodium	2,781 ^a	2,840	1
Thallium	5.5 ^b	92.4	12
Groundwater:			
Metals (mg/L)			
Lead	0.15 ^c	0.21	1
Magnesium	63.38 ^a	82.3	2
Phosphorus	na	0.44	1
Sodium	125.45 ^a	157	3
Petroleum Hydrocarbons (mg/L)			
DRO	1.5	2.8	1
Surface Water:			
Metals (mg/L)			
Magnesium	23.15 ^a	24.6	1
Manganese	0.432 ^a	1.3	1
Molybdenum	0.000923 ^a	0.0015	1
Petroleum Hydrocarbons (mg/L)			
GRO	na	0.0084	2
DRO	na	0.14	2

Notes:
 Results are from laboratory analysis only; results from field analysis are not included.
^a This value is the background level that has been determined for Shemya Island
^b EPA Region III, Risk-Based Concentration (4/13/2000)
^c This value is 10 times the groundwater cleanup level in 18 AAC 75.345, Table C
 DRO diesel range organics by EPA Method 8100M
 GRO gasoline range organics by EPA Method 8015M
 mg/Kg milligrams per kilogram
 mg/L milligrams per liter
 na not applicable, no cleanup criteria currently exists
 TPH total petroleum hydrocarbons by EPA Method 418.1

Metals: elements that occur naturally in the environment and are used to produce many products (i.e., sheet metal, drums, paint, etc.).

Background Levels: Levels of naturally-occurring substances, such as metals, that are commonly found in the soil, sediment, or water of a region.

5-year Review: A review of any cleanup action that results in hazardous substances, pollutants, or contaminants remaining at the site. The 5-year review can be performed at any time within five years after signing the ROD.

Sloughing: the process of collapsing, sliding, or slumping that occurs when loose material becomes unstable due to being placed at a steep angle or becoming water-logged.

Seeps: locations where underground liquids, such as water, appear at the ground surface.

Iron Leachate: Dissolved iron in water caused by contact of iron metal debris with water.

Barrel Bay and Scrap Metal Disposal Area (LF24/LF26)

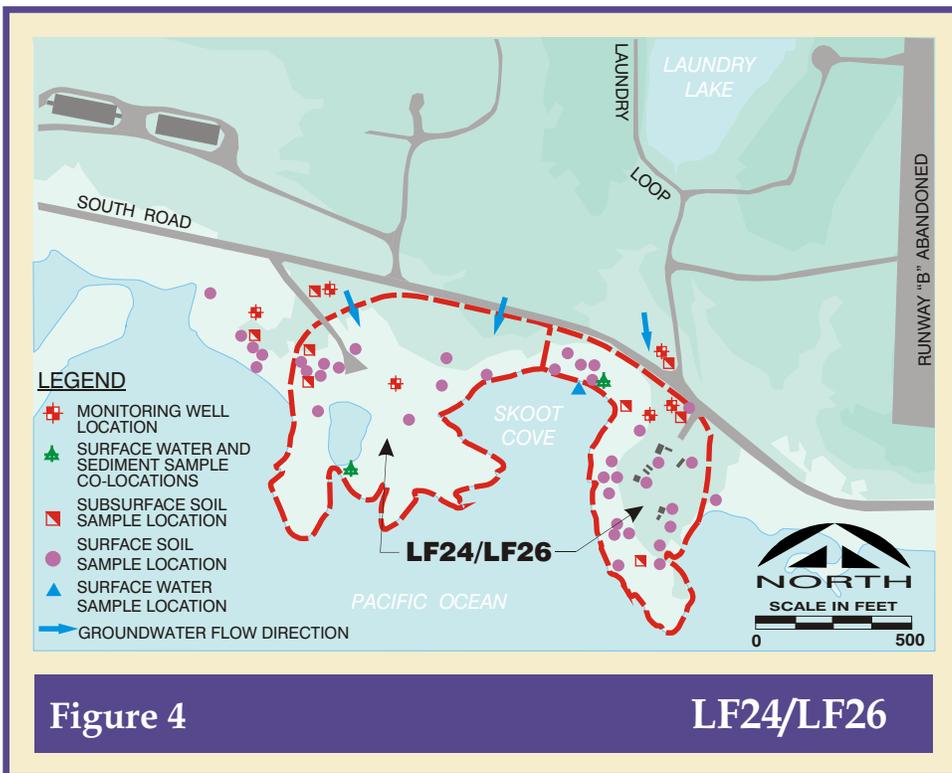
LF24 and LF26 will be discussed together because they are located adjacent to one another and have geographic and ecological similarities. The LF24/LF26 sites are located along the southern coast of Shemya Island, near Skoot Cove (Figure 4). LF24 includes 9.8 acres of the intertidal zone and flat lands above the coastal bluffs directly north and west of Skoot Cove. LF24 was used as a disposal area for empty 55-gallon drums, most of which formerly contained fuel. In 1984, the majority of these drums were removed from the island by the Air Force. As a result of this drum removal effort, the hillsides surrounding LF24 became unstable and considerable **sloughing** occurred. To stabilize the area, most of LF24 was covered with large rocks in 1987.

LF26 is situated on a bedrock outcrop at the end of a 3-acre finger of land jutting into the ocean on the east side of Skoot Cove. LF26 was used as a disposal area for metal debris, vehicle parts, wood, and other debris. Movement of groundwater through rusting and deteriorating debris over time created **seeps** of **iron leachate**. Much of the site was backfilled with large rocks and graded for stabilization in 1987. Environmental studies have been conducted at LF24/LF26 since 1988 to characterize the nature and extent of contaminants. These studies included collecting samples of soil, groundwater, surface water, and sediment (Figure 4). The samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, pesticides, PCBs, and metals. The findings are summarized below and in Table 3.

Soils. Thirty-eight surface and seven subsurface soil samples were collected at LF24/LF26 from 1988 through 1993. Due to the number of sample locations, they are not all shown on Figure 4. Several metals, TPH, two VOCs, and one SVOC (pentachlorophenol) exceeded cleanup criteria. The metal detections were either an isolated elevated level or are attributed to background concentrations and not anthropogenic activities. The TPH concentrations are

most likely attributed to the problematic method (EPA Method 418.1) used to analyze the samples in 1988. It is highly unlikely that petroleum contamination exists at the site since additional samples analyzed for other petroleum constituents (such as VOCs, SVOCs, and GRO) were either not detected or detected at very low levels. Methylene chloride is a common laboratory contaminant and is not associated with the site. The benzene (1 of 7 samples) and pentachlorophenol (1 of 36 samples) are isolated exceedences and probably not associated with the site. Pentachlorophenol is a common wood preservative.

Groundwater. From 1992 to 2000, 16 groundwater samples were collected from monitoring wells in and near the LF24/LF26 area. This site qualifies for a groundwater cleanup level equal to 10 times the Table C cleanup level under 18 AAC 75.345(b)(2) ("10X



Rule") since the groundwater, as determined under 18 AAC 75.350, is not a current or reasonably expected future drinking water source due to potential seawater intrusion. Only four metals were detected at concentrations above cleanup criteria. The groundwater beneath this area is in hydraulic communication with the brackish surface water and thus the elevated levels of magnesium, potassium, and sodium may be associated with seawater. The thallium exceedence was only in one of 16 samples collected and is therefore probably not associated with the site.

Table 3 Chemicals Detected Above Cleanup Criteria at LF24/LF26

Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria	Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria
Soil:				Surface Water:			
Metals (mg/Kg)				Metals (mg/L)			
Arsenic	5.5 ^a	53.1	16	Barium	na	0.007	7
Chromium	26 ^b	81.3	11	Cobalt	na	0.004	1
Iron	29,181 ^c	136,500	17	Copper	0.0031 ^g	0.0673	5
Lead	400 ^d	1,740	3	Lead	0.0081 ^g	0.18	2
Magnesium	11,816 ^c	18,000	12	Manganese	na	1.8	7
Potassium	1,200 ^c	1,990	9	Molybdenum	na	0.008	1
Selenium	3.5 ^b	39	2	Vanadium	na	0.012	5
Sodium	2,781 ^c	7,500	10	Petroleum Hydrocarbons (mg/L)			
Thallium	5.5 ^e	77	28	DRO	na	0.07	1
Petroleum Hydrocarbons (mg/Kg)				VOCs (mg/L)			
TPH	na	16,000	6	Acetone	na	0.002	1
VOCs (mg/Kg)				Carbon disulfide	na	0.0005	1
Benzene	0.02 ^b	0.049	1	2-Hexanone	na	0.01	1
Methyl chloride	0.015 ^b	0.019	1	4-Methyl-2-pentanone	na	0.0026	1
SVOCs (mg/Kg)				Sediment:			
Pentachlorophenol	0.01 ^b	0.21	1	Metals			
Groundwater:				(mg/Kg)			
Metals (mg/L)				Barium	48.52 ^c	62.9	2
Magnesium	63.38 ^c	217.7	5	Cadmium	0.676 ^h	0.95	1
Potassium	22.45 ^c	93.5	4	Chromium	52.3 ^h	79.6	1
Sodium	125.45 ^c	2,320	11	Cobalt	10 ^h	25.3	1
Thallium	0.02 ^f	0.141	1	Copper	39.49 ^c	321	1
				Lead	30.2 ^h	179	1
				Magnesium	11,620 ^c	12,800	1
				Manganese	504 ^c	1,670	2
				Nickel	99.9 ^c	134	1
				Potassium	1,719 ^c	3,670	1
				Selenium	1.0 ^h	8.5	3
				Sodium	4,548 ^c	8,000	1
				Thallium	na	23.7	2
				Zinc	124 ^h	570	1
				SVOCs (mg/Kg)			
				Di-n-butyl phthalate	0.058 ^h	1.6	1

Notes:

Results are from laboratory analysis only; results from field analysis are not included.

^a This value is 10 times the ingestion level in 18 AAC 75.341, Table B1, Under 40 inch Zone

^b This value is the migration to groundwater level in 18 AAC 75.341, Table B1, Under 40 inch Zone

^c This value is the background level that has been determined for Shemya Island

^d This value is the residential land use level in 18 AAC 75.341, Table B1

^e EPA Region III, Risk-Based Concentration (4/13/2000)

^f This value is 10 times the groundwater cleanup level in 18 AAC 75.345, Table C

^g This value is from Interim Final Rule, 60 FR 22231 and EPA, 1999, National Recommended Water Quality Criteria Correction, EPA 822-Z-99-001 (ADEC Proposed Surface Water Regulations)

^h NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pages, 1999

DRO diesel range organics by EPA Method 8100M

GRO gasoline range organics by EPA Method 8015M

mg/Kg milligrams per kilogram

mg/L milligrams per liter

na not applicable, no cleanup criteria currently exists

SVOCs semi-volatile organic compounds

TPH total petroleum hydrocarbons by EPA Method 418.1

VOCs volatile organic compounds

Dioxins: a group of chemicals that can be a contaminant (by-product) of herbicides or produced by incomplete combustion of certain solvents and oils.

Information Repository:

Additional information can be obtained at the information repository located at Elmendorf Air Force Base. The repository contains the Administrative Record for Eareckson AS, including detailed investigation reports, evaluation of potential cleanup technologies, and test results from field studies. The information repository contains the documents listed below.

▪ United States Air Force (USAF). 1990. Installation Restoration Program Stage 1 Final Technical Report for Shemya Air Force Base. Prepared for the Alaska Air Command 5099 CES/CC. 10 August.

(continued on page 11)

Surface Water. From 1993 to 2000, seven surface water samples were collected from three locations within LF24/LF26. Copper and lead were the only contaminants detected at concentrations above the cleanup criteria. Copper and lead concentrations in 13 of the 14 samples analyzed were either not detected or near surface water cleanup criteria. In 1993, trace levels of DRO and low levels of several VOCs were detected in surface water; however, in 1998 and 1999 the VOCs were no longer detected in the surface water.

Sediment. From 1993 to 2000, eight sediment samples were collected from two locations within LF24/LF26. Throughout the years of sediment sampling, various metals have been detected, with a few exceeding cleanup criteria. The metals were either an isolated elevated level or are attributed to background metal concentrations and not anthropogenic activities. Di-n-butyl phthalate is a common laboratory contaminant and is not associated with the site.

Preferred Remedial Alternative

The preferred remedial alternative for LF24/LF26 is no further action and institutional controls. Since the exceedences in the surface water at the ponds and sediments on the beach pose no unacceptable risk to human health or the environment, the selected remedy for the ponds and the beach sediments is no further action. To restrict present and future access or exposure to contaminants at the landfill sites, several institutional controls would be implemented.

- Signs would be posted warning of land use restrictions (restricting excavation of soil and use of groundwater as drinking water).
- Because waste at the landfill at LF24/LF26 would remain in place above ADEC cleanup criteria, institutional notice of waste left in place would be developed by the Air Force with ADEC concurrence. This would be noted in state land records. The Eareckson AS comprehensive map and master plan would be updated. In addition, a 5-year review to evaluate the implementation of institutional controls would be completed.

In addition to the institutional controls, the following activities would be conducted in accordance with ADEC solid waste regulations.

- A land survey will be conducted at each landfill site to identify site boundaries and determine the extent of buried debris. This information would be used to update land records and the Eareckson AS comprehensive map.
- Any uncovered debris encountered during landfill survey activities would be covered or removed and properly disposed of.
- A visual inspection of each landfill cap would be conducted concurrently with monitoring activities. The inspections will determine if the landfill caps are thick and extensive enough to properly cover debris, if significant erosion has occurred



Figure 5

LF28

or may occur, and if the vegetative cover is well established. Any landfill cap that is deemed inadequate for any of the above reasons would be repaired. If the caps remain in good condition, biennial landfill cap inspections would be discontinued.

Scrap Metal Landfill (LF28)

LF28 occupies an area of about 3 acres located adjacent to the active municipal solid waste landfill (Figure 5). It is bordered on the west by a road, and on the east by grass-covered cliffs that slope down to the Pacific Ocean. Groundwater flows to the east-southeast. LF28 was used to dispose of scrap metal and various domestic wastes until 1988. Aerial photographs and historical maps indicate that materials were being disposed of at this site as early as 1971, but the date when the site first started being used is unknown. The landfill was used primarily in the late 1980s when scrap metal debris was collected and buried there as part of an earlier Air Force cleanup effort. The surface was graded sometime after 1988 and is currently a series of hummocks with broken concrete.

Since 1988, environmental studies have been conducted at LF28 to characterize the nature and extent of contaminants. The studies included collecting samples of soil, groundwater, and surface water. The samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, pesticides, PCBs, **dioxins**, and metals. The findings are summarized below and in Table 4.

Soils. Six soil samples were collected from four sample locations between 1988 and 1993. These samples were collected from depths of 0 to 22 feet below ground surface. Only one metal, arsenic, was detected at concentrations above soil cleanup criteria. This exceedence was very close to the background arsenic concentration and can therefore probably be attributed to background concentrations and not anthropogenic activities. Methylene chloride is a common laboratory contaminant and is not associated with the site. In 1988 and 1993, very low levels of TPH were found; however, it is highly likely that these are biogenic since additional samples analyzed for other petroleum constituents (such as VOCs and SVOCs) were either not detected or detected at very low levels.

Groundwater. Four groundwater samples were collected in 1993 and 1994 from four monitoring wells. This site qualifies for a groundwater cleanup level equal to 10 times the Table C cleanup level under 18 AAC 75.345(b)(2) ("10X Rule") since the groundwater, as determined under 18 AAC 75.350, is not a current or reasonably expected future drinking water source due to potential seawater intrusion. Calcium and sulfate were the only metals detected above cleanup criteria; however, these exceedences were very close to the background metal concentrations and can therefore probably be attributed to background concentrations and not anthropogenic activities.

Surface Water. One surface water sample was collected from an area of standing water in 1993. Very low levels of GRO and DRO were found; however, it is highly likely that these are biogenic since additional samples analyzed for other petroleum constituents (such as VOCs and SVOCs) were either not detected or detected at very low levels.

Information Repository (cont)

• USAF. 1993. *Shemya Air Force Base, Alaska, 1992 Installation Restoration Program Field Investigation Report. Prepared for the Alaska Air Command 5099 CES/CC. February.*

• USAF. 1995. *Remedial Investigation/Feasibility Study Report. Volumes I and II. Prepared for the U.S. Air Force, 611th Air Support Group, 611th Civil Engineer Squadron, Elmendorf AFB, Alaska, and Eareckson Air Station, Alaska. August.*

(continued on page 12)

Table 4 Chemicals Detected Above Cleanup Criteria at LF28

Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria
Soil:			
Metal (mg/Kg)			
Arsenic	5.26 ^a	7.6	1
Petroleum Hydrocarbons (mg/Kg)			
TPH	na	60	4
VOCs (mg/Kg)			
Methylene chloride	0.015 ^b	0.018	1
Groundwater:			
Metals (mg/L)			
Calcium	151.96 ^a	200	2
Sulfate	137.42 ^a	314	2
Surface Water:			
Petroleum Hydrocarbons (mg/L)			
GRO	na	0.0056	1
DRO	na	0.23	1

Notes:

Results are from laboratory analysis only; results from field analysis are not included.

^a This value is the background level that has been determined for Shemya Island

^b This value is the migration to groundwater level in 18 AAC 75.341, Table B1, Under 40 inch Zone

DRO diesel range organics by EPA Method 8100M

GRO gasoline range organics by EPA Method 8015M

mg/Kg milligrams per kilogram

mg/L milligrams per liter

na not applicable, no cleanup criteria currently exists

TPH total petroleum hydrocarbons by EPA Method 418.1

VOCs volatile organic compounds

Information Repository (cont)

▪ USAF. 1996a. *Remedial Investigation/Feasibility Study Report. Volume III. Prepared for the U.S. Air Force, 611th Air Support Group, 611th Civil Engineer Squadron, Elmendorf AFB, Alaska, and Eareckson Air Station, Alaska. January.*

▪ USAF. 1996b. *Remedial Investigation/Feasibility Study Report. Volume IV. Prepared for the U.S. Air Force, 611th Air Support Group, 611th Civil Engineer Squadron, Elmendorf AFB, Alaska, and Eareckson Air Station, Alaska. March.*

▪ USAF. 1996c. *Technical Memorandum, Results of 1995 IRP Field Program. Prepared for the U.S. Air Force, 611th Air Support Group, 611th Civil Engineer Squadron, Elmendorf AFB, Alaska, and Eareckson Air Station, Alaska. January.*

(continued on page 13)

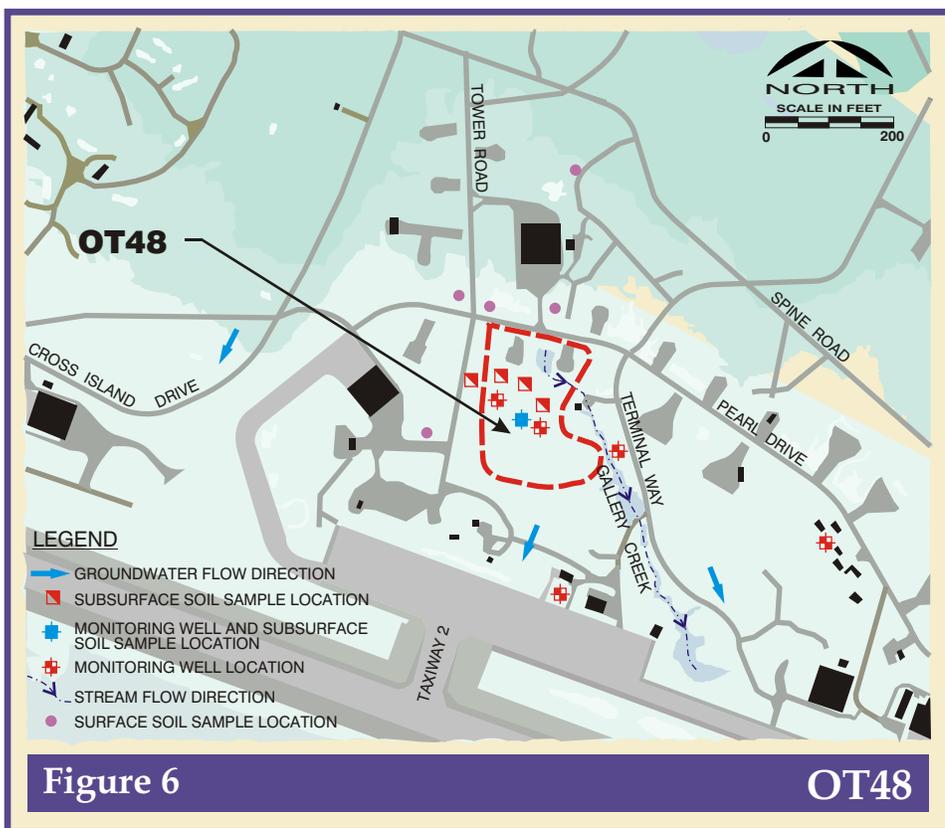
Preferred Remedial Alternative

The preferred remedial alternative for LF28 is no further action and institutional controls. Since the exceedences in the surface water pose no unacceptable risk to human health or the environment, the selected remedy for the area of standing water is no further action. To restrict present and future access or exposure to contaminants at the landfill site, several institutional controls would be implemented.

- Signs would be posted warning of land use restrictions (restricting excavation of soil and use of groundwater as drinking water).
- Because waste at the landfill at LF28 would remain in place above ADEC cleanup criteria, institutional notice of waste left in place would be developed by the Air Force with ADEC concurrence. This would be noted in state land records. The Eareckson AS comprehensive map and master plan would be updated. In addition, a 5-year review to evaluate the implementation of institutional controls would be completed.

In addition to the institutional controls, the following activities would be conducted in accordance with ADEC solid waste regulations.

- A land survey will be conducted at the landfill site to identify site boundaries and determine the extent of buried debris. This information would be used to update land records and the Eareckson AS comprehensive map.
- Any uncovered debris encountered during landfill survey activities would be covered or removed and properly disposed of.
- A visual inspection of the landfill cap would be conducted concurrently with biennial monitoring activities. The inspections will determine if the landfill cap is thick and extensive enough to properly cover debris, if significant erosion has occurred or may occur, and if the vegetative cover is well established. If the landfill cap were deemed inadequate for any of the above reasons it would be repaired. If the cap remain in good condition, biennial landfill cap inspections would be discontinued.



Water Gallery (OT48)

OT48 is located in the south-central portion of Shemya Island, east of Tower Road and west of Terminal Way (Figure 6). The groundwater at OT48 is typically 2 to 3 feet below ground surface and drains into Gallery Creek. Site OT48 has been used since the early 1950s as the source of drinking water for Eareckson AS personnel. The Water Gallery intercepts groundwater using an underground system of perforated piping that collects and stores water for installation use.

Since 1989, environmental studies have been conducted at OT48 to

characterize the nature and extent of contaminants. The studies included collecting samples of soil and groundwater (Figure 6). The samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, pesticides, PCBs, and metals. The findings are summarized below and in Table 5.

Soils. During an investigation in 1992, five surface soil and five subsurface soil samples were collected in and around OT48. Six SVOCs were detected in one surface soil sample; however, this sample is upgradient of the site and not associated with trichloroethylene (TCE) contamination at the site. Arsenic, antimony, and chromium were the only metals detected above cleanup criteria; however, these exceedences were very close to the background metal concentrations and can therefore probably be attributed to background concentrations and not anthropogenic activities.

Groundwater. During the period from 1988 through 2000, nine groundwater samples were collected from six monitoring wells for analysis. From 1992 to 1999, one VOC, TCE, and various metals were detected in groundwater at concentrations exceeding cleanup criteria. TCE concentrations have been declining and were below cleanup criteria in 2000. No analytes exceeded cleanup criteria in the 2000 sampling event. One more round of groundwater samples will be collected to confirm the 2000 sampling event. All of the metals except for antimony were detected in a monitoring well downgradient of the site and since metal contamination was not found on the site, these results are not applicable to the site. The antimony results are close to cleanup criteria.

Preferred Remedial Alternative

Since the contaminant of concern, TCE in groundwater, has steadily been declining at this site, and poses no unacceptable risk to human health or the environment, the selected remedy for OT48 is no further action. If the additional groundwater sampling event reveals there are no analytical results that exceed groundwater cleanup criteria, then the site should be closed under the Air Force 611th Environmental Restoration Section and the ADEC Division of Spill Prevention and Response Contaminated Sites Program. Annual sampling would continue under the Air Force 611th Environmental Compliance Section and the ADEC Division of Environmental Health Drinking Water and Domestic Wastewater Program for as long as the Water Gallery system is used as a drinking water source. Currently, TCE is treated with shallow tray air strippers and metals are treated with an oxidation and filtration system. If at any time the results of the drinking water sampling indicate that the drinking water is not suitable for human consumption, the Air Force would implement appropriate engineering controls under the guidance of ADEC to ensure that the water is of acceptable quality.

Base Operations Spill (SS14)

SS14 is located in the south-central portion of Shemya Island on the asphalt parking area near the former Base Operations Terminal (Figure 7). The site consists of a flat, graded parking apron that is partially paved and is still actively used for aircraft maintenance. On 9 August 1983, a cracked fuel tank in a damaged C-5A aircraft spilled approximately 50 gallons of JP-4 fuel on the parking area. The Station Fire Department reportedly hosed the fuel off the

Table 5 Chemicals Detected Above Cleanup Criteria at OT48

Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria
Soil:			
Metals (mg/Kg)			
Arsenic	5.26 ^a	6.8	1
Antimony	3.6 ^b	24.8	5
Chromium	26 ^b	38.7	4
SVOCs (mg/Kg)			
Carbazole	2 ^b	13	1
Benzo (a) anthracene	6 ^b	43	1
Benzo (a) pyrene	1 ^c	36	1
Benzo (b) fluoranthene	11 ^c	61	1
Dibenzo (a,h) anthracene	1 ^c	4.8	1
Ideno (1,2,3-c,d) pyrene	11 ^c	20	1
Groundwater:			
Metals (mg/L)			
Aluminum	36.5 ^d	300	1
Antimony	0.006 ^e	0.0311	2
Chromium	0.1 ^e	0.22	1
Lead	0.015 ^e	0.03	1
Magnesium	63.38 ^a	230	1
Manganese	3.64 ^a	6.7	1
Nickel	0.105 ^a	0.17	1
Vanadium	0.26 ^e	1.8	1
VOCs (mg/L)			
TCE	0.005 ^e	0.024	5

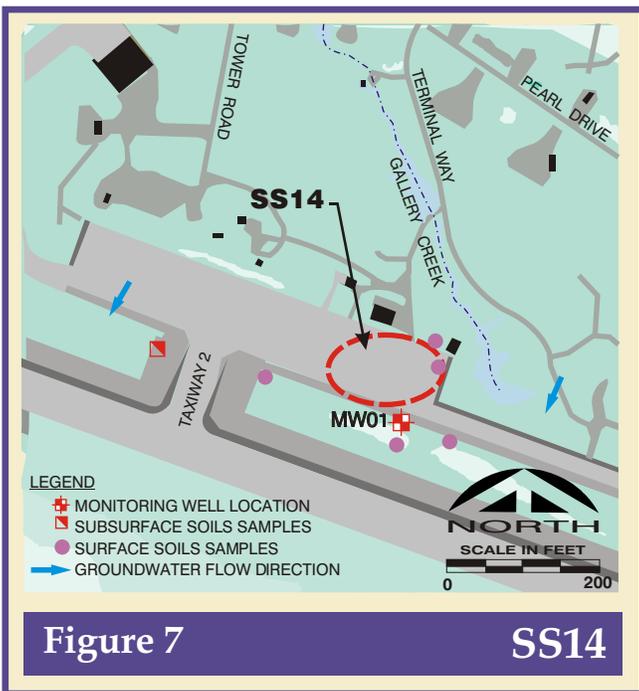
Notes:
 Results are from laboratory analysis only; results from field analysis are not included.
^a This value is the background level that has been determined for Shemya Island
^b This value is the migration to groundwater level in 18 AAC 75.341, Table B1, Under 40 inch Zone
^c This value is the ingestion level in 18 AAC 75.341, Table B1, Under 40 inch Zone
^d This value is the calculated groundwater cleanup level in accordance with 18 AAC 75.341, Table B1
^e This value is the groundwater cleanup level in 18 AAC 75.345, Table C
 mg/Kg milligrams per kilogram
 mg/L milligrams per liter
 SVOCs semi-volatile organic compounds
 TCE trichloroethylene
 VOCs volatile organic compounds

Information Repository (cont)

USAF. 1999b. *Remedial Investigation Basewide Groundwater Monitoring Report, August - September 1998. Prepared for the U.S. Air Force, 611th Air Support Group, 611th Civil Engineer Squadron, Elmendorf AFB, Alaska, and Eareckson Air Station, Alaska. June.*

• USAF. 2000. *Comprehensive Basewide Monitoring Report. June 1999 Basewide Monitoring Activities and Findings. Final. United States Air Force, 611th Air Support Group/611th Civil Engineer Squadron. Elmendorf AFB, Alaska, and Eareckson Air Station, Alaska. January.*

• USAF. 2001. *Year 2000 Basewide Monitoring Program. United States Air*



asphalt with water. The resulting water/fuel mixture flowed into the sandy soils between the parking apron and the south side of the runway. The fuel-saturated soils were later excavated, containerized, and stored at another location on base. Since 1988, following the soil excavation, several investigations were conducted to make sure that all contamination was removed from the site. During investigations in 1992, 1993, and 1994, soil and groundwater samples were collected. These samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, and metals. The findings are summarized below and in Table 6.

Soils. In 1992 and 1994, five soil samples were collected. Four samples were collected from surface locations and one sample from depths of 1 to 5 feet below ground surface. Three SVOCs were detected at concentrations above cleanup criteria; however, these SVOCs were not found in the subsurface samples. These SVOCs may be associated with asphalt chips in the surface soil. No other contaminants were detected above cleanup criteria.

Groundwater. One groundwater sample was collected from a monitoring well. Aluminum was the only analyte found above cleanup criteria; however, aluminum is not a component of JP-4 and therefore not associated with the fuel spill. In addition, it is unlikely that aluminum is a result of anthropogenic activities.

Preferred Remedial Alternative

Because contaminants at SS14 area are at low levels, appear to be decreasing, and pose no unacceptable risk to human health or the environment, the selected remedy for Site SS14 is no further action. The data support the conclusion that the reported 50-gallon fuel spill on the parking apron has been sufficiently remediated through soil removal and natural attenuation and no further monitoring is needed.

USTs at Building 110 (ST39)

ST39 is a relatively flat area located on top of a 240-foot bluff on the northeastern coast of Shemya Island (Figure 8). Building 110 is located at this site and was used by the Navy for radar operations as part of the Classic Owl system. The building is surrounded by a gravel pad and a chain-link fence. Three USTs were located near Building 110 within the fenced area and were used for fuel oil and diesel fuel storage and supply. These USTs were removed in the early 1990s. Soil removed during tank excavation was placed back into the excavation, including contaminated soil. Defined surface water drainages are absent and groundwater is approximately 140 feet below ground surface, generally flowing to the northeast toward the Bering Sea.

From 1988 to 1994, environmental studies were conducted at Site ST39 in conjunction with tank removals to characterize the nature and extent of contaminants. The studies included collecting soil samples (Figure 8). The samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, pesticides, PCBs, and metals. The findings are summarized below and in Table 7.

Soils. During the 1988 to 1994 investigations, 42 soil samples

Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria
Soil:			
SVOCs (mg/Kg)			
Benzo (a) anthracene	6 ^a	10.2	1
Benzo (a) pyrene	1 ^b	7.94	2
Benzo (b) fluoranthene	11 ^b	12.2	1
Groundwater:			
Metals (mg/L)			
Aluminum	36.5 ^c	75	1
Inorganics (mg/L)			
Nitrate	na	6.54	1

Notes:
 Results are from laboratory analysis only; results from field analysis are not included.
^a This value is the migration to groundwater level in 18 AAC 75.341, Table B1, Under 40 inch Zone
^b This value is the ingestion level in 18 AAC 75.341, Table B1, Under 40 inch Zone
^c This value is the calculated groundwater cleanup level in accordance with 18 AAC 75.341, Table B1
 mg/Kg milligrams per kilogram
 mg/L milligrams per liter
 na not applicable, no cleanup criteria currently exists
 SVOCs semi-volatile organic compounds

were collected at ST39. Most of the samples were collected from soil borings, trenches, and tank excavation pits. Not all soil sample locations are shown on the figure due to the number of samples. Petroleum hydrocarbons were detected in subsurface soil samples at concentrations exceeding cleanup criteria. Two metals, arsenic and chromium, were detected above cleanup criteria; however, these values are near the background metal concentrations and are probably attributed to background metal concentrations and not anthropogenic activities.

Groundwater. The likelihood of groundwater contamination due to the presence of contamination in ST39 soils was predicted using a computer model. The model accounted for site conditions such as soil type, depth to groundwater, amount of rainfall, and amount and type of soil contamination. The modeling results indicated that, primarily due to the depth to groundwater, no significant contaminant concentrations should reach the groundwater.

Preferred Remedial Alternative

The preferred remedial alternative for ST39 is institutional controls. Because waste at ST39 would remain in place above ADEC cleanup criteria, institutional notice of waste left in place would be developed by the Air Force with ADEC concurrence. This would be noted in state land records. In addition, land use restrictions (restricting excavation of soil and use of groundwater as drinking water) would be developed. The Eareckson AS comprehensive map and master plan would be updated. In addition, a 5-year review to evaluate the implementation of institutional controls would be completed.

Summary of Preferred Remedial Alternatives

The preferred remedial alternatives for the six sites discussed in this Proposed Plan are:

- North Beach Landfill (LF18) - no further action, institutional controls, and landfill cap inspection
- Barrel Bay and Scrap Metal Disposal Area (LF24/LF26) - no further action, institutional controls, and landfill cap inspection
- Scrap Metal Landfill (LF28) - no further action, institutional controls, and landfill cap inspection
- Water Gallery (OT48) - no further action
- Base Operations Spill (SS14) - no further action
- USTs at Building 110 (ST39) - institutional controls

Table 7 Chemicals Detected Above Cleanup Criteria at ST39

Chemical	Cleanup Criteria	Highest Reported Concentration	Number of Samples Above Cleanup Criteria
Soil:			
Metal (mg/Kg)			
Arsenic	5.74 ^a	16	2
Chromium	26 ^b	31	1
Petroleum Hydrocarbons (mg/Kg)			
Benzene	0.1 ^c	0.1	0
DRO	11,000 ^c	11,000	0
TPH	na	1,770	8

Notes:

Results are from laboratory analysis only; results from field analysis are not included.

^a This value is the background level that has been determined for Shemya Island

^b This value is the migration to groundwater level in 18 AAC 75.341, Table B1, Under 40 inch Zone

^c This value is a proposed alternate cleanup level based on the model

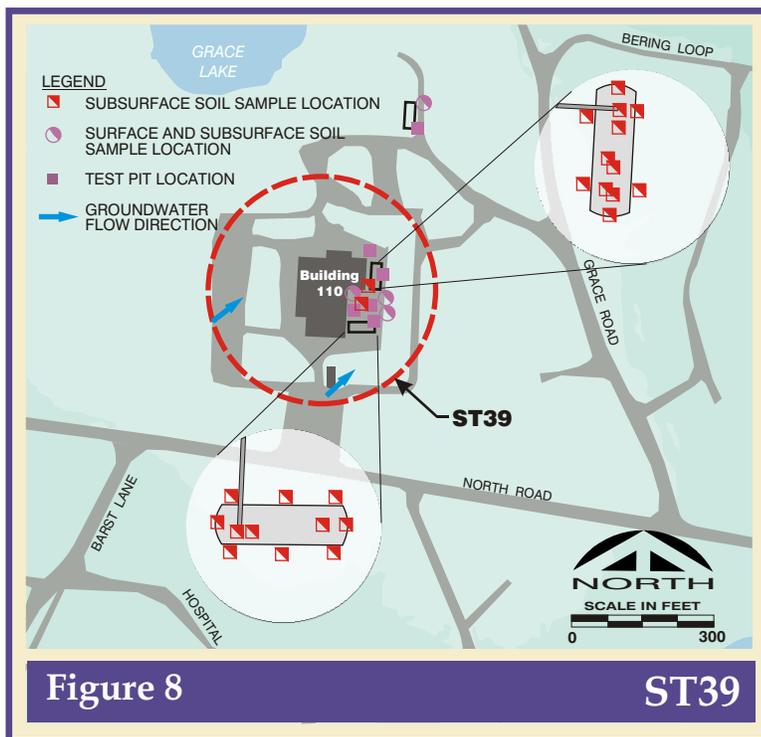
DRO diesel range organics by EPA Method 8100M

GRO gasoline range organics by EPA Method 8015M

mg/Kg milligrams per kilogram

na not applicable, no cleanup criteria currently exists

TPH total petroleum hydrocarbons by EPA Method 418.1



Additional Information

Additional information can be found in the information repository located at Elmendorf Air Force Base. The list of source material is provided for readers who want more detailed information than is presented in this Proposed Plan.



**Community Relations Coordinator
Steve Wilhelmi
611 CES/CEVR
10471 20th Street, Suite 347
Elmendorf AFB, Alaska 99506-2200**

Contact for Questions

**If you have any questions about
the information provided in this
Proposed Plan,**

**or if you would like to be added to
or deleted from the mailing list,
please contact the Air Force
Community Relations Coordinator:**

**Mr. Steve Wilhelmi
Community Relations Coordinator
611 CES/CEVR
10471 20th Street, Suite 347
Elmendorf Air Force Base, Alaska
99506-2200
steve.wilhelmi@elmendorf.af.mil
(907) 552-8166 or (800) 222-4137**



COMMUNITY PARTICIPATION

You are encouraged to provide comments on any of the alternatives presented in this Proposed Plan for Eareckson AS. A final decision on the alternatives for each of these sites will not be made until public comments are considered. Your comments can be presented either in writing or at the following scheduled public meeting:

May 2, 2002 (Thursday)
7-9 p.m.
Loussac Library
Anchorage, Alaska

A pre-addressed comment form is included in this Proposed Plan. The public comment period will end on May 31, 2002.

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**Community Relations Coordinator
Steve Wilhelmi
10471 20th Street, Suite 347
Elmendorf AFB, Alaska 99506-2200**

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Groundwater Use Determination 18 AAC 75.350

The groundwater at LF18, LF24/LF26, and LF28 meets the criteria stipulated in 18 AAC 75.350 to classify groundwater as a non-drinking water source. The specific criteria spelled out in 18 AAC 75.350 are discussed below, along with an explanation of why the groundwater meets the criteria.

1. **Criterion** - The groundwater at LF18, LF24/LF26, and LF28 may not be currently used for a public or private drinking water system.

Basis – There are no drinking water wells at LF18, LF24/LF26, and LF28. All of the island’s drinking water is obtained from the water gallery.

2. **Criterion** - The groundwater at LF18, LF24/LF26, and LF28 cannot be within the zone of contribution of any public or private drinking water well.

Basis –Two of the landfills, LF18 and LF28, are located on the northside of the groundwater divide and LF24/LF26 is approximately 1.5 miles southwest of the drinking water gallery. All three of these landfills are located on the coast. The groundwater at each of the landfills discharges to either the Bering Sea or the Pacific Ocean and away from the drinking water gallery. In addition, the groundwater cannot be used for drinking water due to potential seawater intrusion.

3. **Criterion** - The groundwater at the landfills may not be within a recharge area for a private or public drinking water well, wellhead protection area, or a sole source aquifer.

Basis – The drinking water gallery, classified as groundwater under direct influence of surface water and thus subject to surface water treatment rules, is protected by a Watershed Protection Plan in order to protect the drinking water supply. There are no wellhead protection areas on Shemya Island. Two of the landfills, LF18 and LF28, are located on the northside of the groundwater divide and LF24/LF26 is approximately 1.5 miles southwest of the drinking water gallery. The groundwater at each of the landfills discharges to either the Bering Sea or the Pacific Ocean and away from the drinking water gallery. In addition, the groundwater cannot be used for drinking water due to potential seawater intrusion.

Groundwater Use Determination
18 AAC 75.350

4. **Criterion** - The groundwater at LF18, LF24/LF26, and LF28 may not be a reasonably expected potential future source of drinking water based on the availability of groundwater, quality of the groundwater, existence and enforceability of institutional controls, land use of the site and neighboring property, need for a drinking water source and availability of an alternative source, and exemption of the groundwater under 40 CFR 146.4:

Basis -

- The groundwater at LF18, LF24/LF26, and LF28 cannot be used for drinking water due to potential seawater intrusion.
 - The Air Force will implement institutional controls to include site descriptions and to restrict use of the groundwater; these institutional controls will be noted in state land records. In addition, these restrictions would remain with the property should the Air Force decide to dispose of it. Note that the Air Force has no plans to dispose of the property.
 - Shemya Island is an industrial facility and the Air Force has no plans for residential development on the island.
5. **Criterion** - The affected groundwater will not be transported to groundwater that is a source of drinking water, or that is a reasonably expected potential future source of drinking water.

Basis - The groundwater at each of the landfills discharges to either the Bering Sea or the Pacific Ocean, which is away from the water gallery. The groundwater at these landfill sites cannot be used for drinking water because of the potential saltwater intrusion.