This Proposed Plan proposes the preferred cleanup alternative for the Solid Waste Management Unit (SWMU) 17, Power Plant No. 3 Area at the former Adak Naval Complex, Adak Island, Alaska. This Proposed Plan was developed in accordance with State of Alaska regulations governing petroleum-release sites, the Alaska Department of Environmental Conservation (DEC) Oil and Other Hazardous Substances Pollution Control Regulations (18 Alaska Administrative Code [AAC] Chapter 75). This document is being issued by the Navy, the lead agency for site activities, and the Alaska DEC, the lead regulatory agency. This document summarizes information that can be found in greater detail in the Final Focused Feasibility Study (FFS) Report for the SWMU 17, Power Plant No. 3 Area and other relevant documents referenced in this Proposed Plan. The Navy and the Alaska DEC encourage the public to review the Final FFS Report and other relevant documents to increase their understanding of the site and the activities that have been conducted there. The Final FFS Report and other relevant documents cited in this Proposed Plan are available in the information repositories listed on the side bar of this page.

The public is encouraged to review and comment on this Proposed Plan. The Navy, in consultation with the Alaska DEC, may modify any of the cleanup alternatives, including the preferred cleanup alternative, based on public comments or new information. Following consideration of public comments, the final decision for the SWMU 17, Power Plant No. 3 Area will be presented in a Decision Document (DD). The DD will include a responsiveness summary describing how public comments were addressed.

The Proposed Plan has the following purposes:

- Provide basic background information
- Describe the cleanup options that were evaluated
- Identify the preferred cleanup alternative for remedial action
- Explain the reasons for recommending the preferred cleanup alternative
- Solicit public review of and comment on all the cleanup alternatives
- Provide information on how the public can be involved in the remedy selection process

**Dates to Remember**

**PUBLIC COMMENT PERIOD:**
August 1 through
August 31, 2006

The U.S. Navy and the Alaska Department of Environmental Conservation will accept written comments on the Proposed Plan during the public comment period.

For more information, see the information repositories at the following locations:

Bob Reeve High School
Adak, AK 99546

Library Reserve Room
University of Alaska, Anchorage
3211 Providence Drive
Anchorage, AK 99501
(907) 786-1871

Naval Facilities Engineering Command Northwest
1101 Tautog Circle
Silverdale, WA 98315
SITE BACKGROUND

The former Adak Naval Complex is located on Adak Island, which is approximately 1,200 air miles southwest of Anchorage, Alaska, in the Aleutian Island chain (Figure 1). Figure 2 shows the location of the SWMU 17, Power Plant No. 3 Area on Adak Island. The former U.S. Navy base occupied 76,800 acres on the northern half of the island. The U.S. Fish and Wildlife Service manages the southern portion of the island, which is a designated wilderness area within the Alaska Maritime National Wildlife Refuge System.
All Navy operations ceased at the former Adak Naval Complex on March 31, 1997, when the active Navy mission ended. From April 1997 through September 2000, critical facilities such as the power plant, airfield, and environmental cleanup systems were operated by the Navy through a caretaker contractor. In June 1998, the Navy leased the downtown area and facilities to the Adak Reuse Corporation (ARC). In October 2000, ARC began operation of community facilities such as the airfield and utility systems.

In September 2000, the federal government entered into a land transfer agreement with The Aleut Corporation, an Alaska Native corporation. This agreement set forth the terms and conditions for the conveyance of approximately 47,000 acres of the former Adak Naval Complex property to The Aleut Corporation. The actual conveyance or transfer of property occurred on March 17, 2004. The land transfer includes all of the downtown area, housing units, and industrial facilities. The transferred land has institutional controls currently in place that limit exposure to chemical contamination. The institutional controls include a requirement to notify the Navy of soil excavation activities, groundwater restrictions that prohibit use of the downtown aquifer as a drinking water resource, and a fishing advisory. In addition, land use restrictions that prohibit residential use of land are applicable to specific sites on Adak, including the SWMU 17, Power Plant No. 3 Area. The City of Adak currently owns the SWMU 17, Power Plant No. 3 Area.

The Navy established a community involvement program in 1994 to provide Adak residents and other interested Alaska citizens with timely and updated information on the environmental cleanup and the transfer and reuse of Navy land and facilities. The community involvement program also provides a mechanism for public input on environmental cleanup decisions. Information is conveyed to the public via fact sheets and newsletters; Restoration Advisory Board (RAB) meetings and other formal public meetings; a web site (www.adakupdate.com); information repositories on Adak Island (Bob Reeve High School building, second floor) and in Anchorage (University of Alaska library’s reserve room); and the Administrative Record file located at Naval Facilities Engineering Command Northwest, Silverdale, Washington. In addition, a mailing list is maintained and updated to send newsletters, fact sheets, and announcements of upcoming meetings and significant activities, such as public comment periods, to concerned citizens. Public input is obtained through RAB meetings and other formal public meetings, community interviews, requests for public comments, and a telephone hotline.

Various environmental field investigations were performed by the Navy at the SWMU 17, Power Plant No. 3 Area between 1986 and 2005, as indicated in Table 1. Results of these investigations indicated that petroleum-related chemicals and some volatile organic compounds were present in samples of subsurface soil, groundwater, sediment, and surface water collected from several locations at the SWMU 17, Power Plant No. 3 Area.
Table 1. Summary of Environmental Field Investigations, SWMU 17

<table>
<thead>
<tr>
<th>Date</th>
<th>Investigation Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986-</td>
<td>Initial assessment study, site inspection, reconnaissance investigation, supplement to</td>
</tr>
<tr>
<td>1995a</td>
<td>the reconnaissance investigation, Resource Conservation and Recovery Act facility assessment, site investigation, and a supplemental investigation and treatability study*</td>
</tr>
<tr>
<td>1995</td>
<td>Preliminary source evaluation to evaluate site conditions resulting from a release of</td>
</tr>
<tr>
<td></td>
<td>petroleum and hazardous chemicals</td>
</tr>
<tr>
<td>1997</td>
<td>Site investigation to determine the extent and source of the free-product plume</td>
</tr>
<tr>
<td>1999</td>
<td>Site summary report to present all site data collected to that point and compare chemical concentrations in soil and groundwater to supplemental site-screening criteria established by Alaska DEC</td>
</tr>
<tr>
<td>2001</td>
<td>Remedial investigation to delineate the lateral extent of dissolved-phase, petroleum-related chemicals in the groundwater</td>
</tr>
<tr>
<td>2005</td>
<td>Site investigation to evaluate the current conditions of the sediment in Yakutat Creek for the ecological risk assessment</td>
</tr>
</tbody>
</table>

*Investigations completed before 1995 primarily addressed COCs under the CERCLA process

Notes:
COC – chemical of concern
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act

Potential sources of the petroleum hydrocarbons present at the site are identified on Figure 3. These potential sources include a fuel farm located north of the power plant building, consisting of five aboveground storage tanks (ASTs) numbered 31015 through 31019; two former oil/water separators located northeast of the power plant building; a former waste oil pond (now removed), which was located east of the power plant; and a retention pond, which is located between the waste oil pond and Yakutat Creek. Two of the ASTs installed at the site stored jet petroleum No. 5 (JP-5), one stored waste oil, and the remaining two stored reserve oil supplies. The two vertical ASTs (31018 and 31019) were reported to be cleaned and closed during 1998. One horizontal AST (31017) was also reported to be removed at that time. The two remaining ASTs (31015 and 31016) remain in operation and contain JP-5 used to fuel the power plant. The former waste oil pond was constructed in the mid-1960s to contain waste petroleum oil and lubricants generated at the plant.

Although environmental field investigations have not identified the petroleum source, the most likely source is from the power plant tank farm, or the two former oil/water separators. A reported release of “approximately 500 gallons” of
JP-5 from the Power Plant No. 3 tank farm occurred during 1994 as the result of a cracked valve. Free product was not observed on the groundwater surface prior to the petroleum release from the cracked valve. During the removal of the two oil/water separators, petroleum hydrocarbons were reported in soil at levels above the Alaska DEC soil cleanup criteria. Broken influent and effluent piping as well as overflow of the separators appear to be the causes of the releases. Other possible sources of petroleum releases include over-filling of the ASTs and leaking piping located in the tank farm. However, tightness testing of the pipelines to the ASTs occurred in October 1996, and the results of the testing indicated that leaks from the piping were very unlikely.

Cleanup activities that have already been implemented at the SWMU 17, Power Plant No. 3 Area include AST cleaning and closures, contaminated soil excavation, free-product removals, oil/water separator removals, waste oil pond and retention pond sediment removals, fill placement near Amulet Way to prevent fuel seeps, and natural attenuation monitoring. A summary of the cleanup activities performed at the site is provided in Table 2. These cleanup activities are also shown on Figure 4. In addition, results of the free-product recovery activities performed at the site are provided in Table 3.
Investigation and cleanup of petroleum-contaminated sites at the former Adak Naval Complex have been ongoing since 1986. Adak was initially proposed for placement on the National Priorities List in 1992 and was officially listed in 1994. The Navy, as lead agency, entered into a three-party Federal Facilities Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) and Alaska DEC and a two-party State-Adak Environmental Restoration Agreement (SAERA) with the Alaska DEC to facilitate investigation and cleanup activities.

In 1993, the Navy, EPA, and Alaska DEC signed the FFA, which incorporated the EPA’s cleanup process under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The CERCLA exclusion of petroleum as a hazardous substance required that cleanup of petroleum-related chemicals would follow State of Alaska regulations. Therefore, the FFA stated that petroleum-contaminated sites, such as those containing underground storage tanks (USTs) and leaking underground fuel lines, would be evaluated under a separate two-party agreement between the Navy and the State of Alaska. This agreement, the SAERA, was signed in April 1994.

In May 1997, the Navy and Alaska DEC agreed to integrate the cleanup decision process for petroleum sites with the cleanup decision process being conducted for hazardous substance release sites under CERCLA. As a result, the Record of Decision (ROD) for Operable Unit A (OU A) was prepared for both the petroleum-contaminated sites and the hazardous-substance-release sites and signed by the Navy, the EPA, and the Alaska DEC in 2000.

The ROD for OU A selected final or interim remedies for each of the 128 petroleum-contaminated sites identified on Adak Island. An interim remedy, free-product recovery, was selected for 14 sites that contained measurable quantities of free-phase petroleum product. SWMU 17, Power Plant No. 3 Area was one of these 14 sites. In addition, the ROD for OU A specified that these 14 sites would require future remedy selection. In 2003, the petroleum sites were transferred from CERCLA authority (managed by EPA) to state authority (managed by Alaska DEC). Therefore, final remedies for the 14 petroleum-contaminated sites will be selected in accordance with Alaska State regulation 18 AAC 75.325 through AAC 75.390, which provides the requirements for petroleum cleanup decisions.

A Proposed Plan and a DD were previously prepared for 10 sites (of the 14 sites described above) where the remaining petroleum-related chemicals pose no risk to human health or the environment above target health goals, provided that institutional controls remain in effect. Three of the remaining four sites (the Naval Mobile Construction Battalion [NMCB] Building T-1416 Expanded Area site, SWMU 62 New Housing Fuel Leak site, and the South of Runway 18-36 Area) where petroleum-related chemicals pose a potential risk are addressed in separate documents. The Proposed Plan for the NMCB Building T-1416 Expanded Area site was issued on August 16, 2005 and the DD for this site was signed on March 22, 2006. Proposed Plans for the SWMU 62 New Housing Fuel Leak site and the South of Runway 18-36 Area were issued on December 13, 2005.

This Proposed Plan addresses the SWMU 17, Power Plant No. 3 Area, which was originally included as one of the four sites where petroleum-related chemicals pose a potential risk to human health or the environment above target health goals. The initial draft FFS prepared in August 2004 (using information current through November 2002) for the SWMU 17, Power Plant No. 3 Area concluded that contaminants in sediment in Yakutat Creek posed a potential unacceptable risk. Because risks were only slightly above target health goals, the data used to evaluate the ecological risk were more than 6 years old, and samples were collected before the upgradient contaminant sources were remediated, the Navy performed additional sediment sampling in Yakutat Creek in June 2005 to assess whether risks remained unacceptable. Risks were recalculated using the additional data. The revised risk assessment concluded that contaminants in Yakutat Creek are unlikely to pose a significant risk (see Summary of Site Risks section).

Site Characteristics

Physical Characteristics that Impact Remedy Selection
Adak Island experiences a polar maritime climate characterized by persistently overcast skies, high winds, frequent and often violent storms, and a narrow range of temperature fluctuation throughout the year. The average total annual precipitation for Adak Island is about 60 inches, most of which falls as rain in the lower elevations. Average monthly precipitation varies from a low of about 3 inches during June and July to a high of 7 to 8 inches during November and December. Snowfall averages over 100 inches a year at sea level.

Prior to the military use of Adak Island during World War II, the western portion of the downtown area, which includes the eastern portion of the SWMU 17, Power Plant No. 3 Area, was occupied by a back-beach lagoon. The lagoon was separated from Kuluk Bay by a series of sand dunes. The lagoon was filled with sand from dune deposits by the military forces to construct the airfield. Therefore, the flat lowland area of the site, between Amulet Way and South Sweeper...
Creek, is part of the filled lagoon. The subsurface material in the lowland area consists of sequences of silty sand (fill) overlying the former lagoon bottom. Glacial till and bedrock are encountered beneath the former lagoon bottom at depth in the lowland portion of the site.

The geology and hydrogeology of the upland portion of SWMU 17, Power Plant No. 3 Area (the Western portion of the site) consists of two general profiles: tephra (volcanic ash) over glacial till or tephra over bedrock. These general profiles are described as approximately 8 feet of tephra directly overlying low-permeability glacial till or bedrock. Typically the tephra has a fairly uniform thickness throughout the uplands area on Adak Island. The glacial material are predominantly irregular, discontinuous layers of till deposits composed of unsorted gravels supported by a matrix of silt, clay, and fine sand. The underlying bedrock is predominantly volcanic with relatively minor amounts of marine sandstone, conglomerate, and shale.

Groundwater is found beneath the site at depths ranging from less than 2 feet below ground surface (bgs) to as much as 20 feet bgs, depending on the season and the location. Groundwater at the site generally flows east, toward Yakutat Creek and South Sweeper Creek. Average groundwater depths in the upland (western) portion of the site range from 2.7 to 15.8 feet bgs. Groundwater within the upland portion of the site occurs in discontinuous water-bearing zones contained in the higher permeability materials overlying glacial till or bedrock. Groundwater springs have been observed at the base of the upland section of the site (near Amulet Way) during prolonged periods of heavy precipitation. On average, groundwater in the lowland portion of the site is within 7 feet of the ground surface. Groundwater beneath the lowland portion of the site occurs as a broad, continuous aquifer extending from near the intersection of Aleutian and Amulet Way east toward Yakutat Creek and South Sweeper Creek.

Two streams flow near SWMU 17, Power Plant No. 3 Area: Yakutat Creek and South Sweeper Creek. These two streams make up the South Sweeper Creek riverine system that discharges into Sweeper Cove. South Sweeper Creek is a perennial stream located approximately 1,200 feet northeast of the Power Plant No. 3 Building. Yakutat Creek is a perennial stream located approximately 200 feet south of the power plant and is considered the southern boundary of the site. It flows southwest to northeast from the upland area, joining South Sweeper Creek east of the Power Plant No. 3 Building. From the confluence of these two streams surface water flows south approximately 4,800 feet to Sweeper Cove. South Sweeper Creek and the lower reach of Yakutat Creek are tidally influenced. The stormwater conveyances in the vicinity of SWMU 17, Power Plant No. 3 Area consist primarily of ditches, culverts, catch basin inlets, manholes, and outlets. In general, surface water collects in the ditches and catch basins, and is transported through the ditches or the storm sewer system to Yakutat Creek or South Sweeper Creek.

Land Use
Power Plant No. 3 (Building 10284) became operational in 1950. This facility has been the primary source of electrical power for the downtown area on Adak since that time. The former waste oil pond was constructed in the mid-1960s to contain waste petroleum oil and lubricants generated at the plant. The Quonset hut (Building T2267) was used for electric line and transformer repairs and for auto repair. This structure is no longer in use. The dry cleaning facility (Building 10203), located south of Power Plant No. 3, operated from 1968 until 1995.

The SWMU 17 site is classified for public facilities reuse by ARC (Figure 5). Public facilities reuse is intended to provide for and protect areas of public lands or facilities for public use, including power-generating facilities. The adjacent property to the south, including the dry cleaners (Building 10203), and to the west is classified for commercial reuse. The adjacent property to the southeast, east, and north is classified for future residential reuse although no housing units currently exist north of Yakutat Creek.
Groundwater Use
According to Alaska regulations (18 AAC 65.350), groundwater is considered to be a drinking water source unless it can be demonstrated that the groundwater is not currently being used as a drinking water source and groundwater is not a reasonably expected potential future source of drinking water. Groundwater has not historically been used as a drinking water source on Adak Island, nor is it currently being used as such. Groundwater is not considered a reasonably expected potential future drinking water source at SWMU 17, Power Plant No. 3 Area. Groundwater within the upland portion of the site occurs as discontinuous water-bearing zones contained in the higher permeability materials overlying glacial till or bedrock. The discontinuous nature of groundwater in this upland portion of the site is expected to yield a quantity of water insufficient to support a water supply well. Because of this, groundwater beneath this portion of SWMU 17, Power Plant No. 3 Area is determined to not be appropriate as a potential future source of drinking water. The shallow occurrence of groundwater in the lowland portion of the site does not provide sufficient distance between the ground surface and the groundwater surface for the placement of a 10-foot thick watertight seal, as required by Alaska regulation 18 AAC 80.015. Because of the shallow occurrence of groundwater in the lowland portion of the site, groundwater beneath this portion of SWMU 17, Power Plant No. 3 Area is determined to not be appropriate as a potential future source of drinking water. Institutional controls are also in place preventing the future use of any of the downtown groundwater aquifer as a drinking water source.

Soil and Groundwater
Chemical-specific screening criteria and cleanup levels for soil and groundwater have been established for petroleum-contaminated sites at the former Adak Naval Complex in accordance with Alaska DEC regulation 18 AAC Chapter 75. Screening criteria were used to estimate the potential extent of contamination. Cleanup levels are the specified concentrations for remediation. The soil and groundwater screening criteria and cleanup levels proposed for the SWMU 17, Power Plant No. 3 Area are provided in Table 4.

The Alaska regulations establish four methods for determining cleanup levels for soil [18 AAC 75.340]. The Alaska DEC Method Two cleanup levels, the most stringent cleanup levels for soil, were established to prevent migration of contaminants from soil to groundwater in the over 40 inches of rainfall zone (18 AAC 75.341, Tables B1 and B2). The Alaska DEC Method Two cleanup levels were used as screening criteria for the SWMU 17, Power Plant No. 3 Area to estimate the potential extent of soil impacted by petroleum contamination at the site. The Alaska DEC Method Four cleanup levels [18 AAC 75.340(a)(4)], which are based on site-specific risk assessments, were used to establish cleanup levels for the site. The risk assessment for this site demonstrated that the existing concentrations in soil do not pose a risk to humans or the environment above target health goals. Therefore, the existing concentrations at the site are protective of human health and the environment, and by default, are the cleanup levels for the site.

The Alaska regulations establish three methods for determining cleanup levels for groundwater [18 AAC 75.345]. The tabulated groundwater cleanup levels [18 AAC 75.345(b)(1), Table C] were used as screening criteria to estimate the potential extent of groundwater impacted by petroleum contamination at the site. Cleanup levels specified for remediation of groundwater at the SWMU 17, Power Plant No. 3 Area are based on 10 times these values because groundwater is not reasonably expected to be a potential future source of drinking water [18 AAC 75.345(b)(2)].

Surface Water and Sediment
Alaska regulation 18 AAC 70 establishes water use classes (and subclasses) for the water bodies of the state. Waters of Sweeper Cove and the lower reach of South Sweeper Creek fall within the “marine water” class, and the “water of Sweeper Cove and the lower reach of South Sweeper Creek” is considered to be a drinking water source.

### CLEANUP LEVELS

#### Soil and Groundwater Screening Criteria and Cleanup Levels, SWMU 17

**Table 4. Soil and Groundwater Screening Criteria and Cleanup Levels, SWMU 17**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Soil&quot; Screening Criteria (Method 2) (mg/kg)</th>
<th>Groundwater Screening Criteria (Table C) (mg/L)</th>
<th>Ten Times Table C (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Petroleum Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRO</td>
<td>230</td>
<td>1.5</td>
<td>15</td>
</tr>
<tr>
<td>GRO</td>
<td>260</td>
<td>1.3</td>
<td>13</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzene</td>
<td>0.02</td>
<td>0.005</td>
<td>0.05</td>
</tr>
<tr>
<td>Toluene</td>
<td>4.8</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>5</td>
<td>0.7</td>
<td>7</td>
</tr>
<tr>
<td>Total Xylenes</td>
<td>69</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Noncarcinogenic Polycyclic Aromatic Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Methylnaphthalene</td>
<td>38</td>
<td>1.5</td>
<td>15</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>19</td>
<td>0.7</td>
<td>7</td>
</tr>
<tr>
<td>Carcinogenic Polycyclic Aromatic Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>2.4</td>
<td>0.0002</td>
<td>0.002</td>
</tr>
</tbody>
</table>

*a* Used as screening criteria to determine potential extent of contamination  
*b* Used as cleanup levels for remediation  

Notes:
- DRO – diesel-range organics  
- GRO – gasoline-range organics  
- mg/kg – milligrams per kilogram  
- mg/L – milligram per liter
Various environmental field investigations were performed at the SWMU 17, Power Plant No. 3 Area between 1986 and 2005. Based upon the results of these field investigations, the potential extent of contamination was estimated for free product, soil, and groundwater. Potential extent of contamination for soil and groundwater was estimated by comparing site concentrations to the screening criteria as discussed in the cleanup levels section. More detailed site characterization information is provided in the Final FFS Report for the SWMU 17, Power Plant No. 3 Area.

**Free Product**

Between March 1993 and October 2003, monitoring wells within the vicinity of the SWMU 17, Power Plant No. 3 Area were measured periodically for the presence of free product. During this time, free product was observed in 16 of the 34 wells installed at the site. The maximum measured free-product thickness reported at the site was 3.36 feet, in well MW-4 on April 18, 1998. Figure 6 shows the estimated extent of residual free product remaining at the site based on the maximum measured free-product thickness reported in each well during the period from May 11, 2002 to November 8, 2002.
Soil and Groundwater

The extent of soil and groundwater impacted by petroleum contamination at the SWMU 17, Power Plant No. 3 Area was estimated by comparing analytical results to the screening criteria as discussed in the Cleanup Levels section. For soil, the following chemicals were detected above the screening criteria (see Table 5):

- diesel-range organics (DRO)
- gasoline-range organics (GRO)
- benzene
- toluene
- ethylbenzene
- total xylenes
- 2-methylnaphthalene
- naphthalene
- benzo(a)pyrene

For groundwater, both the maximum detected analytical result and the most recent analytical result available for each chemical at each location were compared to the screening criteria to determine the extent of groundwater contamination. The most recent analytical results represent the current conditions at the site. For groundwater, the following chemicals were detected in groundwater above the screening criteria (see Table 5):

- DRO
- GRO
- benzene

If only the most recent groundwater data are compared to the screening criteria, no changes to the above list would be made. Concentrations of chemicals in soil and groundwater above the screening criteria do not represent a human or ecological health risk as discussed in the Summary of Site Risks section below.

### Table 5. Chemicals Detected in Soil and Groundwater at Concentrations Greater than Alaska DEC Screening Criteria, SWMU 17

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Maximum Soil Concentration(^a) (mg/kg)</th>
<th>Screening Criteria ((\text{Alaska DEC Method 2})) (mg/kg)</th>
<th>Maximum Groundwater Concentration (mg/L)</th>
<th>Maximum Groundwater Concentration during Most Recent Sampling Event (mg/L)</th>
<th>Screening Criteria ((\text{Alaska DEC Table C})) (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Petroleum Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRO</td>
<td>220,000(^b)</td>
<td>230</td>
<td>496</td>
<td>160</td>
<td>1.5</td>
</tr>
<tr>
<td>GRO</td>
<td>870</td>
<td>260</td>
<td>2.8</td>
<td>2.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Volatile Organic Compounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzene</td>
<td>0.8(^b)</td>
<td>0.02</td>
<td>0.00873</td>
<td>0.00873</td>
<td>0.005</td>
</tr>
<tr>
<td>Toluene</td>
<td>6.9(^b)</td>
<td>4.8</td>
<td>0.210</td>
<td>ND</td>
<td>1</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>16(^b)</td>
<td>5</td>
<td>0.270</td>
<td>0.0442</td>
<td>0.7</td>
</tr>
<tr>
<td>Total Xylenes</td>
<td>120(^b)</td>
<td>69</td>
<td>0.640</td>
<td>0.0431</td>
<td>10</td>
</tr>
<tr>
<td>Noncarcinogenic Polycyclic Aromatic Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Methylnaphthalene</td>
<td>71 (^J)</td>
<td>38</td>
<td>0.74</td>
<td>0.071</td>
<td>1.5</td>
</tr>
<tr>
<td>Naphthalene</td>
<td>45 (^J)</td>
<td>19</td>
<td>0.214 J</td>
<td>0.08</td>
<td>0.7</td>
</tr>
<tr>
<td>Carcinogenic Polycyclic Aromatic Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>12</td>
<td>2.4</td>
<td>0.0001</td>
<td>0.0001</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

\(^a\)Maximum soil concentrations detected were used in developing exposure point concentrations for the human health risk assessment that resulted in no risk above target health goals.

\(^b\)This sample is located in an area where an interim remedial action was undertaken in 2002 that included filling with clean, gravelly soil and regrading.

Notes:

- Concentrations shown in bolded italics exceed the screening criteria
- DEC – Department of Environmental Conservation
- DRO – diesel-range organics
- GRO – gasoline-range organics
- J – estimated concentration
- mg/kg – milligrams per kilogram
- mg/L – milligram per liter
- ND – not detected
A human health risk assessment and an ecological risk assessment were conducted to assess if residual petroleum at the SWMU 17, Power Plant No. 3 Area would pose a potential unacceptable risk to human health or the environment if no cleanup actions were to take place. Risks (human health only) and hazards (human health and ecological) from exposure to petroleum compounds were estimated for each complete exposure pathway. More detailed information on the risk assessment is provided in the Final FFS Report for the SWMU 17, Power Plant No. 3 Area.

Human health risks and hazards resulting from exposure to petroleum compounds in soil and groundwater were estimated for each complete exposure pathway. The complete exposure pathways evaluated include ingestion, dermal contact, and inhalation of chemicals in soil by construction workers; dermal contact and inhalation of chemicals in groundwater by construction workers; and ingestion and dermal contact of chemicals in sediment of Yakutat Creek by child recreational receptors (aged 6 to 12 years). Risks and hazards resulting from exposure to soil and groundwater were estimated based on proposed land use (Figure 5) and groundwater not being used as drinking water source because institutional controls prohibit the use of groundwater. The shallow groundwater depth and low yield also preclude the use of groundwater as a drinking water source at the site. The potential risks to construction workers resulting from exposure to subsurface soil and groundwater were found to be below target health goals. In addition, the potential risks to recreational receptors resulting from exposure to sediment in Yakutat Creek were also found to be below target health goals. Therefore, petroleum-related chemicals at the site pose no unacceptable risks provided that institutional controls prohibiting the use of groundwater as a drinking water source remain in effect. While exposures to free product cannot be quantitatively evaluated in risk assessments, exposures to free product may represent an unacceptable health risk to construction workers. Therefore, in the event free product is encountered during construction, appropriate measures should be implemented to minimize contact and exposure.

No site-specific cleanup levels were calculated for soil and groundwater at the SWMU 17, Power Plant No. 3 Area because risks and hazards were below target health goals. Therefore, for soil, the existing concentrations at the site are protective of human health and the environment, and by default, are the soil cleanup levels for the site. However, analytical data collected from monitoring wells at the site indicated that concentrations of petroleum hydrocarbons exceeded the proposed groundwater cleanup levels discussed in the Cleanup Levels section. The proposed groundwater cleanup levels for the SWMU 17, Power Plant No. 3 Area are the Alaska DEC cleanup levels established for groundwater not currently used for, or not reasonably expected to be used for drinking water, because the water is not potentially potable (i.e., shallow groundwater and low yield makes the water undrinkable). In addition, institutional controls are currently in place for groundwater, which restrict the use of groundwater as a drinking water source. Figure 6 shows the extent of groundwater contamination exceeding the proposed groundwater cleanup levels.

Ecological hazards due to exposure to petroleum compounds in site surface soil and sediment from Yakutat Creek were estimated for terrestrial and aquatic receptors, respectively. Concentrations of petroleum compounds in surface water of Yakutat Creek were less than risk-based screening concentrations (RBSCs). Therefore, there were no hazards resulting from chemicals in surface water. No chemicals were identified as chemicals of concern in soil, although some detected chemicals lacked toxicity information. Therefore, ecological hazards resulting from exposure to surface soil are unlikely. Ecological hazards resulting from exposure to sediment only slightly exceeded the target health goal for one chemical: DRO. The ecological hazard resulting from to exposure to DRO in sediment was estimated at 1.49, only slightly exceeding the target health goal of 1.0. However, hazards greater than 1.0, but less than 10 should be evaluated using professional judgment. Based on professional judgment and an evaluation of site-specific conditions, threats to aquatic receptors resulting from exposure to DRO in sediments are very unlikely at this site. Threats to aquatic receptors are very unlikely, because of the source removal actions that have occurred at SWMU 17, Power Plant No. 3 Area and because the DRO concentrations are lessening over time due to naturally-occurring biodegradation. Therefore, no site-specific risk-based cleanup levels were calculated for chemicals in sediment.

**SUMMARY OF SITE RISKS**

**REMEDIAL ACTION OBJECTIVES**

Based on the risk analysis conducted for this site and the regulatory requirements, the following remedial action objectives (RAOs) were developed for the protection of human health at SWMU 17, Power Plant No. 3 Area:

- Reduce petroleum hydrocarbons in groundwater to concentrations less than or equal to the Alaska DEC groundwater cleanup levels established for groundwater not currently used for, or not reasonably expected to be used for, drinking water
- Minimize exposure to free-phase product
The necessity for RAOs to protect ecological receptors was evaluated on the basis of ecological hazards resulting from exposure to petroleum hydrocarbons released at the site. Ecological hazards were estimated for site soil, surface water in Yakutat Creek, and sediment in Yakutat Creek. Ecological hazards from exposure to soil were found to be below target health goals for all detected petroleum compounds with published toxicity information. Ecological hazards from exposure to surface water in Sweeper Cove were found to be below target health goals. The hazard for DRO in sediment was calculated to be 1.49, which is greater than the target health goal of 1.0. However, the ecological risk assessment concluded that the potential ecological threat in Yakutat Creek from residual DRO is unlikely to present a significant risk as discussed in Summary of Site Risks section.

### REMEDIAL ACTION ALTERNATIVES

A comprehensive array of remedial alternatives was previously identified, developed, and evaluated by the Navy for the 128 petroleum-release sites, at the former Adak Naval Complex during the 1998 FFS, as amended in 1999. The 1998 FFS, as amended, provided the information required to select the preferred remedies for the 128 petroleum release sites in the OU A ROD, which was signed in 2000. For the 14 free-product recovery sites, the OU A ROD selected an interim remedy, which consisted of free-product recovery. The OU A ROD also specified that these 14 sites were designated for future final remedy selection. Final remedy selection for SWMU 17, Power Plant No. 3 Area is described in this Proposed Plan.

The list of cleanup alternatives developed for petroleum-release sites during the 1998 FFS, as amended, was used as the starting point for identifying alternatives for SWMU 17, Power Plant No. 3 Area. These alternative are as follows:

**Alternative 1, No Action.**  
This alternative is included as a baseline to represent current conditions. No remedial actions are included with this alternative. It is used for comparison to the other alternatives.

**Alternative 2, Limited Groundwater Monitoring.**  
Groundwater monitoring would be conducted to confirm that petroleum-related chemicals in groundwater are declining. This approach to cleanup relies on naturally occurring processes to reduce petroleum concentrations in groundwater. Microorganisms present in soil and groundwater break down petroleum compounds into harmless chemicals.

**Alternative 3, Monitored Natural Attenuation (MNA) and Institutional Controls.**  
Groundwater monitoring would be conducted to evaluate whether petroleum-related chemicals in groundwater are attenuating to concentrations below applicable Alaska DEC groundwater cleanup levels. Petroleum-related chemicals that currently exceed applicable Alaska DEC cleanup levels would be monitored, as well as natural attenuation indicator compounds. This approach to cleanup relies on naturally occurring processes to reduce petroleum concentrations in groundwater. This alternative also includes institutional controls as an additional means of reducing potential exposure to petroleum contamination.

**Alternative 4, Product Recovery.**  
Free product on the groundwater surface would be collected to the maximum extent practicable using skimmers.

**Alternative 5, Limited Soil Removal/Source Removal and Thermal Desorption.**  
Petroleum-contaminated soil would be excavated and then heated to drive off the petroleum compounds.

**Alternative 6, Ex Situ Bioremediation of Soil.**  
Petroleum-contaminated soil would be excavated and placed in a lined pile for treatment. Air, water, and nutrients would be added to the soil to encourage microorganisms to break down the petroleum compounds to harmless chemicals.

**Alternative 7, In Situ Bioremediation of Soil, MNA, and Institutional Controls.**  
Petroleum-contaminated soil would be treated in the ground. This alternative relies on the same naturally-occurring microorganisms as natural attenuation. However, the growth of the microorganisms is encouraged by increasing air flow in ground by either blowing air into the ground or by pulling air through the soil. This alternative would also include institutional controls.

**Alternative 8, Soil Cover, MNA, and Institutional Controls.**  
Contaminated surface soil would be covered with a layer of clean soil to prevent contact with petroleum. Institutional controls would be used to further limit contact with petroleum chemicals in soil and groundwater. Natural attenuation would cause the petroleum concentrations to decrease. This alternative would also include institutional controls.

**Alternative 9, Soil Vapor Extraction/Air Sparging, MNA, and Institutional Controls.**  
A vacuum system is used to cause light petroleum compounds to move to vapor extraction wells. It is only effective for lighter petroleum materials such as those present in gasoline. Institutional controls would be used to limit potential contact with petroleum.
The results of the 1998 FFS, as amended, were applied to the analysis of remedial alternatives for SWMU 17, Power Plant No. 3 Area. The criteria used to complete the alternative evaluation in the 1998 FFS, as amended, were based on EPA guidance, which encompasses Alaska DEC guidance, and are summarized in Table 6. State acceptance and community acceptance will be evaluated after public and state comments on the proposed cleanup actions are received. Therefore, these two criteria were not evaluated in the 1998 FFS, as amended, or in this Proposed Plan.

<table>
<thead>
<tr>
<th>Table 6. CERCLA Criteria</th>
<th>Comparable Alaska DEC Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall protection of human health and the environment</td>
<td>Protectiveness</td>
<td>Whether a cleanup action provides adequate protection and how potential risks are eliminated, reduced, or controlled through treatment or control</td>
</tr>
<tr>
<td>Compliance with regulations</td>
<td>Regulations</td>
<td>Whether a cleanup action will meet all potential cleanup levels</td>
</tr>
<tr>
<td>Long-term effectiveness and permanence</td>
<td>Short- and long-term effectiveness</td>
<td>The ability of a cleanup action to reliably protect human health and the environment over time</td>
</tr>
<tr>
<td>Reduction of toxicity, mobility, or volume through active treatment</td>
<td>None</td>
<td>How well treatment technologies that may be used in a cleanup action work; how well the cleanup treatment may work to make the chemicals less harmful, make them less likely to spread, or reduce the amount of contaminated material</td>
</tr>
<tr>
<td>Short-term effectiveness</td>
<td>Short- and long-term effectiveness</td>
<td>How quickly the cleanup action is able to protect human health and the environment and what is its potential to create adverse effects during construction and implementation</td>
</tr>
<tr>
<td>Implementability, suitability</td>
<td>Practicable</td>
<td>How readily the cleanup can be accomplished: Are needed materials and services available? How appropriate is the solution to the problem?</td>
</tr>
<tr>
<td>Cost</td>
<td>Practicable</td>
<td>Costs to build, operate, and maintain the cleanup remedy</td>
</tr>
<tr>
<td>State acceptance</td>
<td>None</td>
<td>Whether, based on its review of the project documents and proposed plan, the state agrees with, opposes, or has no comment on the preferred alternative</td>
</tr>
<tr>
<td>Community acceptance</td>
<td>Public input</td>
<td>Whether the public agrees with, opposes, or has no comment on the preferred alternative (determined after reviewing the public comments received on this proposed plan)</td>
</tr>
</tbody>
</table>

An evaluation of alternatives using the EPA criteria was performed separately for each of the 128 petroleum-release sites at the Former Adak Naval Complex in the 1998 FFS, as amended. In order to summarize the results of the evaluations for the 128 petroleum-release sites, the January 1998 Proposed Plan for Cleanup Action at Petroleum Sites on Adak Island (U.S. Navy et. al 1998) presented the evaluations for nine categories of sites. Sites that had similar characteristics were grouped together into the nine categories and a single alternative evaluation was presented for each category. Because free product has been recovered to the maximum extent practicable, the category applicable to SWMU 17, Power Plant No. 3 Area is:

- **Category 7** – Diesel sites, soil concentrations above screening levels (Alaska DEC Method Two Cleanup Levels), without buildings over the source area, groundwater risk above acceptable risk (groundwater risk is not acceptable if concentrations are greater than the Alaska DEC Cleanup Levels for groundwater not used as a drinking water source).

The alternative evaluation that was performed for the Category 7 Sites in the January 1998 Proposed Plan for Cleanup Action at Petroleum Sites on Adak Island is applicable to SWMU 17, Power Plant No. 3 Area, because the petroleum concentrations in soil are above the screening criteria (Alaska DEC Method Two cleanup levels) and the petroleum concentrations in groundwater are above the Alaska DEC cleanup levels for groundwater not used as a drinking water source.
The preferred cleanup alternative for Category 7 sites presented in the January 1998 Proposed Plan was modified slightly. First, Alternative 2, Limited Groundwater Monitoring, was not evaluated in the January 1998 Proposed Plan. It was added in the 1999 FFS Amendment, and an evaluation was never performed for this alternative. Therefore, an evaluation of this alternative was added. Furthermore, the site-specific costs presented in the January 1998 Proposed Plan are not directly applicable to SWMU 17, Power Plant No. 3 Area. Therefore, the cost evaluation was also modified to provide relative costs. The resulting modified evaluation is included as Table 7.

Alternatives 4, 8, and 9 are not applicable to Category 7 sites, and an evaluation for these alternatives is not provided in Table 7. Alternative 4 is not applicable to Category 7 sites because free product is not present in recoverable quantities at Category 7 sites. Alternatives 8 and 9 are also not applicable to the Category 7 sites. Alternative 8 is not applicable, because this alternative applies only to sites with unacceptable ecological risks. Alternative 9 is not applicable because this alternative applies to sites with only GRO present.

The preferred cleanup alternative for SWMU 17, Power Plant No. 3 Area is Alternative 3, MNA and Institutional Controls. In order to maintain consistency with cleanup decisions made in the OU A ROD, the 1998 FFS (as amended), the January 1998 Proposed Plan, and the OU A ROD were reviewed to determine what factors or criteria were used to select the preferred remedy for the 128 sites addressed in these documents. These factors or criteria are the suitability criteria listed in Table 8. Because site conditions do not pose a risk to human health or the environment at SWMU 17, Power Plant No. 3 Area, remedial alternatives developed for sites that do pose a risk above target health goals (Alternatives 5, 6, and 7) were eliminated as potential preferred remedial alternatives. Therefore, the list of preferred remedial alternatives that may be selected for this site is limited to Alternatives 1, 2, or 3.

The preferred cleanup alternative for this site was selected based on a comparison of site-specific conditions to the criteria used to evaluate the suitability of an alternative, as presented in Table 8. A solid bullet in this table adjacent to a suitability criterion indicates that site-specific conditions match the alternative’s suitability criterion. An alternative is identified as the preferred remedy when site-specific conditions most closely match the alternative’s suitability criteria.

Based on these comparisons, Alternative 3, MNA and Institutional Controls; is the selected preferred remedial alternative for SWMU 17, Power Plant No. 3 Area. This alternative will provide an appropriate, cost-effective remedy that protects human health and the environment and that can be implemented at the earliest possible time. Alternative 3 is selected for this site because groundwater concentrations are above the Alaska DEC cleanup levels. MNA is needed to reduce concentrations to below the Alaska DEC cleanup levels and institutional controls are needed as long as concentrations are above Alaska DEC cleanup levels. Therefore, Alternative 3 is protective of human health and the environment and complies with Alaska regulations.
### Table 8. Evaluation of Suitability of Cleanup Alternative, SWMU 17

<table>
<thead>
<tr>
<th>Criteria to Determine the Suitability of Alternative</th>
<th>SWMU 17</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternative 1: No Action</strong></td>
<td></td>
</tr>
<tr>
<td>● Petroleum-related chemicals do not pose an imminent threat to human health or the environment</td>
<td>●</td>
</tr>
<tr>
<td>● Petroleum-related chemicals on site do not exceed ADEC soil or groundwater cleanup levels</td>
<td>○</td>
</tr>
<tr>
<td><strong>Selected as Preferred Alternative</strong></td>
<td>NO</td>
</tr>
<tr>
<td><strong>Alternative 2: Limited Groundwater Monitoring</strong></td>
<td></td>
</tr>
<tr>
<td>● Petroleum-related chemicals do not pose an imminent threat to human health or the environment (exclusive of the human health groundwater ingestion pathway)</td>
<td>●</td>
</tr>
<tr>
<td>● Groundwater at the site is not a reasonably expected potential future source of drinking water based on 18 AAC 75.350(2)</td>
<td>●</td>
</tr>
<tr>
<td>● Groundwater that is closely connected hydrologically to nearby surface water does not cause a violation of the Alaska Water Quality Standards, 18 AAC 70</td>
<td>NA</td>
</tr>
<tr>
<td>● Soil contains petroleum-related chemicals at concentrations above ADEC soil cleanup levels</td>
<td>●</td>
</tr>
<tr>
<td>● Groundwater monitoring indicates the presence of petroleum-related chemicals at concentrations below ADEC groundwater cleanup levels</td>
<td>○</td>
</tr>
<tr>
<td><strong>Selected as Preferred Alternative</strong></td>
<td>NO</td>
</tr>
<tr>
<td><strong>Alternative 3: Monitored Natural Attenuation and Institutional Controls</strong></td>
<td></td>
</tr>
<tr>
<td>● Petroleum-related chemicals do not pose an imminent threat to human health or the environment (exclusive of the human health groundwater ingestion pathway)</td>
<td>●</td>
</tr>
<tr>
<td>● Groundwater at the site is a reasonably expected potential future source of drinking water based on 18 AAC 75.350(2)</td>
<td>○</td>
</tr>
<tr>
<td>● Groundwater that is closely connected hydrologically to nearby surface water does not cause a violation of the Alaska Water Quality Standards, 18 AAC 70</td>
<td>NA</td>
</tr>
<tr>
<td>● Soil contains petroleum-related chemicals at concentrations above ADEC soil cleanup levels</td>
<td>●</td>
</tr>
<tr>
<td>● Groundwater monitoring indicates the presence of petroleum-related chemicals at concentrations above ADEC groundwater cleanup levels</td>
<td>●</td>
</tr>
<tr>
<td><strong>Selected as Preferred Alternative</strong></td>
<td>YES</td>
</tr>
<tr>
<td><strong>Alternative 4: Product Recovery</strong></td>
<td></td>
</tr>
<tr>
<td>● Site has quantities of residual free product on the groundwater surface that are considered practicable to recover</td>
<td>○</td>
</tr>
<tr>
<td><strong>Selected as Preferred Alternative</strong></td>
<td>NO</td>
</tr>
</tbody>
</table>

● true  ○ false

Notes:
AAC – Alaska Administrative Code
ADEC – Alaska Department of Environmental Conservation
NA – not applicable
SWMU – solid waste management unit
COMMUNITY PARTICIPATION

The dates of the public comment period and the locations of the information repositories are provided on the front page of this Proposed Plan. Comments from the public will be used by the Navy and the Alaska DEC to help determine what action to take. We invite you to comment on this Proposed Plan. You may submit written comments during the public comment period by sending them to:

**Mark Wicklein, P.E.**  
Naval Facilities Engineering Command Northwest  
1101 Tautog Circle  
Silverdale, WA 98315  
Phone: (360) 396-0226  
Fax: (360) 396-0857  
mark.wicklein@navy.mil

After considering public comments, the Navy and the Alaska DEC will select the final cleanup remedy. The preferred cleanup remedy may be modified from the remedy presented in the Proposed Plan based on public comments or new information. The chosen remedy will be described in a DD. The Navy will respond to comments on the Proposed Plan in a responsiveness summary. The responsiveness summary will be part of the DD, which will be available for review in the information repositories at the locations listed on the front page of this plan.

For further information on the SWMU 17, Power Plant No. 3 Area, please contact:

**Mark Wicklein, P.E.**  
Naval Facilities Engineering Command Northwest  
1101 Tautog Circle  
Silverdale, WA 98315  
Phone: (360) 396-0226  
Fax: (360) 396-0857  
mark.wicklein@navy.mil

**Jason Weigle**  
Project Manager, Federal Facilities Environmental Restoration Program, Contaminated Sites Program  
Alaska Department of Environmental Conservation  
555 Cordova St.  
Anchorage, AK 99501  
Phone: (907) 269-7528  
Fax: (907) 269-7649  
Jason_Weigle@dec.state.ak.us
ACRONYMS

AAC  Alaska Administrative Code  MNA  monitored natural attenuation
ARC  Adak Reuse Corporation   NMCB  Naval Mobile Construction Battalion
CERCLA  Comprehensive Environmental Response,   OU  Operable Unit
Compensation, and Liability Act RAB  Restoration Advisory Board
AST  aboveground storage tank   RAO  remedial action objective
DD  Decision Document   RBSC  risk-based screening concentration
DEC  Department of Environmental Conservation ROD  Record of Decision
DRO  diesel-range organics   SAERA  State-Adak Environmental Restoration Agreement
EPA  Environmental Protection Agency SARA  Superfund Amendments and Reauthorization Act
FFA  Federal Facilities Agreement   SWMU  Solid Waste Management Unit
FFS  focused feasibility study   TAH  total aromatic hydrocarbons
bgs  below ground surface   TaqH  total aqueous hydrocarbons
GRO  gasoline-range organics   TPH  total petroleum hydrocarbons
JP  jet petroleum   UST  underground storage tank
µg/L  micrograms per liter

GLOSSARY

Administrative Record. All the documents supporting a government agency’s decision. The administrative record contains all documents, data, and descriptions of site-specific actions or observations that are used to make decisions about the site.

Aquatic. Living or growing in, on, or near the water: aquatic animals and plants.

Aquifer. An underground layer of earth, gravel, or porous stone that yields water.

Complete exposure pathway. A path from the source(s) of a contaminant to humans and other species (animals and plants) via soil, water, or food. A complete exposure pathway consists of the following four elements: (1) a contaminant source and a mechanism of chemical release (e.g., a leaking UST), (2) an environmental medium (e.g., groundwater) that retains or transports the contaminant, (3) a point of potential human/ecological contact with the affected environmental medium, and (4) a means of entry into the body at the contact point. If any of these four elements is missing, the pathway is incomplete and there is no exposure to the chemical.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Also known as Superfund, a federal law authorizing action to respond to the release, or substantial threat of release, into the environment of hazardous substances, pollutants, or contaminants that may present an imminent and substantial danger to public health or welfare. CERCLA’s emphasis is on the cleanup of old/inactive hazardous substance sites; it does not include cleanup of spills of petroleum, oil, and lubricants.

Conglomerate. Rock composed of rounded fragments varying from small pebbles to large boulders in a cement (hardened clay).

Contamination. Any physical, chemical, biological, or radiological substance or matter that is present in soil, groundwater, air, or a combination of these media at a concentration that is greater than regulated levels.

Decision Document (DD). A legal document describing the remedial actions selected for a site by the lead regulatory agency (Alaska DEC).

Diesel-range organics (DRO). See the total petroleum hydrocarbons (TPH) definition.

Ex situ. A method of cleaning up sites where soil and groundwater are removed from the ground and treated above ground.

Federal Facilities Agreement (FFA). An agreement between the Navy, EPA, and the Alaska DEC that ensures that the environmental impacts associated with past and present activities at the facility are thoroughly investigated and that appropriate remedial actions are taken as necessary to protect the public health, welfare, and the environment.

Free-phase petroleum. Petroleum that is present at a site as a separate liquid, which is usually found as a floating layer on groundwater. Does not include petroleum adsorbed onto soil or dissolved in groundwater.

Free product/free-product. See free-phase petroleum definition.

Free-product thickness. A measure of thickness of the floating layer of petroleum on groundwater.

Glacial till. Unlayered mixture of clay, silt, sand, gravel, and boulders ranging widely in size and shape deposited directly by a glacier (without reworking by meltwater).
Gasoline-range organics (GRO). See the total petroleum hydrocarbons (TPH) definition.

Hazard. Non-carcinogenic effects resulting from exposure to a chemical.

Hazard index. The sum of hazard quotients.

Hazard quotient. A measure of the non-carcinogenic hazard from exposure to a chemical from a site, which is calculated as the ratio of estimated exposure to a chemical from a site to the estimated safe dose level of that chemical.

Hydrocarbons. A large group of chemical compounds composed of only carbon and hydrogen.

In situ. A method of cleaning up a site without excavating soil or extracting groundwater. Soil and groundwater are treated in place.

Institutional controls. Administrative controls that prevent human exposure to contaminated soils through community education, soil excavation restrictions, groundwater use restrictions, etc.

Land transfer agreement. An agreement to transfer the land ownership from one party to another. May include restrictions on certain activities on the transferred land.

Land use restrictions. Institutional controls that rely on legal and administrative mechanisms to limit access to contaminated media. Includes restrictions on land development, prohibitions on groundwater use, and requirements for excavation notification. Land use restrictions are the same as equitable servitude restrictions.

Maximum extent practicable. Capable of being designed, constructed, and implemented in a reliable cost-effective manner, taking into consideration existing technology, site location, and logistics.

Monitored natural attenuation (MNA). Essentially the same as natural attenuation (see below), but includes a monitoring component such that the reduction in concentrations of contaminants can be verified.

National Priorities List. A federal listing of hazardous waste sites requiring cleanup through the CERCLA program.

Natural attenuation. The process by which the concentration of contaminants in the environment is reduced by natural processes such as volatilization, dispersion, and microbial degradation.

Operable Unit (OU). A separate unit or geographic subarea of a site based on geography, geology, or type of contaminants which is investigated and evaluated separately from other units at the site.

Permeability. A measure of how easily water passes through soil. The greater the permeability, the more easily water moves through soil.

Proposed Plan. A document used to facilitate public involvement in the remedy selection process. The document presents the lead agency’s preliminary recommendation concerning how best to address contamination at the site, presents alternatives that were evaluated, and explains the reasons the lead agency recommends the preferred alternative.

Receptor. A person or species evaluated for exposure to a contaminant.

Record of Decision (ROD). A legal document describing the remedial actions selected for a site by the lead regulatory agency (EPA).

Remedial action objectives (RAOs). The objectives of the remedial action at a contaminated site.

Risk. A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard.

Risk assessment. A process for characterizing the current and potential threats to human health and the environment that may be posed by contaminants migrating to groundwater or surface water, being released to air, leaching through soil, remaining in the soil, and bioaccumulating in the food chain. The primary purpose of a risk assessment is to provide risk managers with an understanding of the actual and potential risks to human health and the environment posed by a site and any uncertainties associated with the assessment. This information may be useful in determining whether there is a current or potential threat to human health or the environment that warrants remedial action.

Risk-based screening concentration (RBSC). A conservative concentration that meets the target health goals and is protective of ecological receptors. Concentrations greater than RBSCs may result in unacceptable hazards.

Screening criteria. Criteria used to determine the potential extent of contamination. These criteria may or may not be used as the cleanup levels for remediation of a site.

State-Adak Environmental Restoration Agreement (SAERA). An agreement between the Navy and the Alaska DEC to implement site characterization and remediation of petroleum sites on Adak.

Target health goals. Maximum numeric risk levels established by a regulatory agency as allowable risks that do not require further action. When a risk assessment is conducted, the numeric site-specific risk estimates must be equal to or below regulatory target health goals in order for the risk to be considered “acceptable”. In Alaska, the target health goal for a carcinogenic compound is $1 \times 10^{-5}$ (a risk of contracting cancer of 1 in 100,000) and the target health goal for non-cancer chemicals is a hazard quotient or hazard index of one.

Terrestrial. Organisms or species that live on land.

Total aqueous hydrocarbons (TAqH). The total concentration of benzene, toluene, ethylbenzene, total xylenes, and polynuclear aromatic hydrocarbons (multi-ring aromatic compounds) in a sample.

Total aromatic hydrocarbons (TAH). The total concentration of benzene, toluene, ethylbenzene, and total xylenes in a sample.

Total petroleum hydrocarbons (TPH). TPH is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Because there are so many different chemicals in crude oil and in other petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of petroleum compounds at a site. TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals. The grouping of relatively heavier petroleum hydrocarbon chemicals is often referred to as “diesel-range,” whereas the grouping of lighter petroleum hydrocarbon chemicals is often referred to as “gasoline-range.” These two ranges of petroleum hydrocarbons are typically analyzed separately in the laboratory, using slightly different methods.

Volatile organic compounds. Volatile organic compounds are organic chemicals that easily form vapors at normal temperature and pressure. The term is generally applied to organic solvents, certain paint additives, aerosol spray can propellants, fuels (such as gasoline, and kerosene), petroleum distillates, dry cleaning products and many other industrial and consumer products ranging from office supplies to building materials. Nitrogen (N), oxygen (O), phosphorus (P) and sulfur (S) are also commonly found in organic chemicals.
COMMENT FORM

Your Name: 
Your Address: 
Your Phone Number: 
Comments: 

Please mail or fax comments on this Proposed Plan to:  
Mark Wicklein, P.E.  
Environmental Operations Team, Code 05ER  
Naval Facilities Engineering Command Northwest  
1101 Tautog Circle  
Silverdale, WA 98315  
Fax: (360) 396-0857

If you have special needs or require this document in an alternate form, please call Mark Wicklein at (360) 396-0226.