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EPA Superfund
Record of Decision:

FORT WAINWRIGHT
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04/09/1996

RECORD OF DECISION

for

OPERABLE UNIT 3
FORT WAINWRIGHT
FAIRBANKS, ALASKA

JANUARY 1996

DECLARATION STATEMENT
for
RECORD OF DECISION
FORT WAINWRIGHT
FAIRBANKS, ALASKA
OPERABLE UNIT 3
JANUARY 1996

SITE NAME AND LOCATION

Operable Unit 3
Fort Wainwright
Fairbanks, Alaska

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedial actions for Operable Unit 3 at Fort Wainwright in Fairbanks, Alaska. Operable Unit 3 comprises the following areas: the Tank Farm; the Railcar Off-Loading Facility; and Mileposts 2.7, 3.0, and 15.75 of the Fairbanks-Eielson Pipeline. The ROD was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986; 42 United States Code, Section 9601 et seq.; and, to the extent practicable, in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 Code of Federal Regulations 300 et seq. This decision is based on the Administrative Record for this operable unit.

The United States Army; the United States Environmental Protection Agency; and the State of Alaska, through the Alaska Department of Environmental Conservation, have agreed to the selected remedies.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. Specific hazardous substances include benzene, toluene, ethylbenzene, xylenes, 1,2-dichloroethane, isopropylbenzene, trimethylbenzene, and inorganic lead.

DESCRIPTION OF SELECTED REMEDIES

This is the first operable unit to reach a final-action ROD. This ROD addresses soil and groundwater contamination at Operable Unit 3.

The remedies were selected to reduce and prevent the risks associated with potential current or future exposure to the contaminants. The remedial action objectives of this ROD are designed to:

- Restore groundwater to drinking water quality;
- Clean up soil to prevent further leaching of contaminants into groundwater; and
- Reduce or prevent further migration of contaminated groundwater.

The major components of the remedies are:

RECORD OF DECISION
FORT WAINWRIGHT
FAIRBANKS, ALASKA
OPERABLE UNIT 3
JANUARY 1996

This Record of Decision for Operable Unit 3 presents the remedial alternatives considered, provides the rationale for the remedial actions selected, and states how the remedial actions satisfy the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) statutory requirements. Fort Wainwright was listed on the National Priorities List in August 1990 under CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986.

The United States Army completed a Remedial Investigation (RI) to provide information regarding the nature and extent of soil and groundwater contamination. A baseline Risk Assessment was developed and used in conjunction with the RI to determine the need for remedial action and to aid in selecting remedies. A Feasibility Study was completed to evaluate remedial options.

1.0 SITE NAME, LOCATION, AND DESCRIPTION

1.1 SITE LOCATION AND DESCRIPTION

Fort Wainwright, also referred to as the site, is located on the east edge of the City of Fairbanks in the Fairbanks-North Star Borough in interior Alaska (see Figure 1). Primary missions at Fort Wainwright include training of infantry soldiers in the arctic environment, testing of equipment in arctic conditions, preparation of troops for defense of the Pacific Rim, and rapid deployment of troops worldwide. On-site industrial activities include fixed-wing aircraft, helicopter, and support vehicle maintenance. The 918,000-acre site includes the main post area, a range complex, and two maneuver areas.

Fort Wainwright originally was established as a cold-weather testing station in 1938. Renamed Ladd Army Airfield in 1939, the site next served as a resupply point for remote field stations and a crew transfer point in the Lend-Lease Program through which military aircraft and other supplies were ferried to the Soviet Union during World War II. In 1947, the site was redesignated as Ladd Air Force Base and began serving as a resupply and maintenance base for remote distance early warning sites and experimental stations in the Arctic Ocean. The site was renamed For Wainwright on January 1, 1961, and all of its operations were transferred to the United States Army.

Most of Operable Unit 3 (OU-3) is located in the main containment area of Fort Wainwright. It consists of the following source areas: the Tank Farm on Birch Hill and associated Truck Fill Stand (TFS) at the base of Birch Hill, a Railcar Off-Loading Facility (ROLF), and three mileposts along the Fairbanks-Eielson Pipeline (Mileposts 2.7, 3.0, and 15.75). Figure 1 illustrates the entire installation and each source area.

1.1.1 Tank Farm Source Area

The Tank Farm is located north of the main containment areas and is illustrated in Figure 2. The boundaries of this source area extend from the aboveground storage tanks (ASTs) on Birch Hill to Valve Pit A, which is on the northwest bank of the Chena River. The Tank Farm includes 14 bolted-steel, 10,000-barrel tanks and two welded-steel, 25,000-barrel tanks on the southwest slope of Birch Hill: three buildings; two underground storage tanks (USTs); pipelines connecting the tanks; two welded-steel, 2,250-barrel ASTs at the TFS area; the Canadian Oil Line (CANOL) pipeline; and Valve Pit A.

All the tanks were used to store fuel for Fort Wainwright and Eielson Air Force Base. Fuel stored in the tanks included arctic-grade diesel fuel, aviation-grade leaded gasoline, aircraft turbine and jet engine fuel (JP-4), leaded vehicle motor gasoline, and unleaded and regular motor fuel. All tanks have been emptied and cleaned. The pipelines have been purged. The two original USTs were removed; one was replaced with a double-walled tank in the 1980s.

The elevation of the north section of the Tank Farm, the AST area on Birch Hill, ranges from 441 feet to 748 feet above mean sea level (MSL). Except in developed areas, Birch Hill is densely forested. No permanent surface water bodies are located on Birch Hill near the ASTs. However, snow and ice meltwater accumulate in the depressions and in the diked areas around the ASTs.

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The south section of the Tank Farm, including the TFS area and Valve Pit A, is located in the Chena River floodplain. This section is characterized by nearly flat topography that gently slopes southward. The subsurface is typified by discontinuous permafrost and poorly drained soils covered by thick organic mats. Surface water ponding is common throughout the area from spring breakup until early to mid-summer. Wetlands are scattered throughout the area.

1.1.2 Railcar Off-Loading Facility Source Area

The ROLF, which is located south of the Tank Farm, is illustrated in Figure 3. A pipeline connects the ROLF to the Tank Farm. The ROLF is bounded on its north and west sides by the Chena River and Gaffney Road on the south side. The ROLF was built in 1939 to receive fuel from tanks on railcars and to distribute the fuels to the airfield refueling points, quartermaster fuel, and the Birch Hill AST Tank Farm. The facility is no longer used, but the following structures are still present: a TFS, one area with 16-tank-car unloading headers and another with eight-tank-car unloading headers, three 8-inch and four 3-inch pipelines that traverse the facility, five valve pits (B, C, D, E, and F), and two warehouses (Buildings 1129 and 1130). Fuel was stored in USTs at this facility until they were removed in 1990.

The ROLF is located on a nearly flat floodplain of the Chena River. Brush and birch trees grow along the Chena River and adjacent to Valve Pits B and C. Trees and brush have been cleared elsewhere in the ROLF. Surface water bodies are not present in the central region of the ROLF. A steep west-facing embankment is west of Valve Pit C. Small ponds and wetlands occur in the area between the embankment and the Chena River.

1.1.3 Milepost Source Areas

The Fairbanks-Eielson Pipeline was constructed in 1953 and 1954 and put into service in 1955 to transport fuel from Haines to Fairbanks. The portion of the pipeline between Fort Wainwright and the Mapco refinery was decommissioned in 1992. Spills have been reported at two locations along the pipeline at Milepost 2.7 and at Laurance Road and Robyn Drive in the City of North Pole (Milepost 15.75). Contamination was detected at Milepost 3.0 during an investigation of the Birch Hill UST facility.

The Milepost 2.7 Source Area includes areas that were contaminated by the pipeline break. TFSs 1 and 2, a water separator, valve pits, and some pipelines associated with the Birch Hill UST facility. Figure 4 illustrates Mileposts 2.7. The Milepost 2.7 Source Area consists of a moderately to steeply south-facing hillside north of the pipeline and a shallow, south-facing slope south of the pipeline. The source area is located within a surface water drainage pathway from the upland Birch Hill UST facility, northeast of the pipeline source area. Soils in the Milepost 2.7 Source Area are poorly drained. Ponded surface water is common from spring breakup until mid-summer. A black spruce-scrub-shrub wetland borders the south side of the source area. The area is densely vegetated. Discontinuous permafrost is typical in the area's subsurface soils.

The Milepost 3.0 Source Area includes contaminated areas associated with the Fairbanks-Eielson Pipeline, a TFS, a water separator, valve pits, and some pipelines associated with the Birch Hill UST facility (see Figures 1 and 4). Site descriptions provided for Milepost 2.7 are accurate for the Milepost 3.0 Source Area as well.

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The Milepost 15.75 Source Area is located in a residential area approximately 1 mile south of North Pole between the Chena River to the north and east and the Tanana River to the west. The source area is located on an off-post right-of-way for a military fuel pipeline. Figure 5 illustrates Milepost 15.75. This source area includes all contaminated areas associated with a fuel spill from a 1989 underground pipeline break. The site is flat except for drainage ditches that parallel Laurance Road. The drainage ditch on the south side of Laurance Road usually contains water. Soils in the area are sandy with little gravel and generally are moderately well-drained. The surrounding area is forested with trees and shrubs.

1.2 HYDROGEOLOGY

The main aquifer in the Fort Wainwright area, including the Milepost 15.75 Source Area, is an alluvial aquifer in a buried river valley. According to United States Geological Survey maps, this aquifer ranges from a few feet thick at the base of Birch Hill to at least 300 feet thick under the fort's main containment area. The aquifer may reach a thickness of 700 feet in the Tanana River valley.

Groundwater in the Tanana-Chena floodplain generally occurs under unconfined conditions. A confined layer of groundwater may develop seasonally where the depth to the water table is less than the depth of the seasonal frost penetration. A confined groundwater layer also may occur beneath permafrost, where the frozen ground forms a wall around the water.

The depth to groundwater at the fort varies from approximately 20 feet at the base of Birch Hill to 7 feet below ground surface (BGS) south of the Fort Wainwright airfield. Close to the Chena River, the depth to groundwater may range from 5 feet to 15 feet. The depth to groundwater in the North Pole area by the Tanana River varies from 5 feet to 10 feet BGS. It should be noted that the depth to groundwater varies with seasonal changes, changes to the normal weather trends, and the stages of the Tanana and Chena Rivers.

Groundwater movement between the Tanana and Chena Rivers follows a northwest regional pattern but fluctuates seasonally because of the effects of changing river stages. Although the level of the Chena River is controlled, seasonal fluctuations in levels do occur.

Groundwater levels near the Chena River may fluctuate greatly because of river stages. Typically, groundwater levels increase when the river stage increases, particularly during spring breakup and late summer runoff. Groundwater levels usually decrease during fall and winter, when precipitation becomes snow. When river water levels go down, the groundwater seeps into surface water bodies, such as the Chena River.

In addition to shifts in the groundwater flow direction because of the surface water hydrology, the groundwater flow direction may be impacted by high-volume pumping for dewatering operations.

Where present, permafrost forms discontinuous confining layers that influence groundwater movement and distribution. The presence of near-surface permafrost usually restricts groundwater movement within the shallow subsurface. Three types of aquifers are associated with permafrost: superapermafrost aquifers, intrapermafrost aquifers, and subpermfrost aquifers. A superpermafrost aquifer is situated above the permafrost table in the active layer, and the permafrost tables act as a relatively impermeable basal boundary. Superpermafrost aquifers are usually seasonal aquifers that freeze or experience significant storage depletion in the winter. Many of the monitoring wells at Fort Wainwright and some

domestic wells are completed in the suprapermafrost aquifer. Intrapermafrost aquifers are found in unfrozen talik zones within the body of permafrost. Subpermafrost aquifers are situated below the permafrost serving as a relatively impermeable boundary.

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Groundwater characterization conducted during the Remedial Investigation (RI) indicates the presence of thaw channels in the Tank Farm area.

The Chena River flows through Fort Wainwright to the City of Fairbanks and into the Tanana River. The ROLF, Valve Pit A, and Valve Pit B are located directly on the banks of the Chena River. The wells that are located downstream along the Chena River include the Fairbanks Municipal Utilities System (MUS; 1 mile), College Utilities (1.5 miles), and numerous residential wells located on the north bank of the river less than 0.5 mile downstream.

1.3 LAND USE

Land use at the OU-3 source areas in generally light industrial. There are residential area directly adjacent to and hydrogelogically downgradient of the Tank Farm Source Area and Milepost 15.75. Recreational uses are known to occur at all source areas because of the presence of the Chena River and dense wooded areas.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 SITE HISTORY

The Tank Farm and associated TFS are part of the Fairbanks Fuel Terminal, which was constructed in 1943 beginning with the installation of the fourteen 10,000-barrel-capacity, bolted-steel tanks on Birch Hill. The mission of the Fairbanks Fuel Terminal was to provide backup fuel support for Eielson Air Force Base. Fuel was transported via the CANOL pipeline and the Haines-Fairbanks pipeline. At Fort Wainwright, the CANOL pipeline connected the Birch Hill UST facility to the ROLF and ran west to the Tank Farm. the portion of the pipeline between the ROLF and the Tank Farm remains in place. The Haines-Fairbanks pipeline was constructed from 1954 to 1955. The only active portion of this pipeline, now called the Fairbanks-Eielson Pipeline, runs between Eielson Air Force Base and the Mapco refinery in North Pole.

2.1.1 Tank Farm Source Area

Petroleum spills occurred in and around the tanks and the TFS throughout the fuel terminal's history. the bolted-steel tanks were subject to minor leaks, and many truck spills occurred in the TFS area. In addition, the tanks were painted with lead-based paints, which subsequently were sandblasted. As a result, surface soils around the ASTs are contaminated with lead-based paint. Surface and subsurface soils at the Fairbanks Fuel Terminal also are contaminated with petroleum. Groundwater beneath the terminal at the base of Birch Hill also contains petroleum constituents.

2.1.2 Railcar Off-Loading Facility Source Area

Available records indicate that one 20-gallon spill of fuel occurred at the ROLF between 1970 and 1987. However, it is known that the tank car headers were prone to minor leaks, and at least one major spill of JP-4 occurred at one of the headers. Additionally, the USTs formerly at the ROLF reportedly were overfilled on numerous occasions. In 1991, a pipeline from Valve Pit C to the Airfield failed a hydrostatic pressure test and was taken out of service. Valve pits on either side of the Chena River and at the ROLF had leaks. Subsurface soil and groundwater are contaminated with petroleum constituents.