Proposed Plan
Air Force Proposes Environmental Restoration Alternatives for Waste Accumulation Area (Site SS018) with Soil and Groundwater Impacts – Public Comments Invited

A. INTRODUCTION

The purpose of this *Proposed Plan* (PP) is to present to the general public and interested stakeholders the preferred remedial alternative for managing potential risks associated with soil and *groundwater* contamination at Waste Accumulation Area (Site SS018) at the Former Galena Forward Operating Location (FOL), Alaska, and to solicit comments on the recommended *remedial alternative*. The PP summarizes information that can be found in greater detail in the *Remedial Investigation* (RI) and *Feasibility Study* (FS) Reports and other documents contained in the *Administrative Record* (AR) for the site. Italicized words or phrases are defined in the glossary at the end of this document.

Site SS018 is subject to the *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)* process. In accordance with the Defense Environmental Restoration Program, the U.S. Air Force (Air Force), representing the Office of the Secretary of Defense, is the CERCLA lead agency responsible for environmental response actions at the Former Galena FOL. The site is not listed on the National Priorities List, and the *Alaska Department of Environmental Conservation (ADEC)* is the lead regulatory support agency. The PP is a document the lead agency (the Air Force) is required to issue to fulfill the requirements of 42 United States Code (U.S.C.) § 9617 CERCLA §117(a) and the *National Contingency Plan* (NCP) Title 40 Code of Federal Regulations (C.F.R.) §300.430(f)(2).

Figure 1 shows where Site SS018 is in the CERCLA process leading up to implementation of a remedy. An RI has been conducted at Site SS018 to determine the types, quantities and extent of contamination, and to develop ways to address contamination at this site. The RI found that:

- Soil is contaminated with petroleum-related contaminants, volatile organic compounds (VOCs), pesticides, and semi-volatile organic compounds (SVOCs). Contamination in soil is from multiple sources; Site SS018 has been divided into five subareas based on the different sources. On the northern edge of the site, contamination of petroleum-related contaminants, VOCs and pesticides extends to 10 feet below ground surface (bgs) and is from isolated spills near the access road to the sewage treatment

Community Involvement Opportunities

Public comments on this Proposed Plan (PP) will be considered before a final remedy is selected for this site.

Public Comment Period
Through 5:00 p.m., November 28, 2016
The public is encouraged to send written comments regarding information provided in this PP and supporting documents to:

Mr. AL Weilbacher
2261 Hughes Ave. Ste 155
JBSA Lackland, TX 78236-9853
E-mail: adolph.weilbacher@us.af.mil
Phone: (210) 395-9421
** All mailed comments must be postmarked by November 28, 2016.

General Questions/Comments may also be referred to the Air Force Public Affairs team at (866) 725-7617 or afcec.pa@us.af.mil.

Public Meeting
Date: October 26, 2016 Time: 7:00 p.m.

The public is encouraged to attend a community meeting to discuss the information presented in this PP. There will be an opportunity to ask questions and provide formal comments during the meeting. Representatives from the Air Force and ADEC will participate. The meeting will be held at the following location:

Larsen Charlie Community Hall,
Galena, AK

Information Repository & Administrative Record (AR)
The Remedial Investigation (RI), Risk Assessment, and Feasibility Study can be found in the AR located at:

The Charles Evans Community Library,
Antoski Street (inside Galena High School),
Galena, AK 99741 (907) 656-1205.

All supporting documents can also be found online at: http://www.afcec.af.mil/Home/BRAC/Galena.aspx or directly at:
http://afcec.publicadmin-record.us.af.mil/Search.aspx
To search for supporting documents, select BRAC, select Galena, then enter the referenced AR# into the Full Metadata Search field for easy access. AR numbers for supporting documents can be found at the end of this PP.

lagoons. Near the center of the site, above a diesel fuel pipeline, petroleum-related and VOC contamination extends to approximately 14 feet bgs and is from a historical leak in the pipeline. Further south of the historical fuel leak, located south of a concrete pad previously used to store drums of waste, soil is contaminated with VOCs from approximately 5 to 12 feet bgs. The contamination appears to be from wash/rinse water rather than a solvent leak from the drums. On the eastern edge of the site, soil is contaminated with VOCs at depths of approximately 12 to 41 feet bgs and is associated with the trichloroethene (TCE) *plume* in groundwater originating in upgradient Site SS006.

- Groundwater is contaminated with petroleum-related contaminants near the location of the pipeline that runs through Site SS018. Deep petroleum contamination of groundwater is most likely from the diesel pipeline leak. Groundwater is also contaminated with TCE, which is due to the TCE plume originating from upgradient Site SS006.

Figure 2 shows the site layout and locations of soil and groundwater contamination. In the FS for Site SS018 the following alternatives were evaluated to mitigate risks associated with soil and groundwater contamination at the site:

- **Alternative 1:** No Action
- **Alternative 2:** Apply *monitored natural attenuation* (MNA) to groundwater at the site and impose land use controls (LUCs) to mitigate potential exposures until all cleanup levels (CULs) are achieved.
- **Alternative 3:** *Bioventing* to remove petroleum-related contaminants from the soil. Use MNA to remediate groundwater and impose LUCs to mitigate potential exposures until all CULs are achieved.
- **Alternative 4:** Excavation of the petroleum-contaminated soil, MNA to remediate groundwater and impose LUCs to mitigate potential exposures until all CULs are achieved.

Contents

The Air Force's preferred alternative for Site SS018 is **Alternative 4** because it will achieve all *Remedial Action Objectives* (RAOs) to protect human health and the environment (see Section F). Alternative 4 is also cost effective and it will achieve *Cleanup*

Figure 1 – CERCLA Process

Complete in a shorter timeframe than the other alternatives evaluated.

Public input is important to the remedy selection process. New information or opinions the Air Force or ADEC learn during the *public comment period* could result in the selection of remedial actions that differ from the preferred alternative. The Air Force encourages public comment on this PP and all alternatives described or other material in the AR, either at the public meeting scheduled for October 26, 2016 or by written comment. The public will have until the end of the comment period (November 26, 2016) to submit written comments.

A comment sheet is provided as an attachment to this PP. After comments from the public are received and considered, a *Record of Decision* (ROD) document will be written. The ROD will include a summary of any comments received during the public review period along with an explanation of how the comments changed the decision that was reached, if applicable. After the ROD is finalized, the remedy will be implemented following completion of the *Remedial Design/Remedial Action* Work Plan.

B. SITE BACKGROUND

B.1 Galena FOL History

The Former Galena FOL was established as an airfield during World War II and most recently served as a forward operating base for the Pacific Air Force's 611th Air Support Group headquartered at Elmendorf Air Force Base, Alaska. The Former Galena FOL was recommended for closure by the Department of Defense (DoD) *Base Closure and Realignment Act (*BRAC*)* Commission in 2005 and was officially closed September 30, 2008.

Today, the Air Force Civil Engineer Center (AFCEC) manages the environmental *cleanup* for the Air Force at the Former Galena FOL. Regulatory support is provided by ADEC.

B.2 Site SS018 History

Since the 1950s, waste lube oil, antifreeze, solvents, oil rags, and other wastes from power plant operations and other Former Galena FOL petroleum, oil, and lubricants operational activities were accumulated and stored in drums. The drums were stored at Site SS018 before being shipped off-base for disposal. Waste oils were accumulated at Site SS018 and then applied to the local roads for dust control until 1984, when the State of Alaska discontinued permits for road oiling. Waste materials were stored until approximately 1996. During a site observation in 1992, at least 1,000 drums were stored at Site SS018 and thousands of drums have been stored at Site SS018 over time. The drummed wastes were originally stored on the ground or on pallets.

In 1984, a 30-foot by 50-foot bermed concrete pad was constructed in the central portion of Site SS018 as a secondary containment (**Figure 2**). During various site visits, however, it was noticed that drums were leaking out of the concrete pad and onto the ground. Drums were stored both inside and outside the bermed concrete pad area.

An active diesel fuel pipeline runs through Site SS018, from Building 1499 Power Plant at Site TU001, north of Site SS018, to the Sewer Pump Station Building 1497 and Valve Pit 9. In the early winter of 1999, a leak occurred in the pipeline and the pipeline was removed and replaced in November 1999.

Site SS018 currently contains the concrete pad, existing Building 1497 (sewer pump station); and existing underground utility infrastructure (diesel fuel pipeline, sewer, water and electrical).

B.3 Previous Public Participation Activities

The Air Force and ADEC, through the Galena Restoration Advisory Board, work with local stakeholders, including the Louden Tribal Council and City of Galena to address any environmental concerns at the Former Galena FOL. The Galena Restoration Advisory Board consists of Air Force and ADEC representatives and government and community stakeholders including the Alaska Department of Transportation, the Bureau of Land Management, US Fish and Wildlife Service, City of Galena, Galena Interior Learning Academy, Louden Tribal Council, Gana-A'Yoo, and private citizens. The Restoration Advisory Board meets twice a year to promote community involvement and disseminate information on the progress of environmental restoration activities.

In an effort to involve the community in the decision-making process, the public is given the opportunity to comment on the Air Force's recommendations through public meetings and review and comment of PPs.

The Air Force also established a community outreach program to notify area residents and interested parties about upcoming meetings, major site activities, and site restoration progress. Periodic

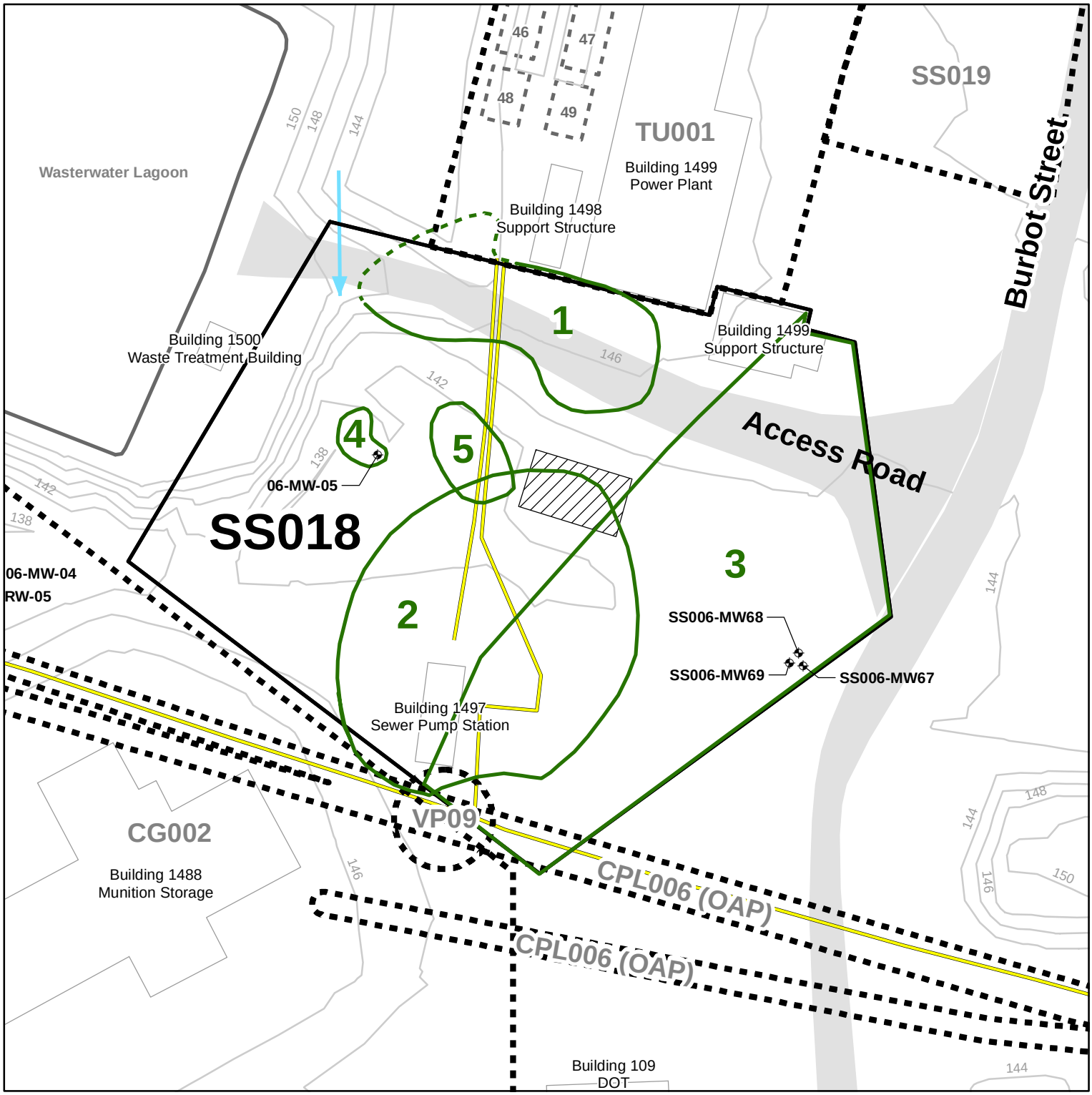
AFCEC and ADEC Contact Information

BRAC Environmental Coordinator:
Mr. AL Weilbacher

E-mail: adolph.weilbacher@us.af.mil
Phone: (210) 395-9421

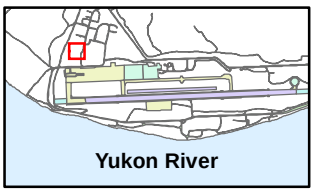
ADEC Environmental Program Specialist:
Mr. Dennis Shepard

E-mail: dennis.shepard@alaska.gov
Phone: (907) 451-2180



Legend

- Airfield Surface or Road
- Approximate Groundwater Flow Direction
- Ground Surface Elevation Contour
- SS018
- Adjacent Site
- Approximate Location of Former Diesel Storage Tank
- Concrete Drum Storage Pad
- Fuel/Gas Line
- Monitoring Well
- Area of soil contamination (dashed where inferred)



0 30 60
Feet
N

S:\ES\Remed\749388_Galena_FOL_PBR\Database\GIS\SS018\PP_SS018_SiteLayout_COCAreas_Fig-2.mxd lxh 7/28/2016

FIGURE 2

Site SS018 Layout and Area of Soil and Groundwater Contamination

Proposed Plan for SS018
Former Galena Forward Operating Location, Alaska

PARSONS

newsletters, which are available on the Air Force website (http://www.afcec.af.mil/Home/BRAC/Galena.aspx) are published to inform the public about the progress of the environmental cleanup.

C. SITE CHARACTERISTICS

Site SS018 is located in the southwest portion of the Former Galena FOL containment "triangle" on land owned by the City of Galena. Site SS018 is bordered to the southwest by the Missile Storage Area Building 1488, to the north by Power Plant 49 and associated tanks, to the west by the sewage treatment plant (Building 1500) and aerated sewage lagoon, and to the east by Burbot Street (formerly Engineers Way).

For the purposes of the RI, Site SS018 was divided into five subareas based on the location and types of contaminants present. These subareas are depicted on **Figure 2** and described in more detail in Section C.2.

Figure 2 shows the estimated area of soil contamination at Site SS018 and the locations of major site features. Sources of contamination include: the historical use of the site as a waste accumulation storage area, past spills, the underground fuel pipeline that leaked in the past, and the proximity of the site to the Site SS006 TCE plume. **Figure 3** is a photograph of the Site SS018 area.

The geology of Site SS018 is dominated by unconsolidated (loose, not rock-like) sediments deposited by the Yukon River to depths of at least 550 feet bgs. The top several feet of soil at Site SS018 consist of fill material that was historically graded flat, generally consisting of brown or gray sand with silt and occasional gravel lenses. The geology below the fill appears to be primarily silty sand in the upper 10 feet bgs, transitioning to primarily sands and gravels to a depth of at least 41 feet bgs.

Groundwater at Site SS018 exists in an aquifer that consists mainly of interlayered sand and gravelly sand. The aquifer extends to depths greater than 200 feet bgs.

The groundwater flow direction and elevation of the groundwater surface at Site SS018 varies throughout the year because both are dependent on the water level in the Yukon River. From August/September to May, groundwater surface elevations are generally higher in wells farther from the river, and groundwater flows south toward the river. As the water level in the river rises in May, the groundwater surface elevations become higher near the river and groundwater flows to the north, away from the river. The water level in the Yukon River typically decreases in mid to late June, and groundwater once again flows south toward the river. From mid-June to September, the groundwater surface elevation and flow direction can change often, depending on small fluctuations that occur in river water levels. If the water level in the river increases, groundwater will flow north, away from the river. Similarly, decreases in the river water level cause the groundwater to flow south, toward the river.

Figure 3 –Site SS018 Area – View to the north from the sewer pump station. The power plant is shown on the left and an intermodal container covering the concrete pad is shown on the right. The underground fuel pipeline runs directly from the sewer pump station to the power plant.

The topography at Site SS018 is relatively flat except where the ground surface increases towards the road on the north side of the site. The ground surface elevation is approximately 140 to 145 feet above mean seal level. The depth to groundwater ranges from approximately 5 to 28 feet bgs depending on the season.

C.1 Environmental Investigations

An RI was completed at Site SS018 to determine the nature and extent of contamination. RI field work for Site SS018 was completed in 2010 and 2011. Field work for Site SS018 consisted of soil sampling, collecting groundwater grab samples, and installing and sampling monitoring wells. Soil samples were collected from "surface soil" (0 to 2 feet bgs), "combined surface and subsurface soil" (0 to 15 feet bgs) and "deep soil" (greater than 15 feet bgs) and analyzed for various contaminants. The most recent base-wide groundwater sampling events, which included sampling at Site SS018, were conducted from 2010 to 2014.

Although there was sufficient information from the RI to develop remedial alternatives, there are some uncertainties as to the extent of contamination in soil that exceeds the CULs in Subarea 1. Additional sampling will be conducted to further delineate the extent of contaminants in soil, and these results will be used in the design of the proposed remedy.

C.2 Soil

Soil samples collected at Site SS018 were analyzed for *gasoline range organics* (GRO), diesel range organics (DRO), residual range organics (RRO), VOCs, metals, SVOCs and pesticides.

Several petroleum-related contaminants, pesticides, SVOCs and VOCs were identified as constituents of concern (COCs) and are discussed in their subarea-specific section below. COCs are site-related contaminants that pose an unacceptable risk to human health and/or the environment. COCs are selected based on (1) results of the risk assessment, and (2) comparing concentrations of contaminants to applicable CULs and background threshold values. They are the basis for determining the design of the remedy for a site. More information on selection of COCs can be found in the FS Report in the AR.

Subarea 1

Subarea 1 is characterized by petroleum, pesticides, VOCs, and SVOCs at concentrations greater than ADEC migration to groundwater CULs but below the human health CULs in soil to approximately 10 feet bgs. Subarea 1 is approximately 5,800 square feet, however the extent of contamination is not completely defined on the northwest side.

The maximum concentration of each COC exceeded the CUL. The maximum concentrations of COCs, along with its respective CUL is presented in **Table 1**.

Table 1. Subarea 1 COCs in Soil

COC	Max Concentration (mg/kg)[1]	Cleanup Level (mg/kg)[(2)]
Petroleum Contaminants		
DRO	560	250
VOCs		
TCE	0.0431	0.02
cis-1,2-DCE	0.487	0.24
Benzene	0.297	0.025
Napthalene	84	20
SVOCs		
1-Methylnapthalene	110	6.2
2-Methylnapthalene	156	6.1
Pesticides		
4,4-DDT	13	7.3
alpha-BHC	0.011	0.0064
gamma-BHC	0.05	0.0095
Dieldrin	0.012	0.0076
Heptaclor Epoxide	0.015	0.014

Notes:
(1) mg/kg = milligram per kilogram
(2)Soil CULs are the lowest applicable levels from ADEC Tables B1 or B2 Method Two CULs (under 40-inch zone) per 18 AAC 75.341, updated October 2008

Petroleum contamination (i.e., DRO) is in surface soil from 0 to 2 feet bgs. Contamination from VOCs and SVOCs is in combined surface and subsurface soil and is in samples from 0 to 9 feet bgs. Contamination from pesticides is in subsurface soil, in samples ranging from 5 to 9 feet bgs.

TCE contamination was detected in isolated samples in Subarea 1, which covers an area of approximately 5,800 feet. COCs in Subarea 1 appear to be from isolated spills along the northern site boundary and along the wastewater treatment building access road, which separates the storage yard from the power plant (Site TU001). Petroleum-related contamination in soil appears to be from these isolated spills and separate from the fuel leak associated with Subarea 5.

Subarea 2

Subarea 2 is characterized by TCE concentrations greater than the ADEC migration to groundwater CULs but below the human health CULs in soil to a depth of 12 feet bgs. Low-level chlorinated VOCs appear to be from wash/rinse water from drums rather than leakage of a solvent product. Subarea 2 is approximately 14,400 square feet and includes most of the 30-foot by 50-foot concrete pad. Approximately 200 square feet of Subarea 2 overlaps with Subarea 5.

The maximum concentration of each COC, along with its respective CUL (in samples collected from 2010-2013) is presented in **Table 2**. The maximum concentration of each COC exceeded the CUL.

Table 2. Subarea 2 COCs in Soil

COC	Max Concentration (mg/kg)[1]	Cleanup Level (mg/kg)[(2)]
VOCs		
Benzene	3.46	0.025
Isopropyl Benzene	54.5	51
Tetrachloroethene (PCE)	0.102	0.024
Toluene	75.5	6.5
TCE	0.436	0.02
1,2,4-Trimethylbenzene	422	23
1,3,5-Trimethylbenzene	137	23
Ethylbenzene	117	6.9
Naphthalene	159	20
n-Butylbenzene	74.9	15
n-Propylbenzene	92.7	15
sec-Butylbenzene	44.5	12
Xylenes	221	63

Notes:
(1) mg/kg = milligram per kilogram
(2)Soil CULs are the lowest applicable levels from ADEC Tables B1 or B2 Method Two CULs (under 40-inch zone) per 18 AAC 75.341, updated October 2008

Subarea 3

Subarea 3 is characterized by uncontaminated shallow soil underlain by TCE contamination in deep soil. Subarea 3 overlaps Subarea 2 areally, however, these areas are separated vertically. In the RI, Subarea 3 was defined as soil greater than 12 feet bgs.

TCE in Subarea 3 was the only analyte that exceeded CULs (**Figure 2**). No other subareas had COCs identified in deep soil. The extent of TCE in deep soil is limited to Subarea 3. Soil contamination extends vertically from 12 to 41 feet bgs over an area of approximately 24,100 square feet. TCE in deep soil in Subarea 3 is associated with the TCE plume in groundwater emanating from upgradient Site SS006 and will be addressed as part of the Site SS006 remedy.

Subarea 4

Subarea 4 is characterized by pesticides in surface soil (0 to 2 ft bgs) at concentrations greater than the ADEC migration to groundwater CULs but below the human health CULs. Subarea 4 is approximately 340 square feet and located on the west side of Site SS018, west of Subarea 5. The pesticides dieldrin and gamma-BHC were identified as COCs, the maximum concentrations, along with the respective CULs are presented in **Table 3**.

Table 3. Subarea 4 COCs in Soil

COC	Maximum Concentration (mg/kg)[1]	Cleanup Level (mg/kg)[(2)]
Pesticides		
Dieldrin	0.0588	0.0076
gamma-BHC	0.0714	0.0095

Notes:
(1) mg/kg = milligram per kilogram
(2)Soil CULs are the lowest applicable levels from ADEC Tables B1 or B2 Method Two CULs (under 40-inch zone) per 18 AAC 75.341, updated October 2008

Subarea 5

Subarea 5 is characterized by the presence of petroleum hydrocarbons to 14 feet bgs and is associated with the leak of an underground diesel fuel pipeline that crosses the site. Subarea 5 is approximately 1,100 square feet and approximately 200 square feet of Subarea 5 overlaps with Subarea 2. Subarea 5 contains petroleum contaminants including DRO, GRO and several petroleum related VOCs and SVOCs as COCs. The maximum concentration of each COC, along with its respective CUL are presented in **Table 4**.

Table 4. Subarea 5 COCs in Soil

COC	Maximum Concentration (mg/kg)[1]	Cleanup Level (mg/kg)[(2)]
Petroleum Contaminants		
DRO	39,200	250
GRO	9,160	300
VOCs		
1,2,4-Trimethylbenzene	422	23
1,3,5-Trimethylbenzene	174	23
Benzene	6.27	0.025
Isopropyl Benzene	54.5	51
Napthalene	230	20
n-Butylbenzene	74.9	15
n-Propylbenzene	114	15
sec-Butylbenzene	60.5	12
Toluene	75.5	6.5
Xylenes	976	63
SVOCs		
1-Methylnapthalene	124	6.2
2-Methylnapthalene	127	6.1

Notes:
(1) mg/kg = milligram per kilogram
(2)Soil CULs are the lowest applicable levels from ADEC Tables B1 or B2 Method Two CULs (under 40-inch zone) per 18 AAC 75.341, updated October 2008

C.3 Groundwater

Groundwater samples at Site SS018 were analyzed for GRO, DRO, RRO, VOCs, metals, SVOCs and pesticides. Only the petroleum contaminants DRO and RRO were identified as COCs for Site SS018. During sampling events conducted from 2010 to 2013, the maximum concentration of DRO and RRO exceeded the CULs, which are shown in the **Table 5**.

Table 5. COCs in Groundwater

COC	Maximum Concentration (µg/L)[1]	Cleanup Level (µg/L)[(2)]
Petroleum Contaminants		
DRO	73,000	1,500
RRO	1,700	1,100

Notes:
(1)µg/L = micrograms per liter
(2)Groundwater CULs are ADEC Table C CULs per 18 AAC 75.345, updated October 2008

DRO and RRO are present above the ADEC groundwater CULs in Subarea 5, however, laboratory data indicates that there is uncertainty in the result of the concentration of RRO in groundwater. Installation and sampling of a *source area* groundwater monitoring well in Subarea 5 will be done to determine if RRO should remain a COC.

Petroleum contamination in groundwater in Subarea 5 is attributed to the fuel line leak.

Although TCE was detected in concentrations above CULs in groundwater in Subarea 3, the contamination is attributed to a TCE plume associated with nearby Site SS006 and will be addressed in the Site SS006 remediation design.

D. SCOPE AND ROLE OF RESPONSE ACTION

The overall cleanup strategy for Site SS018 is to achieve ADEC closure status of "Cleanup Complete". The proposed response action for Site SS018 addresses all contaminated soil and groundwater and exposure pathways. No *principal threat wastes* are present at Site SS018.

E. SUMMARY OF SITE RISKS

E.1 Human Health Risks

The comparison of contaminant concentrations in soil at Site SS018 to the ADEC Method Two CULs for soil and ADEC Table C CULs for groundwater indicate that there may be unacceptable risks to the following *receptors*:

Current and future occupational workers: Potential exposure to chemicals in surface soil, indoor air and potable groundwater. Potentially complete routes of exposure to groundwater include ingestion as drinking water and inhalation of VOCs emitted from potable groundwater.

Hypothetical future residents: Potential exposure to chemicals in surface soil, indoor air and potable groundwater. Potentially complete routes of exposure to surface soil include incidental soil ingestion, dermal contact with soil, and inhalation of ambient vapors or dust. Potentially complete routes of exposure to potable groundwater include ingestion as drinking water, dermal contact and inhalation of VOCs emitted from potable groundwater.

Other chemicals (TCE) and metals (arsenic and manganese) have been detected at Site SS018 that may also contribute to cumulative risk to human health. Additional information regarding current and future effects of all contaminants detected at Site SS018 on human health including carcinogenic and non-carcinogenic risks can be found in the AR in the *Human Health Risk Assessment* completed for Site SS018.

E.2 Ecological Risk

A reconnaissance-level site visit was completed in October 2009 and August 2010 as part of the Preliminary Assessment of the Former Galena FOL. The site has pavement/gravel surfaces and weedy vegetation that are not viable habitat. Because the site is located more than 1,000 feet from the Yukon River, there are no potentially complete aquatic ecological exposure pathways. It was concluded that no further terrestrial or aquatic ecological evaluation was necessary for Site SS018 and ecological risk is not a concern for the site.

E.3 Risk Assessment Summary

It is the lead agency's current judgement that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this site which may present an imminent and substantial endangerment to public health or welfare.

F. REMEDIAL ACTION OBJECTIVES

RAOs are specific goals for protecting human health and the environment from risks and hazards associated with site-related contamination. RAOs can be accomplished by ensuring people are not exposed to contamination or by reducing concentrations of COCs to levels considered by ADEC to be protective. Specifically, the Air Force proposes the following RAOs for response actions at Site SS018:

RAO 1: Prevent the exposure of human receptors to concentrations of contaminants in soil and groundwater that pose a cumulative *carcinogenic risk* greater than 1 in 100,000 or a cumulative *non-carcinogenic hazard index* greater than 1 across all exposure pathways, in accordance with ADEC cumulative risk standards.

RAO 2: Reduce COC concentrations in groundwater to the ADEC Table C groundwater CULs, listed in Table 5 of this proposed plan

RAO 3: Prevent further degradation of groundwater by reducing concentrations of COCs in soil to levels protective of groundwater quality.

Based on the RAOs and *Applicable or Relevant and Appropriate Requirements* (ARARs), a number of technologies and approaches were identified and screened using criteria such as effectiveness for achieving RAOs, implementability, and cost.

F.1 Preliminary Remediation Goals

The proposed soil CULs for Site SS018 are the lowest applicable levels for ADEC Tables B1 or B2 Method Two CULs (Under 40-inch Zone) per 18 Alaska Administrative Code (AAC) 75.341. The Air Force may consider calculating alternative CULs using Method Three per 18 AAC 75.340(e) in the future and will follow the CERCLA process to establish any change in the CULs. CULs for human health exposures (i.e., direct contact and outdoor inhalation) will be achieved up to a depth of 15 feet bgs. Migration to Groundwater CULs that are protective of groundwater quality will be achieved at all depths. The proposed groundwater CULs for Site

SS018 are ADEC Table C CULs per 18 AAC 75.345. The preliminary remediation goals for soil and groundwater are chemical-specific ARARs for Site SS018.

There are no specific CULs proposed for soil vapor at Site SS018. The potential for future *vapor intrusion* will be reevaluated in accordance with ADEC's Vapor Intrusion Guidance for Contaminated Sites, or the most current applicable vapor intrusion guidance, upon achievement of the proposed soil and groundwater CULs or if land use changes.

After completing site cleanup, the risk from hazardous substances will be evaluated to ensure it does not exceed an excess cumulative carcinogenic risk standard of 1 in 100,000 or a cumulative non-carcinogenic hazard index of 1 across all exposure pathways per 18 AAC 75.325(g).

G. SUMMARY OF REMEDIAL ALTERNATIVES

In the Site SS018 FS, *general response actions* that could potentially be implemented to manage risks and treat contaminants at Site SS018 were identified. Specific response actions for each general response action were then identified and screened based on their likely site-specific effectiveness, implementability, and relative cost. The site-specific response actions retained from this screening process were combined into four remedial alternatives. The preferred remedial alternative for Site SS018 is Alternative 4. The four remedial alternatives evaluated are described below:

Alternative 1 – No Action

Capital Cost:	*$ 0*
Operations and Maintenance	
(O&M) Cost:	*$ 0*
Total Present Value:	*$ 0*

Under the CERCLA, evaluation of a no-action remedial alternative is required, pursuant to the NCP, 40 Code of Federal Regulations [CFR] 300.430[e][6], to provide a baseline for comparison with other remedial alternatives. Under Alternative 1, No Action would be taken to address the impacted media identified at the site. With the No Action alternative, no formal programs would be put into place to control or monitor potential receptor exposures to site contaminants. Over time, the organic contaminants would attenuate naturally. Alternative 1 does not meet the RAOs and does not comply with the ARARs.

Alternative 2 – Land Use Controls and Monitored Natural Attenuation

Capital Cost:	*$ 124,000*
O&M Cost:	*$ 1,036,000*
Total Present Value:	*$1,160,000*

Alternative 2 consists of the following actions:

- File a Notice of Environmental Contamination with the state recorder's office.
- Utilize administrative procedures and policies (LUCs) to prevent receptors from coming into contact with contamination at the site, until cleanup goals are achieved.
- Apply MNA to verify that COC concentrations in groundwater are stable or decreasing and that the contaminant plume is not expanding.
- Conduct Five-Year Reviews to evaluate the protectiveness of the remedy and modify if necessary.

Alternative 2 would require long-term maintenance of LUCs that would be used to prevent uncontrolled exposure of potential receptors to contaminated soil and groundwater. Alternative 2 would require collection of additional soil data to better define the area requiring LUCs. Controls/monitoring would be required if any excavation activities are performed that are unrelated to site restoration. In addition, land use would be restricted to preclude residential development and withdrawal of groundwater for any beneficial use over the groundwater plume. Any structures built at the site would need to be designed and constructed to mitigate vapor intrusion concerns. Implementation of Alternative 2 would require documentation of the LUCs, maintenance of administrative controls through review of work clearance permits, periodic inspections of the site, periodic monitoring of contaminant concentrations and corrective action for LUC violations. A LUC implementation plan would be prepared after the ROD is finalized for Site SS018. LUCs would be maintained until cleanup goals are achieved. Groundwater monitoring would be conducted to ensure contaminant plumes in groundwater do not migrate and concentrations decrease over time. Details of the MNA sampling would be described in a work plan. Cleanup complete with ICs would be achieved in approximately 30 years; a time period of at least 100 years is anticipated for Cleanup Complete for Alternative 2.

With Alternative 2, RAO 1 would be achieved after implementing LUCs. LUCs would not achieve RAOs 2 and 3; however, LUCs should effectively protect human receptors from exposure to COCs at concentrations that could pose a hazard. All RAOs

would eventually be met through MNA, but only over a long timeframe.

Alternative 3 –Bioventing for Petroleum-Related Contaminants in Soil, Land Use Controls, and Monitored Natural Attenuation

Capital Cost:	*$ 358,000*
O&M Cost:	*$1,342,000*
Total Present Value:	*$1,700,000*

Alternative 3 consists of the following actions:

- All components of Alternative 2.
- Apply bioventing to remove petroleum-related contaminants in soil in Subarea 5.

A bioventing system would be installed in the Subarea 5 to remove petroleum contamination from the soil, and MNA and LUCs would be used to address the remaining VOC, SVOC and pesticide contamination. Bioventing works by injecting air into the soil to biodegrade contaminants. Bioventing supplies oxygen to the existing soil microorganisms; these microorganisms utilize the oxygen and break down the petroleum compounds to carbon dioxide and water.

The bioventing system would consist of a blower that would be installed in a small shed at the site and electrical power would be provided via connection to a nearby transformer. The blower would be connected to a network of air injection wells installed in the area with petroleum hydrocarbons in the soil. Piping would be buried and several vapor monitoring points would be installed in order to measure the effectiveness of the bioventing system at various locations at the site. The bioventing system would require periodic maintenance and sampling to ensure it is operating properly.

Alternative 3 is expected to achieve CULs in Subarea 5 after approximately 10 years of bioventing operations. After this period of active remediation, it is expected that the site would achieve Cleanup Complete with ICs. An additional 20 years is assumed to reduce concentrations of DRO and GRO in Subarea 5 to the concentrations protective of groundwater and achieve Cleanup Complete (without ICs) (total of 30 years). Contamination in soil at Subarea 1 will naturally attenuate to levels that will allow Cleanup Complete within 10 years. Because of the low magnitude of the pesticide exceedances in Subarea 4 in samples collected in 1994, it is expected that this subarea will meet the requirements for Cleanup Complete following additional confirmation sampling. Chlorinated VOCs in Subarea 2 are expected to naturally attenuate over time and meet CULs within 30 years. Excavation with disposal of soil outside of Galena would be used as a contingency measure if contaminant concentrations in subareas 1, 2, and 4 do not attenuate as expected. This alternative is expected to take approximately 30 years to achieve cleanup goals.

As with Alternative 2, LUCs and MNA would be required until CULs are achieved. RAO 1 would be achieved upon implementation of LUCs. RAO 2 would be achieved once groundwater monitoring confirms the ADEC Table C CULs have been achieved. RAO 3 would be achieved once contaminant concentrations in soil are reduced to concentrations protective of groundwater either through active remediation or natural attenuation.

Alternative 4 – Excavation, Monitored Natural Attenuation and Land Use Controls

Capital Cost:	*$ 454,000*
O&M Cost:	*$ 686,000*
Total Present Value:	*$ 1,140,000*

Alternative 4 consists of the following actions:

- All components of Alternative 2.
- Excavate the petroleum-contaminated soil in Subarea 5 and treat at the Galena *landfarm*.

Remedial Alternative 4 is similar to Alternative 3 except that instead of treating petroleum contaminated soil in Subarea 5 with bioventing, the contaminated soil would be removed with excavation. The petroleum-contaminated soil would be excavated and treated at the Galena landfarm. Excavation of an estimated volume of approximately 700 cubic yards (CY) of petroleum contaminated soil would be near the fuel pipeline that crosses Site SS018 and is approximately 5 to 7 feet bgs (**Figure 2**). The pipeline is used only occasionally to refill a backup generator in the City of Galena's power plant. If the excavation cannot be completed with the pipeline in place, approximately 60 feet of fuel pipeline will be temporarily removed to facilitate this excavation. Once the excavation is complete, the area will be backfilled with clean, compacted soil. Compared to Alternative 3, petroleum-impacted soil is expected to reach CULs more quickly through excavation. Because the petroleum source would be removed with Alternative 4, it is assumed that three years of groundwater monitoring would be required instead of 10 years.

Alternative 4 is expected to achieve CULs protective of human health for soil to a depth of 15 feet in Subarea 5 after the excavation is complete. The residual soil contamination remaining in Subarea 5 is expected to naturally attenuate, Alternative 4 includes a contingency of applying ISCO if a significant GRO or DRO source is present deeper than 15 feet bgs or if other circumstances prevent excavation to 15 feet bgs. After three years of groundwater monitoring, it is expected that Site

SS018 would achieve Cleanup Complete with ICs. Contamination in soil at Subareas 1, 2, and 4 will naturally attenuate to levels that will allow Cleanup Complete as in the timeframes described for Alternative 3. As in Alternative 3, excavation with disposal of soil outside of Galena would be used as a contingency measure if contaminant concentrations do not attenuate as expected. Alternative 4 is expected to take approximately 30 years to achieve cleanup goals.

With Alterative 4, RAO 1 would be achieved upon completion of the excavation and LUCs. RAO 2 would be achieved once groundwater monitoring confirms the ADEC Table C CULs have been achieved. RAO 3 would be achieved once contaminant concentrations in soil are reduced to concentrations protective of groundwater either through active remediation or natural attenuation.

H. EVALUATION OF ALTERNATIVES

Remedial alternatives were evaluated with respect to seven of the nine evaluation criteria outlined by the NCP (40 CFR 300.430) and USEPA guidance for conducting FSs under CERCLA. These evaluation criteria are divided into three categories: *threshold criteria, primary balancing criteria, and modifying criteria*. Threshold criteria are those that must be met for an alternative to be viable for selection in the ROD. Primary balancing criteria form the basis for comparing alternatives for the site-specific conditions. Modifying criteria are addressed in the ROD after the PP is completed, incorporating state and community feedback.

The nine evaluation criteria are categorized as follows:

Threshold Criteria

- Overall protection of human health and the environment
- Compliance with ARARs

Primary Balancing Criteria

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility or volume (TMV) through treatment
- Short-term effectiveness
- Implementability
- Cost

Modifying Criteria

- State acceptance
- Community acceptance

Each remedial alternative was evaluated against the criteria. The results are summarized in **Table 6** and explained in further detail in the following sections.

H.1 Threshold Criteria

The two threshold criteria (Overall Protection of Human Health and the Environment, and Compliance with ARARs) are used as pass/fail criteria to reflect the emphasis on these criteria over other evaluation criteria. Remedial alternatives that fail to meet the threshold criteria were removed from further evaluation and not evaluated with respect to the balancing criteria. **Table 6** summarizes the comparative analysis of the remedial alternatives for Site SS018, and includes both the threshold and balancing criteria.

H.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment is measured by whether the RAOs are achieved. Achievement of RAOs could not be demonstrated by Alternative 1 (No Action), and therefore this alternative fails to meet this threshold criterion. Alternative 2 (LUCs and MNA) would protect human health through implementation of LUCs and would ultimately achieve all RAOs through natural attenuation processes, although some recalcitrant COCs (e.g., DRO) will take many years to attenuate. Alternatives 3 and 4 would achieve all RAOs and are considered protective of human health and the environment.

H.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

Except for Alternative 1, 'No Action', each alternative complies with ARARs. Detailed information on the ARARs can be found in the FS report for Site SS018.

H.2 Primary Balancing Criteria

A numerical ranking system was developed for comparison and ranking of the remedial alternatives that pass the threshold criteria. The five primary balancing criteria are weighted to provide a maximum possible 20 points each for a total possible score of 100 points. Modifying criteria (state and community acceptance) are not included in the ranking system, but will be considered in the selection of the final remedy in the ROD though the comments received on the PP. Ranking assignments were simplified to provide relative indications of low, moderate, or high conformance with the specified criteria. **Table 6** summarizes the comparative analysis of the remedial alternatives for Site SS018 and lists their numerical scores against the evaluation criteria.

H.2.1 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of the remedial

Table 6- Comparative Analysis of Remedial Alternatives for Site SS018

CRITERIA	Alternatives			
	1	2	3	4
	No Action	LUCs and MNA	Bioventing, MNA and LUCs	Excavation, MNA and LUCs
THRESHOLD CRITERIA				
Overall Protection of Human Health and the Environment	Fail	Pass	Pass	Pass
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)	Fail	Pass	Pass	Pass
BALANCING CRITERIA(1)				
Long-Term Effectiveness and Permanence	N/A	6	20	20
Reduction of Toxicity, Mobility, or Volume Through Treatment	N/A	0	20	20
Short-Term Effectiveness	N/A	20	13	13
Implementability	N/A	20	13	13
Cost	N/A	20	13	20
MODIFYING CRITERIA				
State Acceptance	N/A	Neutral	Neutral	Accept
Community Acceptance	N/A	TBD	TBD	TBD
TOTAL SCORE	N/A	66	79	86

Notes: LUC = land use control, MNA = monitored natural attenuation, N/A = not applicable because the alternative failed threshold criteria, TBD = to be determined

1. Balancing Criteria Scores based on the following: Very Low = 0, Low = 6, Moderate = 13, High = 20. Scoring for Table 6 has been updated in response to input from ADEC subsequent to the finalization of the Site SS018 FS report.

alternative to maintain reliable protection of human health and the environment over time. This criterion includes the consideration of residual risk that would remain at Galena following remediation (if any), and the adequacy and reliability of controls. Alternative 2 was scored "low" (6) because this alternative assumes the LTM of LUCs to prevent receptors from being exposed to contamination. Because both Alternatives 3 and 4 actively treat or remove contamination to ultimately achieve Cleanup Complete, both alternatives were scored "high" (20).

H.2.2 Reduction in Toxicity, Mobility, or Volume through Treatment

Reduction in TMV through treatment refers to the anticipated performance of the treatment technologies that may be included as part of the remedial alternative. Alternative 2 relies solely on natural processes to reduce contaminant concentrations at Site SS018. Because Alternative 2 relies solely on natural processes to reduce the TMV of contaminants and does not utilize any treatment technologies, this alternative was scored "very low" (0). Both Alternatives 3 and 4 reduce TMV through treatment. Alternative 3 would use an engineered *in situ* treatment technology to reduce site-related COC concentrations in soil, while Alternative 4 would remove the contamination and treat the contamination in the Galena landfarm. Alternatives 3 and 4 were both scored "high" (20) because they actively treat contaminants and would ultimately achieve Cleanup Complete.

H.2.3 Short-Term Effectiveness

Short-term effectiveness addresses the time needed to implement the remedy and any adverse impacts to workers, the community, and the environment during construction and operation of the remedy. Alternative 2 does not include engineered cleanup, and therefore has no associated construction and could be rapidly implemented. Because of the lack of significant construction activity, there is little risk posed to construction workers, the community, or the environment by Alternative 2, and this alternative was scored "high" (20) against this criterion.

Alternatives 3 and 4 involve operation of remedial systems and therefore have associated construction and system operations and maintenance (O&M). Due to the construction activity, there are risks posed to construction workers, the community, and the environment; however, these tasks are routine construction activities and are considered low-risk activities. Both Alternatives 3 and 4 were scored "moderate" (13) against this criterion.

H.2.4 Implementability

Implementability addresses the technical and administrative feasibility of a remedial alternative from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered. Alternative 2 involves implementation, monitoring, and maintenance of LUCs; long-term groundwater monitoring; and eventual well abandonment. Alternative 2 would require collection of additional soil data to better define the area requiring LUCs. These activities are easily implemented, and Alternative 2 was scored "high" (20) against this criterion. Alternative 3 involves installation and O&M of a bioventing system, MNA, and implementation of LUCs. Alternative 4 assumes the current landfarm being used at Galena will remain open to accommodate the soil excavated from Site SS018. Both Alternatives 3 (bioventing) and 4 (excavation), have been implemented previously at the Former Galena FOL and thus are considered readily implementable and were both scored "moderate" (13) against this criterion. Because there is nearby electrical power and space available at the site for a blower shed, bioventing does not present any significant logistical challenges. Because of the small size of the excavation (~700 CY), Alternative 4 also has few logistical challenges. Except for the fuel pipeline which can be removed and replaced if necessary, there are no buildings or other utilities present that would prevent excavation from removing the contamination.

H.2.5 Cost

The estimated total present value costs for the remedial alternatives that passed the threshold criteria are:

Remedial Alternative 2: $1.16M

Remedial Alternative 3: $1.70M

Remedial Alternative 4: $1.14M

Based on relative cost, Alternatives 2 and 4 were scored "high" (20) and Alternative 3 was scored "moderate" (13) against this criterion. The total present value cost is based on a 1.40 percent discount rate. Cost estimates were developed following USEPA guidance and are considered accurate to within -30 percent to +50 percent of actual expected costs.

I. PREFERRED ALTERNATIVE

Based on the comparative analysis of alternatives described above and the scoring results summarized in **Table 6**, Alternative 4 is selected as the preferred remedial alternative. Alternative 4 received the highest cumulative score based on the evaluation criteria applied.

Alternative 4 uses excavation to remove petroleum-contaminated soil in Subarea 5, the soil would be treated at the Galena landfarm. If necessary to facilitate the excavation, the 4-inch-diameter fuel

pipeline that crosses the site would be temporarily removed and then replaced after the excavation is completed. Groundwater would be treated *in situ* using MNA, and LUCs would be implemented to prevent people from being exposed to contaminants present at the site.

The proposed preferred alternative is based on current information and could change in response to public comments or new information.

RAO 1 would be achieved upon completion of the excavation and LUCs. RAOs 2 and 3 would be achieved after confirmation via groundwater monitoring that contaminant concentrations in groundwater do not exceed ADEC Table C CULs. With Alternative 4 the TMV of contaminants would be actively reduced to meet the RAOs.

With Alternative 4, Site SS018 is expected to reach "remedy in place" within two years of finalizing the ROD. Alternative 4 is expected to achieve the ADEC Method Two CULs for human health for soil to a depth of 15 feet in Subarea 5 after the excavation is complete. After three years of groundwater monitoring, it is expected that Site SS018 would achieve Cleanup Complete with ICs. Contamination in soil at Subarea 1 will naturally attenuate to levels that will allow Site Closeout within 10 years. Pesticides detected in samples collected in 1994, in Subarea 4, are expected to meet the requirements for Cleanup Complete following additional confirmation sampling. CVOCs in Subarea 2 are expected to naturally attenuate over time and meet the ADEC Method Two CULs within 30 years. Excavation with disposal of soil outside of Galena would be used as a contingency measure if contaminant concentrations in subareas 1, 2, and 4 do not attenuate as expected.

Remedy details will be provided in a work plan, which will detail the design of the excavation and the monitoring program. The work plan will specify performance metrics and outline a plan for system modification, optimization, and contingencies.

After completing site cleanup, the risk from hazardous substances will be evaluated to ensure it does not exceed a cumulative carcinogenic risk of 1 in 100,000 or a cumulative non-carcinogenic hazard index of 1 across all exposure pathways per 18 AAC 75.325(g). Alternative 4 is expected to take 30 years to meet CULs at an estimated total present value cost of $1,140,000.

Based on information currently available, the Air Force believes the preferred remedial alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Air Force expects the preferred remedial alternative to satisfy the statutory requirements of CERCLA § 121(b):

1) Be protective of human health and the environment;
2) Comply with ARARs;
3) Be cost-effective;
4) Utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and
5) Satisfy the preference for treatment as a principal element.

ADEC concurs that the alternative selected complies with state law and has approved the Site SS018 FS. ADEC can also provide additional comments to the Air Force during the public comment period for this PP.

J. COMMUNITY PARTICIPATION

A public meeting will be held to allow the public the opportunity to review and provide comments on this PP. Details of the meeting are provided in the "Community Involvement Opportunities" text box, together with the location of the AR for the Former Galena FOL.

Relevant documents found in the AR include:

- Remedial Investigation Results Report: Waste Accumulation Area (Site AOC023), Former Galena Forward Operating Location, Alaska, Final (AR #694).
- Feasibility Study Report for Waste Accumulation Area (Site SS018), Final (AR #539939).
- Human Health Risk Assessment for Waste Accumulation Area (Site AOC023), Former Galena Forward Operating Location, Alaska, Final (AR #458946).

Acronyms and Abbreviations

µg/L	microgram(s) per liter
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirement
Bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	constituent of concern
CUL	cleanup level
CY	cubic yard
DoD	Department of Defense
DRO	diesel range organics
FOL	Forward Operating Location
FS	Feasibility Study
GRO	gasoline range organics
IC	Institutional control
LUC	land use control
mg/kg	milligram(s) per kilogram
MNA	monitored natural attenuation
NCP	National Contingency Plan
O&M	operations and maintenance
PAH	polynuclear aromatic hydrocarbon
PP	Proposed Plan
RAO	remedial action objective
RI	remedial investigation
ROD	Record of Decision
RRO	residual range organics
SVOC	semi-volatile organic compound
TCE	trichloroethene
TMV	toxicity, mobility, or volume
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound

Administrative Record (AR): A record maintained by the USAF of all reports, studies, evaluations, records, or other information relating to the environmental restoration program for a specific installation.

Alaska Department of Environmental Conservation (ADEC): The state agency responsible for protecting public health and environment within the state. The Spill Prevention and Response Division is charged with protecting public health and the environment from sites contaminated by oil or other hazardous substances.

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

Base Closure and Realignment Act: The federal law that provides the authority, process, and schedule for closing an operating DoD facility.

Bioventing: A technique to treat soil contaminated with petroleum products or other organic chemicals. Air is forced into the soil through specially designed wells. The oxygen enhances growth of naturally occurring bacteria in soil. The bacteria feed on the contaminants in the soil, chemically breaking down the contaminants into non-hazardous components. The air can be heated to enhance bacteria growth.

Carcinogenic Risk: Cancer risk is assessed by examining the likelihood of cancer resulting from exposure to contaminants at a site. Cancer risk is expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to carcinogens. For example, a 1 in 100,000 risk (usually written as "1 x 10^{-5}") means for every 100,000 people (receptors) exposed to site contaminants, one extra case of cancer may occur than normally would be expected from all other causes in the area. ADEC has established a target cumulative cancer risk standard of 1 in 100,000 ($1x10^{-5}$) per 18 Alaska Administrative Code (AAC) 75.325(g).

Cleanup: Efforts to mitigate environmental damages or threat to human health, safety, or welfare from hazardous substances or oil. It may include removal of hazardous substances from the environment, including restoration, remediation, and other measures necessary to mitigate or avoid further threat to public health, safety and welfare, or the environment. Cleanup is often used interchangeably with terms like corrective action, remedial action, removal action, or response action. It is often used broadly to describe various actions or phases of an action, such as the RI/FS in the CERCLA process.

Cleanup Complete: A determination made by ADEC for a contaminated site when efforts to reduce hazardous substance contamination have either achieved the strictest levels established in state regulation, or the possibility of human exposure to any residual contamination is highly unlikely. When "cleanup complete" is achieved, land use and/or activity controls to protect human health and the environment from future exposure are not required.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): Commonly known as the Superfund law, CERCLA is a federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The USEPA is responsible for implementing these laws. Under the program, USEPA can either: 1) pay for the site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work, and/or 2) take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.

Defense Environmental Restoration Program: A program establishing authorities and responsibilities for conducting environmental restoration activities at facilities under DoD jurisdiction. This law establishes DoD and Component Environmental Restoration Accounts (ERAs) to fund DERP activities (10 USC § 2701 et seq.). The Air Force conducts its DERP activities as the Environmental Restoration Program.

Diesel-Range Organics (DRO): Consists of compounds that generally represent the diesel fuel range of petroleum hydrocarbons.

Feasibility Study (FS): A CERCLA document that analyzes potential remediation methods based on human health and ecological risk assessment results. The FS emphasizes RAOs and evaluates the relative advantages and disadvantages of selected potential remedial alternatives at contaminated sites.

Future Occupational Worker: This receptor is a standard industrial worker who works at the same location for multiple years and whose work involves incidental contact with soil, either indoors (as dust) or outdoors. This worker is not involved in excavation work, but work activities may include outdoor maintenance activities such as light landscaping. Current and future occupational

workers may be exposed to constituents in soil to 2 feet bgs by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air; and inhalation of vapors migrating from subsurface soil and groundwater to indoor air. Potential exposure to constituents in groundwater may occur by ingestion as drinking water. Dermal contact with groundwater is not anticipated for the occupational worker. Additionally, dermal contact with, incidental ingestion of, and inhalation of ambient dust from subsurface soil (below 2 feet bgs) is not anticipated for the occupational worker.

Gasoline Range Organics (GRO): Consists of compounds that generally represent the gasoline range of petroleum hydrocarbons.

General Response Action: A broadly defined group, class, or type of action that could possibly be used to achieve the RAOs.

Groundwater: Water found beneath the earth's surface that fills pores between soil/sediment particles (such as silt, sand, or gravel) creating a saturated zone. In aquifers, groundwater is present in sufficient quantities that it can be used for drinking water, irrigation, or other purposes.

Human Health Risk Assessment: An estimate of the potential harmful effects humans may experience as a result of exposure to chemicals in contaminated soil or groundwater.

Hypothetical Future Resident: The on-site resident receptor is evaluated to address unrestricted land use, even where future residential land use is unlikely. This receptor is a standard child/adult resident who lives at the same location for multiple years and whose activities involve contact with soil and groundwater. Hypothetical long-term future residents may be exposed to constituents in soil to 15 feet bgs by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air; and inhalation of vapors migrating from subsurface soil and groundwater to indoor air. Hypothetical near-term future residents may be exposed to constituents in soil to 2 feet bgs by incidental ingestion, dermal contact, and inhalation of ambient dust and vapors in ambient air; and inhalation of vapors migrating from subsurface soil and groundwater to indoor air. Potential exposure to groundwater may occur by ingestion as drinking water and dermal contact. The long-term future resident scenario addresses residential development following deep excavation and redistribution of soil. The near-term future resident scenario addresses residential development without deep excavation; therefore, dermal contact with, incidental ingestion of, and inhalation of ambient dust from subsurface soil is not anticipated for near-term residents.

Landfarm: The Galena landfarm is treatment facility constructed by the Air Force and regulated by ADEC for remediating soil from the Former Galena FOL contaminated with petroleum, oils, and lubricants (POL). The Galena landfarm is a 2-acre site located 8 miles east of Galena on the old Campion Air Station airstrip. Petroleum contaminated soil is treated in the landfarm using naturally occurring microorganisms to biodegrade the contaminants. Once the petroleum concentrations meet the established cleanup criteria, the soil is moved to the City of Galena landfill for use as cover material.

Modifying Criteria: Modifying criteria for remedial alternatives, which include state and community acceptance, may be considered to the extent that information is available during the FS, but can be fully considered only after public comment on the PP is received. In the final balancing of trade-offs between alternatives upon which the final remedy selection is based, modifying criteria are of equal importance to the balancing criteria.

Monitored Natural Attenuation (MNA): The remedial approach that allows natural processes to reduce concentrations of contaminants to acceptable levels. MNA involves periodic monitoring of the impacts of physical, chemical, and biological processes that act to reduce the mass, toxicity, and mobility of subsurface contamination. Physical, chemical, and biological processes involved in MNA include biodegradation, chemical stabilization, dispersion, sorption, and volatilization.

National Contingency Plan (NCP): The National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), more commonly called the NCP, is the federal government's plan for responding to both oil spills and releases of hazardous substances (actual and potential). The NCP is at the heart of the National Response System, under which federal departments and agencies help state and local officials protect public health and the environment during hazardous materials emergencies, including emergency removal actions at hazardous waste sites.

Non- Carcinogenic Hazard Index: The measure used to describe the potential for non-cancer health effects to occur in an individual is expressed as a "*hazard index*". The hazard index is a comparison of the estimated exposure level (considering all contaminants present at the site and all potential pathways of exposure) to an exposure level that is considered to be without an appreciable risk of adverse effects (a "safe" level). If the hazard index (the ratio of the estimated exposure level to the "safe" exposure level) is less than 1, there is low potential for adverse human health effects resulting from exposure to contaminants at the site.

Plume: The volume of water, soil, or air impacted by the migration of contamination away from a given point of origin. The plume of a contaminant in groundwater is the volume of water which, as it moves underground, carries the contaminant with it. Portions of the plume close to the source will typically have higher concentrations than portions farther away from the source. Natural physical, chemical, and biological processes diminish the concentration levels as the water carries the contaminant away from the source.

Primary Balancing Criteria: Criteria used to weigh major trade-offs among remedial alternatives. The five criteria are long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost.

Principal Threat Waste: Principal threat wastes are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur.

Proposed Plan (PP): This document summarizes for the public the preferred cleanup strategy, rationale for the preference, and alternatives presented in the detailed analysis of the RI/FS. It must actively solicit public review and comment on all the alternatives under consideration.

Public Comment Period: The time period for the public to review and submit comment on various documents and actions. A comment period cannot be less than 30 days and upon timely request to the lead agency, the comment period will be extended by a minimum of 30 additional days.

Receptors: The organism(s) or ecological resource(s) of interest that might be adversely affected by contact or exposure to a stressor. "Stressor" means any physical, chemical or biological entity that can induce an adverse effect.

Record of Decision (ROD): A document that explains which cleanup alternative(s) will be used at a site or that justifies no further action. The ROD is based on information and technical analysis generated during the RI/FS and consideration of public comments and community concerns.

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

Remedial Action Objectives (RAOs): The specific goals for protecting human health and the environment. RAOs are developed by evaluating the ARARs that are protective of human health and the environment and results of the RIs, including the human and ecological risk assessments. RAOs provide a general description of what the cleanup will accomplish.

Remedial Alternatives: General response actions that have the potential to meet the RAOs for a specific site.

Remedial Design: The phase of the project where engineering plans, technical drawings, and specifications are developed for the selected cleanup plan.

Remedial Investigation (RI): A CERCLA process to determine the nature and extent of the contamination resulting from the release of a hazardous substance. The RI emphasizes characterization and associated data collection at hazardous waste sites.

Residual Range Organics (RRO): Consists of compounds that contain heavy fuel products such as Bunker C fuel or asphalt.

Source Area: Area where contamination originated or was released at the site, including soil that is contaminated as a result of contaminant migration. Source areas are typically located in unsaturated or variably saturated soil above the groundwater surface. ADEC regulatory guidance also considers a source area to include all areas of the site impacted with contamination above cleanup levels, including groundwater extent.

Threshold Criteria: Requirements that each remedial alternative must meet in order to be eligible for selection. They include overall protection of human health and the environment and compliance with ARARs.

Vapor Intrusion: The migration of released volatile chemicals from the subsurface into overlying buildings.

The Air Force encourages the public to comment on the remedial alternatives described in this Proposed Plan. Comments may be provided in writing or verbally at the community meeting to be held on October 26, 2016, at 7:00 p.m. at the Larsen Charlie Community Hall, Galena, Alaska. Written comments may be submitted using the comment form below. If additional space is needed, comments may be written neatly on plain white paper.

In addition, the Air Force welcomes written comments submitted directly to our office. Comments may be submitted to:

Mr. AL Weilbacher
2261 Hughes Ave. Ste 155
JBSA Lackland, TX 78236-9853
(210) 395-9421
Or via e-mail at adolph.weilbacher@us.af.mil

General Questions/Comments may also be referred to the Air Force Public Affairs team at (866) 725-7617 or afcec.pa@us.af.mil.

After the comment period closes on November 28, 2016, the Air Force will respond to all comments, which will be included in the responsiveness summary of the ROD.

Please complete the following information and mail to the address above or copy into an email to Mr. Weilbacher.

Name: _____
Address: _____
_____
Phone: _____
E-mail: _____

☐ I support the Air Force's preferred alternative
☐ I do not support the Air Force's preferred alternative

Additional Comments:

This page left intentionally blank.