

Adak Island UPDATE

South of Runway 18-36 Area: Proposed Cleanup

Naval Facilities Engineering Command Northwest

Site Background

December 2005

The South of Runway 18-36 Area consists of the lowland area surrounding the southern portion of runway 18-36. It extends from the East Canal of the airport ditch system on the east to South Sweeper Creek on the west and south to Sweeper Cove (Figure 1). To the east, this site adjoins another large petroleum-release site, the Naval Mobile Construction Battalion Building T-1416 Expanded Area. The primary physical features on the site include the southern portion of runway 18-36, Main Road, the northern end of Transit Road south to the Transit Road Bridge, and the southern portion of the West Canal and the Crossover Canal of the airport ditch system. The canals that constitute the airport ditch system are engineered structures used to divert surface water from the vicinity of runway 18-36. Because the site is within the low-fly zone established for the airfield, no buildings are located within the site boundaries.

A 6-inch-diameter jet petroleum (No. 5 fuel) line located near the southeast corner of runway 18-36, uncovered during September 1990, was reported to

be the source of a subsurface fuel release. This inactive pipeline was cleaned (but not closed) about 5 years ago. Several additional pipelines present at the site may be sources of potential releases. These include one 8-inch-diameter motor vehicle gasoline (mogas) pipeline, one 4-inch-diameter mogas pipeline, and one 10-inch diameter aviation gasoline pipeline that were cleaned and closed in 2003 and one 8-inch-diameter mogas pipeline and a 12-inch-diameter diesel fuel transfer pipeline that were abandoned in the late 1950s.

Various environmental field investigations were performed by the Navy at the South of Runway 18-36 Area between 1990 and 2001. Petroleum-related chemicals and some volatile organic compounds (organic chemicals that easily form vapors at normal temperature and pressure) were found in samples of subsurface soil, groundwater, sediment, and surface water collected at the site. In addition, free product (petroleum found as a separate floating layer on water) was detected in 19 of the 26 wells installed at the site.

The following cleanup activities have been implemented at the South of Runway 18-36 Area:

- During June 2003, cleaned and closed three pipelines that cross the South of Runway 18-36 Area
- Recovered approximately 215 gallons of free product from June 1997 through November 2004
- Completed petroleum corrective action work in August 1998, including capping 270 feet of stained soil within the West Canal south of the Crossover Canal
- Removed, treated, and disposed of sediment contaminated with polychlorinated biphenyls from South Sweeper Creek during April to August 1999
- Installed a culvert in the Crossover Canal of the airport ditch drainage system during May to September 2001 to reduce the potential for contamination to seep into the airport ditch drainage system
- Removed, cleaned, and disposed of approximately 70 cubic yards of petroleum-contaminated soil on the south bank of the Crossover Canal during culvert installation
- Installed a product interception device along the bank of South Sweeper Creek during August 2001 to prevent release of petroleum into the creek by eliminating an observed seep adjacent to and east from the Transit Road Bridge

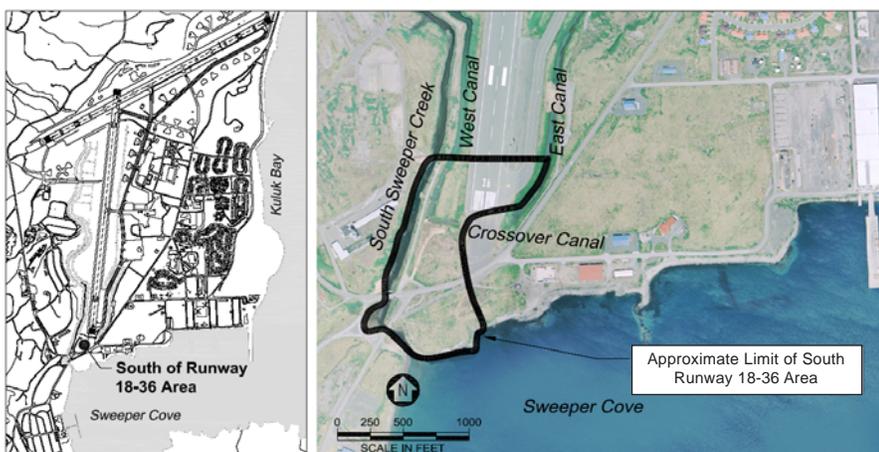


Figure 1. Location Map, South of Runway 18-36 Area

Regulatory Background and Framework

Investigation and cleanup of petroleum-contaminated sites at the former Adak Naval Complex 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 was signed by the Navy, the U.S. Environmental Protection Agency, and the Alaska DEC. The ROD is the legal document describing the cleanup actions selected for a site.

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 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 final remedy selection in the future. To clarify regulatory authority, the ROD for OU A was amended in September 2003 to remove these petroleum sites from CERCLA authority. Therefore, final remedies for the 14 petroleum-contaminated sites are now being selected in accordance with Alaska State petroleum cleanup regulations.

Remedies were selected during 2004 for 10 of these 14 free-product-recovery petroleum sites where petroleum-related chemicals pose no unacceptable risk to human health and the environment, provided that institutional controls remain in effect prohibiting the use of groundwater as a drinking water source. Remedy selection is currently being conducted for the four free-product-recovery petroleum 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 South of Runway 18-36 Area. 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 Recovery Petroleum 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 also 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.

Soil

The Alaska regulations establish four methods for determining cleanup levels for soil. Alternative cleanup levels 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.

However, the risk assessment for this site established that the existing concentrations in soil do not pose a risk to humans or the environment. 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.

Groundwater

The Alaska regulations establish three methods for determining cleanup levels for groundwater. Cleanup levels specified for remediation of groundwater at the South of Runway 18-36 Area are based on 10 times the tabulated groundwater cleanup levels (18 AAC 75.345[b][2]) because groundwater is not reasonably expected to be a potential future source of drinking water because of potential saltwater intrusion. The extent of groundwater at the site containing petroleum-related chemicals at concentrations greater than the applicable groundwater cleanup levels is shown on Figure 2.

Surface Water – Sweeper Cove and South Sweeper Creek

Under the Alaska water quality standards, Sweeper Cove (located adjacent to the site) and the lower reach of South Sweeper Creek (located west of the site) fall within the marine water class and the following subclasses: water supply for aquaculture; secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. The water quality standards established for this use class and these subclasses specify cleanup levels for total aqueous hydrocarbons (TAQH) and total aromatic hydrocarbons (TAH) in the water column. In addition, there may be no concentration of petroleum hydrocarbons, oils, and grease in shoreline or bottom sediments that causes deleterious effects to aquatic life. Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.

Cleanup Levels at the Free-Product Recovery Petroleum Sites (continued)

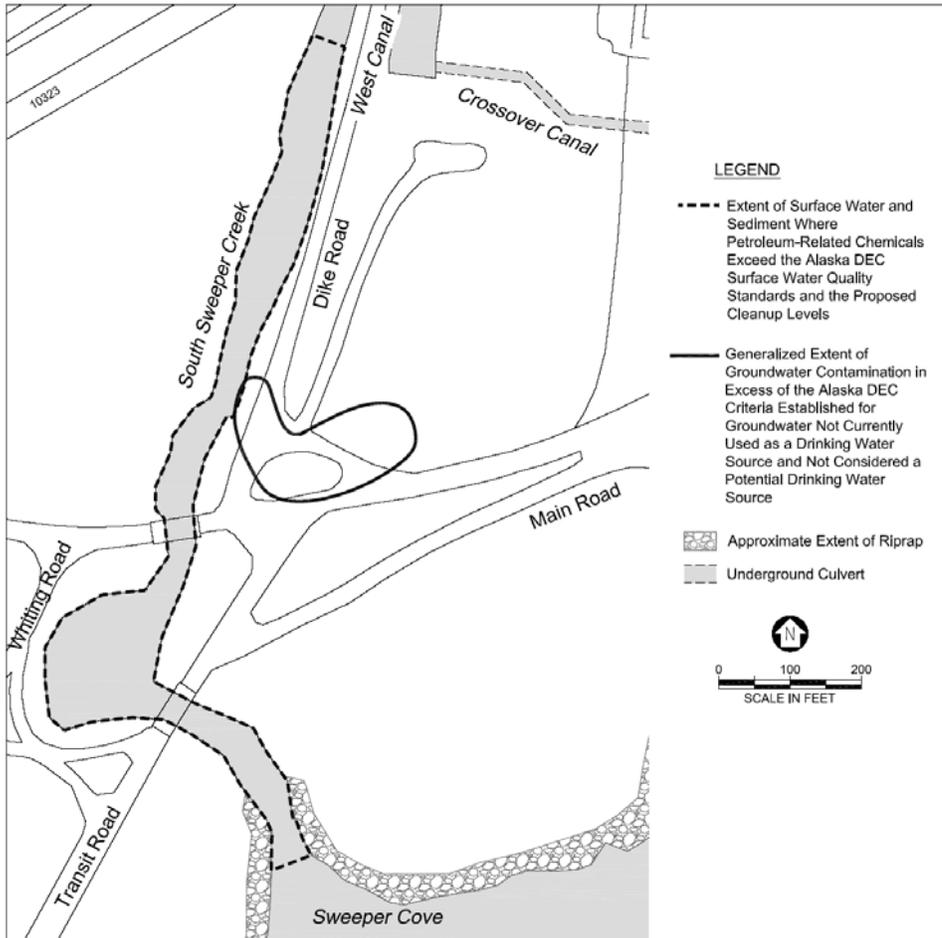


Figure 2. Extent of Groundwater, Surface Water, and Sediment Contamination, South of Runway 18-36 Area

Surface Water - Sweeper Cove and South Sweeper Creek (continued)

Because Alaska State regulations do not establish surface water cleanup levels for individual chemicals, diesel-range organics, or gasoline-range organics, the results

of the ecological risk assessment were used to establish additional risk-based cleanup levels for chemicals in surface water that may result in a potential risk to ecological receptors. These risk-based cleanup levels are additional cleanup levels for surface water and do not replace the TAqH and TAH criteria. Both

the risk-based cleanup levels and the surface water quality criteria apply to South Sweeper Creek. The extent of surface water at the site containing petroleum-related chemicals at concentrations greater than the applicable surface water cleanup levels is shown on Figure 2.

Surface Water – West Canal

Under the Alaska water quality standards, the canals of the airport ditch system, including the West Canal (located north 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 surface waters must be virtually free from floating oils.

Sediment

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. Sediment cleanup levels were calculated for chemicals that could potentially pose an unacceptable risk to ecological receptors as a result of exposure to sediment in South Sweeper Creek. The extent of sediment at the site containing petroleum-related chemicals at concentrations greater than the applicable sediment cleanup levels is shown on Figure 2.

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 South of Runway 18-36 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 petroleum product

Based on the ecological risk analysis conducted for this site and appropriate

application of the regulatory requirements, the following RAOs were developed for the protection of the environment at the South of Runway 18-36 Area:

- Prevent the migration of petroleum hydrocarbons to sediments that would result in adverse health effects to ecological receptors

Remedial Action Objectives (continued)

- Prevent the migration of petroleum hydrocarbons to surface water that would result in adverse health effects to ecological receptors and/or an exceedance of the Alaska surface water quality standards
- Prevent ecological exposure to petroleum hydrocarbons in surface water and sediment that would result in adverse health effects to ecological receptors and/or an exceedance of the Alaska surface water quality standards

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 restrictions on land development (i.e., residential land development would be prohibited), the downtown groundwater use prohibition, and the soil excavation notification requirements.
- **Alternative 2 – Institutional Controls, Passive Free-Product Recovery and Containment, Monitored Natural Attenuation (MNA) for Groundwater, and Natural Recovery for Surface Water and Sediment:** 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 seven new monitoring wells for free-product recovery and groundwater monitoring, free-product recovery from the free-product collection/containment trench and new and existing wells using passive recovery, MNA for groundwater, and natural recovery for surface water and sediment. 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 and natural recovery use 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, Passive Free-Product Recovery and Containment, Creek Bank Soil Excavation, iSOC™ and MNA for Groundwater, and Natural Recovery for Surface Water and Sediment:** This alternative consists of institutional controls that are already in place as described in the Institutional Control Management Plan for Adak, installation of two free-product collection/containment trenches to protect surface water, installation of one in situ submerged oxygen curtain (iSOC™) by Inventures Technologies, Inc., to protect surface water from migration of petroleum compounds dissolved in groundwater, excavation of creek bank soil for eliminating and/or reducing sheen in South Sweeper Creek, disposal of excavated soil, installation of six new monitoring wells for free-product recovery and groundwater monitoring, free-product recovery from the free-product collection/containment trenches and new and existing wells using passive recovery, MNA for groundwater, and natural recovery for surface water and sediment. iSOC™ is a method of cleaning up a site where oxygen is injected into the subsurface to promote microbial degradation of contaminants dissolved in groundwater.
- **Alternative 4 – Institutional Controls, Passive Free-Product Recovery and Containment, Creek Bank/Hot Spot Soil Excavation, iSOC™ and MNA for Groundwater, Sediment Removal, and Natural Recovery for Surface Water:** This alternative consists of institutional controls that are already in place as described in the Institutional Control Management Plan for Adak, installation of three free-product collection/containment trenches to protect surface water, installation of one iSOC™ to protect surface water from migration of petroleum compounds dissolved in groundwater, excavation of creek bank soil for eliminating and/or reducing sheen in South Sweeper Creek, excavation of hot spot soil in source areas to reduce the volume of petroleum hydrocarbons, excavation of sediment to protect ecological receptors, disposal of excavated soil and sediment, installation of nine new monitoring wells for free-product recovery and groundwater monitoring, free-product recovery from the free-product collection/containment trenches and new and existing wells using passive recovery, MNA for groundwater, and natural recovery for surface water.

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 South of Runway 18-36 Area (see Figure 3). This remedy, as described above, will involve continued use of institutional controls, free-product recovery and containment, MNA for groundwater, and natural recovery for surface water and sediment. 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 alternative. However, the Navy, in consultation with the Alaska DEC, may modify the preferred cleanup alternative, based on public comments.

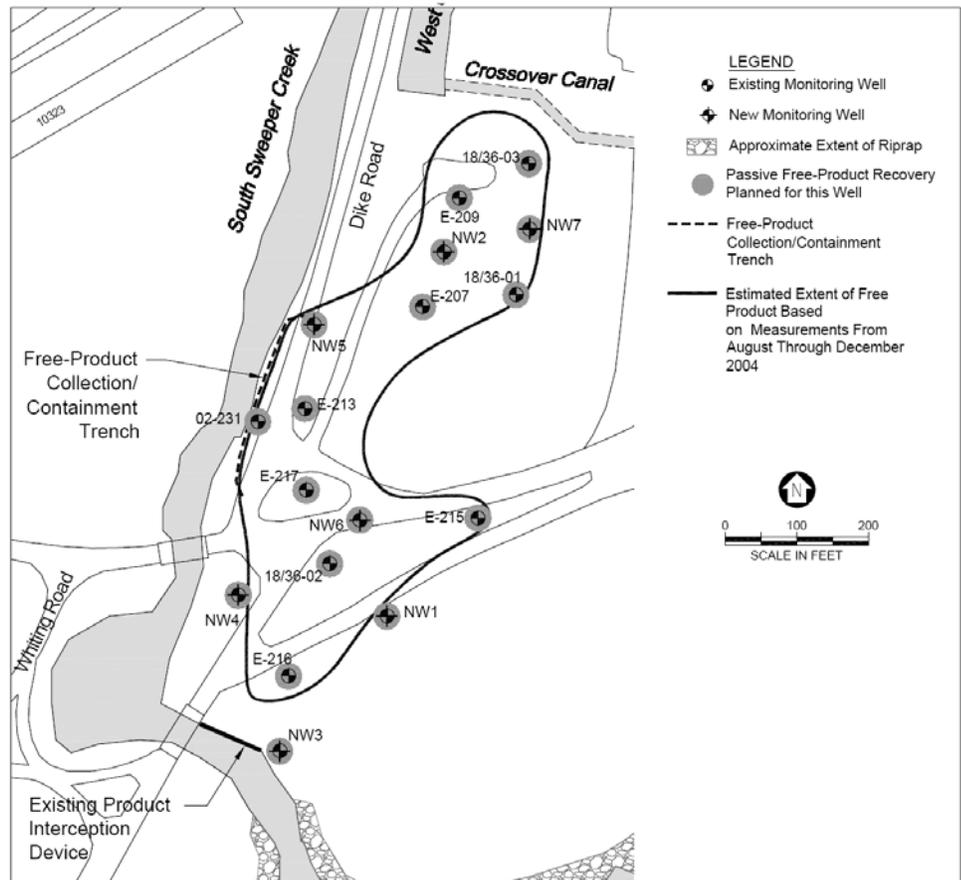


Figure 3. Preferred Cleanup Alternative Activities, South of Runway 18-36 Area

Additional Information

More detailed information on the proposed cleanup plan for the South of Runway 18-36 Area site can be found at the Adak Island High School, the University of Alaska at Anchorage, and the Navy site file at Poulso, Washington.

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

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