

Adak Island UPDATE

SWMU 62, New Housing Fuel Leak Site: Proposed Cleanup

Naval Facilities Engineering Command Northwest

Site Background

December 2005

The Solid Waste Management Unit (SWMU) 62, New Housing Fuel Leak site at the former Adak Naval Complex is located in the downtown area of Adak Island, east of Runway 18-36, north of Public Works Road, west of Bayshore Highway, and south of Kagalaska Drive (Figure 1). The SWMU 62, New Housing Fuel Leak site consists primarily of personnel housing units and includes Sandy Cove Housing (88 units), Eagle Bay Housing (33 units), and Turnkey Housing (15 units). Turnkey and Eagle Bay Housing are no longer occupied. These housing units occupy approximately 100 acres that include open grass-covered areas between the separate housing complexes.

Jet petroleum No. 5 (JP-5), which is similar in composition to kerosene or Jet A, is used as heating fuel at the former Adak Naval Complex. For the housing units in the SWMU 62, New Housing Fuel Leak site, JP-5 was formerly distributed from large above-

ground storage tanks to individual housing units by underground piping. One 6-inch and two 2.5-inch JP-5 pipelines distributed fuel to the large above-ground storage tanks. In addition, two other pipelines cross the site that are not associated with the heating fuel distribution system. These include an aviation gasoline distribution system formerly used to provide fuel to truck fill stands along the airfield and a 4-inch diesel pipeline.

During 1988 and 1989, five piping fuel leaks were discovered and repaired after occupants reported hydrocarbon-like odors in the housing units. Because of the leaks that had been detected, the heating fuel distribution system was pressure tested to assess the extent of potential releases. Sixteen additional piping leaks were detected and repaired as a result of pressure testing. Figure 2 shows the 14 housing units where the 21 piping leaks were identified. The

volume of fuel released to the environment from the heating fuel distribution system at the SWMU 62, New Housing Fuel Leak site has not been determined.

Various environmental field investigations were performed by the Navy at the SWMU 62, New Housing Fuel Leak site between 1988 and 2001. Results of these investigations indicated that petroleum-related chemicals were present in samples of subsurface soil and groundwater collected from numerous locations at the SWMU 62, New Housing Fuel Leak site. In addition, measurable thicknesses of free product (petroleum found as a separate floating layer on water) were observed in 112 monitoring wells at the site.

During 1989, the Navy conducted soil removal actions from under selected housing units where heating fuel was released through piping leaks. These activities resulted in the removal of approximately 100 cubic yards of soil. The excavated material was replaced with clean sand, and vapor barriers sealed to the housing unit foundations were installed. These removal actions eliminated surface exposure to released petroleum hydrocarbons in the housing area. In addition, a free-product recovery trench and 16 free-product recovery wells were installed during 1989 and extensively modified during October 1996. The recovery system operated until May 2000, when it was determined to have met the negotiated product recovery endpoints and was shut down. This system recovered an estimated 154,000 gallons of free product during its 11-year operational life.

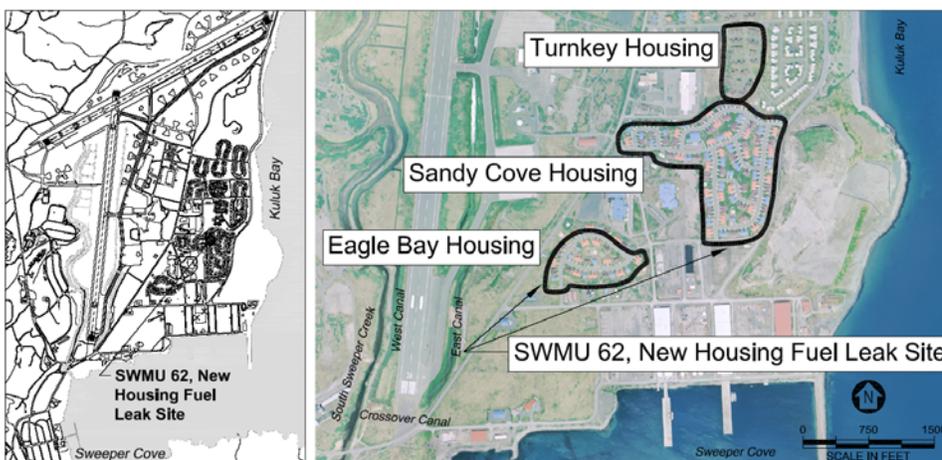


Figure 1. Location Map, SWMU 62, New Housing Fuel Leak Site

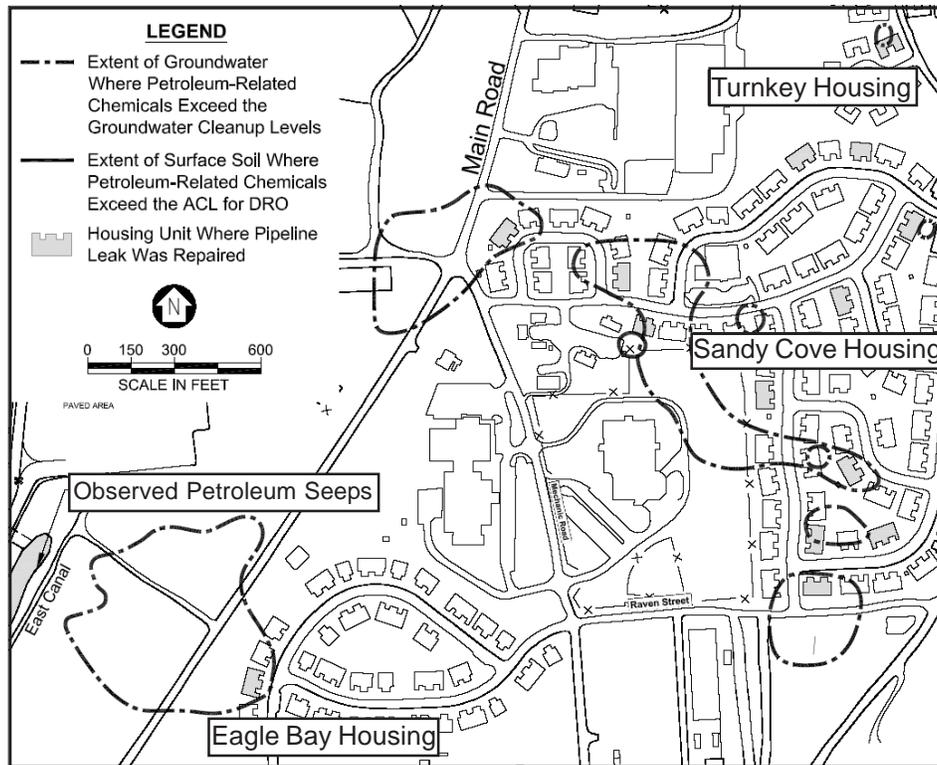


Figure 2. Extent of Surface Soil and Groundwater Contamination, SWMU 62, New Housing Fuel Leak site

Regulatory Background and Framework

Investigation and cleanup of petroleum-contaminated sites at the former Naval Complex on Adak have been ongoing since 1986. In May 1997, the Navy and Alaska Department of Environmental Conservation (DEC) agreed to integrate the cleanup decision process for petroleum sites with the cleanup decision process being conducted for hazardous-substance-release sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly referred to as Superfund). As a result, in 2000, 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, U.S. Environmental Protection Agency, and Alaska DEC. The ROD is the legal document describing the cleanup actions selected for a site.

The ROD for OU A presents the 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 product. Free-product recovery, regular groundwater monitoring, and removal actions have been conducted at these sites. Removal actions included removal of storage tanks and piping and removal of some contaminated surface soils and sediments. The ROD for OU A specified that, in addition to the interim actions, each of these 14 sites would require a final remedy selection in the future. To clarify regulatory authority, the ROD for OU A was amended in September of 2003 to remove these petroleum sites from CERCLA authority. Therefore, final remedies for the 14 free-product sites are now being selected in accordance with Alaska State petroleum cleanup regulations (discussed in more detail later).

Remedies were selected during 2004 for 10 of these 14 free-product sites. The sites with selected remedies were sites where petroleum-related chemicals pose no unacceptable risk to human health and the environment, provided that institutional controls prohibiting the use of groundwater as a drinking water source continue to remain effective. Remedy selection is currently being conducted for the four free-product sites where petroleum-related chemicals do pose a potential risk to human health or the environment. This document summarizes the selection of a preferred remedial alternative for one of those four sites, the SWMU 62, New Housing Fuel Leak site. The three remaining free-product sites where petroleum-related chemicals pose a potential risk to human health or the environment are being addressed separately.

Cleanup Levels at the Free-Product Sites

Cleanup levels are needed as part of the process of selecting the preferred cleanup remedy. Cleanup levels are used to help determine how much cleanup is required and to establish when a site can be considered "clean" after the completion of remedial actions. Chemical-specific cleanup levels for soil and groundwater have been established for petroleum-contaminated sites on Adak in accordance with Alaska DEC regulation 18 Alaska Administrative Code (AAC) 75.

The Alaska regulations establish four methods for determining cleanup levels for soil. Alternative cleanup levels (ACLs) are proposed for remediation of soil following Alaska DEC Method Four (18 AAC 75.340[a][4]), which uses site-specific risk assessments to establish proposed cleanup levels. The ACLs are established at concentrations such that risks from hazardous substances do not exceed the following target health

goals: a cumulative carcinogenic risk of 1 in 100,000 and a cumulative noncarcinogenic hazard index of 1.0. Figure 2 shows the extent of surface soil at the SWMU 62, New Housing Fuel Leak site containing petroleum-related chemicals at concentrations greater than the ACLs.

The Alaska regulations establish three methods for determining cleanup levels for groundwater. Cleanup levels specified for remediation of groundwater at the SWMU 62, New Housing Fuel Leak site, are based on the tabulated groundwater cleanup levels (18 AAC 75.345[b][1], Table C) because groundwater is considered to be a reasonably expected potential future source of drinking water. The extent of groundwater at the site containing petroleum-related chemicals at concentrations greater than the applicable groundwater cleanup levels is also shown on Figure 2.

Under the Alaska water quality standards, the canals of the airport ditch system, including the East Canal (located west of the site), fall within a designated fresh water class, and a secondary recreation subclass. The water quality standards established for this use class and subclass specify that petroleum hydrocarbons, oils, and grease may not cause a film, sheen, or discoloration on the surface or floor of the water body or adjoining shorelines, and that surface waters must be virtually free from floating oils.

Alaska State regulations do not establish cleanup levels for sediment. Therefore, sediment cleanup levels are established based on the results of the ecological risk assessment conducted for the site. Because no ecological risks above target health goals were identified in sediment at the SWMU 62, New Housing Fuel Leak site, no cleanup levels are necessary for sediment.

Remedial Action Objectives

Based on the human health risk analysis conducted for this site and appropriate application of the regulatory requirements, the following remedial action objectives (RAOs) were developed for the protection of human health at the SWMU 62, New Housing Fuel Leak site:

- Prevent human exposure to petroleum hydrocarbons in surface soil that would result in adverse health effects.

- Reduce petroleum hydrocarbons in groundwater to concentrations less than or equal to the Alaska DEC groundwater cleanup levels established for groundwater used as a drinking water source. (Groundwater is considered a potential future source of drinking water at the SWMU 62, New Housing Fuel Leak site because potable water could be obtained from a well installed at the site.)

- Minimize exposure to free product in soil, groundwater, and surface water.
- Prevent migration of free product to surface water that would result in an exceedance of the Alaska DEC surface water quality standard for sheen.

Based on the ecological risk analysis conducted for this site, no RAOs were found to be necessary for the protection of ecological receptors at the SWMU 62, New Housing Fuel Leak site.

Remedy Selection

Four different cleanup alternatives were evaluated for the site:

- **Alternative 1 – No Action:** No action or monitoring would be implemented with this alternative. Institutional controls, as described in the Institutional Control Management Plan for Adak, are currently in place for the site. Institutional controls applicable to this site include the downtown groundwater use prohibition and the soil excavation notification requirements.
- **Alternative 2 – Institutional Controls, Free-Product Containment and Passive Recovery, Surface Soil Excavation, and Monitored Natural Attenuation (MNA) for Groundwater:** This alternative consists of institutional controls that are already in place as described in the Institutional Control Management Plan for Adak, installation of one free-product collection/containment trench to protect surface water, disposal of excavated trench soil, installation of four new monitoring wells for free-product recovery and/or groundwater monitoring, surface soil excavation and disposal, free-product recovery from the free-product collection/containment trench and new and existing wells using passive recovery, sorbent boom maintenance, and MNA for groundwater. Passive recovery is a method of recovering

free product from the subsurface using skimmers or sorbent materials to remove free product floating on the groundwater surface. MNA uses natural processes such as volatilization, dispersion, and microbial degradation to reduce the concentration of contaminants. MNA includes a monitoring component to verify the reduction in concentrations of contaminants.

- **Alternative 3 – Institutional Controls, Free-Product Containment and Active Recovery, Canal Bank Soil and Surface Soil Excavation, and MNA for Groundwater:** This alternative consists of institutional controls that are already in place as described in the Institutional Control Management Plan for Adak, installation of one free-product collection/containment trench, surface soil and canal bank excavation, disposal of soil from the surface soil and canal bank excavation areas, installation of seven new free-product recovery wells, modification and start-up of the existing active recovery system at Eagle Bay Housing, passive free-product recovery from the free-product collection/containment trench and existing wells in the Sandy Cove Housing area, installation of four new monitoring wells for groundwater monitoring, and MNA for groundwater. Active recovery is a method of recovering

free product from the subsurface in which groundwater is pumped together with free product.

- **Alternative 4 – Institutional Controls, Passive Free-Product Recovery, Surface Soil Excavation, In Situ Steam Stripping, and MNA for Groundwater:** This alternative consists of institutional controls that are already in place as described in the Institutional Control Management Plan for Adak, surface soil excavation and disposal, in situ steam stripping in the Eagle Bay Housing area, installation of 10 new wells for groundwater monitoring to replace wells that would be abandoned prior to in situ steam stripping, installation of three new groundwater monitoring wells in the Eagle Bay Housing area, passive free-product recovery in existing wells in the Sandy Cove Housing area, MNA for groundwater, and sorbent boom maintenance. In situ steam stripping uses steam injected into the subsurface to mobilize free product to aid its removal through soil vapor extraction and groundwater and free-product pumping.

In order to be selected as the best remedy, a cleanup alternative must meet several strict criteria established by state regulations, in addition to achieving the RAOs. These criteria are protection of human health and the environment, compliance with Alaska regulations, long-term and short-term effectiveness, cost-effectiveness, and implementability.

Proposed Remedy

Alternative 2 is the preferred cleanup alternative for the SWMU 62, New Housing Fuel Leak site (see Figures 3 and 4). As mentioned above, this remedy will involve continued use of institutional controls, recovery and containment of free product, excavation of surface soil, and MNA for groundwater. This alternative will provide an appropriate, cost-effective remedy that protects human health and the environment and can be implemented at the earliest possible time. The Alaska DEC concurs with the selection of this alternative as the preferred cleanup alternative. However, the Navy, in consultation with the Alaska DEC, may modify the preferred cleanup alternative, based on public comments.

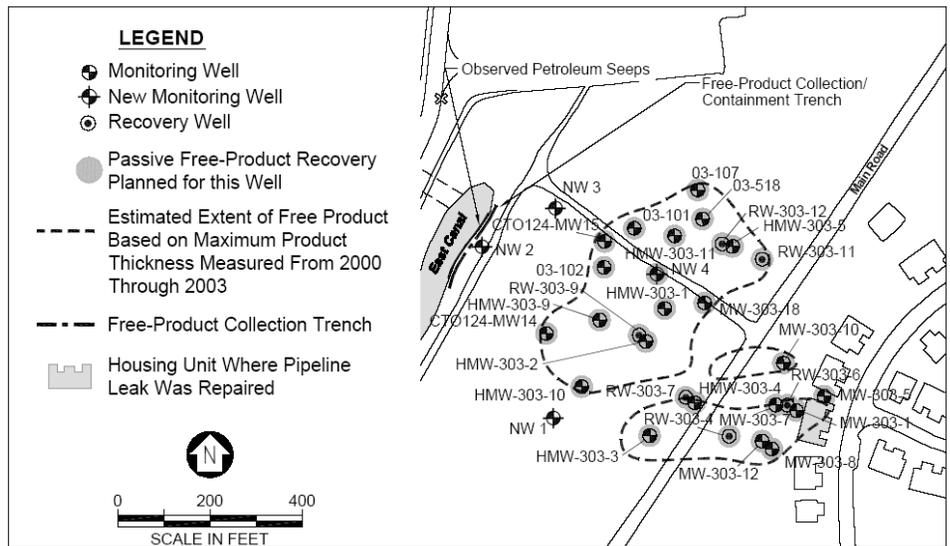


Figure 3. Preferred Cleanup Alternative Activities at Eagle Bay Housing, SWMU 62, New Housing Fuel Leak Site

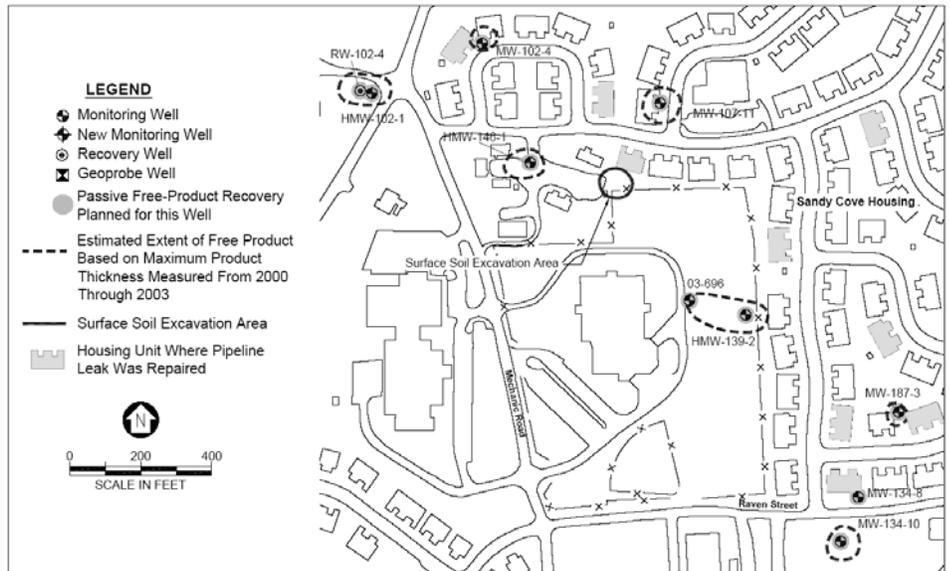


Figure 4. Preferred Cleanup Alternative Activities at Sandy Cove Housing, SWMU 62, New Housing Fuel Leak Site

Additional Information

More detailed information on the proposed cleanup plan for the SWMU 62, New Housing Fuel Leak site can be found at the Adak Island High School, the University of Alaska at Anchorage, and the Navy site file in Poulsbo, Washington.

Public comment period for the proposed cleanup plan is from December 13, 2005, to January 13, 2006.

For further information on the SWMU 62, New Housing Fuel Leak Site, please contact:

Mark Wicklein, P.E.
 Naval Facilities Engineering
 Command Northwest
 19917 Seventh Avenue NE
 Poulsbo, WA 98370-7570
 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