Final Cleanup Report, 19 Sites

Former Adak Naval Complex
Adak Island, Alaska

NAS Adak
Adak, Alaska

Department of the Navy
Naval Facilities Engineering Command
Engineering Field Activity, Northwest
19917 Seventh Avenue NE
Poulsbo, WA 98370-7570
CLEANUP REPORT, 19 SITES

FORMER ADAK NAVAL COMPLEX
ADAK ISLAND, ALASKA

Prepared by
URS Group, Inc.
Seattle, Washington

Prepared for
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Southwest Division, Naval Facilities Engineering Command
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U  Response to Agency Comments
### ABBREVIATIONS AND ACRONYMS

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<tr>
<td>AAC</td>
<td>Alaska Administrative Code</td>
</tr>
<tr>
<td>AST</td>
<td>aboveground storage tank</td>
</tr>
<tr>
<td>bgs</td>
<td>below ground surface</td>
</tr>
<tr>
<td>BTEX</td>
<td>benzene, toluene, ethylbenzene, and total xylenes</td>
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<tr>
<td>CERCLA</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Act</td>
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<td>cPAH</td>
<td>carcinogenic polycyclic aromatic hydrocarbon</td>
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<td>low-molecular-weight polycyclic aromatic hydrocarbons</td>
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<td>MAUW</td>
<td>Modified Advanced Underwater Weapons</td>
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<tr>
<td>MCL</td>
<td>maximum contaminant level</td>
</tr>
<tr>
<td>MNA</td>
<td>monitored natural attenuation</td>
</tr>
<tr>
<td>µg/L</td>
<td>microgram per liter</td>
</tr>
<tr>
<td>mg/kg</td>
<td>milligram per kilogram</td>
</tr>
<tr>
<td>NAVFAC</td>
<td>Naval Facility</td>
</tr>
<tr>
<td>NEX</td>
<td>Navy Exchange</td>
</tr>
<tr>
<td>NFA</td>
<td>no further action</td>
</tr>
<tr>
<td>NFRAP</td>
<td>no further remedial action planned</td>
</tr>
<tr>
<td>NPL</td>
<td>National Priorities List</td>
</tr>
<tr>
<td>OU A</td>
<td>Operable Unit A</td>
</tr>
<tr>
<td>OWS</td>
<td>oil/water separator</td>
</tr>
<tr>
<td>PAH</td>
<td>polycyclic aromatic hydrocarbons</td>
</tr>
<tr>
<td>PCB</td>
<td>polychlorinated biphenyl</td>
</tr>
<tr>
<td>PID</td>
<td>photoionization detector</td>
</tr>
<tr>
<td>ROD</td>
<td>Record of Decision</td>
</tr>
<tr>
<td>ROICC</td>
<td>Resident Officer in Change of Construction</td>
</tr>
<tr>
<td>RRO</td>
<td>residual-range organics</td>
</tr>
<tr>
<td>SAERA</td>
<td>State-Adak Environmental Restoration Agreement</td>
</tr>
</tbody>
</table>
ABBREVIATIONS AND ACRONYMS (Continued)

SARA Superfund Amendments and Reauthorization Act of 1986
TCLP toxicity characteristics leaching procedure
TOC total organic carbon
TPH total petroleum hydrocarbons
URS URS Group, Inc.
VOC volatile organic compounds
VPH volatile petroleum hydrocarbons
EPA U.S. Environmental Protection Agency
Navy U.S. Navy
UST underground storage tank
1.0 INTRODUCTION

The U.S. Navy (Navy), through Engineering Field Activity, Northwest (EFA NW), conducted investigations and remedial actions at 19 sites at the former Adak Naval Complex, Adak Island, located in southwest Alaska (Figure 1-1) from 1993 through 2003. These sites were investigated to assess the nature and extent of petroleum hydrocarbons and other chemicals that may or may not have been present in soil or groundwater as a result of historical site operations. Remedies were established for each of the 19 sites in the Operable Unit A (OU A) Record of Decision (ROD) (U.S. Navy, USEPA, Alaska DEC 2000). The remedies are considered complete by the Navy. This document is the final closure report that summarizes the releases, subsequent completion of the remedial actions, and the rationale for the final status of the 19 petroleum release sites at the former Adak Naval Complex, Adak, Alaska. URS Group, Inc. (URS) was tasked to prepare this report under Contract No. N44255-02-D-2008, Delivery Order No. 0045.

1.1 PURPOSE AND SCOPE

The purposes of this document are as follows:

- Summarize existing site-specific information for each of 19 sites at the former Adak Naval Complex, Adak Island, Alaska.
- Describe implementation and results of OU A ROD-prescribed remedies.
- Present rationale to support a decision of No Further Action or No Further Remedial Action Planned in accordance with Alaska Administrative Code (AAC) 18 AAC 75.380.
- Solicit Alaska Department of Environmental Conservation (DEC) concurrence with the proposed final status for each of the 19 sites.

The sites summarized in this document are:

- Amulet Housing, Well AMW-706 Area
- Amulet Housing, Well AMW-709 Area
- Boy Scout Camp, West Haven Lake (UST BS-1)
- Contractor’s Camp Burn Pad
- Finger Bay Quonset Hut (UST FBQH-1)
- Girl Scout Camp (UST GS-1)
• MAUW Compound (UST 24000-A)
• Mount Moffett Power Plant No. 5 (USTs 10574 through 10577)
• NAVFAC Compound (USTs 20052 and 20053)
• Navy Exchange Building (UST 30027-A)
• New Roberts Housing (UST HST-7C)
• Officer Hill and Amulet Housing (UST 31047-A)
• Officer Hill and Amulet Housing (UST 31049-A)
• Officer Hill and Amulet Housing (UST 31052-A)
• Quarters A (UST)
• ROICC Contractor’s Area (UST ROICC-8)
• ROICC Warehouse (UST ROICC-2)
• ROICC Warehouse (UST ROICC-3)
• Yakutat Hangar (USTs T-2039-B and T-2039-C)

Site locations are shown on Figure 1-2.

1.2 DOCUMENT ORGANIZATION

Section 1 (Introduction) provides an introduction, summarizes the scope and objectives of the report, provides background information, and describes the approach to the remedy selection and site screening processes.

Section 2 (Approach to Site Assessment) provides general descriptions of the types of evaluations used to assess the sites discussed herein.

Section 3 (Remedial Actions) provides general descriptions of the remedial actions implemented as required by the OU A ROD (U.S. Navy, USEPA, Alaska DEC 2000).

Section 4 (Institutional Controls) describes the institutional controls specified in the OU A ROD (U.S. Navy, USEPA, Alaska DEC 2000) and how they relate to the subject sites.

Section 5 (Cleanup Levels/Endpoint Criteria) describes the general cleanup or endpoint criteria that were used to make decisions at these sites.

Sections 6 through 24 provide site-specific results of evaluations and remedial actions along with the final recommended disposition and rationale.

Section 25 provides references.
1.3 BACKGROUND

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 incorporates 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 during 2000. The ROD for OU A selected final or interim remedies for each of the 128 petroleum-contaminated sites identified on Adak Island. The OU A ROD specified remedies for the 19 sites were one of the following:

- Limited soil removal
- Limited groundwater monitoring
- Monitored natural attenuation

A description of the remedies and the endpoints is provided in Section 3.

To clarify regulatory authority, the ROD for OU A was amended in 2003 to remove petroleum sites from CERCLA authority. The OU A ROD Amendment removed 62 petroleum release sites from the OU A ROD, consistent with the State-Adak Environmental Restoration Agreement. The 19 sites discussed in this document are affected by this amendment. The result is that these 19 sites fall under State of Alaska regulations.
2.0 APPROACH TO SITE ASSESSMENT

The petroleum sites addressed herein have been characterized and evaluated in three phases. Of the 19 sites discussed, the majority are related to former USTs, and were first assessed during the UST removal and closure phase. A second phase of assessment followed a number of these sites prior to selection of a remedy. The OU A ROD specified a remedy for each of the 19 sites, which are considered complete at this time. Cleanup levels or other criteria used to evaluate the condition of each of these sites has varied over time with the criteria being constituent at each site but varying the phase of activity. The cleanup levels and endpoint criteria are discussed in Section 5.

2.1 UST REMOVAL AND CLOSURE ASSESSMENTS

UST removals and site assessments were generally performed between 1993 and 1996. These assessments identified and remediated petroleum-release sources and removed USTs, aboveground storage tanks (ASTs), oil/water separators (OWSs), and inactive pipelines.

Over excavation (based on field screening) was used to remove petroleum-affected soil that appeared to be limited in extent. Excavated soil was treated using either bioremediation or thermal desorption. Soil samples collected from the limits of excavation were sent to a laboratory and analyzed for petroleum hydrocarbons, typically diesel-range organics (DRO) and gasoline-range organics (GRO).

Results of each UST site assessment were compared to Alaska DEC Method One soil cleanup levels as discussed in Section 5. Results were documented in a site assessment report that was the basis of site disposition recommendations submitted by the Navy to the Alaska DEC.

Additional site investigations were performed between August 1996 and March 1998 at the sites that were found to exceed Alaska DEC Method One soil cleanup levels. Sites with petroleum concentrations in soil that were less than the Alaska DEC Method One soil cleanup levels were not included in the subsequent evaluations; these sites were considered “clean” and are listed in the OU A ROD as no further action (NFA) sites.

2.2 ADDITIONAL SITE ASSESSMENTS

The sites that were not eliminated in the initial screening step described above were subjected to further site investigations between August 1996 and March 1998. Analytical results for soil samples were compared against supplemental screening criteria that are discussed in Section 5.
These supplemental criteria were developed to focus attention on the most problematic sites by screening out for NFA those sites that meet the referenced criteria. The supplemental investigations are reported in the three-volume document *Site Summary Report for Petroleum Release Sites Exceeding Supplemental Screening Criteria* (U.S. Navy 1999a). For a site to pass the screening and be designated NFA, it must meet the following criteria:

- Have no free product
- Be more than 200 feet from downgradient surface water
- Have DRO and GRO concentrations in site soil samples that fall below supplemental screening concentrations (specified in Section 5)

It was determined that further action was required at sites that did not meet the supplemental screening criteria and the final remedy for these sites was determined in the OU A ROD. The 19 sites discussed herein did not meet supplemental screening criteria and have OU A ROD specified remedies.
3.0 OU A ROD SPECIFIED REMEDIAL ACTIONS AND ENDPOINTS

Three remedies were specified in the OU A ROD for the 19 subject sites. The specified remedies were as follows:

- Limited soil removal
- Limited groundwater monitoring
- Monitored natural attenuation

The remedy or remedies implemented at each of the sites are summarized in Table 3-1 and discussed in the site-specific section (Sections 6 through 24).

Limited soil removal was selected at sites where the volume of soil exceeding soil criteria was limited, the impacted soils were readily accessible, and the exceedances of cleanup criteria were observed in surface or near surface soil (Table 3-1). In cases where it was demonstrated that the cleanup criteria were met, the sites were recommended for or received NFA status. Sites at which the cleanup criteria could not be met were reverted to a limited groundwater monitoring remedy.

Limited groundwater monitoring was selected for sites where existing conditions are determined to be protective of human health and the environment, but some uncertainty exists regarding the representativeness of existing hydrogeologic data (Table 3-1). For example, at sites where analytical results for DRO in soil exceed the applicable soil cleanup level but concentrations of petroleum-related chemicals in groundwater were well below the applicable groundwater cleanup levels, limited groundwater monitoring was selected to determine if contaminants are leaching from soil into groundwater. Under this remedy, monitoring of groundwater was prescribed for four consecutive quarters. If a site met the groundwater cleanup criteria in the OU A ROD during the quarterly monitoring program, no further action was required. The OU A ROD also described the limited soil removal action as having a follow-on monitoring phase if some minor volume of soil remained at concentrations exceeding the cleanup criteria. Therefore, some sites have a remedy that was implemented as limited soil removal followed by limited monitoring. The OU A ROD specifies that monitoring will be considered complete at a given location if chemical concentrations are below the endpoint criteria (18 AAC 75.345) for two consecutive groundwater monitoring events.

Monitored natural attenuation (MNA) was specified at sites where petroleum hydrocarbons were measured in groundwater at concentrations greater than Alaska DEC groundwater cleanup levels (Table 3-1). The monitored natural attenuation remedy is intended to permanently reduce petroleum hydrocarbon concentrations by natural degradation and dispersion processes to
concentrations below cleanup levels. Monitoring was performed at these sites to (1) verify that natural attenuation is occurring, (2) monitor locations where chemical concentrations exceeded Alaska DEC groundwater cleanup levels, and (3) estimate the rate of natural attenuation and demonstrate achievement of cleanup levels within the OU A ROD specified timeframe of 75 years. The OU A ROD specifies that monitoring will be considered complete at a given location if chemical concentrations are below the endpoint criteria (Alaska DEC groundwater cleanup levels) for two consecutive groundwater monitoring events.

The MNA and limited groundwater monitoring remedies were initiated in August 1999 with quarterly monitoring that progressed through June 2000. Monitoring was conducted annually from 2001 with sampling events conducted between September and October of each year. The most recent monitoring data used in this closure report is from the annual event completed in October 2002. Sites that were monitored beyond 2002 had not met groundwater cleanup levels as of the production of this report.
### Table 3-1

**OU A ROD Prescribed Remedies and Post-ROD Remedial Activities**

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Post-ROD Remedial Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limited Soil Removal</strong></td>
<td></td>
</tr>
<tr>
<td>Contractor’s Camp Burn Pad</td>
<td>Limited soil removals conducted during 1999 and 2000 removed 125 cubic yards of petroleum-contaminated soil. Confirmation sampling did not identify concentrations of petroleum-related chemicals above the most stringent applicable Alaska DEC Method Two soil cleanup levels (U.S. Navy 2000a).</td>
</tr>
<tr>
<td>Girl Scout Camp (UST GS-1)</td>
<td>Limited soil removal conducted during 1999 removed 192 cubic yards of petroleum-contaminated soil. Confirmation sampling identified DRO in one sample at 250 mg/kg, which is greater than the most stringent applicable Alaska DEC Method Two level of 230 mg/kg. All other concentrations of petroleum-related chemicals were below Method Two soil cleanup levels (U.S. Navy 2000a).</td>
</tr>
<tr>
<td>Mount Moffett Power Plant No. 5 (USTs 10574 through 10577)</td>
<td>Limited soil removal conducted during 1999 removed 60 cubic yards of petroleum-contaminated soil. Confirmation sampling identified concentrations of DRO above the most stringent applicable Alaska DEC Method Two soil cleanup levels. However, no continuous groundwater body has been identified at this site that could transport petroleum-related chemicals 1,000 feet to the nearest downgradient surface water body (U.S. Navy 2000a).</td>
</tr>
<tr>
<td>Officer Hill and Amulet Housing (UST 31047-A)</td>
<td>Limited soil removal conducted during 1999 removed 7 cubic yards of petroleum-contaminated soil. Confirmation sampling identified concentrations of DRO above the most stringent applicable Alaska DEC Method Two soil cleanup levels. Groundwater is not present at the site, and further excavation at the site is not possible due to the presence of shallow bedrock and the close proximity of Building 31047 (U.S. Navy 2000a).</td>
</tr>
<tr>
<td>Officer Hill and Amulet Housing (UST 31049-A)</td>
<td>Limited soil removal conducted during 1999 removed 2 cubic yards of petroleum-contaminated soil. Confirmation sampling identified concentrations of petroleum-related chemicals below most stringent applicable Alaska DEC Method Two soil cleanup levels (U.S. Navy 2000a).</td>
</tr>
<tr>
<td>Quarters A (UST 42200)</td>
<td>Limited soil removal conducted during 1999 removed 2 cubic yards of petroleum-contaminated soil. Confirmation sampling identified concentrations of petroleum-related chemicals below most stringent applicable Alaska DEC Method Two soil cleanup levels (U.S. Navy 2000a).</td>
</tr>
<tr>
<td><strong>Limited Soil Removal Followed by Limited Monitoring</strong></td>
<td></td>
</tr>
<tr>
<td>Boy Scout Camp, West Haven Lake (UST BS-1)</td>
<td>Although limited monitoring was the selected remedy in the OU A ROD, the observed surface soil staining was addressed as part of the ongoing Limited Soil Removal remedy at nearby sites. A total of 107 cubic yards of contaminated soil was removed. DRO concentrations in two confirmation soil samples showed DRO exceeded the criteria of 230 mg/kg. Limited Monitoring of groundwater conducted quarterly between 1999 and 2000. Target analytes concentrations in groundwater were less than applicable groundwater cleanup levels for all four sampling events.</td>
</tr>
<tr>
<td>Finger Bay Quonset Hut (UST FBQH-1)</td>
<td>Limited soil removal conducted during 1999 removed 22 cubic yards of petroleum-contaminated soil. Confirmation sampling identified concentrations of DRO above the most stringent applicable Alaska DEC Method Two soil cleanup levels (U.S. Navy 2000a). Limited monitoring of groundwater was conducted in 2001 and 2002 to evaluate if petroleum-related chemicals are leaching from the soil into groundwater. Analytical results were non-detect or below applicable groundwater cleanup levels for all analytes.</td>
</tr>
</tbody>
</table>
Table 3-1 (Continued)
OU A ROD Prescribed Remedies and Post-ROD Remedial Activities

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Post-ROD Remedial Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navy Exchange Building (UST 30027-A)</td>
<td>Limited soil removal conducted during 1999 removed 37 cubic yards of petroleum-contaminated soil. Confirmation sampling identified DRO concentrations in soil above the most stringent applicable Alaska DEC Method Two cleanup levels. Further excavation is not possible in the area due to the close proximity of the Exchange Building and buried utilities (U.S. Navy 2000a). A monitoring well was installed within the former UST location and quarterly monitoring was conducted from 1999 through 2000. DRO and GRO were not detected in groundwater samples.</td>
</tr>
<tr>
<td>Officer Hill and Amulet Housing (UST 31052-A)</td>
<td>Limited soil removal conducted during 1999 removed 2 cubic yards of petroleum-contaminated soil. Confirmation sampling identified DRO concentrations in soil above the most stringent applicable Alaska DEC Method Two soil cleanup level. Further excavation at the site is not possible due to the close proximity of Building 31052 (U.S. Navy 2000a). A well was installed down gradient from the former UST location during 2001 to assess the presence or absence of petroleum hydrocarbons in groundwater as a result of leaching from soil; limited monitoring was conducted during 2001 and 2002. Analytical results were either below applicable groundwater cleanup levels and or non-detected during both sampling events.</td>
</tr>
<tr>
<td>Yakutat Hangar (UST T-2039-B and T-2039-C)</td>
<td>Limited soil removal conducted during 1999 removed 30 cubic yards of petroleum-contaminated soil. Field screening and confirmation sampling indicate that petroleum-impacted soils remained at the site (U.S. Navy 2000a). In 1999, three additional monitoring wells were installed down gradient from the former UST location and limited groundwater monitoring was conducted to assess the presence or absence of petroleum hydrocarbons in groundwater as a result of leaching from soil. All analytical results in groundwater samples collected between 1996 and October 2001 in four wells were below applicable Alaska DEC groundwater cleanup levels at this site.</td>
</tr>
<tr>
<td>MAUW Compound (UST 24000-A)</td>
<td>Limited groundwater monitoring was conducted quarterly at two locations between August 1999 and June 2000, and annually during October 2001. All analytical results in groundwater samples collected between 1999 and October 2001 were below applicable Alaska DEC groundwater cleanup levels.</td>
</tr>
<tr>
<td>NAVFAC Compound (USTs 20052 and 20053)</td>
<td>Limited groundwater monitoring conducted quarterly between 1999 and 2000. Target analytes concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels, for four consecutive sampling events.</td>
</tr>
<tr>
<td>New Roberts Housing (UST HST-7C)</td>
<td>Limited groundwater monitoring conducted quarterly between 1999 and 2000, and annually during September 2001; target analytes concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels for seven consecutive sampling events at one location, and five sampling events at two locations.</td>
</tr>
<tr>
<td>ROICC Contractor’s Warehouse (UST ROICC-2)</td>
<td>Limited groundwater monitoring conducted quarterly at two locations between 1999 and 2000; target analytes concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels for four or more sampling events.</td>
</tr>
</tbody>
</table>
### Table 3-1 (Continued)

#### OU A ROD Prescribed Remedies and Post-ROD Remedial Activities

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Post-ROD Remedial Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limited Groundwater Monitoring (Continued)</strong></td>
<td></td>
</tr>
<tr>
<td>ROICC Contractor’s Warehouse (UST ROICC-3)</td>
<td>Limited groundwater monitoring conducted quarterly at two locations between 1999 and 2000; target analytes concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels for all four consecutive sampling events.</td>
</tr>
<tr>
<td><strong>Monitored Natural Attenuation (MNA)</strong></td>
<td></td>
</tr>
<tr>
<td>Amulet Housing, Well AMW-706 Area</td>
<td>Groundwater monitoring for MNA was conducted between 1999 and 2002. Remedy criteria for petroleum have been met. Total and dissolved lead concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels for six consecutive sampling events ending in 2002.</td>
</tr>
<tr>
<td>Amulet Housing, Well AMW-709 Area</td>
<td>Compliance groundwater monitoring for lead was conducted between 1999 and 2002. Remedy criteria for petroleum have been met. Total and dissolved lead concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels for six consecutive sampling events ending in 2002.</td>
</tr>
<tr>
<td>ROICC Contractor’s Area (UST ROICC-8)</td>
<td>Natural attenuation groundwater monitoring was conducted at two locations quarterly between 1999 and 2000, and annually during 2001 and 2002. Target analytes concentrations in groundwater were less than applicable Alaska DEC groundwater cleanup levels for all sampling events.</td>
</tr>
</tbody>
</table>

**Notes:**
- DEC - Department of Environmental Conservation
- DRO - diesel-range organics
- GRO - gasoline-range organics
- mg/kg - milligram per kilogram
- ROD - Record of Decision
- UST - underground storage tank
4.0 INSTITUTIONAL CONTROLS

CERCLA, RCRA, and Alaska’s Oil and Hazardous Substances Pollution Control regulations (18 AAC 75) require cleanup of hazardous substances that have been released into the environment to a degree that is determined to be protective of human health and the environment. The purpose of institutional controls are to ensure compliance with land use assumptions used to establish cleanup levels. The OUA ROD prescribed institutional controls at some of the 19 sites discussed herein and specified in the Institutional Control Management Plan (U.S. Navy 2004). Domestic use of groundwater was prohibited throughout the downtown aquifer. The limits of the groundwater use restriction are shown on Figure 1-2. Sites at which domestic use of groundwater is prohibited are identified in Table 4-1.

Excavation notifications are required for excavation greater than 2 feet below ground surface in the downtown area. The notifications are evaluated by the Navy to determine whether a proposed project at an institutional control site is consistent with the land use assumptions. The notifications are an additional tool for the Navy to receive timely information (in the absence of local zoning requirements) to monitor land use restrictions. The primary purpose of the Excavation Notification is to apprise the Navy of changes to land use. Information regarding the depth of contamination and type of contamination present is available in the Institutional Control section of the AdakUpdate.com website or in the information repository on the second floor of the Bob Reeves High School, Adak, Alaska. The final cleanup sites at which excavation notifications are required are identified in Table 4-1.

The reasonably anticipated future use of land is an important consideration in determining the extent of cleanup necessary to achieve the required protectiveness. For example, if the site is an industrial area, and it is anticipated to remain industrial, residual contamination may remain on-site under the assumption that the land will not be used for residential purposes. The contaminant levels left on-site are safe for workers, but may not be safe for full-time residents living on the property if land use becomes residential at some time in the future. In this particular scenario, institutional controls would be necessary to restrict present and future land use to industrial purposes and ensure that engineering controls remain intact. Generalized proposed land reuse areas are shown on Figure 4-1 (ASCG 1998).

The investigations conducted by the Navy, in cooperation with the ADEC or USEPA, required certain restrictions on the land based on reasonable land use considerations. Those land use restrictions include areas restricted to industrial or outdoor recreational uses. Land use restrictions are applied to Amulet Housing, Well AMW-706 Area, Amulet Housing, Well AMW-709 Area, and ROICC Contractor’s Area (UST ROICC-8) through an equitable servitude.
The Navy has relinquished most of the property (except Parcel 4) it has occupied pursuant to a Public Land Order. The property will revert back to the Department of Interior who will convey a substantial portion of the property to The Aleut Corporation (TAC). It is anticipated that TAC, in turn, will convey portions of Adak to the City of Adak and possibly others. In the future, as landowners, both TAC and the City of Adak may have a role in implementing and enforcing certain institutional controls as part of a system of local land use controls. Involvement by TAC and the City of Adak does not relieve the Navy of its fundamental responsibility to ensure the continued effectiveness of all CERCLA remedies, as well as selected remedies related to petroleum sites under the jurisdiction of ADEC. The Interim Conveyance and attached Equitable Servitude contains the statutory covenant that delineates the Navy’s right to access sites on Adak to respond to releases of hazardous substances related to past U.S. Department of Defense (DoD) activities.

Equitable servitude restrictions are slightly different from the other controls because they are the primary mechanism by which the land use, groundwater use, and excavation restrictions are implemented. An equitable servitude provides notice to future purchasers of property about the use restrictions since they are contained in the title records of the property.

Generally, equitable servitudes are placed by the grantor (seller) that transfers ownership of real property to the grantee (buyer). Such covenants or servitudes indicate that the grantor is not giving the grantee every possible right of ownership that could be given. Rather, the grantor reserves certain rights, and the grantee takes the property subject to the reserved rights of the grantor. The equitable servitude that transfers parcels of property that have land use restrictions will have reserved those rights and uses. The grantor has the authority to enforce those reserved uses against future owners. By this mechanism, the restrictions are part of the title of the real property. Thus they ‘run with the land’ and the rights of all future owners of the parcels are similarly reserved. The provisions of the equitable servitude have been incorporated in the Interim Conveyance transferring the property to TAC.

Land use at Amulet Housing, Well AMW-706 Area, Amulet Housing, Well AMW-709 Area, and ROICC Contractor’s Area (UST ROICC-8) is restricted to recreational or industrial purposes. Residential use of land at these sites is prohibited.
## Table 4-1
### Institutional Controls for Final Cleanup Sites

<table>
<thead>
<tr>
<th>Site</th>
<th>Groundwater Use Restriction</th>
<th>Land Use Restriction</th>
<th>Soil Excavation Restriction</th>
<th>Equitable Servitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amulet Housing, Well AMW-706 Area</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Amulet Housing, Well AMW-709 Area</td>
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<td>●</td>
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<tr>
<td>Boy Scout Camp, West Haven Lake (UST BS-1)</td>
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<tr>
<td>Contractor’s Camp Burn Pad</td>
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<tr>
<td>Finger Bay Quonset Hut (UST FBQH-1)</td>
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<td>Girl Scout Camp (UST GS-1)</td>
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<td>MAUW Compound (UST 24000-A)</td>
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<tr>
<td>Mount Moffett Power Plant No. 5 (USTs 10574 through 10577)</td>
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<tr>
<td>NAVFAC Compound (USTs 20052 and 20053)</td>
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<tr>
<td>Navy Exchange Building (UST 30027-A)</td>
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<tr>
<td>New Roberts Housing (UST HST-7C)</td>
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<td>Officer Hill and Amulet Housing (UST 31047-A)</td>
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<td>Officer Hill and Amulet Housing (UST 31049-A)</td>
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<td>Officer Hill and Amulet Housing (UST 31052-A)</td>
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<tr>
<td>Quarters A (UST)</td>
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<tr>
<td>ROIICC Contractor’s Area (UST ROICC-8)</td>
<td>●</td>
<td>●</td>
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<td></td>
</tr>
<tr>
<td>ROIICC Warehouse (UST ROIICC-2)</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROIICC Warehouse (UST ROIICC-3)</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yakutat Hangar (USTs T-2039-B and T-2039-C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.0 CLEANUP LEVELS

5.1 SOIL

Concentrations of petroleum-related chemicals reported in soil samples collected during UST removal activities, were compared to Alaska DEC Method One soil cleanup levels for the non-Arctic zone as specified by Alaska regulations 18 AAC 78.315 and 18 AAC 75.341(a)(1). Cleanup levels were determined for GRO, DRO, and residual-range organics (RRO) on a site-specific basis using the Alaska DEC Matrix Score Sheet presented in Table A1 of 18 AAC 75.341(a). Under Method One, soil cleanup levels for benzene, toluene, ethylbenzene, and xylenes (BTEX) are established at the most stringent Method Two levels applicable at the site (18 AAC 75.341[a][4]). The Method One soil cleanup levels established for each site are provided in the site-specific sections (Sections 6 through 24).

Petroleum release sites on Adak Island that contained petroleum-related chemicals in soil at concentrations above Alaska DEC Method One soil cleanup levels were subjected to further site assessment activities performed between 1996 and 1998. Results of chemical analyses conducted on soil samples collected during these further site assessment activities were compared to supplemental screening criteria provided in Table 5-1 below:

**Table 5-1**

<table>
<thead>
<tr>
<th>Site Use</th>
<th>Maximum DRO (mg/kg)</th>
<th>Maximum GRO (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surface</td>
<td>Subsurface</td>
</tr>
<tr>
<td>Residential</td>
<td>1,250 (0-2 ft bgs)</td>
<td>5,000 (&gt;2 ft bgs)</td>
</tr>
<tr>
<td>Industrial</td>
<td>5,000 (0-1 ft bgs)</td>
<td>12,500 (&gt;1 ft bgs)</td>
</tr>
<tr>
<td>Recreational</td>
<td>12,500 (0-1 ft bgs)</td>
<td>12,500 (&gt;1 ft bgs)</td>
</tr>
</tbody>
</table>

Notes:
- ft bgs – feet below ground surface
- mg/kg – milligram per kilogram or part per million equivalent
- > - greater than

Supplemental criteria were developed by the Navy and Alaska DEC for site screening purposes because the Alaska Oil and Other Hazardous Substances Pollution Control regulations were not yet finalized. The supplemental screening criteria were intended to focus attention on the most problematic petroleum-release sites, by screening out those sites that pose low potential for adverse future human or ecological exposure. Sites that met the supplemental screening criteria were determined to require no further action in the OU A ROD. Sites that did not meet the
supplemental screening criteria required further action and a remedy was specified for these sites in the OU A ROD. The OU A ROD specified a remedy for the 19 sites discussed herein.

Petroleum-release sites that met the supplemental screening criteria were recommended for no further action by the Navy. The no further action remedy was selected for those sites where the Alaska DEC concurred with the Navy recommendations, as determined in the ROD for OU A (U.S. Navy, USEPA, and Alaska DEC 2000).

Alaska DEC amended the Oil and Other Hazardous Substances Pollution Control regulations (18 AAC 75) while the site summary reports for petroleum sites on Adak Island were being finalized (U.S. Navy 1999). The final promulgated regulation was issued on January 22, 1999. The Alaska DEC Method Two soil cleanup levels identified in the final regulation (18 AAC 75) replaced the supplemental screening criteria as applicable soil cleanup levels for petroleum release sites on Adak Island, Alaska.

To determine if conditions at the 19 sites met site closure criteria, residual concentrations of petroleum-related chemicals reported in soil samples collected at the site following completion of the remedial action were compared to Alaska DEC Method Two soil cleanup levels, specified by Alaska regulation 18 AAC 75.341(a)(2). Cleanup levels are determined for petroleum-related chemicals based upon the site being located in the over 40-inch annual rainfall zone, and the prevention of contaminant migration from soil into groundwater. These are the most stringent Method Two soil cleanup levels established for sites in the over 40-inch rainfall zone. Method Two soil cleanup levels established for petroleum-related chemicals released at these sites are the following:

- GRO ....................................... 260 mg/kg
- DRO ....................................... 230 mg/kg
- RRO .................................... 9,700 mg/kg
- Benzene ................................. 0.02 mg/kg
- Toluene ................................. 4.8 mg/kg
- Ethylbenzene ........................... 5.0 mg/kg
- Total xylenes ........................... 69 mg/kg
- 2-Methylnaphthalene ............... 19 mg/kg
- Acenaphthene ......................... 190 mg/kg
- Acenaphthylene ....................... 190 mg/kg
- Anthracene ............................ 3,900 mg/kg
- Benzo(a)anthracene .................. 5.5 mg/kg
- Benzo(b)fluoranthene ............... 17 mg/kg
- Benzo(k)fluoranthene ............... 170 mg/kg
• Benzo(a)pyrene ....................... 2.4 mg/kg
• Benzo(g,h,i)perylene ........... 1,400 mg/kg
• Chrysene .......................... 550 mg/kg
• Dibenz(a,h)anthracene .......... 5.0 mg/kg
• Fluoranthene ...................... 1,900 mg/kg
• Fluorene ........................... 240 mg/kg
• Indeno(1,2,3-c,d)pyrene .......... 50 mg/kg
• Naphthalene ......................... 19 mg/kg
• Phenanthrene ....................... 3,900 mg/kg
• Pyrene ............................... 1,400 mg/kg
• Lead (residential) ................. 400 mg/kg
• Lead (industrial) ................. 1,000 mg/kg

The Alaska DEC Method Two soil cleanup levels also identify less-stringent cleanup levels based on ingestion of soil and inhalation of dust or vapors. The lower of these cleanup levels may be proposed at a site where direct ingestion of contaminated groundwater is not a viable transport pathway. Because groundwater has not been observed in monitoring wells at the Mount Moffett Power Plant site in sufficient quantities to support a water supply well, the Method Two soil cleanup level for DRO that is established for ingestion of soil in the over 40-inch rainfall zone (8,250 mg/kg) is proposed for the site.

5.2 GROUNDWATER

Groundwater cleanup levels are specified in 18 AAC 75.345 Table C. If the Alaska DEC determines that the groundwater is not a current source of drinking water or that the reasonably expected potential future use of the groundwater is not a drinking water source, a concentration equal to 10 times the cleanup levels in Table C can be applied as the groundwater cleanup level under 18 AAC 75.350. Relevant Table C groundwater cleanup levels are as follows:

• GRO................................. 1,300 µg/L
• DRO................................. 1,500 µg/L
• RRO................................. 1,100 µg/L
• Benzene............................. 5.0 µg/L
• Toluene ......................... 1,000 µg/L
• Ethylbenzene ..................... 700 µg/L
• Total xylenes ..................... 10,000 µg/L
• 2-Methylnaphthalene ......... 700 µg/L
• Acenaphthene ................... 2,200 µg/L
• Acenaphthylene......................2,200 µg/L
• Anthracene ........................11,000 µg/L
• Benzo(a)anthracene..............1.0 µg/L
• Benzo(b)fluoranthene ...........1.0 µg/L
• Benzo(k)fluoranthene ..........10 µg/L
• Benzo(a)pyrene ............0.2 µg/L
• Benzo(g,h,i)perylene.........1,100 µg/L
• Chrysene .............................100 µg/L
• Dibenz(a,h)anthracene .......0.1 µg/L
• Fluoranthene .................1,460 µg/L
• Fluorene .............................1,460 µg/L
• Indeno(1,2,3-c,d)pyrene........1.0 µg/L
• Naphthalene ......................700 µg/L
• Phenanthrene ..................11,000 µg/L
• Pyrene ..............................1,100 µg/L