THE PROPOSED PLAN FOR REMEDIAL ACTION AT OPERABLE UNIT D, FORT RICHARDSON, ALASKA

April 1999

This Proposed Plan presents cleanup strategies for Operable Unit D at Fort Richardson, Alaska. These alternatives are being considered by the U.S. Army (Army), the ***Alaska Department of Environmental Conservation (ADEC),*** and the ***U.S. Environmental Protection Agency (EPA)***. The Army, ADEC, and EPA are soliciting comments on the information and proposed remedial actions discussed in this document. A glossary of terms is provided on each page for quick reference to the words and abbreviations in ***bold italics*** found throughout this document.

This Operable Unit D Proposed Plan is designed to do the following four things:

- Solicit public review and comment on the proposed cleanup alternatives.
- Identify cleanup alternatives considered for contaminated areas.
- Present the preferred cleanup remedies that will protect human health and the environment by controlling contaminant releases, reducing further movement of ***groundwater*** contamination, and protecting potential drinking water sources and aquatic resources in Ship Creek.
- Identify a proposed course of action for all Operable Unit D source areas.

This is the final Proposed Plan for Fort Richardson. Therefore, the focus on Operable Unit D includes consideration of any potential cumulative health or ecological risks that may become evident from the combination of exposure to source areas from all operable units. This Proposed Plan includes a brief history of the Operable Unit D source areas, the nature and extent of contamination, the potential risks associated with contaminants, and the reasons for conducting cleanup actions at the source areas where required. In addition, this Proposed Plan provides a status report of the ***Two-Party Agreemen***t, the status of the underground storage tank program, and closure of ***Resource Conservation and Recovery Act (RCRA)*** sites at Fort Richardson.

Alaska Department of Environmental Conservation (ADEC): *The state agency responsible for protecting public health and the environment within the state.*

U.S. Environmental Protection Agency (EPA): *The federal agency responsible for enforcing or overseeing the federal environmental laws.*

Groundwater: *Water found below the earth's surface that fills pores and other void spaces, creating a saturated zone.*

Two-Party Agreement: *Defines the process by which the Army agrees to investigate and cleanup petroleum-contaminated areas under Alaska laws and regulations.*

Resource Conservation and Recovery Act (RCRA): *A federal law that established a regulatory system to track hazardous and solid wastes from their generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous wastes. It also provides a framework for management of non-hazardous solid wastes. RCRA is designed to prevent the creation of new, uncontrolled hazardous waste sites.*

HOW YOU CAN PARTICIPATE

The public is encouraged to participate in the decision-making process regarding Operable Unit D. You can comment on the proposed actions presented in this plan from April 29 to May 28, 1999, in the following three ways:

1. Attend the Open House public meeting at 7 p.m. on May 13, 1999, at Russian Jack Chalet;
2. Leave a recorded telephone message at 1-888-343-9460 (toll free); or
3. Send written comments to the address at right before the public comment period ends May 28, 1999.

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This Proposed Plan fulfills the requirements of Section 117(a) of the ***Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)***, also known as Superfund, by providing a discussion about the remedial action plans for Operable Unit D. The Army, ADEC, and EPA have selected a preferred remedial alternative for Operable Unit D based on criteria found in the ***National Oil and Hazardous Substances Pollution Contingency Plan (NCP).***

Although this Proposed Plan identifies preferred remedial alternatives for Operable Unit D, the agencies will not make a final decision until the public comment period ends and all comments have been reviewed and considered. The 30-day public comment period is from April 29 through May 28, 1999. The public is encouraged to review and comment on all of the alternatives presented in this Proposed Plan. The three ways you can submit comments on the Proposed Plan are listed on page 1.

All public comments, whether provided at the public meeting, submitted in writing, or recorded on the toll-free telephone line during the comment period, will be considered equally by the Army, ADEC, and EPA when reaching a final decision for remedial action. In addition to this Proposed Plan, other documents can be found at either of the information repositories. See the list of related reports in the shaded box on page 30. Photocopies of these reports can be made at the information repositories, which are listed on page 31. The ***Administrative Record*** is available for the public to view at the Public Works Office, Building 724, on Quartermaster Road, Fort Richardson.

The Army, ADEC, and EPA will present their responses to all comments received during the comment period in a document called the ***Responsiveness Summary***. The decision on remedial action for Operable Unit D will be presented in a document called the ***Record of Decision (ROD).*** The Responsiveness Summary will be part of the ROD and will be available for review at the information repositories and in the Administrative Record. Depending on public comments, the actual cleanup actions selected may be the preferred alternative, a modification of the preferred alternative, a combination of alternatives, or a different alternative.

Site History and Background

Fort Richardson, established in 1940 as a military staging and supply center during World War II, originally occupied 162,000 acres north of Anchorage. In 1950, the fort was divided between the Army and the Air Force. The fort now occupies approximately 62,000 acres bounded to the west by Elmendorf Air Force Base, to the east by Chugach State Park, and to the north and south by the Municipality of Anchorage. Fort Richardson's current mission is to train and equip forces to deploy rapidly in support of combat operations and other operations worldwide, as directed; conduct operations in cold regions and mountainous terrain; serve as the land force component command for joint operations; and provide installation support for Alaska.

Fort Richardson was added to EPA's ***National Priorities List*** in June 1994. On December 5, 1994, the Army, ADEC, and EPA signed a ***Federal Facilities Agreement (FFA)*** that outlines the procedures and schedules required for a thorough investigation of suspected historical hazardous substance sources at Fort Richardson. The FFA ensures that

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): *A federal law established in 1980, modified in 1986, also known as Superfund. CERCLA established a nationwide process for cleaning up hazardous waste sites that potentially endanger public health and the environment.*

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): *The federal regulation that guides the Superfund program.*

Administrative Record: *A file that is maintained and contains all information used by the agencies to make decisions about site cleanup actions. The file is available for public review.*

Responsiveness Summary: *A summary of oral and/or written public comments received during a comment period and the responses to those comments. A responsiveness summary is an appendix to a Record of Decision.*

Record of Decision (ROD): *A document that explains which cleanup alternative(s) will be used at a site and why. The ROD is based on information gathered during the RI/FS and consideration of public comments.*

National Priorities List (NPL): *A list maintained by the EPA of the most serious uncontrolled or abandoned waste sites.*

Federal Facilities Agreement (FFA): *A legal document that details the involvement and interaction between the Army, EPA, and ADEC regarding cleanup activities at Fort Richardson.*

appropriate actions protect public health and the environment in accordance with state and federal laws. To facilitate an investigation of such a large installation, the FFA divided Fort Richardson's potential hazardous-substance source areas into four Operable Units (***OU***s): OUA, OUB, OUC, and OUD. The potential source areas were grouped into OUs based on the amount of existing information, the similarity of potential hazardous-substance contamination, and the level of effort required to complete a ***Remedial Investigation (RI)***. OUD is addressed in this Proposed Plan. Decisions for OUA and OUB are documented in the ROD published and signed in September 1997. The cleanup decisions for OUC are documented in the ROD published and signed in September 1998.

During an RI, information is gathered through field investigations to determine the nature and extent of contamination and the potential human health and ecological risks associated with that contamination. Following completion of the RI, a ***Feasibility Study (FS)*** is performed to evaluate various cleanup alternatives based on information collected during the RI. All cleanup alternatives developed during the FS are then reviewed by the Army, ADEC, and EPA and evaluated against nine criteria established by the NCP (listed in Table 9 on page 19 of this document). This Proposed Plan summarizes the cleanup options and methods presented in the FS report.

The Army also intends to clean up petroleum-contaminated sites at Fort Richardson under the terms of a Two-Party Agreement between the Army and the State of Alaska. This agreement, signed in 1994, defines the process by which the Army agrees to investigate and clean up petroleum-contaminated areas at Fort Richardson under Alaska laws and regulations. Three source areas, generally associated with underground storage tanks that have leaked or spilled petroleum products or chlorinated solvents, are proposed for evaluation. The source areas that are being evaluated under this Two-Party Agreement are further discussed on page 26.

Operable Unit (OU): *At a complex contaminated site, the site may be divided into areas, which are grouped together for ease of investigation and cleanup. These groups are frequently called operable units.*

Remedial Investigation (RI): *A Remedial Investigation gathers the data necessary to determine the type and extent of contamination at a site. It precedes and is related to the feasibility study.*

Feasibility Study (FS): *The Feasibility Study establishes the criteria for cleaning up a site and identifies and screens possible cleanup alternatives. The FS also analyzes the technologies and costs of the alternatives.*

SOURCE AREA EVALUATIONS

OUD consists of 12 source areas: Building 35-752 – High Frequency Transmitter Site; Building 45-590 – Auto Hobby Shop; Building 726 – Laundry Facility; Building 796 – Battery Shop; Stormwater Outfall to Ship Creek; Dust Palliative Locations (four separate areas); Landfill Fire Training Area; Grease Pits; Circle Road Drum Site; Building 700/718; Building 704; and Building 955. These source areas are shown on Figure 1.

Each source area was part of a screening process called a Preliminary Source Evaluation. This process allowed for preliminary information to be gathered and analyzed for each source area. Based on this information, the Army, ADEC, and EPA determined that no further action or investigation was warranted at 8 of the 12 source areas. Therefore four source areas were included in the RI. Table 1 shows the recommended disposition of all 12 source areas. Of the four source areas evaluated in the RI, three (Buildings 35-752, 796, and 45-590) were determined to require cleanup action under CERCLA. Detailed information about these three source areas requiring cleanup is stated in this Proposed Plan. The fourth source area, Building 726 – Laundry Facility, was evaluated in the RI; however upon completion of a conservative risk-based screening evaluation, it was recommended for no further action. Summary information about the other OUD source areas can be found on page 25 and detailed information can be found in the documents listed in the shaded box on page 30 of this document.

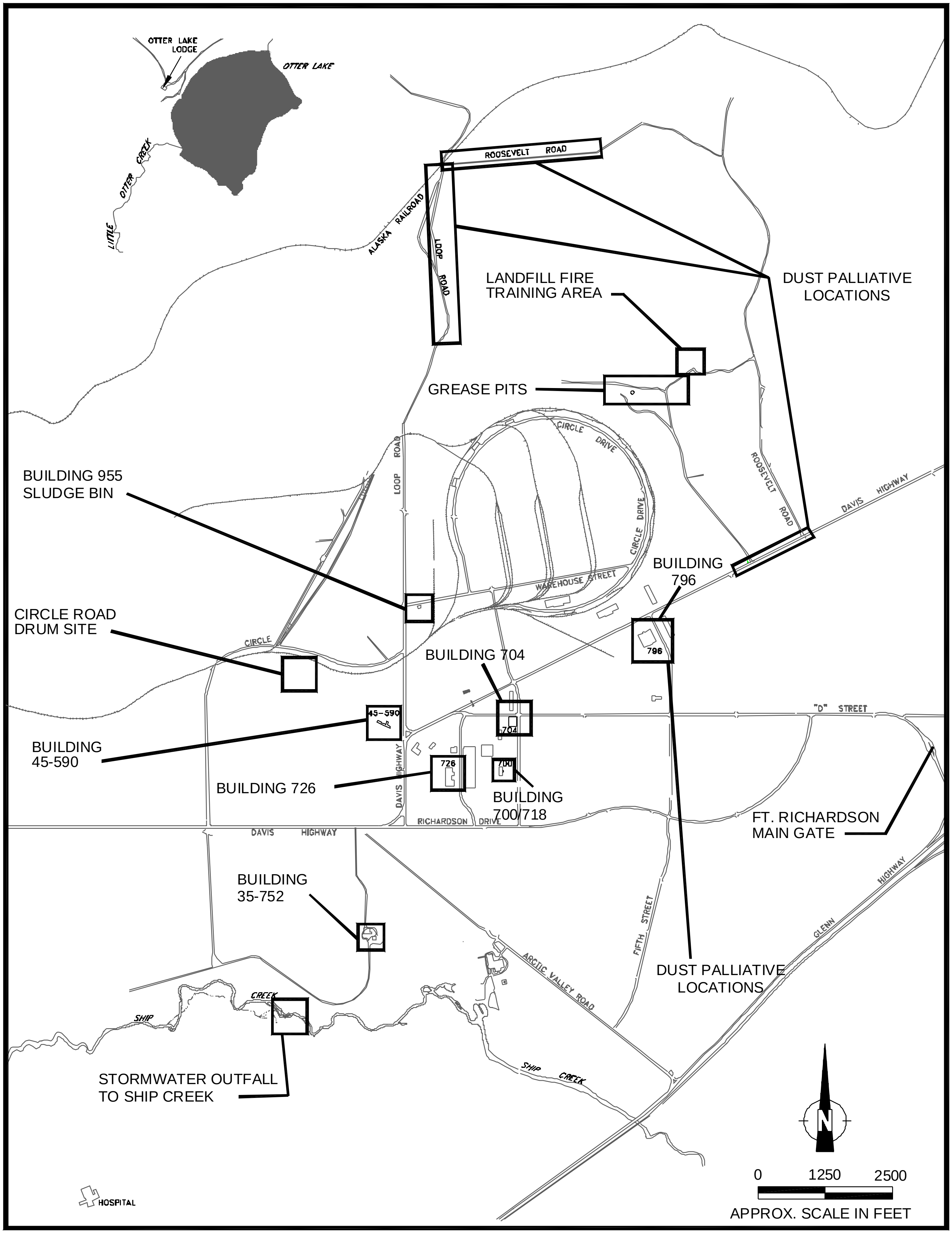


Figure 1. Fort Richardson Site Map with Original OUD Source Areas.

Table 1. OUD Source Areas.

Source Areas Requiring Further Action Under CERCLA

- Building 35-752 – High Frequency Transmitter Site
- Building 45-590 – Auto Hobby Shop
- Building 796 – Battery Shop

Source Areas Recommended for No Further Action Under CERCLA

- Stormwater Outfall to Ship Creek
- Dust Palliative Locations (four separate areas)
- Landfill Fire Training Area
- Grease Pits
- Circle Road Drum Site
- Building 955*
- Building 726 – Laundry Facility

Source Areas Referred to Two-Party Agreement

- Building 700/718
- Building 704
- Building 955†

* A removal of ***DDT***-contaminated soil occurred in 1998; however, confirmatory samples indicate that a second removal action at Building 955 is required prior to its status as a No Further Action CERCLA source area.

† Petroleum contamination in soil at Building 955 will be addressed under the Two-Party Agreement.

DDT (dichlorodiphenyltrichloroethane): *A toxic and persistent chlorinated insecticide once widely used to control mosquitoes in Alaska. This chemical has been banned from use in the United States.*

PCBs (polychlorinated biphenyls): *A group of toxic and persistent chlorinated organic chemicals formerly used primarily in the electrical and plastic industries. This group of chemicals has been banned from use in the United States.*

DESCRIPTION OF SOURCE AREAS

At the conclusion of the RI/FS and risk assessment process, three source areas in OUD were identified as requiring further action under CERCLA: Building 35-752, Building 796, and Building 45-590. For each source area, this Proposed Plan describes the nature and extent of contamination, identifies the cleanup alternatives, and identifies the preferred alternative.

BUILDING 35-752 – HIGH FREQUENCY TRANSMITTER SOURCE AREA

The Building 35-752 source area actually consists of three separate sites: the former underground storage tank area south of Building 35-752, the man-made cooling pond southwest of the building (including the portion of the stormwater drainage ditch that flows southwest from the man-made cooling pond to Ship Creek), and the former drum accumulation area east of Building 35-752. The source area covers approximately 2 acres (not including the ditch) and is shown on Figure 2.

Building 35-752 housed four generators used by the adjacent Transmitter Building 35-750 between 1953 and 1987. The four generators were fueled by diesel stored in seven 5,000-gallon underground storage tanks on the south side of Building 35-752. These seven underground storage tanks were removed in 1990. Soil from within the tank excavation was analyzed and found to be contaminated with petroleum hydrocarbons and ***polychlorinated biphenyls (PCBs)***. The removed soil was stockpiled off site. The excavation was backfilled with soil from another post area; however, this backfill soil was later analyzed and determined to also be contaminated with PCBs. A man-made cooling pond southwest of the building receives water used to cool the generators and equipment in Building 35-750. Water levels in the pond vary throughout the year. Since the removal of the generators in 1987, the building has been used for general storage, including short-term use as an emergency hazardous waste storage area. In 1989, the building was used as a temporary storage location for 125 bags, each weighing 2,000 pounds, of PCB-contaminated soil. The bags were removed in 1990. Dust on the floor of Building 35-752 contains levels of residual PCB contamination above ***risk-based concentrations***. To prevent exposure to the PCBs, the building will be sealed using plywood to cover doors and windows, and an 8-foot-tall security fence will be installed around the building. The south end of the east side of Building 35-752 was the location of an unlined drum storage area used in the 1960s and 1970s. The drums reportedly contained various fuel products and solvents. Surface soil in this drum accumulation area contains low levels of PCBs. In addition, a stockpile from another area on post containing approximately 1,500 cubic yards of PCB-contaminated soil is located near Building 35-752. The levels of PCBs in this soil are comparable to those present in on-site soil and sediment.

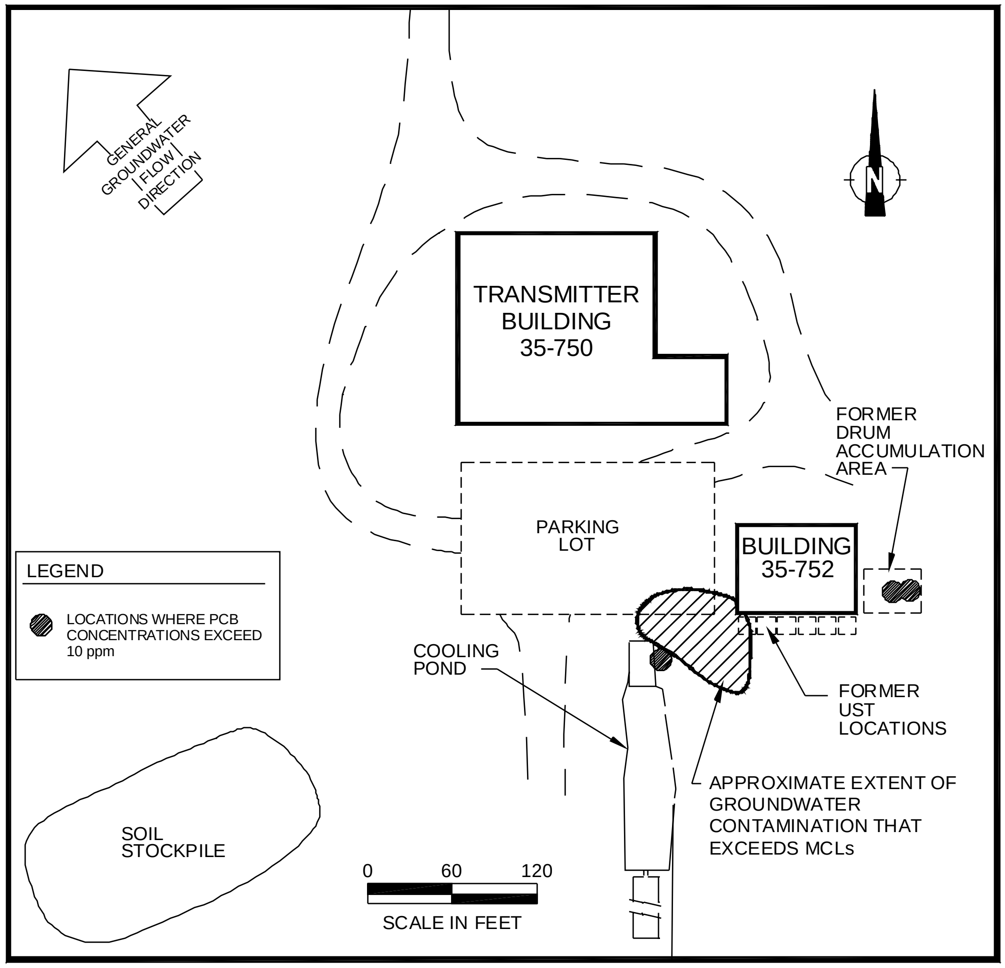


Figure 2. Estimated Extent of Groundwater Contamination that Exceeds MCLs and Areas of PCB Contamination at Building 35-752.

Risk-based concentration (RBC): *Concentration at which no cancer risk to human health is expected based on conservative exposure assumptions.*

Parts per million (ppm): *Unit commonly used to express concentrations of contamination (in soil: expressed as milligrams per kilogram-mg/Kg and in water: milligrams per liter-mg/L) and ppm is 1 in 1,000,000.*

Summary of Source Area Contamination at Building 35-752

Soil and Sediment

Contamination detected in surface and subsurface soil and cooling pond sediment at Building 35-752 consists of low levels of PCBs. The localized areas of PCB contamination (shown in Figure 2) exceed EPA CERCLA guidance for PCB concentrations in soil or sediment at industrial sites of 10 ***parts per million (ppm)***. Land use at this source area is expected to remain industrial; therefore, 10 ppm is proposed as the cleanup level for PCB in soil and sediment at this source area. Possible sources of contamination include: contaminated backfill used in association with the underground storage tank removal; cooling fluids used on site in conjunction with power generation and transformers; nearby road oiling; and storage of contaminated soil in Building 35-752. In addition, soil excavated from the site for a paving project has been stockpiled on site. The stockpiled soil contains low levels of PCB-contaminated soil. Its location is shown on Figure 2. Table 2 shows the contaminants of concern in soil at this source area, frequency of detection, and the cleanup level.

Table 2. Summary of Soil and Sediment Contamination at Building 35-752.

Chemical	Matrix / Media	Detection Range (ppm)	Detection Frequency	Cleanup Level* (ppm)
PCB	Surface Soil† 0-2 feet	0.03 - 16	22 / 26	10
PCB	Subsurface Soil 2-20 feet	0.07 - 27	14 / 47	10
PCB	Sediment	0.10 - 5	19 / 19	10
PCB	Stockpiled soil	0.37 - 78	30 / 30	10

Key:
PCB = Polychlorinated biphenyl; ppm = Parts per million.
* Based on industrial use.
† In addition to the results of samples collected for the Remedial Investigation, additional surface soil samples were collected in November 1998 to better define the extent of PCB contamination. These results are included.

Benzene: *A major industrial chemical made from coal and oil. In industry, benzene is used to make other chemicals, as well as some types of plastics, detergents and pesticides, and is a component of gasoline.*

Trichloroethene (TCE): *A man-made chemical. TCE is a very volatile compound. It is used as a solvent, mostly to remove grease from metal parts. It is also a component of other chemicals.*

Parts per billion (ppb): *Unit commonly used to express concentrations of contamination (water: expressed as micrograms per liter µg/L) and ppb is 1 in 1,000,000,000.*

Groundwater

The shallow groundwater beneath the source area is contaminated with ***benzene***, ***trichloroethene (TCE)***, and metals (primarily aluminum, iron, and manganese). The benzene and TCE contamination may be related to impacts from petroleum products or solvents used on site. The source of the metals contamination is unknown; however, possible explanations are rusting tanks, which have since been removed, or unfiltered samples. Table 3 shows the contaminants of concern in groundwater at this source area, frequency of detection, and the cleanup level.

Table 3. Summary of Groundwater Contamination at Building 35-752.

Chemical	Matrix / Media	Detection Range (ppb)	Detection Frequency	Cleanup Level* (ppb)
Benzene	GW	1.6 - 240	12 / 42	5
Trichloroethene	GW	0.20 - 11	29 / 42	5
Aluminum	GW	30 - 93,100	14 / 20	50
Iron	GW	20 - 116,700	19 / 20	300
Manganese	GW	2.0 - 4,580	18 / 20	50

Key:
GW = Groundwater; ***ppb = Parts per billion***.
* Federal maximum contaminant level (MCL).

Building 796 - Battery Shop

Building 796, a battery and vehicle and maintenance weapons repair shop, is at the southwest corner of Fifth Street and Davis Highway. Activities currently conducted at this facility include battery rework and other vehicle maintenance. Former activities at the battery shop included draining batteries into a floor drain that subsequently drained into a dry well on the east side of Building 796. Since the mid-1980s, batteries have not been drained, but have been disposed of through Fort Richardson's Defense Reutilization and Marketing Office. Building 796 has an oil/water separator connected to the post's sanitary sewer system. Building 796 was included in the RI/FS due to the past disposal practices for battery acid.

Maximum Contaminant Level (MCL): *The maximum level of certain contaminants permitted in public drinking water supplies. EPA set these levels under the Safe Drinking Water Act.*

Summary of Source Area Contamination at Building 796

Soil

Low levels of contamination were detected in soil at Building 796; however, the levels do not pose an unacceptable risk to human health or the environment based on residential exposure scenarios. Therefore, soil at Building 796 does not require remedial action.

Groundwater

Groundwater associated with Building 796 has been impacted and requires remedial action based on the depth and amount of water and the presence of benzo(a)pyrene and 1,2-dibromoethane. Levels of contamination were evaluated for potential future residential and industrial use of the source area. 1,2-Dibromoethane was detected above the maximum contaminant level in 1 of 12 samples. Benzo(a)pyrene was detected above the ***maximum contaminant level (MCL)*** in 2 of 8 samples. Currently, groundwater is not used as a source of drinking water at this source area. Figure 3 illustrates the estimated extent of groundwater contamination that exceeds federal MCLs at Building 796. It is important to note that the RI was unable to prove that waste management practices at the Battery Shop and the contamination in groundwater are related. Therefore, the source of groundwater contamination is currently unknown. Table 4 shows the contaminants of concern in groundwater at this source area, frequency of detection, and the cleanup level.

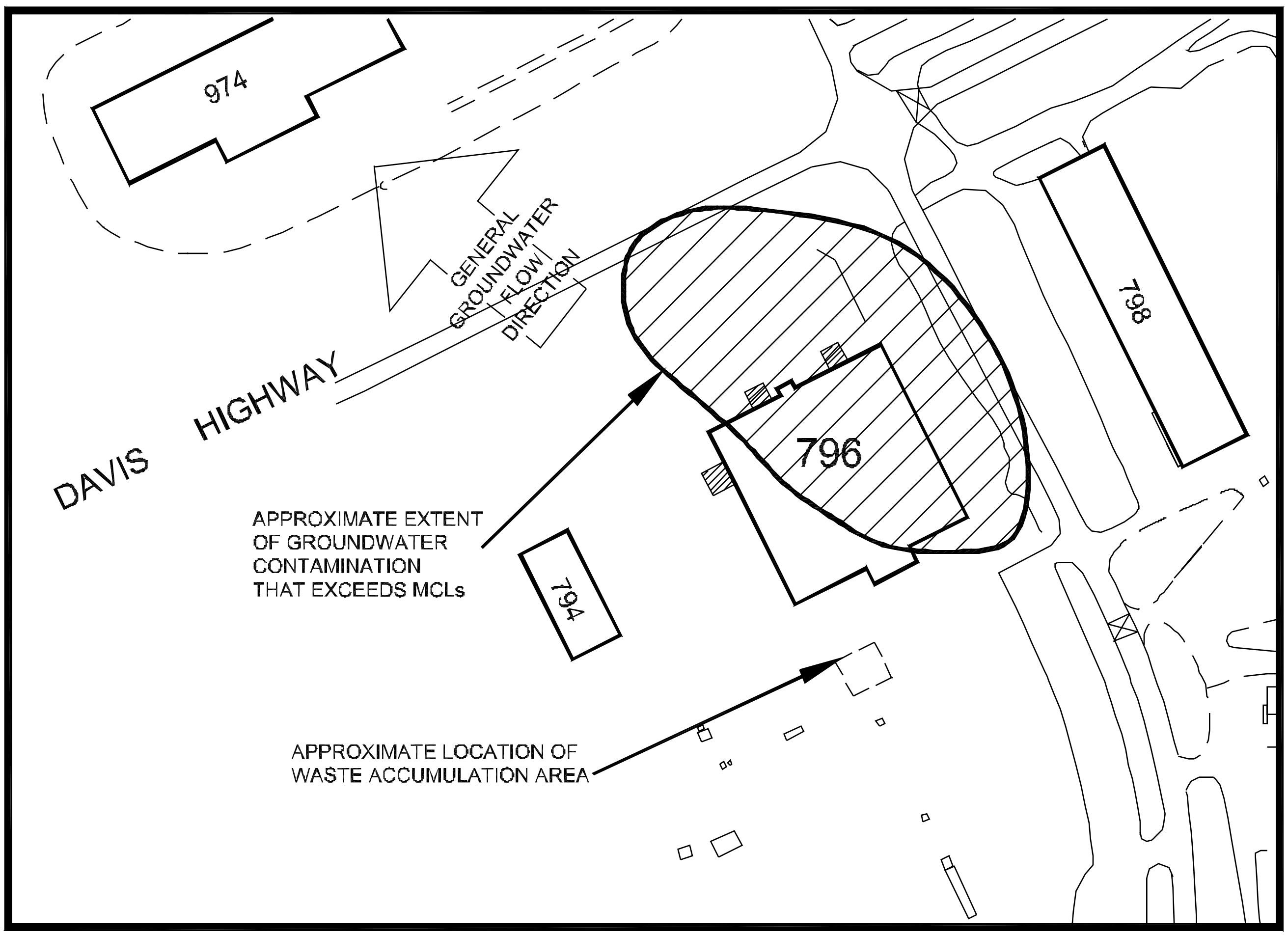


Figure 3. Estimated Extent of Groundwater Contamination that Exceeds MCLs at Building 796.

Table 4. Summary of Groundwater Contamination at Building 796.

Chemical	Matrix / Media	Detection Range (ppb)	Detection Frequency	Cleanup Level* (ppb)
1,2-Dibromoethane	GW	0.13	1 / 12	0.05
Benzo(a)pyrene	GW	0.50 - 1.0	2 / 8	0.2

Key:
GW = Groundwater; ppm = Parts per million.
* Federal maximum contaminant level (MCL).

Tetrachloroethene (PCE): *A chlorinated solvent used for dry cleaning and vapor degreasing.*

Building 45-590 - Auto Hobby Shop

Building 45-590 is located in the western portion of Fort Richardson near the corner of the Davis Highway and Loop Road. It was initially constructed in 1943 as an auto hobby shop. Between 1956 and 1972, the building was refurbished and annexes were added. In 1993, only one of the annexes was being used for auto maintenance. A waste oil underground storage tank was present on the south side of the building between the center and west annexes. Floor drains were installed in the west annex, with the drains discharging to an oil/water separator. Liquid from the oil/water separator drained to the sanitary sewer system. Oil from the unit drained to the waste oil underground storage tank, which has subsequently been removed.

A portion of the concrete apron outside of the west annex was used as an accumulation point for containers that were filled with wastes from auto maintenance activities. An aboveground tank, located at the east end of the west annex, was also used to store waste oil. According to facility personnel, there was no piping associated with this tank. Waste oil was carried to the tank by buckets and removed by a vacuum-pump truck. There was no secondary containment around the containers or tank. The building was demolished and removed during the summer of 1995.

Summary of Contamination at Building 45-590

Soil

Low levels of contamination were detected in soil at Building 45-590; however, the levels do not pose an unacceptable risk to human health based on residential exposure scenarios. Therefore, soil at Building 45-590 does not require remedial action.

Groundwater

Groundwater has been impacted and requires remedial action based on the presence of two chlorinated solvents: carbon tetrachloride and ***tetrachloroethene (PCE)***. Levels of contamination were evaluated based on potential future residential and industrial use of the source area including domestic use of groundwater. Currently, groundwater is not used as a source of drinking water. The source of the PCE in groundwater appears to be primarily related to PCE releases that have occurred at Building 726 and is unrelated to activities associated with Building 45-590. Extensive fieldwork conducted during the RI attempted to determine the source of the contamination, but was unsuccessful. Detailed information about this fieldwork can be found in the OUD RI report. Figure 4 illustrates the estimated extent of groundwater contamination that exceeds federal MCLs associated with Building 45-590. Table 5 shows the contaminants of concern in groundwater at this source area, frequency of detection, and the cleanup level.

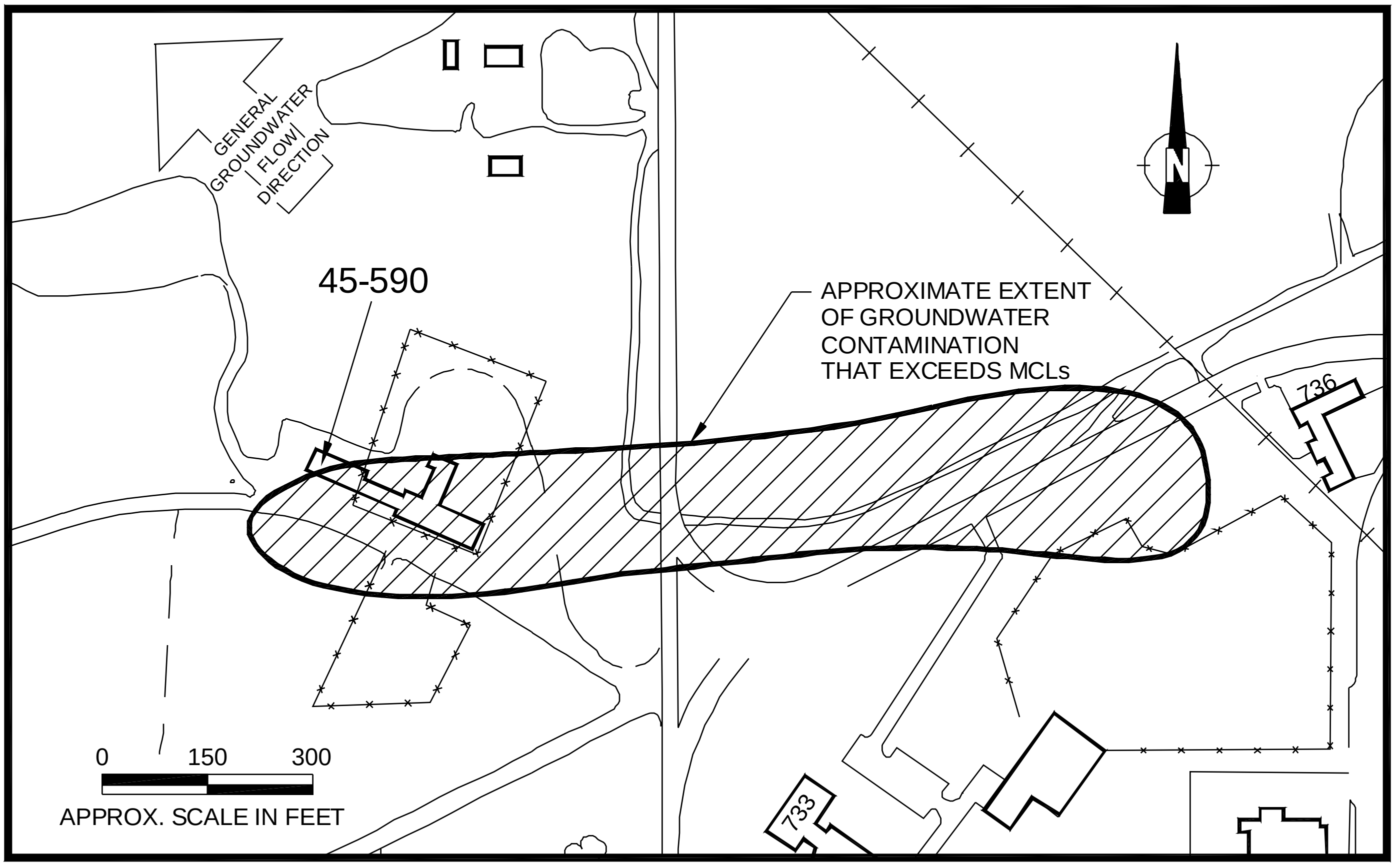


Figure 4. Estimated Extent of Groundwater Contamination that Exceeds MCLs at Building 45-590.

Table 5. Summary of Groundwater Contamination at Building 45-590.

Chemical	Matrix / Media	Detection Range (ppb)	Detection Frequency	Cleanup Level* (ppb)
Carbon tetrachloride	GW	0.10 - 0.80	7 / 21	5
PCE	GW	0.60 - 100	17 / 26	5

Key:
GW = Groundwater; ppm = Parts per million; PCE = Tetrachloroethene.
* Federal maximum contaminant level (MCL).

SUMMARY OF SOURCE AREA RISKS

Risk Assessment: *A study to determine risks posed by the site if no cleanup action was taken and determines cleanup levels to be protective of human health and the environment. There are two types of risk assessments: human health and ecological.*

A ***Risk Assessment*** for OUD was completed as part of the RI. Human Health and Ecological factors were considered in these assessments relative to the contamination detected at each source area. The following sections describe both the Human Health and Ecological Risk Assessments. In addition, because OUD is the final OU at Fort Richardson, potential cumulative health or ecological risks from the combination of exposures from all Fort Richardson OUs were evaluated in a Postwide Risk Assessment. A summary of the Postwide Risk Assessment is presented on page 25 of this Proposed Plan.

Human Health Risk Assessment

A baseline Human Health Risk Assessment was conducted to evaluate the estimated human health effects that could result if contamination at the OUD source areas is not cleaned up (no ***remedial action*** is performed). The detailed report discussing this evaluation is *Final RI/FS Operable Unit D, Fort Richardson, Alaska, Volume IIa Risk Assessment*. The OUD source area evaluations were based on the location and amount of contamination present, toxicity of each contaminant, current and potential future use of each source area, and exposure pathways by which people could be exposed to contaminants. The evaluation results were used to support decisions about the extent of remediation and to aid in the selection of remedial technologies.

The estimated risks from each pathway were added to determine total risk. Risks were evaluated for cancer-causing and noncancer-causing (toxic) effects. The NCP defines the ***acceptable risk range*** for CERCLA sites as excess lifetime cancer risks ranging from 1 in 10,000 ($1x10^{-4}$) to 1 in a million ($1x10^{-6}$). This risk level means that an individual could face an additional 1-in-10,000 to 1-in-1-million chance of developing cancer because of exposure to chemicals at OUD. Noncancer effects were evaluated by calculating the ratio between the estimated intake of a contaminant and the level at which no adverse health effects are expected to occur. This ratio is called a ***hazard index***. The estimated risks associated with OUD source areas are presented in Table 6 below and discussed in the following paragraphs.

Remedial Action: *The actual construction or implementation of the selected cleanup plan.*

Acceptable risk range: *Excess lifetime cancer risks ranging from 1 in 10,000 to 1 in 1 million. This means that an individual could face an additional 1-in-10,000 to 1-in-1-million chance of developing cancer because of exposure to chemicals at a site beyond those cancers expected from other causes.*

Hazard index (HI): *An estimate of the likelihood that exposures to a compound will cause health effects other than cancer. A hazard index above 1 indicates that some people may experience at least one negative health effect.*

Table 6. Summary of Source Area Estimated Risks, OUD.

Source Area	*Primary Contaminants of Concern*	*Potential Excess Lifetime Cancer Risk Without Cleanup*		*Potential Hazard Index Without Cleanup*	
		Industrial Use Only*	**Unrestricted Use†**	**Industrial Use Only***	**Unrestricted Use†**
Building 35-752 Soil	Polychlorinated biphenyls (PCBs).	3 in 1,000,000	2 in 100,000	0.2	0.5
Building 35-752 Groundwater	Benzene, Trichloroethene (TCE), Aluminum, Iron, Manganese.	0	3 in 100,000	0	7
Building 45-590 Groundwater	Carbon tetrachloride, Tetrachloroethene (PCE).	0	1 in 100,000	0	0.1
Building 796 Groundwater	Benzo(a)pyrene and 1,2-Dibromoethane.	0	4 in 10,000	0	1

*Current industrial worker has no exposure to groundwater.
†Unrestricted use includes residential exposure to groundwater.

Building 35-752

The estimated risks associated with the contaminants at Building 35-752 are presented in Table 6. The risks presented are conservative because they were calculated using exposure assumptions based on future residential land use, which is not likely at this source area. The expected current and future land use at Building 35-752 will continue to be industrial. It was also assumed that the groundwater would be used as a source of drinking water. The groundwater aquifer at Building 35-752 is between 10 to 20 feet; as a result, this aquifer is not suitable to be developed as a source of drinking water. Therefore, the residential values represented in Table 6 are especially protective of human health.

Institutional Control: *Legal and enforceable restrictions or agreements that enhance and complement the permanence of a cleanup remedy. They may also include physical barriers that prevent humans or animals from trespassing on the site, warning signs, zoning, and land use or deed restrictions. They remain in effect as long as protection is needed.*

Soil and Sediment

The conclusion of the baseline Human Health Risk Assessment for soil and sediment at Building 35-752 indicates that, although PCB levels exist in soil and in the cooling pond sediment, they do not pose an unacceptable risk to human health under current exposure conditions. However, levels present do exceed limits recently established by EPA for PCBs in soil and sediment and, therefore, cleanup is necessary. This source area will be cleaned up to industrial use standards instead of residential use standards, based on the Army's commitment to monitor the land use and control activity at this source area in order for use to remain industrial.

Groundwater

Groundwater cleanup at Building 35-752 will be performed for the overall protection of groundwater as a resource in accordance with the NCP.

The conclusion of the baseline Human Health Risk Assessment for Building 35-752 determined that there is currently no risk associated with groundwater because there is currently no exposure to groundwater. In addition, ***institutional controls*** will prohibit access to the groundwater as a source of drinking water; and the land use at this source area and neighboring source areas will remain industrial for the foreseeable future. However, concentrations of benzene, TCE, aluminum, iron, and manganese were detected at concentrations above federal and state drinking water standards in groundwater at depths of approximately 10 to 20 feet below ground surface that may pose a risk to future residents if groundwater is used for domestic purposes.

Building 796

The estimated risks associated with the contaminants at Building 796 are presented in Table 6. The risks presented are conservative because they were calculated based on future residential land use, which is not likely at this source area. The expected current and future land use at Building 796 will continue to be industrial. The risks were also based on the assumption that the groundwater would be used as a source of drinking water; however, the groundwater aquifer is not a source of drinking water. Therefore, the residential values represented in Table 6 are especially protective of human health.

Soil

Soil does not require cleanup at Building 796 because no contamination at this source area posed unacceptable risk to human health or the environment.

Groundwater

Groundwater cleanup at Building 796 will be performed for the overall protection of groundwater as a resource in accordance with the NCP.

The conclusion of the baseline Human Health Risk Assessment for Building 796 determined that there is currently no risk associated with groundwater because there is currently no exposure to groundwater. In addition, institutional controls will prohibit access to the groundwater as a source of drinking water; and the land use at this source area and neighboring source areas will remain industrial for the foreseeable future. However, concentrations of benzo(a)pyrene and 1,2-dibromoethane were detected at concentrations above federal and state drinking water standards in groundwater at depths of approximately 100 feet below ground surface that may pose a risk to future residents if groundwater was used for domestic purposes.

Building 45-590

The estimated risks associated with the contaminants at Building 45-590 are presented in Table 6. The risks presented are conservative because they were calculated based on future residential land use, which is not likely at this source area. The expected current and future land use at Building 45-590 will continue to be industrial. The risks were also based on the assumption that the groundwater would be used as a source of drinking water; however, the groundwater aquifer is not currently a source of drinking water. Therefore, the residential values represented in Table 6 are especially protective of human health.

Soil
Soil does not require cleanup at Building 45-590 because no contamination at this source area posed unacceptable risk to human health or the environment.

Groundwater
Groundwater cleanup at Building 45-590 will be performed for the overall protection of groundwater as a resource in accordance with the NCP.

The conclusion of the baseline Human Health Risk Assessment for Building 45-590 determined that there is currently no risk associated with groundwater because there is currently no exposure to groundwater. In addition, institutional controls will prohibit access to the groundwater as a source of drinking water; and the land use at this source area and neighboring source areas will remain industrial for the foreseeable future. However, concentrations of carbon tetrachloride and PCE were detected at concentrations above federal and state drinking water standards in groundwater at depths of approximately 100 feet below ground surface that may pose a risk to future residents if groundwater was used for domestic purposes.

Ecological Risk Assessment

The Ecological Risk Assessment addresses the current and future impacts and the potential risks posed by source-related contaminants to the plants and animals of OUD in the absence of remedial action. Unlike the Human Health Risk Assessment, the Ecological Risk Assessment focuses on the effects to populations or communities, not individuals. If potential risks to individuals of a species are identified during the screening-phase of the Ecological Risk Assessment, they are evaluated within a larger context to determine their significance in the ecological risk characterization.

The ecological risk characterization required evaluation of surface soil, sediment, and surface water at Building 35-752. The other OUD source areas did not require an ecological risk evaluation because potential risks were screened out during the initial stages of the Ecological Risk Assessment. Ecological receptors included in the evaluation consisted of aquatic biota, mallard duck, red fox, moose, bald eagle, shrew, vole, and the American robin. These receptors represent different levels in the food chain, habitats, and sizes of home range.

The primary ecological concern consists of potential impacts to Ship Creek from migration of PCBs. This is because PCBs tend to bioaccumulate, or concentrate, up the food chain, which may result in much higher concentrations in tissues of upper-level predators. These levels are generally greater than PCBs found in soil or sediment. PCBs were detected in soil and sediment near Building 35-752, and source area characterization data indicated that PCBs may be migrating through a drainage ditch that connects the man-made cooling pond to Ship Creek. Though the Postwide Ecological Risk Assessment (described on page 25) confirmed the presence of PCBs in the drainage ditch, the associated ecological risk was determined to be very low. Cleanup activities proposed in this plan address this PCB contamination.

PURPOSE AND SCOPE OF REMEDIAL ACTION

Remedial action objective: *A specific requirement that must be met by the cleanup remedy.*

The OUD investigation identified soil and groundwater contamination requiring remedial action. The need for remedial action was based on regulatory requirements identified by the Army, EPA and ADEC, and not necessarily the outcome of the OUD Human Health or Ecological Risk Assessments. Contaminants that presented an elevated risk based on a hypothetical conservative residential exposure scenario were identified as contaminants of concern at each source area. Those contaminants of concern that were detected in groundwater at levels that exceed state and federal drinking water standards (i.e., MCLs) were determined to require remedial action. The ***remedial action objectives*** for the three source areas covered in this Proposed Plan are to:

- Restore groundwater at Buildings 35-752, 45-590, and 796 to drinking water quality for protection of human health.
- Prevent further migration of sorbed contaminants (primarily PCBs and chlorinated pesticides) to Ship Creek from the cooling pond sediment and surface soil at Building 35-752.
- Minimize the potential off-site migration of contaminated groundwater (primarily benzene) from Building 35-752.
- Reduce risk associated with PCB-contaminated soil and sediment at Building 35-752 consistent with industrial land use.

SUMMARY OF ALTERNATIVES

Many technologies were considered for use in cleaning up the soil and groundwater at the three OUD source areas. The most favorable options, referred to as alternatives, were evaluated based on their effectiveness, implementability and relative cost, and are included in this Proposed Plan. Additional alternatives may have been evaluated in the OUD FS report, but were screened out as not favorable. The proposed alternatives and the technologies presented in this Proposed Plan are discussed below. For additional details about these alternatives, see the OUD FS report at the information repository.

Soil & Sediment Contamination at Building 35-752

The proposed alternatives and technologies discussed below were chosen to address the soil contamination at Building 35-752 and are listed in Table 7. PCB-contaminated dust inside Building 35-752 will be addressed by sealing the building. With the exception of the No Action Alternative, all alternatives will include:

- Sealing windows and doors with plywood and installing an 8-foot-tall security fence around Building 35-752,
- Eliminating the cooling water discharge from Building 35-750 into the man-made cooling pond near Building 35-752, and
- Filling the man-made cooling pond with clean soil following removal of contaminated sediment.

The Army, EPA, and ADEC believe it is important for these three actions to occur regardless of the alternative chosen because they substantially reduce risk. Sealing Building 35-752 eliminates human exposure to PCBs inside the building. The activities addressing the cooling pond will eliminate further migration of PCB-contaminated sediment and potential exposure to ecological receptors.

Table 7. Summary of Alternatives Considered for Soil at Building 35-752.	
1.	No Action.
2.	Institutional Controls with Natural Attenuation.
3.	Phytoremediation.
4.	Slurry-Phase Bioremediation.
5.	In-Situ Thermal Desorption.
6.	Excavation and Off-Site Disposal.

Present-worth cost: *The total project cost expressed in 1998 U.S. dollars.*

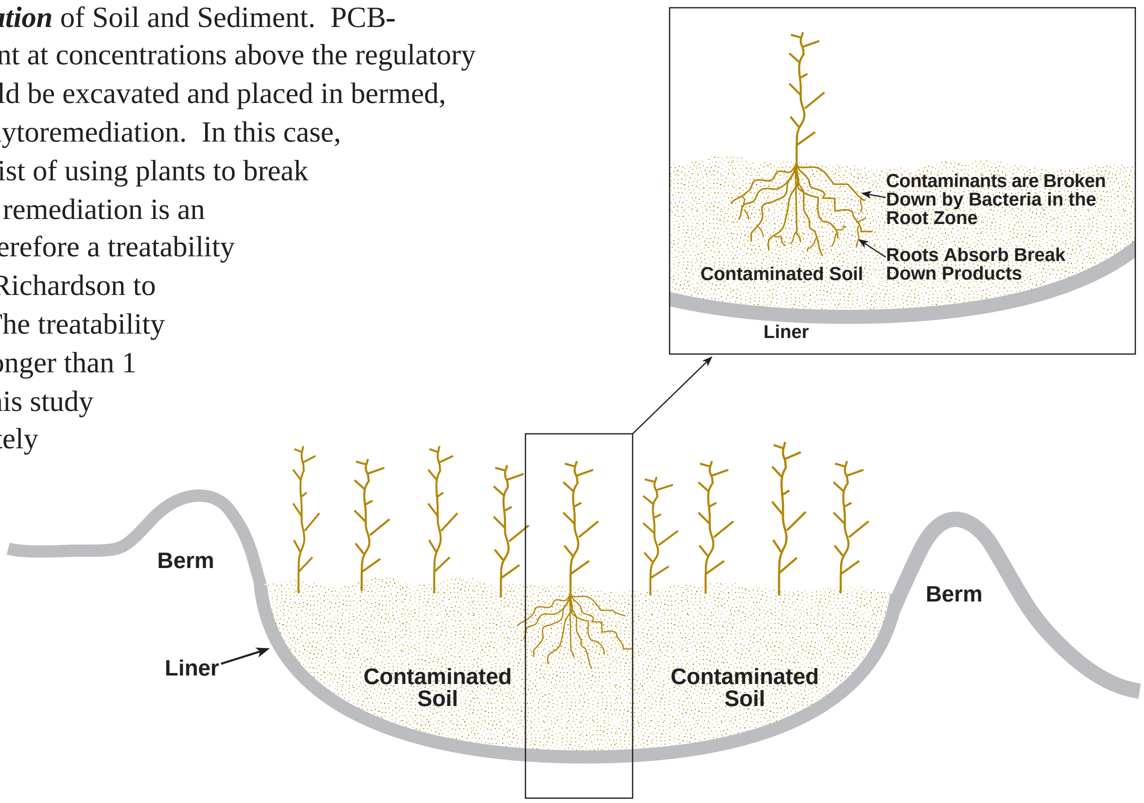
Phytoremediation: *The use of plants to remove contamination from soils.*

Alternative 1: No Action. CERCLA requires evaluation of a "no action" alternative to reflect current conditions without any cleanup effort. This alternative is used for comparison to other alternatives and does not include any type of monitoring or institutional controls. There are no costs associated with this alternative.

Alternative 2: **Institutional Controls with Natural Attenuation**. Institutional controls for Building 35-752 would include land use and source area access restrictions. The source area would be restricted to industrial use only. Fences and signs would be located around the source area to discourage trespassers and to inform the public of the contamination. These institutional controls would be used to decrease or minimize potential exposure to contaminants.

Natural attenuation or breakdown of some PCB contamination could occur over a very long time from natural biological and chemical processes. However, there is no conclusive evidence that natural attenuation occurs at a rate fast enough to be protective of human health and the environment. An annual sampling program would be put in place to monitor the contaminant levels over time to ensure breakdown is occurring. The estimated ***present-worth cost*** of this alternative is $406,960, which includes monitoring for 20 years.

Alternative 3: ***Phytoremediation*** of Soil and Sediment. PCB-contaminated soil and sediment at concentrations above the regulatory cleanup level of 10 ppm would be excavated and placed in bermed, lined cells for treatment by phytoremediation. In this case, phytoremediation would consist of using plants to break down the PCBs. This type of remediation is an innovative technology, and therefore a treatability study will take place at Fort Richardson to determine its effectiveness. The treatability study is expected to take no longer than 1 year. Costs associated with this study are expected to be approximately $150,000.



Phytoremediation

Operation and maintenance: *Activities conducted at a site to ensure the remedy and any monitoring systems are operating properly.*

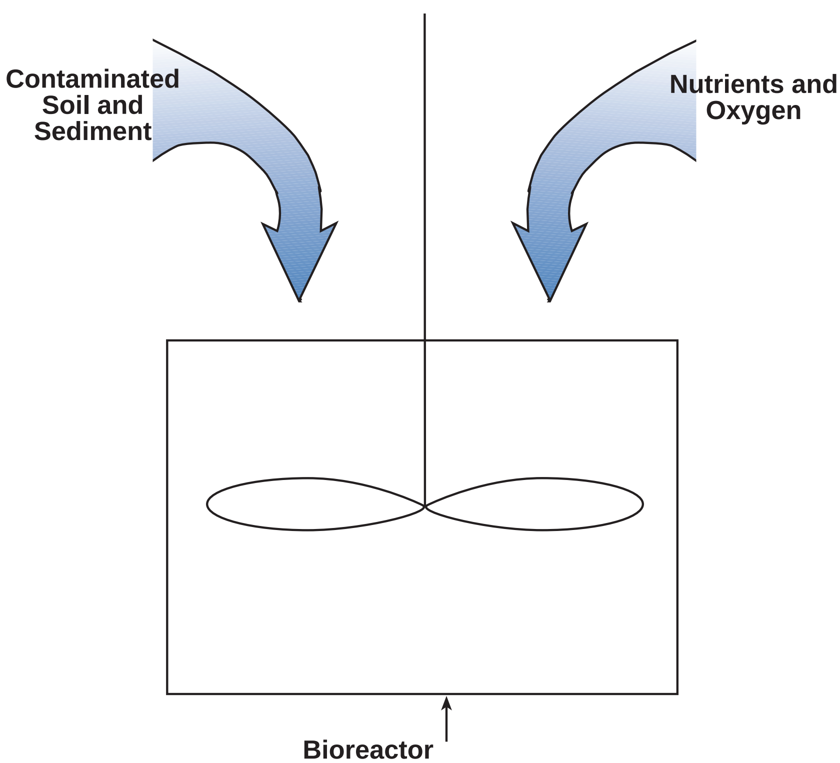
Bioremediation: *A cleanup technology that relies on the action of biological processes to break down contamination into non-hazardous components, such as carbon dioxide and water.*

Operation and maintenance of this alternative involves watering and general care of the plants and maintaining the integrity of the fence and liners while the remediation process is occurring. Excess water from snowmelt and rain may need to be pumped out of the bermed, lined cells to prevent runoff and migration of soil. Water that is pumped out of the cells would be stored on site and used later to water the cells during drier summer months. Other costs will consist of periodic sampling to monitor the effectiveness of the technology. Following successful treatability study results, full-scale phytoremediation will be implemented under Alternative 3. Cleanup goals are expected to be reached in two field seasons. The estimated present-worth cost for the full-scale operation of this alternative is $371,525, following the $150,000 treatability study.

Alternative 4: Slurry-Phase *Bioremediation* of Soil and Sediment. In this alternative, the PCB-contaminated soil and sediment that exceed the cleanup level of 10 ppm would be excavated as described in Alternative 3. Treatment of the contaminated material would be through the use of slurry-phase bioreactors. Slurry-phase biological treatment involves the controlled treatment of excavated soil in a bioreactor. The excavated soil is first processed to physically separate stones and rubble. The soil is then mixed with water to a predetermined concentration dependent upon the concentration of the contaminants, the rate of biodegradation, and the physical nature of the soil. Some processes prewash the soil to concentrate the contaminants. Clean sand may then be discharged, leaving only contaminated fine soils and washwater for biotreatment.

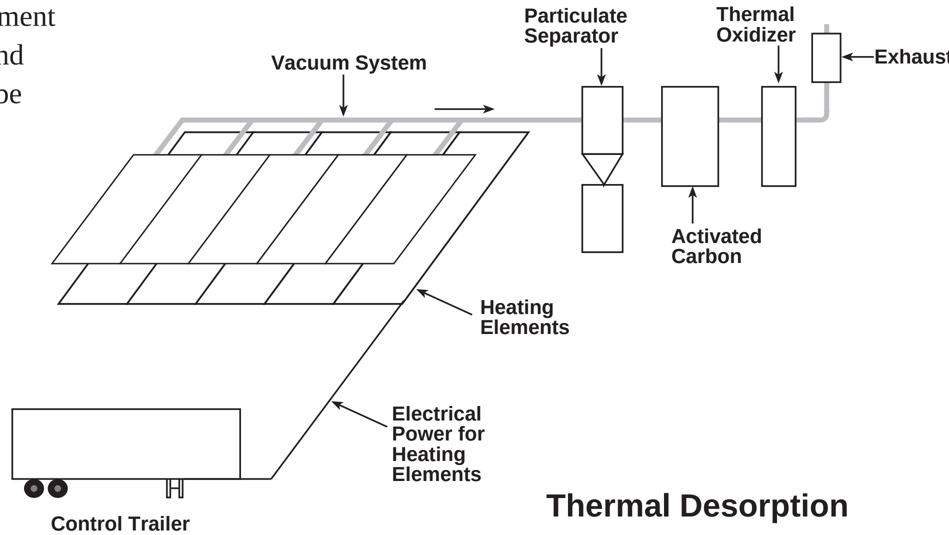
The solids are maintained in suspension in a reactor vessel and mixed with nutrients and oxygen. If necessary, an acid or base may be added to control pH. Microorganisms also may be added. When biodegradation of the contaminants is complete, the soil slurry is dewatered and disposed of at a permitted facility.

Under Alternative 4, cleanup goals are expected to be met after one field season of operating time. Costs may be attributed to physical maintenance of the reactors and monitoring remedial effectiveness with sample collection and associated laboratory analysis. The present-worth cost for this alternative is $421,117.



Slurry-Phase Bioremediation

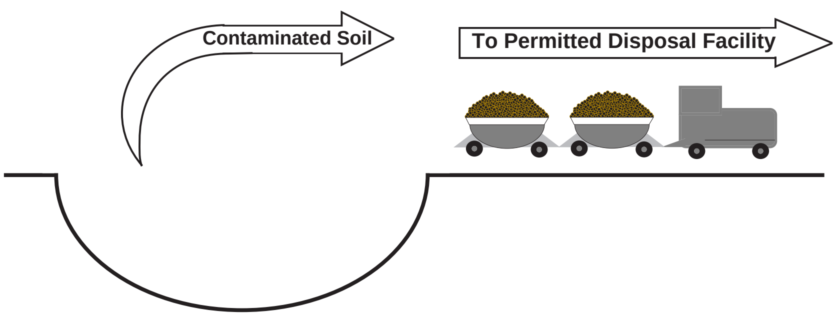
Alternative 5: Thermal Desorption for Treatment of Soil and Sediment. In this alternative, soil and sediment that exceeds the cleanup level would be excavated and combined with the existing stockpile and treated with thermal desorption. Contaminants are vaporized by heating the soil. Contaminated vapors are then drawn out of the soil by a vacuum system. Most of the contaminants are destroyed in the extremely hot soil (1,472ºF to 1,832ºF) near the heat source. Remaining vapors are removed in a trailer-mounted vapor treatment system, emitting only carbon dioxide and water vapor into the atmosphere.



Thermal Desorption

Under Alternative 5, cleanup goals are expected to be met after 4 to 5 months of operating time. The present-worth cost for this alternative is $888,170, which includes annual monitoring for 5 years.

Alternative 6: Excavation and Off-Site Disposal. Alternative 6 involves the excavation of contaminated soil and off-site disposal. The excavation would be backfilled with clean soil. The excavated soil would then be transported to a permitted facility in the Lower 48 for disposal. There are no landfills permitted to accept PCB-contaminated soil in Alaska. Excavation and disposal is expected to be completed in one field season. The estimated present-worth cost to implement Alternative 6 is $3,638,407.



Excavation and Off-Site Disposal

GROUNDWATER CONTAMINATION - BUILDINGS 35-752, 796, & 45-590

The proposed alternatives and technologies discussed in the following paragraphs were chosen for cleanup of contaminated groundwater at Buildings 35-752, 796 and 45-590, and are listed in Table 8 below.

Table 8. Summary of Alternatives Considered for Groundwater at Buildings 35-752, 796, and 45-590.

1. No Action.
2. Institutional Controls with Monitored Natural Attenuation.
3. Extraction and Treatment by Carbon Adsorption.

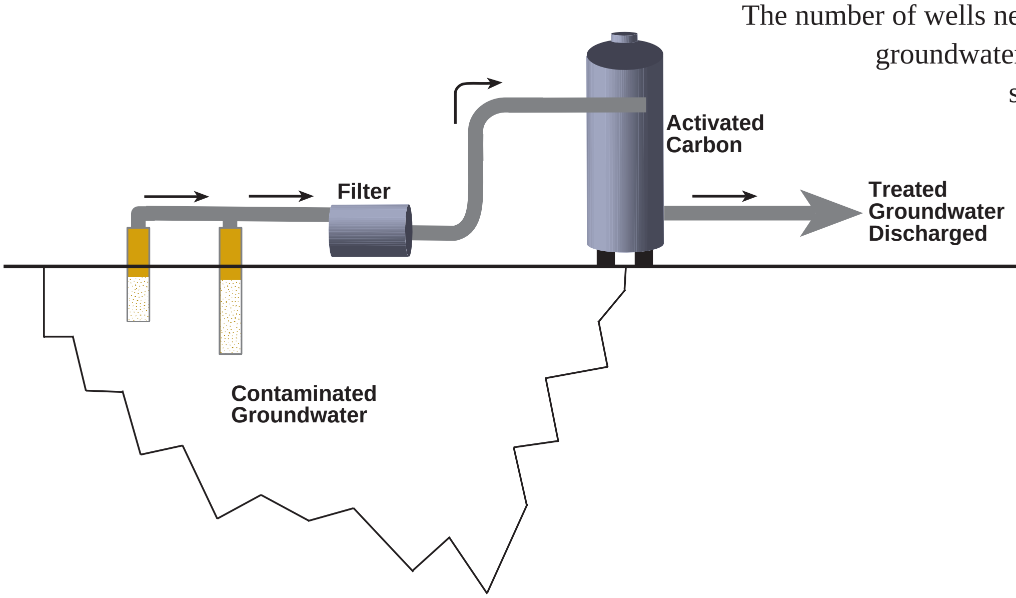
Alternative 1: No Action. CERCLA requires evaluation of a “no action” alternative to reflect current conditions without any cleanup effort. Under this alternative, contaminated groundwater would be left in its present condition to recover over time through natural processes, such as chemical and biological breakdown of contaminants. No institutional controls or groundwater monitoring would be implemented to minimize exposure to contamination under this alternative. In addition, no action would be taken to remove potential sources of contamination. There are no costs associated with this alternative.

Alternative 2: Institutional Controls with Monitored Natural Attenuation. Institutional controls for this alternative focus on restrictive covenants, easements, deed restrictions, or other appropriate measures for restricting installation of drinking water wells or other groundwater use at the source area. These restrictions would remain in place until cleanup goals were attained.

Natural attenuation or breakdown of contaminants would occur over time because of biological and chemical processes. An estimated timeframe to attain cleanup goals will be determined by modeling groundwater during remedial design of this alternative. Periodic monitoring would be required until cleanup levels are met. For costing purposes, monitoring for 20 years has been estimated. While monitored natural attenuation may take more or less than 20 years, it is anticipated that it would require more time for remediation than Alternative 3 (described below). The estimated present-worth cost of this alternative for Building 35-752 is $195,392; for Building 796 the cost is $471,569; and for Building 45-590 the cost is also $471,569.

Alternative 3: Extraction and Treatment by Carbon Adsorption. This alternative involves extracting groundwater and treating it using carbon adsorption techniques until cleanup goals are achieved. Groundwater is pumped through a series of canisters or columns containing activated carbon to which dissolved organic contaminants adsorb. Periodic replacement or regeneration of the carbon is required. The treated groundwater would then be discharged to the sanitary sewer, on-site storm sewer, or reintroduced on site through injection wells or an infiltration basin. The exact location where treated groundwater will be discharged will be determined during remedial action. The number of wells needed to extract contaminated groundwater also will be determined as the cleanup system is designed.

Under Alternative 3, the treatment and monitoring of the source area is expected to continue for 20 years or until cleanup goals have been achieved. The present-worth cost for Building 35-752 is estimated to be $10,043,394; for Building 796 the cost is $12,463,907; and for Building 45-590 the cost is also $12,463,907.



Extraction and Treatment by Carbon Adsorption

EVALUATION OF ALTERNATIVES

The preferred alternatives for cleanup of soil and groundwater contamination were selected on the basis of the nine remedial alternative evaluation criteria found in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nine criteria are divided into three categories: threshold, balancing, and modifying criteria. To be eligible for selection or further consideration, an alternative must meet the two threshold criteria: overall protection of human health and the environment and compliance with ***applicable or relevant and appropriate requirements (ARARs).*** The next five criteria are "balancing criteria" and are used to weigh trade-offs among alternatives. The final two criteria, "modifying criteria," measure acceptance of the cleanup alternatives by the state and the community. These nine criteria are presented and explained in further detail in Table 9.

Applicable or relevant and appropriate requirements (ARARs): *State and federal laws and regulations that need to be met or considered in development and implementation of cleanup alternatives at a site. These include cleanup standards, standards of control, and other substantive environmental protection requirements, factors, or limitations under state and federal law.*

Public comment is requested to evaluate community acceptance of cleanup alternatives. Public input could result in the modification of cleanup alternatives. EPA and ADEC have been involved with the development of the cleanup alternatives presented in this Proposed Plan, and their concurrence will be demonstrated by signing the ROD.

Table 9. Criteria for Evaluation of Alternatives.

Threshold Criteria: Must be met by all alternatives.

1. Overall protection of human health and the environment. How well does the alternative protect human health and the environment, both during and after construction?
2. Compliance with requirements. Does the alternative meet all applicable or relevant and appropriate state and federal laws?

Balancing Criteria: Used to compare alternatives.

3. Long-term effectiveness and permanence. How well does the alternative protect human health and the environment after completion of cleanup? What, if any, risks will remain at the site?
4. Reduction of toxicity, mobility, and volume through treatment. Does the alternative effectively treat the contamination to significantly reduce the toxicity, mobility, and volume of the hazardous substances?
5. Short-term effectiveness. Are there potential adverse effects to either human health or the environment during construction or implementation of the alternative?
6. Implementability. Is the alternative both technically and administratively feasible? Has the technology been used successfully at similar areas?
7. Cost. What are the relative costs of the alternative?

Modifying Criteria: Evaluated as a result of public comments.

8. State acceptance. What are the state's comments or concerns about the alternatives considered and about the preferred alternative? Does the state support or oppose the preferred alternative?
9. Community acceptance. What are the community's comments or concerns about the alternatives considered and the preferred alternative? Does the community generally support or oppose the preferred alternative?

Soil & Sediment Contamination, Building 35-752

Overall Protection of Human Health and the Environment
Alternatives 2, 3, 4, 5, and 6 meet this threshold criteria, which requires that any cleanup remedy considered protects human health and the environment. The primary difference between these alternatives, with respect to this criteria, is the length of time required to reach cleanup goals. Alternative 6 would be completed earliest because the contaminated soil and sediments would be removed from the source area and treated and disposed of at a permitted facility out of state. Alternatives 4 and 5 would take longer to complete than Alternative 6 because contaminated soil and sediment would remain on site for treatment. Alternative 3 would take longer than Alternatives 4, 5, and 6 because it implements an innovative but unproven technology that may take several field seasons to complete. Alternative 2 relies on natural processes to slowly decrease contaminant concentrations in the soil and sediment, which is expected to take longer than all other proposed alternatives. Alternative 1 does not meet this threshold criteria because contaminants would remain in place with no method of determining a decrease in concentration.

Compliance with Applicable or Relevant and Appropriate Requirements
Potential ARARs for OUD include State of Alaska Solid Waste Management Regulations, State of Alaska Hazardous Waste Regulations, and the Resource Conservation and Recovery Act (federal hazardous waste regulations).

Alternatives 3, 4, 5, and 6 are expected to meet all state and federal ARARs. These alternatives include active soil treatment and are expected to achieve state and federal standards more rapidly than Alternatives 1 and 2.

Alternatives 1 and 2 rely on natural processes that may slowly decrease soil contamination. It should be noted, however, that under Alternative 1 no monitoring would be conducted to determine compliance with ARARs. For these reasons, Alternatives 1 and 2 do not meet ARARs and, therefore, will not be discussed further in this evaluation.

Long-Term Effectiveness and Permanence
Alternatives 3, 4, 5, and 6 would involve permanent and active reduction of soil and sediment contamination and would achieve long-term effectiveness. Of these alternatives, Alternatives 3 and 4 rank lower than Alternatives 5 and 6 because they involve the use of an innovative yet unproven technology.

Reduction of Toxicity, Mobility, and Volume Through Treatment
Alternatives 3, 4, 5, and 6 would involve active treatment technologies that reduce the toxicity and mobility of soil and sediment contaminated with PCBs. Alternative 5 differs from the other alternatives in that the proposed remediation would take place in situ or in place without excavation. Alternatives 3, 4, and 6 involve excavation of the soil and sediment followed by treatment. Alternative 6 provides the quickest reduction of toxicity in that once the soil is excavated, it is removed from the source area; therefore, no remaining soil or sediment with PCB concentrations above the regulatory cleanup level would exist at the source area.

Short-Term Effectiveness
Alternatives 3, 4, and 6 would pose some short-term potential risks to workers during soil and sediment excavation at the source area. Additional potential risks are associated with Alternatives 3 and 4 because workers operating the treatment system after excavation may be in contact with the contaminated soil and sediment. These potential risks could be minimized through engineering and institutional controls. Alternative 5 does not involve soil or sediment excavation and, therefore, would involve less dust and truck traffic than those alternatives that involve excavation.

Implementability
Alternatives 4, 5, and 6 would use readily available technologies and would be feasible to construct or implement. Alternative 3 involves the use of an innovative yet unproven technology, but is easily implemented. A treatability study of this technology (phytoremediation) would be conducted as a test before full-scale construction and implementation.

Costs
Costs for each alternative are calculated in terms of present-worth cost. Capital costs are those required to carry out the remediation. They include the costs of design, construction, and treatment. Operating and maintenance costs cover the labor and maintenance required to ensure remediation remains effective.

The estimated costs for each alternative evaluated for Building 35-752 are in Table 10 and are based on the information available at the time the alternatives were developed. The cost for Alternative 3 includes estimated costs to conduct a treatability study.

Long-Term Monitoring: *Collection of groundwater samples over a period of time, usually 20 to 30 years, to measure the performance of cleanup systems or until remedial action objectives are met.*

State Acceptance

ADEC has been involved with the development of remedial alternatives for OUD and agrees with the preferred alternative for Building 35-752.

Community Acceptance

Selection of the preferred alternative is preliminary pending community input and acceptance. Final selection of the cleanup alternatives will consider community acceptance as indicated by comments received during the public comment period.

Summary

The preferred alternative for PCB-contaminated soil at Building 35-752 is Alternative 3 – Phytoremediation. Phytoremediation is cost-effective, and the treatment of soil is expected to remove the contamination and provide long-term effectiveness. In this case, ***long-term monitoring*** would not be required because the contamination would be remediated. However, if phytoremediation proves through treatability studies to be ineffective, thermal desorption (Alternative 5) will be implemented. Following treatment, institutional controls will ensure treated soils remain at the source area. Table 10 shows a comparison of all alternatives evaluated for soil and sediment remediation at Building 35-752.

Table 10. Comparison of Alternatives for Building 35-752 Soil Contamination. The preferred alternative is shaded.

	Alternatives					
	No Action (Alternative 1)	Institutional Controls With Natural Attenuation (Alternative 2)	Phytoremediation (Alternative 3) Including Treatability Study	Slurry-Phase Bioremediation (Alternative 4)	Thermal Desorption (Alternative 5)	Excavation & Off-Site Disposal (Alternative 6)
Threshold Criteria*						
Overall Protection	N	Y	Y	Y	Y	Y
Compliance with ARARs	N	N	Y	Y	Y	Y
Balancing Criteria†						
Long-term effectiveness			◐	◐	◐	●
Reduction of toxicity, mobility, and volume			●	●	●	○
Short-term effectiveness			◐	◐	◐	○
Implementability			◐	◐	◐	●
Costs‡						
Capital Costs§	$0	$115,158	$281,557	$1,136,287	$888,170	$3,638,407
Operation & Maintenance	0	291,801	89,968	61,822	0	0
Treatability Study	0	0	150,000	0	0	0
Total Cost	$0	$406,960	$521,525	$1,198,109	$888,170	3,638,407

Key:
Y = Yes, meets criteria; N = No, does not meet criteria; ● = best satisfies criteria; ◐ = partially satisfies criteria; ○ = least satisfies criteria; ARARs = applicable or relevant and appropriate requirements.
* An alternative must meet the threshold criteria to be considered for selection. Each alternative either fully satisfies the criteria or does not.
† Balancing Criteria are only evaluated for alternatives that satisfy the Threshold Criteria. Alternative 1, No Action, is therefore not evaluated and is not considered an option.
‡ Reported as present-worth cost (i.e., total project cost expressed in 1998 U.S. dollars).
§ Capital Costs include escalation, contingencies (at 10%), and project management costs (at 10%).

Groundwater Contamination, Buildings 35-752, 796, & 45-590

Overall Protection of Human Health and the Environment
Alternatives 2 and 3 meet this threshold criteria, which requires that any cleanup remedy considered protects human health and the environment. The primary difference between these two alternatives, with respect to this criteria, is the length of time required to reach cleanup goals. Alternative 3 would be completed earlier than Alternative 2 because contaminated groundwater would be actively treated. Alternative 2 relies on natural processes to slowly decrease contaminant concentrations in groundwater and protects human health and the environment by requiring institutional controls. Alternative 1 does not meet the threshold criteria because contaminants would remain in place with no method of determining a decrease in concentration.

Compliance with Applicable or Relevant and Appropriate Requirements
Potential ARARs for OUD include State of Alaska Water Quality Standards, State of Alaska Drinking Water Standards, the federal Safe Drinking Water Act, and the federal Clean Water Act.

Alternatives 2 and 3 are expected to meet all ARARs. Alternative 3 includes active groundwater treatment and is expected to achieve state and federal standards more rapidly than Alternative 2, although both options are expected to require at least 20 years of treatment. Alternative 1 and 2 would rely on natural processes that slowly decrease groundwater contamination. It should be noted, however, that under Alternative 1 no monitoring would be conducted to determine compliance with the ARARs. Therefore, Alternative 1 does not meet threshold criteria and will not be discussed in the remaining alternative evaluation for Buildings 35-752, 796, and 45-590.

Long-Term Effectiveness and Permanence
Alternative 3 would involve permanent and active reduction of groundwater contamination and would achieve long-term effectiveness. None of the contaminants would be actively addressed by Alternative 2 except through natural processes. Alternative 2 provides the least effective long-term permanence.

Reduction of Toxicity, Mobility, and Volume Through Treatment
Alternative 3 would involve treatment technologies that reduce the toxicity, mobility, and volume of contaminated groundwater. Alternative 2 would slowly reduce the toxicity, mobility, and volume of the contaminated groundwater through natural attenuation. Because Alternative 2 includes monitoring, the rate and degree of contaminant reduction would be known.

Short-Term Effectiveness
Alternative 3 would pose some short-term potential risk to workers at the source area during the time required for construction and installation of the treatment system at the source area. These risks could be minimized through engineering and institutional controls. Alternative 3 is expected to achieve state and federal standards more rapidly than Alternative 2 because Alternative 3 actively treats groundwater contamination. Alternative 2 does not actively treat groundwater contaminants; therefore, contaminant concentrations and any associated risks would slowly decrease over time through natural processes.

Implementability
Alternative 3 uses readily available technology but requires construction and testing of the unit. Therefore, Alternative 2 would be more implementable.

Costs
Costs for each alternative are calculated in terms of present-worth cost over a period of 20 years, although actual monitoring or cleanup goals may be met in more or less time. Capital costs are those required to carry out the remediation. They include the costs of design, construction, and treatment. Operating and maintenance costs cover the labor and maintenance required to ensure remediation remains effective.

The estimated costs for each alternative evaluated for Buildings 35-752, 796, and 45-590 are provided in Table 11 and are based on the information available at the time the alternatives were developed.

State Acceptance

ADEC has been involved with the development of remedial alternatives for OUD and agrees with the preferred alternative for Buildings 35-752, 796, and 45-490.

Community Acceptance

Selection of the preferred alternative is preliminary pending community input and acceptance. Final selection of the cleanup alternatives will consider community acceptance as indicated by comments received during the public comment period.

Summary

The preferred alternative for benzene- and metals-contaminated groundwater at Building 35-752, carbon tetrachloride- and PCE-contaminated groundwater at Building 45-590, and benzo(a)pyrene- and 1,2-dibromoethane-contaminated groundwater at Building 796 is Alternative 2 – Institutional Controls with Monitored Natural Attenuation. Although Alternative 3 would achieve cleanup more rapidly than Alternative 2, the Army, EPA, and ADEC believe Alternative 2 is the best choice because groundwater at these source areas is not currently used as a source of drinking water; therefore, a less aggressive schedule is acceptable, considering the significant difference in cost between the two alternatives. Alternative 2, the preferred alternative, is expected to achieve overall protection of human health and the environment and to meet ARARs. Additionally, this alternative is a cost-effective and permanent solution at Buildings 35-752, 796, and 45-590. Table 11 shows a comparison of all alternatives evaluated for groundwater remediation at Buildings 35-752, 796, and 45-490. As with any remedial action under CERCLA, as long as contamination remains on site, the effectiveness of the selected remedy is subject to periodic reviews, not to exceed 5 years. If the selected treatment technology is determined to be ineffective, the Army, EPA, and ADEC will propose another alternative.

Table 11. Comparison of Alternatives for Groundwater Contamination: Building 35-752, and Buildings 796 and 45-590. The preferred alternative is shaded.

	Alternatives				
	No Action (Alternative 1)	Institutional Controls With Natural Attenuation (Alternative 2)		Extraction and Treatment by Carbon Adsorption (Alternative 3)	
Threshold Criteria*					
Overall Protection	N	Y		Y	
Compliance with ARARs	N	Y		Y	
Balancing Criteria†					
Long-term effectiveness		◐		●	
Reduction of toxicity, mobility, and volume		◐		●	
Short-term effectiveness		●		◐	
Implementability		●		◐	
Costs‡		**35-752**	**796/45-590§**	**35-752**	**796/45-590§**
Capital Costs#	$0	$88,384	216,616	$4,343,131	$4,633,293
Operation and Maintenance	0	107,008	254,953	5,700,263	5,838,327
Total Cost	$0	$195,392	$471,569	$10,043,394	$10,471,620

Key:

Y = Yes, meets criteria; N = No, does not meet criteria; ●= best satisfies criteria; ◐ = partially satisfies criteria; ○ = least satisfies criteria;
ARARs = applicable or relevant and appropriate requirements.

* An alternative must meet the threshold criteria to be considered for selection. Each alternative either fully satisfies the criteria or does not.

† Balancing Criteria are only evaluated for alternatives that satisfy the Threshold Criteria. Alternative 1, No Action, is therefore not evaluated and is not considered an option.

‡ Reported as present-worth cost (i.e., total project cost expressed in 1998 U.S. dollars).

§ Present-worth costs for Building 796 are the same as the present-worth costs for Building 45-590.

\# Capital Costs include escalation, contingencies (at 10%), and project management costs (at 10%).

Rationale for the Selection of the Preferred Alternatives

After a thorough assessment of multiple alternatives, the preferred alternatives for source areas at OUD were identified. These preferred alternatives and rationales for their selection are described below.

These alternatives are subject to public comment and participation. No alternative will be selected until the public comment period ends and all comments are addressed.

Soil & Sediment Contamination at Building 35-752

The preferred alternative for PCB-contaminated soil and sediment at Building 35-752 is Alternative 3 – Phytoremediation. A thorough assessment of alternatives considered risk, cleanup times, and costs. It was determined that protection of human health and the environment, compliance with ARARs , and cost-effectiveness would best be achieved by phytoremediation. Treatment of the soil is expected to reduce the contamination to below regulatory levels and provide long-term effectiveness. In this case, long-term monitoring and institutional controls would not be required. However, if phytoremediation proves to be ineffective, thermal desorption (Alternative 5) will be implemented. Following treatment, with phytoremediation or thermal desorption, if necessary, institutional controls will ensure treated soils remain at the source area. Whether phytoremediation or thermal desorption is used to treat soil and sediment, the Army is committed to implementing a permanent solution at Building 35-752.

The following are the major components of Alternative 3:

- Phytoremediation of PCB-contaminated soil,
- Sealing windows and doors with plywood and installing an 8-foot-tall security fence around Building 35-752,
- Eliminating the cooling water discharge from Building 35-750 into the man-made cooling pond near Building 35-752, and
- Filling the cooling pond with clean soil.

Groundwater Contamination - Buildings 35-752, 796, and 45-590

The preferred alternative for benzene- and metals-contaminated groundwater at Building 35-752, carbon tetrachloride- and PCE-contaminated groundwater at Building 45-590, and benzo(a)pyrene- and 1,2-dibromoethane-contaminated groundwater at Building 796 is Alternative 2 – Institutional Controls with Monitored Natural Attenuation. Although Alternative 3 would achieve cleanup more rapidly than Alternative 2, the Army, EPA, and ADEC believe that because groundwater associated with these source areas is not used as a source of drinking water and that the Army will remain in control of these areas for the foreseeable future, an alternative that meets all criteria required on a less aggressive schedule is acceptable considering the significant difference in costs between the two alternatives.

The following are the major components of Alternative 2:

- Institutional controls.
- Monitored natural attenuation.

The preferred alternative was chosen due to very conservative assumptions used to determine human health risk. For Building 35-752, it is unlikely that groundwater from the shallow aquifer would be developed as drinking water. Since groundwater exists in deeper aquifers at Buildings 796 and 45-590, institutional controls limiting the use of groundwater will be in place and documented in the Installation Master Land Use Plan. The Army’s land use managers and Public Works environmental project staff would examine this information during routine permit review and approval processes. For all three buildings, groundwater would be monitored periodically under Alternative 2; therefore the progress of achieving ARARs will be determined by the Army, EPA, and ADEC. Any alternative chosen will be reviewed by the Army, EPA, and ADEC at least every 5 years after initiation to ensure all required goals are being met. In addition, long-term monitoring will indicate if the contaminated groundwater is migrating. When combined with a 5-year review process, Alternative 2 will provide a safety net to protect other areas of the post or other receptors from off-site migration of contaminants in groundwater. If migration of contaminants does occur, the Army, EPA, and ADEC will propose a more aggressive approach to remediation.

POSTWIDE RISK ASSESSMENT

Postwide Human Health and Ecological Risk Assessments were performed, in addition to the risk assessments for the OUD source areas described in this Proposed Plan, to evaluate any cumulative risk effects posed by the combined total of contaminants throughout Fort Richardson.

Postwide Human Health Risk Assessment

The Postwide Human Health Risk Assessment identified exposure scenarios and pathways for an industrial worker, a future construction worker, and a trespasser. Contamination that posed the greatest risk to human health was identified at the Poleline Road Disposal Area (OUB); however, cleanup is underway at this source area. Estimated excess lifetime cancer risks from exposure to other chemicals detected on Fort Richardson were less than or within the target range specified by EPA. Noncancer risks were also estimated to be less than the threshold hazard index. Therefore, there are no adverse cumulative risk effects on human health from the combined total of contaminants throughout Fort Richardson.

Postwide Ecological Risk Assessment

The Postwide Ecological Risk Assessment addressed potential risks posed by contaminants from all source areas that accumulate in body tissue and predicted risks to individual ecological receptors in excess of the EPA benchmark hazard index of 1. Results of the Postwide Ecological Risk Assessment indicate that potential risk to nearly all wide-ranging receptors is negligible, with one exception: the cooling pond at Building 35-752. One of the primary data gaps identified in the OUD Ecological Risk Assessment was the potential risk to the Ship Creek ecosystem from bioaccumulating chemicals. The cooling pond at Building 35-752 is connected to Ship Creek via a man-made drainage ditch. The cooling pond drains toward Ship Creek and combines with another ditch that collects and drains stormwater from the main post area. PCBs were detected at low levels from the cooling pond and drainage ditch to Ship Creek. Therefore, the potential for PCBs to adversely impact Ship Creek biota exists. The most useful data to aid in determining the potential for bioaccumulation of PCBs in the Ship Creek ecosystem are measured concentrations of PCBs in benthic organisms (organisms that live in the creek bottom) that are relatively immobile. Therefore, a thorough investigation of Ship Creek was performed that included the collection of benthic organisms for tissue analyses. Tissue sample results of benthic fish (i.e., slimy sculpins) collected downstream of building 35-752 showed that PCBs were not bioaccumulating through the Ship Creek food chain. Therefore, the weight of evidence suggests that there is no significant contaminant-induced degradation of the Ship Creek aquatic habitat. In addition, terrestrial wildlife risk was also determined to be negligible.

SOURCE AREAS RECOMMENDED FOR NO FURTHER ACTION UNDER CERCLA

The Army and agencies agree that the remaining nine source areas included in the original 12 OUD source areas do not require cleanup or further action under CERCLA. These include source areas where removal of contamination has occurred; preliminary risk screening analyses were completed, indicating that the source area does not adversely impact human health or the environment; or where source areas were contaminated with petroleum only. Source areas where only petroleum contamination was identified were referred to the Two-Party Agreement between the Army and the State of Alaska.

The Two-Party Agreement focuses on source areas at Fort Richardson contaminated with petroleum. This agreement is part of the FFA for Fort Richardson. Decisions for cleanup within the Two-Party Agreement, officially referred to as the State-Fort Richardson Environmental Restoration Agreement, are part of OUD and will become part of the OUD ROD. This Two-Party Agreement, which presents the petroleum cleanup strategy, documents all known historical petroleum sources on Fort Richardson and their current cleanup status. It also verifies the Army's commitment to adequately address these petroleum source areas in a manner consistent with state regulations.

Organic compounds: *Chemicals containing carbon. Examples are petroleum products, petroleum-based solvents, and pesticides. Exposure to some organic compounds can produce toxic effects in body tissues and processes.*

CIRCLE ROAD DRUM SITE

The Circle Road Drum Site is located west of the main post area and southeast of the intersection of Circle Drive and Totman Road (see Figure 1). The origin and use of the 59 drums found at the source area are unknown. Tar deposits and other unidentified stains were observed on surface soil at the source area. Wooden pallets and remnants of asphalt piles were also present. Investigations concluded that soil was contaminated with petroleum and several other volatile ***organic compounds***. Groundwater was not impacted by any spills. In 1993 and 1994, the contaminated debris and four hundred cubic yards of soil were removed, incinerated, and used as cover material at the Fort Richardson landfill. Confirmatory samples collected within the excavation did not contain levels requiring action based on ADEC guidance for non-underground storage tank soil cleanup levels; therefore, this source area has been recommended for no further action.

BUILDING 955

Building 955 is southeast of Warehouse Street and Loop Road (see Figure 1) and is the location of the used-oil transfer area, or sludge bin. Waste liquids containing water and some solids were transported to the bin from various post sources and allowed to separate by gravity. An area of DDT-contaminated soil was found during a Preliminary Source Evaluation in 1995. The Army defined the extent of the DDT contamination and conducted a removal of the contaminated soil in 1998. This soil is currently stockpiled at the source area pending completion of a removal action by the Army scheduled for Summer 1999. The Army will conduct this removal under their CERCLA removal authority. This soil will be transported to a permitted disposal facility. Petroleum-contaminated soil at Building 955 will be addressed under the Two-Party Agreement.

Stormwater Outfall to Ship Creek

The stormwater outfall to Ship Creek (see Figure 1) has served as the discharge point for the stormwater drainage system of Fort Richardson's main post area since its construction in 1955, and is still in use today. Contaminants identified in soil and sediment at the outfall of the drainage ditch include low levels of petroleum and arsenic, barium, chromium, lead, and nickel. All were detected at concentrations below federal and state cleanup levels; therefore, the source area has been recommended for no further action.

Dust Palliative Locations

The dust palliative (dust abatement) areas (see Figure 1) consist of three gravel roadways and one gravel parking lot suspected of being treated with waste oil for dust suppression. Potential contaminants included petroleum and some metals. Soil samples collected at the dust palliative locations did not exceed conservative risk screening levels; therefore, these locations have been recommended for no further action.

Building 726 - Laundry Facility

Building 726 is located on Quartermaster Road between the Davis Highway and Richardson Drive. Building operations include dry cleaning, clothing washing, and mattress washing. Chemicals used at the source area include the dry cleaning solvents PCE (a typical dry cleaning agent) and Stoddard solvent (a dry cleaning agent and degreaser/cleaner). These solvents were stored in underground storage tanks from the 1950s, when the facility was constructed, until 1972. The tanks were removed in 1987. Building 726 was investigated in the OUD RI. Levels of dry cleaning solvents were detected below federal and state cleanup requirements for unrestricted use in surface soil at the source area. Therefore, Building 726 is recommended for no further action.

Building 700/718

The east side of Building 718 was a 30-by-30-foot drum storage area for waste produced from activities that occurred at Building 700, a maintenance building and paint shop. Building 700 operations included parts cleaning, spray painting, and mechanical maintenance. The wastes generated during these activities were temporarily stored in drums on pallets adjacent to Building 718. The source area is currently active as a supply storage yard but is no longer used to store drummed wastes. Petroleum-contaminated soil was removed in 1998. Confirmation samples did not identify levels requiring cleanup based on the most stringent ADEC requirements; therefore, the source area is recommended for no further action.

Building 704

Building 704 and the surrounding parking area were used for storage and maintenance of vehicles and heavy equipment. Waste paint, used petroleum products, and solvents were temporarily stored in an outdoor storage area in the northeast corner of the Building 704 parking area prior to disposal. In 1990, a waste characterization of the drums documented the presence of brake fluid, lubricating oil, gasoline, diesel, kerosene, mineral spirits, fuel oil, jet fuel, ballast water, alcohols, chlorinated solvents, and other flammable liquids. All containers were removed in 1991. Soil samples collected in 1995 did not contain levels of contamination that warranted cleanup based on a conservative risk screening procedure; therefore, no further action is recommended for this source area.

Landfill Fire Training Area

The former landfill fire training area (see Figure 1) was constructed over a former sanitary landfill on Fort Richardson. The landfill was closed before 1966. The area was used for fire training from 1985 to 1988. Investigations at the former fire training area have detected petroleum contamination in soil at 6 feet below ground surface. However, the levels detected were below federal and state cleanup requirements. The former landfill, which includes the fire training area, has been closed under the RCRA Solid Waste Landfill Regulations. A soil cap was installed in 1997 as part of a presumptive remedy for the landfill, which includes this source area. For this reason, the land is limited to industrial use. As part of the closure plan, groundwater sampling has been conducted in perimeter wells since 1993. No contamination has been detected to date in either downgradient or upgradient monitoring wells. The monitoring program is expected to continue for 30 years under the landfill closure plan. The fire training area has been recommended for no further action.

Grease Pits

The grease pits source area is located north of the main post in the area of the Fort Richardson former landfill (see Figure 1). The history of the grease pits is not well documented; however, the grease pits were intended for disposal of waste cooking grease and oil. Contaminants identified during the investigation include petroleum, solvents, phthalates, and metals. However, the levels detected were below federal and state cleanup requirements. The grease pits are located in an area of the landfill that has been closed under RCRA Solid Waste Landfill Regulations (similar to the fire training area discussed above). A soil cap was installed in 1997 as part of a presumptive remedy for the landfill, which includes this source area. For this reason, the land is limited to industrial use. As part of the closure plan, groundwater sampling has been conducted in perimeter wells since 1993. No contamination has been detected to date in either downgradient or upgradient wells. The monitoring program is expected to continue for 30 years under the landfill closure plan. The grease pits have been recommended for no further action.

Additional Petroleum Cleanup Sites

Fort Richardson has also undertaken actions necessary to investigate, remediate, and/or close-out actual or potential sources of petroleum, oil, and lubricants contamination. These releases stem from either the past use of underground storage tanks on post or releases from non-underground storage tank petroleum, oil, and lubricant sources. Since 1994, the Army has investigated 113 sites on Fort Richardson. Of those sites, 83 have been closed-out by the State of Alaska as posing no threat to human health or the environment and requiring no further action. Of the remaining sites, 14 have been addressed through removal actions or on-site cleanup; cleanup action is underway at 2 sites; and further investigation or site close-out work remains to be completed at 14 sites under state contaminated sites regulations.

RCRA Hazardous Waste Sites

In addition to the landfill fire training area and grease pits, a number of other waste sites exist that are subject to various RCRA closure and corrective action obligations. In 1991, the Army and EPA completed a ***Federal Facility Compliance Agreement (FFCA)*** which imposed obligations on the Army regarding storage and disposal of hazardous waste. These closure requirements, as well as other compliance requirements of the 1991 FFCA, will continue to be met under the RCRA program, separately from CERCLA. One former OUA site being addressed under the FFCA is Building 986. OUD source areas that are being addressed under the FFCA include the Circle Road Drum Site, Building 704, Building 35-752, and Building 45-590. These source areas were described earlier in the Proposed Plan. An additional source area being addressed under the FFCA is part of OUC called the Open Burn/Open Demolition (OB/OD) Pad. Sampling and analysis at this source area was completed during several field investigations, which includes the OUC 1996 remedial investigation. A RCRA Interim Status Closure Plan, reflecting results of the 1996 CERCLA investigation, will be completed and submitted to EPA in 1999. The OB/OD Pad will be closed in accordance with Title 40 of the ***Code of Federal Regulations*** section 265. Approval and public notice of all interim status closure plans will occur under RCRA at a later date.

For these six source areas, called solid waste management units under RCRA, the FFCA requires the Army to conduct certain sampling activities to establish whether or not hazardous wastes were indeed managed at these units, and in some circumstances, prepare and implement RCRA closure plans. Although the Army has submitted several closure plans to EPA for review and approval, none of these plans have received final approval. Separately from this Proposed Plan, the Army will resubmit these closure plans, which will include sampling and analysis data gathered after the 1991 FFCA, some of which was collected during CERCLA RI/FS activities or any other remediation work that may have been conducted. After EPA approves the RCRA closure plans, the Army will complete clean closure or post-closure activities at each unit.

In addition to the aforementioned six units, three other solid waste management units have been identified for consideration under RCRA (see Table 12). Because of the similarities between the CERCLA remedial action processes and RCRA corrective action requirements, the Army, EPA, and ADEC agreed that any required corrective action at these units would be addressed through CERCLA response actions.

Federal Facility Compliance Agreement (FFCA): *An agreement between the Army and EPA in which hazardous waste sites were identified. The agreement also indicated that the Army was required to investigate and close each of the identified hazardous waste sites under requirements specified in RCRA regulations.*

Code of Federal Regulations: *Federal law that describes required actions for closing appropriate hazardous waste sites under RCRA.*

Table 12. Additional RCRA Solid Waste Management Units.

RCRA Solid Waste Management Unit	Current Governing Regulatory Agreement	Completed Action	Current Status
Building 700/718 Drum Storage Area	Two-Party Agreement (transferred from CERCLA OUD in 1995)	Drums sampled/removed 1990/1991. As a result of 1995 PSE, petroleum-contaminated soil removed in 1998.	Final remedial action report has been completed and approved.
Building 755 Waste Disposal Area	Two-Party Agreement	RCRA site characterization completed 1991. POL Site Preliminary Assessment/ Site Investigation completed on site in 1996.	No further action required – State of Alaska has closed out site.
Building 955 Sludge Bin	Two-Party Agreement (transferred from CERCLA OUD in 1995)	Sludge bin sampled/removed 1991. DDT in soil discovered as a result of 1995 PSE. DDT soil removed 1998.	Site will be recommended to State of Alaska for no further action following confirmation of DDT-soil removal.

Key:
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DDT = Dichlorodiphenyltrichloroethane; OUD = Operable Unit D; POL = Petroleum, oil, and lubricants; PSE = Preliminary Source Evaluation; RCRA = Resource Conservation and Recovery Act.

Data Source:
RCRA Facility Assessment, Preliminary Review/Visual Site Inspection. U.S. Army, Fort Richardson, Alaska. January 1990.

LIST OF RELATED DOCUMENTS

The following list of source material is provided for readers who want more detailed information than is presented in this Proposed Plan. These documents are available in the Fort Richardson Administrative Record. Locations of the Administrative Record and information repositories are listed on page 31.

Background Data Analysis Report, Fort Richardson, Alaska, 1996.

Federal Facility Agreement, Administrative Docket Number 1093-05-02-120, U.S. Department of the Army, Fort Richardson, Alaska, December 5, 1994.

Preliminary Source Evaluation 2, Operable Unit D, Fort Richardson, Alaska, June 1996.

Remedial Investigation/Feasibility Study, Operable Unit D, Fort Richardson, Alaska, 1998:

- Volume I: Remedial Investigation Report
- Volume IIb: Postwide Risk Assessment
- Volume IIa: Risk Assessment
- Volume III: Feasibility Study, 1999

PUBLIC INVOLVEMENT

A public meeting is scheduled at 7:00 p.m. on May 13, 1999, at the Russian Jack Chalet. Representatives from the Army, ADEC, and EPA will be present to answer questions about this Proposed Plan.

The public meeting also will provide an opportunity for interested parties to submit written or verbal comments on this Proposed Plan, the RI/FS, or risk assessment documents. A 30-day comment period is scheduled from April 29 to May 28, 1999.

The Army, ADEC, and EPA will respond to all comments on this Proposed Plan in the Responsiveness Summary, an appendix to the ROD. After consideration of all public comments, a final cleanup decision will be made for OUD. The ROD will detail the decisions made during the CERCLA cleanup process. The ROD will include the Responsiveness Summary containing the public comments received during the comment period. The ROD will be added to the Administrative Record and information repositories. The locations of the record and repositories are listed in the box below.

FOR MORE INFORMATION...

Copies of site documents, fact sheets, and other supporting reports are available for public review at the following locations:

INFORMATION REPOSITORIES

University of Alaska Anchorage
Consortium Library
3211 Providence Drive
Anchorage, Alaska 99508-8176
(907) 786-1845

Alaska Resources Library
222 West 7th Avenue
Anchorage, Alaska 99513
(907) 271-5025

Fort Richardson Post Library
Building 636, B Street
Fort Richardson, Alaska 99503
(907) 384-1648

ADMINISTRATIVE RECORD

Directorate of Public Works
Building 724
Fort Richardson, Alaska 99503
(907) 384-3175

U.S. Army Alaska
APVR-RPW-EV
730 Quartermaster Road
Fort Richardson, Alaska 99505-6500
Attn: Kevin Gardner