

**THE UNITED STATES AIR FORCE
INSTALLATION RESTORATION PROGRAM**



INTERIM DECISION DOCUMENT

**PL001 AND SS086
EIELSON AIR FORCE BASE, ALASKA**

**PREPARED FOR:
AIR FORCE CIVIL ENGINEER CENTER
EIELSON AIR FORCE BASE, ALASKA**

**FINAL
MARCH 2019**

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
354 CES	354th Civil Engineer Squadron
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AR	Administrative Record
BTEX	benzene, toluene, ethylbenzene, and xylenes
BTV	background threshold value
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
CSM	conceptual site model
cy	cubic yards
DD	decision document
DRO	diesel-range organics
EDB	1,2 dibromoethane
EIAP	Environmental Impact Analysis Process
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
GIS	geographic imaging systems
GRO	gasoline-range organics
HRS	hydrant refueling system
IC	institutional control
LUC	land-use control
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ND	nondetect
OIT	Organic Incineration Technology, Inc.
PAH	polycyclic aromatic hydrocarbon

ACRONYMS AND ABBREVIATIONS (Continued)

PAL	project action limit
PCB	polychlorinated biphenyl
PID	photoionization detector
POL	petroleum, oil, and lubricants
RAO	remedial action objectives
RRO	residual-range organics
SVOC	semivolatile organic compound
Taxiway F	Taxiway Fox
Taxiway G	Taxiway Golf
USAF	U.S. Air Force
USC	United States Code
UST	underground storage tank
UU/UE	unlimited use and unrestricted exposure
VOC	volatile organic compound

1.0 SITE NAME AND LOCATION

Eielson Air Force Base (AFB) was established in 1944 with a mission to train and equip personnel for close air support of ground troops in an arctic environment; military operations have continued to the present. Current Eielson AFB operations include industrial areas, aircraft maintenance and operations, an active runway and associated facilities, and administrative offices, as well as residential and recreation facilities.

Eielson AFB was listed on the National Priorities List (54 Fed. Reg. 48184) on 21 November 1989 by the U.S. Environmental Protection Agency (EPA). This listing designated the facility as a federal Superfund site subject to the remedial response requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act.

In May 1991, the U.S. Air Force (USAF), the State of Alaska, and EPA entered into a Federal Facility Agreement (FFA) (USAF 1991) which established the procedural framework and schedule for developing, implementing, and monitoring CERCLA response actions. Under the FFA, the potential source areas were each placed in one of six operable units, based on similar contaminant and environmental characteristics, or were included for evaluation under a source evaluation report.

In April 2014, the USAF and the State of Alaska entered into the *State-Eielson AFB Petroleum Site Restoration Agreement* (USAF 2014d) in order to perform any necessary assessment, monitoring, remediation, and cleanup determinations for petroleum-contaminated sites at the Base. The sites included in this interim decision document (DD) are currently managed under the *State-Eielson AFB Petroleum Site Restoration Agreement* because the potential site contaminants are related to petroleum or petroleum constituents. Therefore, the USAF is the lead agency and the State of Alaska is the lead regulatory agency.

1.1 SOURCE AREA PL001 SUBSITES

Facility Name: Eielson AFB

Site Location: Eielson Airfield; near Aircraft Apron, access by Cargain Road near Mullins Pit Road, Eielson AFB, Alaska 99702 (Figure A-1)

Latitude and Longitude: 64.644652, -147.061947

ADEC Sites File and Hazard Identification Numbers: 107.38.106 and 4394

Operable Unit/Site: Not currently part of an Operable Unit/Source Area PL001

Facility Owner and Point of Contact: The facility owner is the U.S. government. The facility is managed by the USAF, whose point of contact is:

Mr. Gary Fink
AF Restoration Program Manager
10471 20th Street, Suite 302
Joint Base Elmendorf-Richardson, Alaska 99506-2200
Phone number: 907-552-8757

The Alaska Department of Environmental Conservation (ADEC) provides regulatory oversight of the environmental restoration actions at the site, in accordance with the *State-Eielson Air Force Base Petroleum Site Restoration Agreement* (USAF 2014d) and Article 3 of Alaska Administrative Code (AAC) Title 18, Chapter 75 (18 AAC 75) (ADEC 2018).

1.2 SOURCE AREA SS086 SUBSITES

Facility Name: Eielson AFB

Site Location: Eielson Airfield; Taxiway Golf (A through E), Sierra Apron, Apron near Building 1176, Taxiway Fox Repair Project near Building 4370; Eielson AFB, Alaska, 99702 (Figure A-1)

Latitude and Longitude: 64.662346,-147.093966; 64.674944, -147.103417; 64.670833, -147.099166; 64.653616, -147.080950

ADEC Sites File and Hazard Identification Numbers: 107.38.110 and 25729, 107.38.123 and 26155, 107.38.117 and 26000, 107.38.118 and 26001

Operable Unit/Site: Not currently part of an Operable Unit/Source Area SS086

Facility Owner and Point of Contact: The facility owner is the U.S. government. The facility is managed by the USAF, whose point of contact is:

Mr. Gary Fink
AF Restoration Program Manager
10471 20th Street, Suite 302
Joint Base Elmendorf-Richardson, Alaska 99506-2200
Phone number: 907-552-8757

ADEC provides regulatory oversight of the environmental restoration actions at the site, in accordance with the *State-Eielson Air Force Base Petroleum Site Restoration Agreement* (USAF 2014d) and Article 3 of 18 AAC 75 (ADEC 2018).

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2.0 SITE BACKGROUND

Source Area PL001 (Subsites A through M) is located within the south loop of the Eielson AFB airfield (Figure A-1). Source Area SS086 (Subsites A through G) is located along the main runway of the Eielson AFB airfield (Figure A-1). Each subsite boundary is defined as the point or area where contamination has been discovered. This interim DD outlines the known chemicals of concern (COCs) and the selected remedies for Source Areas PL001 and SS086. This interim DD is preceded by a Memorandum for Record that documents the boundaries for preliminary interim land use controls (LUCs) and long-term monitoring goals at SS086 and PL001, as agreed to by the Air Force Civil Engineer Center (AFCEC) and the ADEC (USAF 2016a). The following sections summarize site operational history, previous remedial investigations, the known or suspected sources of contamination, and the physical context of Source Areas PL001 and SS086.

2.1 OPERATIONAL HISTORY

Source Areas PL001 and SS086 have historically been—and will continue to be for the foreseeable future—within an active flight line on Eielson AFB. Source Area PL001 subsites are centered at the former Type I hydrant refueling system (HRS), installed in the mid-1950s and upgraded in 2005. Source Area SS086 subsites are located where fuel was released during aircraft operations, such as refueling of aircraft or overflow of aircraft fuel tank vents.

2.1.1 Source Area PL001

Source Area PL001 is tracked in the ADEC Contaminated Sites Database as File ID 107.38.106 and Hazard ID 4394. Fuel-contaminated soil was uncovered during excavation and construction activities to replace the Type I HRS with a Type III HRS (USAF 2013a). Source Area PL001 comprises approximately 235 acres and was divided into 13 subsites, A through M, in 2005 (Figure A-2). Of these subsites, 10 were related to the former HRS, two sites were related to contamination migration from the former HRS along buried utility structures, and one site was related to the historical burial of petroleum, oil, and lubricant

(POL)-soaked rags. A total of 12 underground storage tanks (USTs) were removed during excavation activities as part of the HRS upgrade project in 2005 and were designated as a separate source area, ST020. During 2014 field activities, the 13 subsites were regrouped into seven subsites based on proximity (USAF 2015d).

2.1.1.1 Known or Suspected Sources of Contamination

Historical contamination found within Source Area PL001 is related to the previously installed Type I HRS and aircraft operations. Investigations of the source area are summarized below from the Phase 1 source evaluation report (USAF 2013a), 2014 site characterization reports (USAF 2015c,d), and the addendum to the 2014 site characterization report (USAF 2016b).

During the initial source evaluation of Source Area PL001 (Figure A-2), NORTECH, Inc. collected 56 soil samples from Source Area PL001, Subsites A through M, adjacent to or overlapping Source Area ST020 refueling loops E-7, E-8, and E-9, as part of an initial source evaluation (NORTECH 2006). Soil samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX). Results indicated that BTEX constituents were present at 10 of the 13 PL001 subsites attributed to the former Type I HRS, two subsites were affected by contaminant migration from the Type I HRS along other buried utility structures, and one subsite was affected by the burial of rags soaked with POL (USAF 2013b). Samples collected from PL001 Subsites A and H contained analytes above ADEC Method Two migration to groundwater cleanup levels (ethylbenzene for Subsite A and benzene for Subsite H).

In addition to soil sampling during the 2005 source evaluation at Source Area PL001, 12 USTs were removed near pump houses 1305, 1321, and 1315 at Installation Restoration Program Source Area ST020. Each pump house was connected to one 50,000-gallon UST storing jet propellant 8 (JP-8) fuel and three 25,000-gallon USTs used as product return tanks. Field screening at the tank removal excavations consisted of 94 soil samples, of which 91 indicated the presence of hydrocarbons. Twenty-five soil samples were collected and submitted for laboratory analysis of gasoline-range organics (GRO), diesel-range organics (DRO), residual-range organics (RRO), BTEX, polycyclic aromatic hydrocarbons (PAHs),

and lead. Most of the target analytes were detected in the majority of samples, but only GRO and BTEX exceeded ADEC Method Two cleanup levels (USAF 2013b). Source Area ST020 includes contamination likely related to the E-7, E-8, and E-9 refueling pad complexes, which are underground POL storage areas, distinguishing the source area from PL001. Although Source Area ST020 is within Source Area PL001, it is governed under a separate DD.

In 2012, CH2M HILL conducted a follow-up source evaluation at Source Area PL001 to determine whether contaminants were still present in concentrations above ADEC cleanup levels at the HRS and UST excavation sites. Eight soil and four groundwater grab samples were collected at three boring locations and analyzed for GRO, DRO, RRO, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and total metals. Metals (arsenic in soil; arsenic and barium in groundwater) were present in concentrations exceeding ADEC cleanup levels and naturally occurring background values for Eielson AFB (USAF 2014b,c). Although the 2013 USAF Phase I Site Evaluation Report identified one sample with PCBs exceeding the groundwater screening level, this was found to be a reporting error during the planning process for a subsequent site characterization. The laboratory data report included with the Phase I Site Evaluation Report includes a “U” qualifier for the result in question that was not presented in the body of the Phase I report. PCBs are no longer considered a COC because PCBs were not found above cleanup levels in any of the Phase I samples, according to the laboratory data.

In 2014, site characterization at Source Area PL001 (Figure A-2) was conducted under the Compliance Restoration Program (USAF 2015c,d). Samples were collected from 51 soil borings and 46 temporary well points advanced at Subsites A through M. Soil and groundwater were analyzed for GRO, DRO, RRO, VOCs, SVOCs, and PAHs. Soil results from three borings at three separate subsites (D/E, G/L, M) exceeded cleanup levels for one or more of the following analytes: GRO, DRO, benzene, benzo(a)pyrene, and 1,2,4-trimethylbenzene (Appendix C, Table C-2). All other soil sample results were below cleanup levels.

Groundwater results from six locations across four subsites (D/E, F, G/L, M) exceeded the project action limits (PALs) for one or more of the following analytes: GRO, DRO, benzene, and benzo(a)pyrene. These results were broadly consistent with soil results, with the exception of one additional DRO exceedance at a downgradient site (Subsite F). All other groundwater sample results were below cleanup levels.

During 2015 site characterization activities, 11 soil samples were analyzed for GRO, DRO, VOCs, PAHs, and metals (USAF 2016b). Of the 10 primary soil samples and one duplicate sample analyzed by the offsite laboratory, no analytes exceeded cleanup levels except metals, and the majority of metals were below background threshold values (BTVs) (USAF 2014a). The observed sodium, calcium, and aluminum values were in higher concentrations than the BTVs, however, there are no cleanup levels for these metals. Local anomalies in calcium and sodium may be related to the usage of ice melting products (e.g., calcium chloride and sodium chloride) on nearby paved surfaces.

No groundwater samples collected in 2015 from the eight wells at Source Area PL001 contained contaminants above the cleanup levels (Figure A-2). Well 19PS20, located along the northeast edge of the south loop, contained detections of GRO, DRO, VOCs, and PAHs. Contamination in Well 19PS20 is likely from an upgradient source unrelated to site activities at PL001 based on the groundwater flow directions in that area and because Well 19PS20 is bounded by clean wells upgradient of Source Area PL001. Due to the presence of likely unrelated contamination in Well 19PS20, an additional point of compliance well (PL001MW04) is proposed in the event that this area is determined to be a critical compliance gap at the PL001 monitoring area (Figure A-2).

Three monitoring wells (19PS20, 09M03, 03M03B) contain arsenic above the 2015 cleanup level. Arsenic exceedances in these three wells were between 2.8 and 4.9 times the BTV in groundwater at Eielson AFB. These exceedances are likely due to reducing conditions related to fuel degradation causing the dissolution of iron oxyhydroxide mineral coatings and liberating iron, arsenic, and manganese.

Contamination at Source Area PL001 is generally confined to small areas near the runway or access road, likely resulting from small, incidental spills associated with the fuel distribution system. Although contamination has migrated to groundwater at Subsides D/E, F, G/L, and M, it appears to be attenuating quickly as the concentrations of contaminants decrease rapidly downgradient in a linear fashion (USAF 2015b,c). COCs remaining at Source Area PL001 include GRO, DRO, benzo(a)pyrene, benzene, and 1,2,4-trimethylbenzene, which are discussed in greater detail in Part 3.0.

2.1.2 Source Area SS086

The subsites along Taxiway Golf (Taxiway G) (Subsites A through E) are tracked in the ADEC Contaminated Sites Database as File ID 107.38.110 (Figure A-3). The Sierra Apron subsite is tracked in the ADEC Contaminated Sites Database as File ID 107.38.123 (Figure A-3). The Tanker Row Apron Repair (Subsite G) project subsite is tracked in the ADEC Contaminated Sites Database as File ID 107.38.117 (Figure A-3). The Taxiway Fox (Taxiway F) near Oscar subsite (Subsite F) is tracked in the ADEC Contaminated Sites Database as File ID 107.38.117 (Figure A-3). The source area is located along the main runway, where aircraft maneuver prior to takeoff or after landing. As part of these activities, past releases of aircraft fuel may have occurred during refueling of aircraft or overflow spillage from aircraft vents (USAF 2013a, 2014c). Impacted soil at Source Area SS086 was initially discovered in 2011 during a runway upgrade project involving the installation of runway edge lights and the construction of a 3-meter-wide shoulder at Taxiway G (USAF 2012). In 2012, additional impacted soil was encountered while extending concrete parking pads at Tanker Row and during the repair of Taxiway F near Building 4370 (ADEC 2013; USAF 2013a). In 2013, contaminated soil was found during the repair of Sierra Apron pads 1 through 3 (Exclusive Paving 2013).

2.1.2.1 Known or Suspected Sources of Contamination

Historical contamination found within the SS086 Source Area is related to past releases of aircraft fuel from the refueling of aircraft or overflow spillage from aircraft vents. Site investigations are summarized below from source evaluations (NORTECH 2006;

USAF 2013a); field reports (ADEC 2013; Exclusive Paving 2013); and the addendum to the 2014 site characterization report (USAF 2016b).

In 2011, as part of the runway upgrade project, GRO and DRO contaminated soil was identified by field screening with a photoionization detector (PID). Contaminated soil was removed during paving activities. To prevent damage to the taxiway surface, the five potentially affected areas were excavated to within 5 feet of the edge of the existing pavement. After excavation, the area was filled with clean gravel and fertilized. No confirmation samples were collected; the areas of interest were paved and are now covered by an active taxiway (USAF 2014c) (Figure A-3).

In 2012, additional impacted soil was encountered while extending concrete parking pads at Tanker Row and during repair work on Taxiway F near Building 4370 (ADEC 2013; USAF 2013b). Approximately 52 cubic yards (cy) of contaminated soil were removed from Tanker Row and transported to Organic Incineration Technology, Inc. (OIT) for thermal remediation. Contaminated soil was also removed at Taxiway F, but the full extent of contamination was not able to be removed due to the potential for damage to existing infrastructure. In 2013, DRO contaminated soil was found during the repair of Sierra Apron pads 1 through 3 (Exclusive Paving 2013). Methylene chloride and 1,2,3-trichloropropane were also detected in exceedance in the impacted soil. The methylene chloride exceedances are attributed to laboratory contamination. The 1,2,3-trichloropropane was only detected in a single stockpile sample and is not likely to remain in the impacted source area. Approximately 14 cy of contaminated soil was removed and transported to OIT Inc. for thermal remediation. The USAF, EPA, and ADEC agreed that Tanker Row, Taxiway F, and Sierra Apron Phase 1 and Phase 2 Source Evaluations were completed under the Eielson FFA and the sites would be managed under the Two-Party agreement (USAF 2017). Additionally, the USAF, EPA, and ADEC agreed that no further action was needed at Sierra Apron (USAF 2017).

In 2013, a Phase II Site Evaluation was conducted to follow-up on the reported soil contamination and evaluate groundwater conditions. Surface and subsurface soil samples were collected from six locations and analyzed for GRO, DRO, RRO, BTEX,

1,2-dibromoethane (EDB), PAHs, and lead. Four groundwater samples were collected from collocated soil borings and analyzed for GRO, DRO, BTEX, EDB, PAHs, and lead. All soil results were below cleanup levels (USAF 2014c). GRO and DRO were not detected in any of the groundwater samples. Ethylbenzene was detected in a groundwater sample from one temporary well (SS086-MW04) and toluene was detected in groundwater samples from three temporary wells (SS086-MW01, SS086-MW03, and SS086-MW04) but did not exceed cleanup levels. The Phase 2 Site Evaluation was not sufficient to qualify the site for “No Further Action” as it did not include investigation beneath the paved surface of the taxiway (USAF 2014c).

During the 2015 site investigations, existing Well 13MW16, located along the northern edge of the flight line, contained detections of GRO, VOCs, and PAHs (USAF 2016b) (Figure A-3). Well 87MW01 contained detections of VOCs and PAHs. Newly installed well AFMW01, located downgradient of Source Area SS086, contained detections of GRO, in addition to estimated concentrations of DRO and VOCs. Nine other monitoring wells across the study area contained PAHs and/or VOCs in estimated concentrations (qualified J). CMW-1, 13MW16, 87MW01, and AFMW01 contained arsenic above the cleanup level. Arsenic exceedances in these four wells were between 2.8 and 4.9 times the BTV in groundwater at Eielson AFB. Two of the wells (CMW-1 and AFMW01) with arsenic exceedances also exceeded the cleanup level for manganese at approximately 1.5 to 4 times the upper tolerance limit.

Contamination at Source Area SS086 is generally confined to small areas near the runway that may have occurred as the result of incidental spills during aircraft refueling or from overflow spillage from aircraft vents. Contamination appears to be confined to surface and near-surface soil; migration of contaminants to groundwater has not occurred at this time based on groundwater sampling results. The COCs remaining at Source Area SS086 include GRO and DRO, which will be discussed in greater detail in Part 3.0.

2.2 CLIMATE

Eielson AFB is situated in a continental climatic zone that covers Alaska's Interior. This climate zone is characterized by low precipitation and low humidity, both a result of the blockage of moist maritime air masses by the Brooks and Alaska Ranges. Central Alaska also experiences extreme seasonal fluctuations in daylight and temperature, owing to its high latitude (Péwé 1975). The average summer temperature is approximately 59 degrees Fahrenheit (°F) while the average winter temperature is -5°F. Annual precipitation averages approximately 11 inches of rain, in addition to an average of 65 inches of snow. Rainfall is generally highest in July and August (Alaska Climate Research Center 2016). Based on shallow groundwater and subsurface soil temperatures gathered during previous investigations, the average soil temperature at Eielson ranges between 3 and 5 degrees Celsius (USAF 2015c, d).

2.3 GEOLOGY

Eielson AFB occupies part of a tectonic basin filled with alluvium shed primarily from the Alaska Range. Along the eastern edge of the base, metamorphic bedrock (the Birch Creek Schist) crops out as the Yukon-Tanana Uplands. Moose Creek Bluff, a metamorphic bedrock inselberg, rises above the floodplain 3.4 miles to the northwest of the base. Tanana River deposits fill the basin beneath Eielson AFB and consist of unconsolidated fluvial sands and gravel, with minor to trace silt. Where unmodified by human activity, the uppermost 10 to 15 feet of basin fill commonly consists of silts and sands (Péwé and Reger 1983). Even at depth, this material is unconsolidated and lacks any degree of cementation.

2.4 HYDROGEOLOGY

The Alaska Range forms the southern margin of the Tanana Basin and supplies most of the water to this catchment basin in the form of glacier melt (Péwé and Reger 1983). The low hills of the Yukon-Tanana Upland to the north supply a smaller amount of water derived from snow melt and summer rains. In the Eielson-Fairbanks area, the floodplain of the Tanana River is approximately 11 miles wide.

The eastern portion of Eielson AFB is underlain by unconsolidated sediment that acts as an unconfined aquifer overlying fractured metamorphic bedrock. This aquifer extends from near the ground surface to a depth of approximately 250 to 400 feet. The hydrogeological properties of the bedrock are unknown, but it likely acts as an aquitard at depth. Some outcrops or shallow occurrences of bedrock locally produce usable quantities of water near the eastern edge of the AFB. Fractured bedrock is generally much less conductive than the fluvial soils of the unconfined aquifer. The aquifer's primary sources of recharge include the Tanana River, its tributaries, and the percolation of rainfall and snowmelt. The direction of groundwater flow in the shallow aquifer is north-northwest, which is parallel to the flow of the Tanana River. Flow may be locally influenced by buried stream channels where the hydraulic conductivity is greater than surrounding sediments, as well as local surface drainages, groundwater production wells, and zones of permafrost.

Based on automatic pressure transducer readings from wells across Eielson AFB from 1991 to 1994, the highest groundwater elevations occur during May and early June during the spring thaw, yielding seasonal fluctuations of approximately 2 feet (USAF 1995).

2.5 CURRENT AND ANTICIPATED FUTURE LAND USE

Source Areas PL001 and SS086 are located within an active airfield and are adjacent to paved taxiways and runways. The selected remedy identified in this interim DD will be assessed for protectiveness in the event of a land use change. The current industrial land use limits the potential receptors to commercial or industrial workers, site visitors, and construction workers.

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3.0 ASSESSMENT OF SITES

The following section presents the conceptual site models (CSMs) for Source Areas PL001 and SS086, COCs remaining onsite, and estimates of the lateral and vertical extent of contamination. The assessment presented below is limited by the accessibility of the source areas, which are located within an active airfield. Contamination may be present below paved taxiways and runways; however, further investigation would require significant disruption of flight line activities. The USAF distributed a memorandum to ADEC and EPA project managers to document the completion of the Phase I and Phase II source evaluations at Tanker Row, Taxiway F Repair, and Sierra Apron and to document no further action for Sierra Apron (USAF 2017). Although per- and polyfluoroalkyl substances were detected within the PL001 monitoring area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.

3.1 CONCEPTUAL SITE MODELS

The CSMs for the subsites included in Source Area PL001 were completed using analytical data from previous investigations and updated throughout the investigative process (USAF 2014c, 2015c,d). The CSM graphic and scoping forms are located in Appendix B. The historical release mechanisms at Source Area PL001 include spills, leaks, direct discharge from the previous Type I HRS, and the burial of rags coated with POL. Exposure media at Source Area PL001 identified in the current CSM include soil, groundwater, and air. The primary exposure pathways are ingestion, inhalation, and dermal contact of contamination in soil and groundwater. The potential groundwater exposure route is primarily for future users, of which, land-use controls (LUCs) currently prohibit the development of groundwater in the monitoring boundary for human consumption. The potential exposure pathway of air includes inhalation of outdoor air. Bioaccumulation of benzo(a)pyrene has not been considered because the site is located within an active airfield and is not used for hunting, subsistence, or farming. Current and future receptors for soil and groundwater media include commercial or industrial workers, site visitors, trespassers, recreational users, and construction workers. Future receptors may include residents, but this DD is only valid for the current land use,

under which there is not to be any residential development. In the event that land use changes, the selected remedy and LUCs must be re-evaluated.

Exposure media at Source Area SS086 include soil and groundwater (Appendix B). Historical release mechanisms at Source Area SS086 include incidental spills from aircraft operations and refueling. The potential exposure pathways for soil include incidental ingestion and dermal absorption of contaminants from soil. The primary exposure pathways in groundwater are ingestion, inhalation of volatile components, and dermal contact. The potential groundwater exposure route is primarily for future users; LUCs currently prohibit the development of groundwater in the monitoring boundary for human consumption. Current and future receptors for soil and groundwater media include commercial or industrial workers, site visitors, trespassers, recreational users, and construction workers. Future receptors may include residents, but this DD is only valid for the current land use, under which there is not to be any residential development. If land use changes, the selected remedy and LUCs must be re-evaluated.

3.2 CHEMICALS OF CONCERN

COCs present in soil at Source Area PL001 subsites are attributed to the decommissioned Type I HRS (Subsites A through E, G, H, L, and M), migration of contaminants from the decommissioned Type I HRS (Subsites J and K), and the burial of rags coated with POL (Subsite F) (USAF 2013b). Contamination at Source Area SS086 is consistent with incidental fuel spills that may have occurred during refueling of aircraft or overflow spillage from aircraft vents.

3.2.1 COCs Present at Source Area PL001

The COCs present at Source Area PL001 are fuel-related constituents; GRO, DRO, 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, ethylbenzene, naphthalene, and xylenes. These COCs have been detected within the source area in exceedance of soil and/or groundwater cleanup levels. Metals detected below BTVs have not

been included in this section as COCs because no anthropogenic source has been identified for the metals concentrations, which are likely caused by natural processes. Table 4-1 in Part 4 summarizes PL001 COCs. A listing of COC results within Source Area PL001 by subsite and the range of concentrations detected is located in Appendix C, Table C-1.

3.2.2 COCs Present at Source Area SS086

COCs identified within Source Area SS086 are GRO and DRO. The full extent of contamination has not been fully delineated due to the location of the site on an active flight line. These COCs have been detected within the monitoring area in exceedance of soil cleanup levels. Migration of contaminants to groundwater has not occurred at this time, according to groundwater sampling results. Table 4-2 in Part 4 summarizes SS086 COCs. A listing of COC results within Source Area SS086 by subsite and the range of concentrations detected is located in Appendix C, Table C-2.

3.3 LATERAL AND VERTICAL EXTENT OF CONTAMINATED AREA: SOURCE AREA PL001

Contamination at Source Area PL001 is generally confined to small areas near the runway or access road, consistent with the previously existing Type I HRS, migration of contaminants from the Type I HRS, and burial of POL-soaked rags. Soil contamination would only be expected to migrate downward to groundwater, attenuating slowly in the process. At Subsites C, D/E, F, G/L, and M, the contamination has migrated to groundwater, but appears to attenuate quickly in that medium, as the groundwater contamination at these sites only exceeds the PALs by a factor of 2.5 or less. Despite a maximum DRO concentration of 46 milligrams per liter (mg/L) at Subsite M, the concentration appears to decrease rapidly in the downgradient direction in a linear fashion, falling below the PAL less than 200 feet downgradient of the maximum concentration (USAF 2015c). It is unlikely that contamination will migrate offsite.

The nature of contamination in soil exceeding PALs at Source Area PL001 consists of GRO, DRO, 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene,

1,3,5-trimethylbenzene, benzene, benzo(a)anthracene, benzo(a)pyrene, ethylbenzene, naphthalene, and xylenes. Benzo(a)anthracene and benzo(a)pyrene were also discovered at a single location at Subsite D/E in the vadose zone at 8.75 feet below ground surface in 2014. GRO, DRO, 1-methylnaphthalene, 2-methylnaphthalene, 1,2,4-trimethylbenzene, benzene, ethylbenzene, naphthalene, and xylenes were discovered at a single location at Subsite G/L in soil below the groundwater interface at a depth of 7.5 feet below ground surface (USAF 2015d). The contamination is well delineated by clean sample results and appears to be localized, affecting only a small portion of each subsite.

The nature of contamination in groundwater exceeding PALs at Source Area PL001 consists of GRO, DRO, 1-methylnaphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, ethylbenzene, naphthalene, and xylene. Benzo(a)anthracene and benzo(a)pyrene was discovered at Subsite D/E, collocated with the soil boring containing the benzo(a)anthracene and benzo(a)pyrene exceedances. DRO was discovered at Subsite F at a single location. GRO, benzene, ethylbenzene, naphthalene, and 1,2,4-trimethylbenzene were encountered at Subsite G/L at a single location, collocated with the subsurface soil exceedances. The contamination is well delineated by clean sample results at Subsides D/E and G/L and appears to be collocated with the soil exceedances. At Subsite F, the DRO, naphthalene, and 1,2,4-trimethylbenzene contamination is bounded to the east and the south by clean sample results, but is generally unbounded to the west and the north.

3.3.1 Approximate Quantity of Contaminated Soil

The estimated quantity of contaminated soil at Source Area PL001 is approximately 170 cy at Subsite D/E, approximately 255 cy at Subsite G/L, and approximately 65 cy at Subsite M. The combined estimated quantity of soil at Source Area PL001 is 490 cy. The estimated quantity of contaminated soil was calculated using the inferred soil contamination boundaries from available sample results and soil boring depths from the 2014 and 2015 field investigations. The estimate was generated by obtaining the lateral square footage areas of the contaminated soil approximations using the Geographic Information Systems (GIS) 'calculate

area' function and applying vertical depth values from soil boring logs with soil analysis and PID readings.

3.4 LATERAL AND VERTICAL EXTENT OF CONTAMINATED AREA: SOURCE AREA SS086

Contamination within Source Area SS086 appears limited to surface and near-surface soil, in quantities consistent with incidental spills that may have occurred during refueling of aircraft or overflow spillage from aircraft vents. Migration of contaminants to groundwater has not occurred at this time, concluded by groundwater sampling results (USAF 2014c). Because Source Area SS086 is located within the airfield of Eielson AFB, the full extent of the contamination cannot be delineated at this time without significantly interfering with flight line operations. It is possible contamination exists below the taxiway, as is evident by recurring encounters with contaminated soil during improvement projects, but the full lateral and vertical extent of contamination has not been investigated and cannot be investigated under the current LUCs.

3.4.1 Approximate Quantity of Contaminated Soil

The calculated estimated quantity of contaminated soil at Source Area SS086 is an approximation determined from the available data. The estimated quantity of contaminated soil at Source Area SS086 is approximately 28 cy at the Sierra Apron Repair subsite, 28 cy at the Tanker Row subsite, 28 cy at the Taxiway F subsite, 51 cy at Subsite A, 40 cy at Subsite B, 39 cy at Subsite C, 47 cy at Subsite D, and 44 cy at Subsite E. The combined total of estimated contaminated soil is 305 cy and was calculated using the GIS 'calculate area' function and the inferred soil contamination boundaries from available sample results and soil boring depths from the 2014 site investigation (USAF 2014c).

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4.0 DESCRIPTION OF SELECTED REMEDY

This interim DD presents the selected remedies for petroleum-related contamination in soil and groundwater within Source Areas PL001 and SS086. This interim DD is needed because the full extent of contaminated soil and groundwater could not be established or active treatment options could not be implemented on the runway and taxiways without critically disrupting the Eielson AFB mission.

The selected remedies were chosen by the USAF in accordance with State of Alaska regulations (18 AAC 75), as documented in the *Addendum to the 2014 Site Characterization Report at Source Area PL001 and 2014 Phase 2 Source Evaluation Report at Source Area SS086* (USAF 2016b). By signing this DD, ADEC agrees that the selected remedies when properly executed comply with state law. The USAF is managing remediation of contamination at Source Areas PL001 and SS086 on Eielson AFB in accordance with the *State-Eielson AFB Petroleum Site Restoration Agreement* signed in April 2014 (USAF 2014d) and the Defense Environmental Restoration Program (Title 10 of the U.S. Code [USC] §2701 et seq.; Executive Order 125080; 52 Federal Register 2923 [23 January 23 1987]). Petroleum is excluded as a CERCLA hazardous substance pursuant to 42 USC 9601(14).

4.1 SELECTED REMEDIES FOR SOURCE AREAS PL001 AND SS086

The selected remedies for Source Areas PL001 and SS086 are as follows:

- Monitor natural attenuation of groundwater at PL001 and SS086 points of compliance until cleanup levels are achieved.
 - Establish groundwater monitoring areas that incorporate the entire south loop and main runway area.
 - Establish points of compliance for groundwater monitoring downgradient of the PL001 and SS086 monitoring areas.
- Maintain institutional controls (ICs) prohibiting the use of, and restricting the access to, groundwater or soil until cleanup is complete.

A monitoring area for Source Area PL001 is established, incorporating the entire south loop and PL001 sub-sites. Similarly, a monitoring area for Source Area SS086 is established,

incorporating the main runway. Due to the difficulties in investigating and monitoring contamination within the flightline restricted areas, the monitoring areas will be managed in their entirety, rather than by source area subsites. Points of compliance will be established downgradient of the monitoring areas to determine if contaminants from specific subsites are migrating out of the south loop (PL001) or main runway (SS086) areas. The points of compliance will be monitored for the COCs specified in Tables 4-1 and 4-2.

Monitored natural attenuation and ICs are the interim remedial actions to manage contaminated groundwater within the monitoring boundaries until land use changes. As discussed above, site usage and large paved areas that cannot be disturbed limit the options for soil remedial action and further site characterization. Remedial action alternatives will be revisited if land use changes or if contamination starts migrating beyond the monitoring area boundaries at concentrations above cleanup levels. Excavation is not considered to be a viable remedial action at this time due to the proximity of the active airfield and taxiways to the Source Area PL001 and SS086 subsites and the unacceptable interruption to base operations that it would cause.

ICs prohibiting unauthorized access to soil and groundwater are in place, and will be retained until groundwater within the monitoring area boundaries is acceptable for unlimited use and unrestricted exposure (UU/UE). The points of compliance will be sampled on an annual basis to record groundwater migrating out of the monitoring area boundaries over time. Monitoring will include sampling wells PL001MW02, PL001MW03, 09M03, 03M03B, and MW-BKG-07 to monitor groundwater of the PL001 monitoring area. Monitoring will include sampling wells 13MW16, 87MW01, 45MW32, 44MW13, 44MW03, CMW-1, AFMW01, AFMW02, and AFMW03 to monitor the groundwater of the SS086 monitoring area (Figure A-3). Groundwater monitoring shall be conducted annually unless the USAF and ADEC agree to a different monitoring frequency. Previous investigations concluded that contamination at Source Areas PL001 and SS086 resulted from incidental releases in the past, therefore it is expected that groundwater contamination will attenuate over time.

4.2 CLEANUP LEVELS FOR COCS AT PL001 MONITORING AREA

The regulatory-based cleanup levels for the PL001 monitoring area are shown in Table 4-1. The soil cleanup levels are in accordance with 18 AAC 75 Table B1, Method Two migration to groundwater and Table B2, Method Two under 40-inch zone, migration to groundwater (ADEC 2018). The groundwater cleanup levels are in accordance with 18 AAC 75 Table C (ADEC 2018).

**Table 4-1
 Cleanup Levels of COCs at PL001**

COCs	Soil Cleanup Level ¹ (mg/kg)	Groundwater Cleanup Level ² (mg/L)
GRO	300	2.2
DRO	250	1.5
1-Methylnaphthalene	0.41	0.011
2-Methylnaphthalene	1.3	0.036
1,2,4-Trimethylbenzene	0.61	0.056
1,3,5-Trimethylbenzene	0.66	0.060
Benzene	0.022	0.0046
Benzo(a)anthracene	0.70	0.00030
Benzo(a)pyrene	1.9	0.00025
Benzo(b)fluoranthene	20	0.0025
Ethylbenzene	0.13	0.015
Naphthalene	0.038	0.0017
Xylenes	1.5	0.190

Notes:

¹18 AAC 75 Table B1, Method Two migration to groundwater and Table B2, Method Two under 40-inch zone migration to groundwater (ADEC 2018)

²18 AAC 75 Table C, groundwater cleanup levels (ADEC 2018)

For definitions, refer to the Acronyms and Abbreviations section.

4.3 CLEANUP LEVELS FOR COCS AT SS086 MONITORING AREA

The regulatory-based cleanup levels for the SS086 monitoring area are shown in Table 4-2. The soil cleanup levels are in accordance with 18 AAC 75 Table B1, Method Two migration to groundwater and Table B2, Method Two under 40-inch zone migration to groundwater (ADEC 2018). The groundwater cleanup levels are in accordance with 18 AAC 75 Table C (ADEC 2018).

**Table 4-2
 Cleanup Levels of COCs at SS086**

COCs	Soil Cleanup Level¹ (mg/kg)	Groundwater Cleanup Level² (mg/L)
GRO	300	-
DRO	250	-

Notes:

¹18 AAC 75 Table B1, Method Two migration to groundwater and Table B2, Method Two under 40-inch zone migration to groundwater (ADEC 2018)

²18 AAC 75 Table C, Groundwater Cleanup Levels (ADEC 2018)

- Not a COC in the specified media

For definitions, refer to the Acronyms and Abbreviations section.

4.4 REMEDIAL ACTION OBJECTIVES

The remedial action objectives (RAOs) for PL001 and SS086 monitoring areas detailed in this interim DD were selected to protect human health and the environment. RAOs for the monitoring areas are listed below:

- Restrict the use of soil above the DD cleanup levels within the PL001 or SS086 monitoring boundary.
- Restrict the use of groundwater above the DD cleanup levels within the PL001 or SS086 monitoring boundary.
- Prevent human exposure to soil and groundwater contamination above PL001 or SS086 DD cleanup levels.

5.0 WASTE MANAGEMENT

Waste generated during implementation of the selected remedies for the PL001 and SS086 monitoring areas will include purge water from groundwater sampling at points of compliance. No hazardous waste has been identified at these source areas. Waste with POL contamination will be characterized, transported, and treated at an approved treatment facility in accordance with 18 AAC 75. Specific details regarding disposal and treatment will be described in a work plan provided to ADEC for review and approval prior to any removal activities.

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6.0 LAND-USE CONTROLS

LUCs are legal, administrative, and/or physical mechanisms for implementing restrictions to land use and access in order to limit the exposure of future landowners and/or users of the property to hazardous or toxic substances and/or to maintain the integrity of the remedial action until the property is suitable for UU/UE. The USAF is responsible for implementing, maintaining, reporting on, and enforcing the LUCs. The USAF shall retain ultimate responsibility for remedy integrity.

LUCs shall be implemented in accordance with the *Land-Use Control Implementation Plan, Eielson Air Force Base, Alaska* (USAF 2015a) and the *Air Force Land-Use Control Checklist for Active-Duty Bases on the National Priorities List (NPL)* (USAF 2015b):

1. Resource Uses and Risk-Exposure Assumptions.

- a. The state has designated all groundwater of the state as potential drinking water. The base currently does not use shallow groundwater as a drinking water source and does not plan on doing so in the future (as it obtains drinking water from deep wells located approximately 1 mile to the north [downgradient]). However, to assess the need for LUCs, contamination present in the groundwater was assessed for risk under a drinking water use scenario.
- b. The Base General Plan designates land use at these source areas as industrial, for both current and future classification. However, to assess the need for LUCs, contamination at the source areas was assessed for UU/UE, particularly residential use.

2. Risks Necessitating the LUCs.

- a. Shallow groundwater is not safe for drinking water because it is contaminated at levels that exceed cleanup levels. Accordingly, the base must impose LUCs to ensure the groundwater is not used for drinking water purposes until it is remediated to project cleanup levels.
- b. Existing soil contamination is not safe for residential use or for onsite industrial or construction workers involved in soil disturbance. LUCs are therefore necessary to preclude such uses and to control the disposition and use of any soil excavated from the source areas.

3. Performance Objectives.

- a. Prevent access to or use of the groundwater until project cleanup levels are met.
- b. Prohibit the development and use of property for residential housing, elementary and secondary schools, or child care facilities and playgrounds.
- c. Prevent the use of contaminated soil for restricted uses in the event of excavation.

4. **Location of LUCs.** The LUC areas are the same as PL001 and SS086 monitoring areas, extending 200 feet beyond the monitoring areas. The LUC areas are the same as the interim LUC areas, which is defined by the boundaries of PL001 and SS086 monitoring areas.
5. **Duration of LUCs.** LUCs will be maintained until the concentration of hazardous substances in the soil and groundwater are at levels that allow for UU/UE.
6. **Description of Each LUC and How It Achieves a Specific LUC Performance Objective.**
 - a. The base construction review process will prevent ground-disturbing construction activities or ensure safe soil management procedures in areas with residual contamination. The base construction review process will also prevent any use of potentially contaminated groundwater for drinking water. The base construction review process is implemented by the 354th Civil Engineer Squadron (354 CES). As part of this process, the contaminated sites review is conducted by AFCEC.
 - b. The base Environmental Impact Analysis Process (EIAP) will assess the potential environmental impact of any action proposed at the source areas. The EIAP is implemented by 354 CES.
 - c. All DD use limitations and exposure restrictions shall be entered in the Base General Plan and the GeoBase geographical information system by 354 CES within 30 days after DD signature
7. **General Performance Responsibility.** The Air Force is responsible for implementing, maintaining, monitoring, reporting and enforcing LUCs.
8. **Specific Performance Responsibility to Bind Contractors and Tenants.** The Air Force shall inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors and other authorized occupants of the source areas regarding the LUCs affecting the source areas.
9. **Specific Performance Responsibility for Transferring Sites.** Although the Air Force may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Air Force shall retain ultimate responsibility for remedy integrity.
10. **Corrective Measures Requirement.** Any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs will be addressed by the Air Force as soon as practicable, but in no case will the process be initiated later than 10 days after the Air Force becomes aware of the breach.
11. **Notification Requirement.** The Air Force will notify ADEC as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The Air Force will notify ADEC regarding how the Air Force has addressed or will address the breach within 10 days of sending ADEC notification of the breach.

12. **Notification to ADEC Regarding Land-Use Changes.** The Air Force shall notify ADEC 45 days in advance of any proposed land-use changes that are inconsistent with LUC objectives or the selected remedy.
13. **Notification of Transfers.** The Air Force must provide notice to ADEC at least six months prior to any transfer or sale of property containing LUCs so that ADEC can be involved in discussions to ensure that appropriate provisions are included in the transfer or conveyance documents to maintain effective LUCs. If it is not possible for the facility to notify ADEC at least six months prior to any transfer or sale, then the facility will notify ADEC as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to LUCs. The Air Force agrees to provide ADEC with such notice, within the same time frames, for federal-to-federal transfer of property accountability. The Air Force shall provide either access to or a copy of the executed deed or transfer assembly to ADEC.
14. **Concurrence Language.** Eielson AFB shall not modify or terminate LUCs, implementation actions, or land uses that are associated with the selected remedy without the approval of ADEC. Eielson AFB shall seek prior concurrence of ADEC before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs.
15. **Monitoring and Reporting Language.** Monitoring of the environmental use restrictions and controls will be conducted annually by the Air Force. The monitoring results will be included in a separate report or as a section of another environmental report, if appropriate, and provided to ADEC. The annual monitoring reports will be used in preparation of Periodic Review if conducted as a matter of policy, to evaluate the effectiveness of the remedy.

The annual monitoring report, submitted to the regulatory agencies by the Air Force, will evaluate the status of the LUCs and how any LUC deficiencies or inconsistent uses have been addressed or if not addressed, how they will be addressed.

16. **Mechanism for Achieving LUC Performance.** The internal procedures that Eielson AFB will use to implement the LUCs include but are not limited to the following:
 - a. **Base Civil Engineer Work Requests** – One tool for achieving the LUC performance objectives is the AF Form 332 (AF332) or Base Civil Engineer Work Request. This form must be submitted and approved before the start of any construction project at Eielson AFB. One step in the approval process for this form is a comparison of the construction site with all constraints that are described in the Base General Plan. The AF332 serves as the document for communicating any construction constraints to the appropriate offices. Any constraints at the site will result in the disapproval of the form unless the requester makes appropriate modifications to the construction plans.
 - b. **Excavation Permits** – Eielson AFB also uses AF Form 103, Base Work Clearance Request or Excavation Permit to enforce soil and sediment disturbance restrictions. The requester submits the permit to the Civil Engineer Squadron for any project that involves mechanical soil or sediment excavation, such as trench digging for underground utilities or soil excavation for building foundations. If constraints

involving soil disturbance or worker safety exist at the excavation area, the permit describes the appropriate procedures that workers must implement before the start of excavation to prevent unknowing exposure to contamination.

- c. **The Base Environmental Impact Analysis Process (EIAP)** – The EIAP is conducted pursuant to the National Environmental Policy Act, as promulgated for the USAF in 32 CFR 989, to assess the potential environmental impact of any federal action initiated by or involving Eielson AFB. An AF Form 813 (AF813) initiates the EIAP. Both AF332 and excavation permits are subject to an evaluation under the EIAP. The proponent of a proposed action is required to submit the AF332 or excavation permit with AF813 so that the appropriate environmental analysis of the proposed action and alternatives to the proposed action is accomplished prior to any construction or excavation activities. The EIAP works to ensure proposed construction and excavation sites take into account the constraints that are described in the Base General Plan and known to the AFCEC Environmental Restoration Installation Support Team. The EIAP also ensures that all environmental factors, such as LUCs, are considered in the selection of locations for construction projects.
- d. **Eielson AFB General Plan** – The Base General Plan is a long-range planning tool that designates current and future land uses. It also provides a framework for selecting the locations of future facilities needed to carry out the Base mission. The Base General Plan describes the specific LUCs for each site, the reasons for the controls, and the areas where the controls are applied. For a LUC to remain protective, base personnel must have access to information concerning its existence, purpose, and maintenance requirements. The Base General Plan provides the important information to ensure that LUC management takes place and that the LUC's presence is effectively communicated.
- e. **Base Well Permitting System** – All Eielson AFB groundwater monitoring, extraction, and injection wells are managed under the GeoBase and Installation Real Property facility. Approval of the construction of new wells is received during the regulatory review and acceptance of work plans for groundwater remedial actions and technology demonstration projects. All modifications to the Eielson AFB well network receive base approval through the submission and approval of the AF Form 332 and the AF Form 103, as described in paragraph 16 a.

The USAF will notify ADEC in advance of any changes to internal procedures associated with the selected remedy that might affect the LUCs.

Implementation of these LUCs will replace interim LUCs and will meet the requirements of the *Settlement Agreement (IC/LUC)* between the USAF, ADEC, and EPA (USAF 2013c).

7.0 SCHEDULE

Wells PL001MW02, PL001MW03, 09M03, 03M03B, and MW-BKG07 will be monitored for contaminants leaving the PL001 monitoring area. An additional compliance monitoring well, PL001MW04, is proposed for monitoring the PL001 monitoring area. Wells 13MW16, 87MW01, 45MW32, 44MW13, and 44MW03, and sentry wells AFMW01, CMW-1, AFMW02, and AFMW03 will be monitored for contaminants leaving the SS086 monitoring area. Point of compliance monitoring wells will be sampled annually.

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8.0 COMMUNITY PARTICIPATION

An Administrative Record (AR) has been established for Eielson AFB by the 354 CES Environmental Restoration Section. The AR is the legal record for the Environmental Restoration Program process at USAF installations and includes copies of all technical reports, regulatory correspondence, meeting minutes, and other documents relied upon for restoration decisions. The AR is available electronically at <http://afcec.publicadmin-record.us.af.mil/>. The USAF contact for public affairs is Captain Luke Nimmo, Eielson AFB 354th Fighter Wing Public Affairs. He can be reached at 907-377-2116.

Upon finalization and approval of this DD by the USAF and ADEC, the DD will be made available by adding the document to the AR. The AR contains the information that has been used to support USAF decision-making and is accessible to the public. The public will be informed of the availability of the final DD by the USAF through a published notice in a local major newspaper. The notice shall include a brief description of the final DD for PL001 and SS086 monitoring areas.

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9.0 REOPENER CLAUSE AND SIGNATURE BLOCK

The final compliance determination will be made by ADEC, in accordance with 18 AAC 75.380, utilizing all applicable cleanup levels and maximum concentrations remaining at Source Areas PL001 and SS086. After reviewing the final cleanup report ADEC will determine if Source Areas PL001 and SS086 have been adequately characterized under 18 AAC 75.335 and have achieved the applicable requirements under the site cleanup rules. Once ADEC has determined that Source Areas PL001 and SS086 have been adequately characterized within the limited ability to access soil contamination beneath the active flight line, and meets the applicable requirements under the site cleanup rules, ADEC will issue a written determination that the cleanup is complete under the current LUCs. The determination may be reviewed and modified in the future if new information becomes available indicating the presence of contaminants, exposures that may cause unacceptable risk to human health or the environment, or a change in current land use. ADEC will, as necessary to ensure protection of human health, safety, or welfare, as well as of the environment, require a responsible person to conduct additional actions that meet the requirements.

AUTHORIZING SIGNATURES

This signature sheet documents the decision made for petroleum contamination at Source Areas PL001 and SS086 on Eielson AFB.

The USAF has selected the remedies. This decision will be reviewed and may be modified in the future if information becomes available that indicates the presence of contaminants or exposures that may cause unacceptable risk to human health or the environment. If additional contaminants are discovered, the USAF and ADEC will determine compliance levels for soil and groundwater cleanup actions.



JASON S. CAMPBELL, Colonel, USAF, P. E.
Deputy Director Environmental Management
Air Force Civil Engineer Center

14 Nov 19


Date

AUTHORIZING SIGNATURES

This signature sheet documents the decision made for petroleum contamination at Source Areas PL001 and SS086 on Eielson AFB.

The USAF has selected the remedies. By signing this declaration, ADEC concurs that proper implementation of the selected remedies will comply with State of Alaska environmental laws.

This decision will be reviewed and may be modified in the future if information becomes available that indicates the presence of contaminants or exposures that may cause unacceptable risk to human health or the environment. If additional contaminants are discovered, the USAF and ADEC will determine compliance levels for soil and groundwater cleanup actions.



MELINDA BRUNNER,
DSMOA Manager, Contaminated Sites Program
Alaska Department of Environmental Conservation

18 Nov 2019

Date

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10.0 REFERENCES

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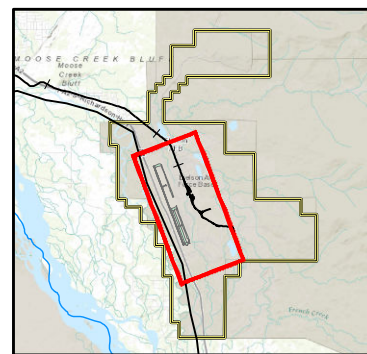
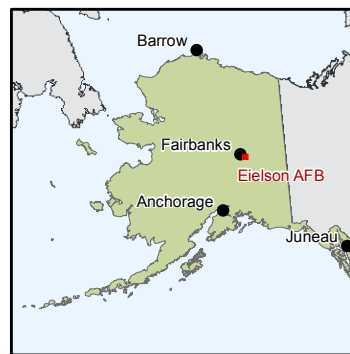
APPENDIX A

Figures



Image Source: GeoBase, 2012

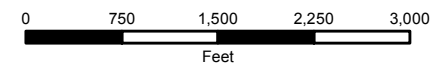
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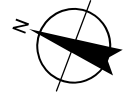
Legend

- PL001 South Loop and SS086 Monitoring Boundary
- Railroad

← *Approximate Regional Groundwater Flow Direction (2013 IWMP)*



1 inch equals 1,500 feet
WGS 1984 UTM Zone 6N



SS086 AND PL001 SITE LOCATION & VICINITY MAP			
EIELSON AIR FORCE BASE, ALASKA			
JACOBS	DATE: 28 APR 2016	PROJECT MANAGER: K. MAHER	FIGURE NO: A-1

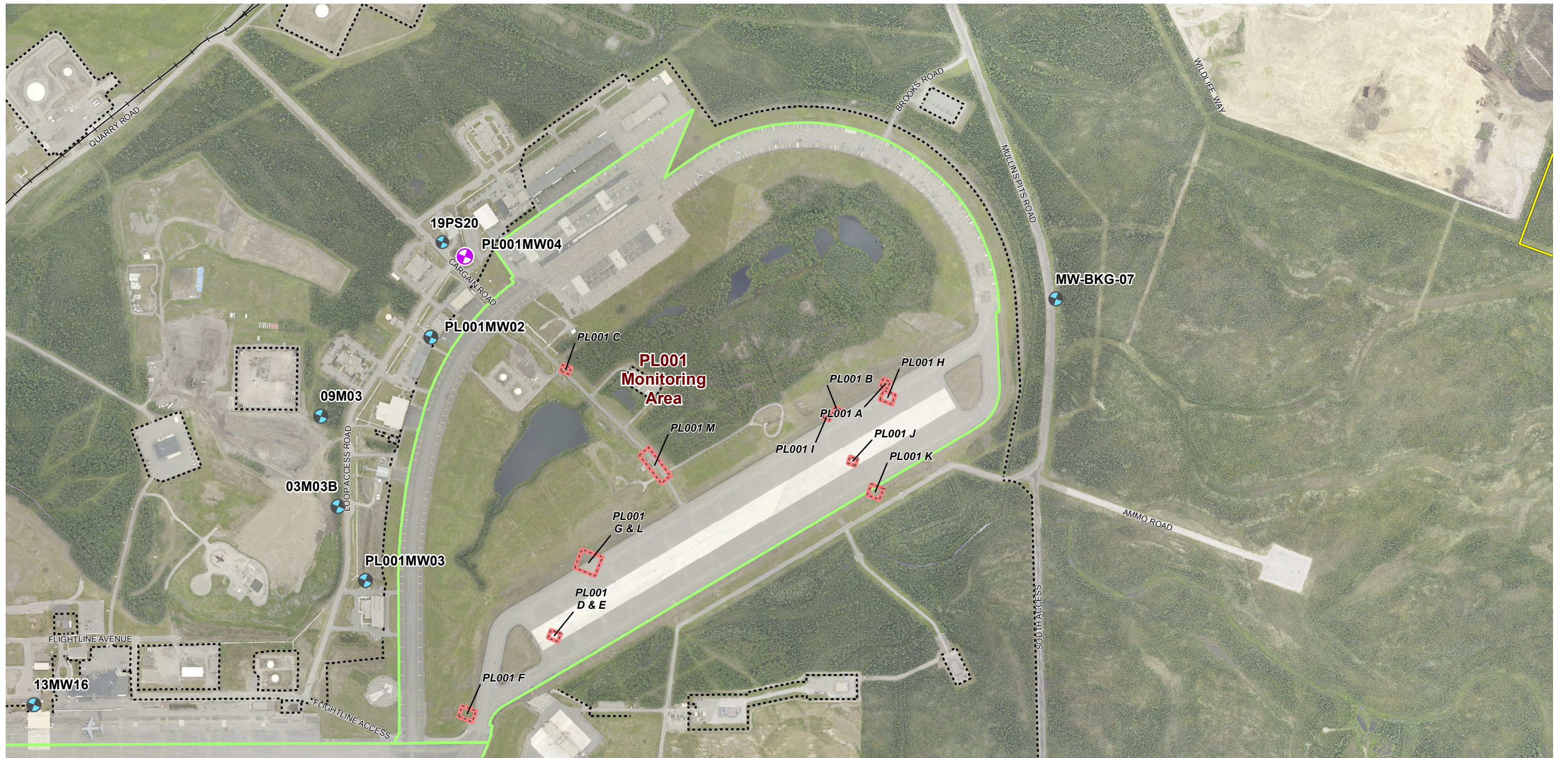
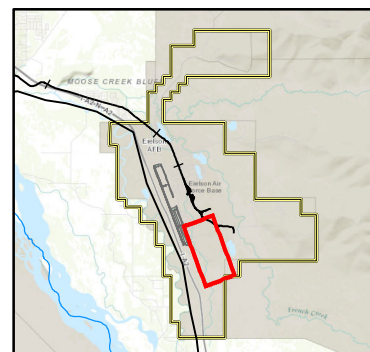
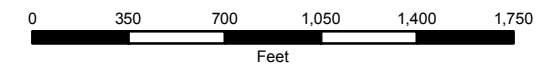


Image Source: GeoBase, 2012



- Proposed Permanent Monitoring Well
- Existing Monitoring Well
- Fence
- PL001 Subsite Location
- PL001 and SS086 Monitoring Boundary

← Approximate Regional Groundwater Flow Direction (2013 IWMP)



1 inch = 699 feet
WGS 1984 UTM Zone 6N



PL001 MONITORING AREA PROPOSED LONG TERM MONITORING LOCATIONS		
EIELSON AIR FORCE BASE, ALASKA		
JACOBS	DATE: 11 JAN 2017	PROJECT MANAGER: K. MAHER
		FIGURE NO: A-2

P:\AK_Eielson_AFB\GIS\MAXD17EL_PBR\PL001_SS086 DD\PL001_WellLocations.mxd huffha

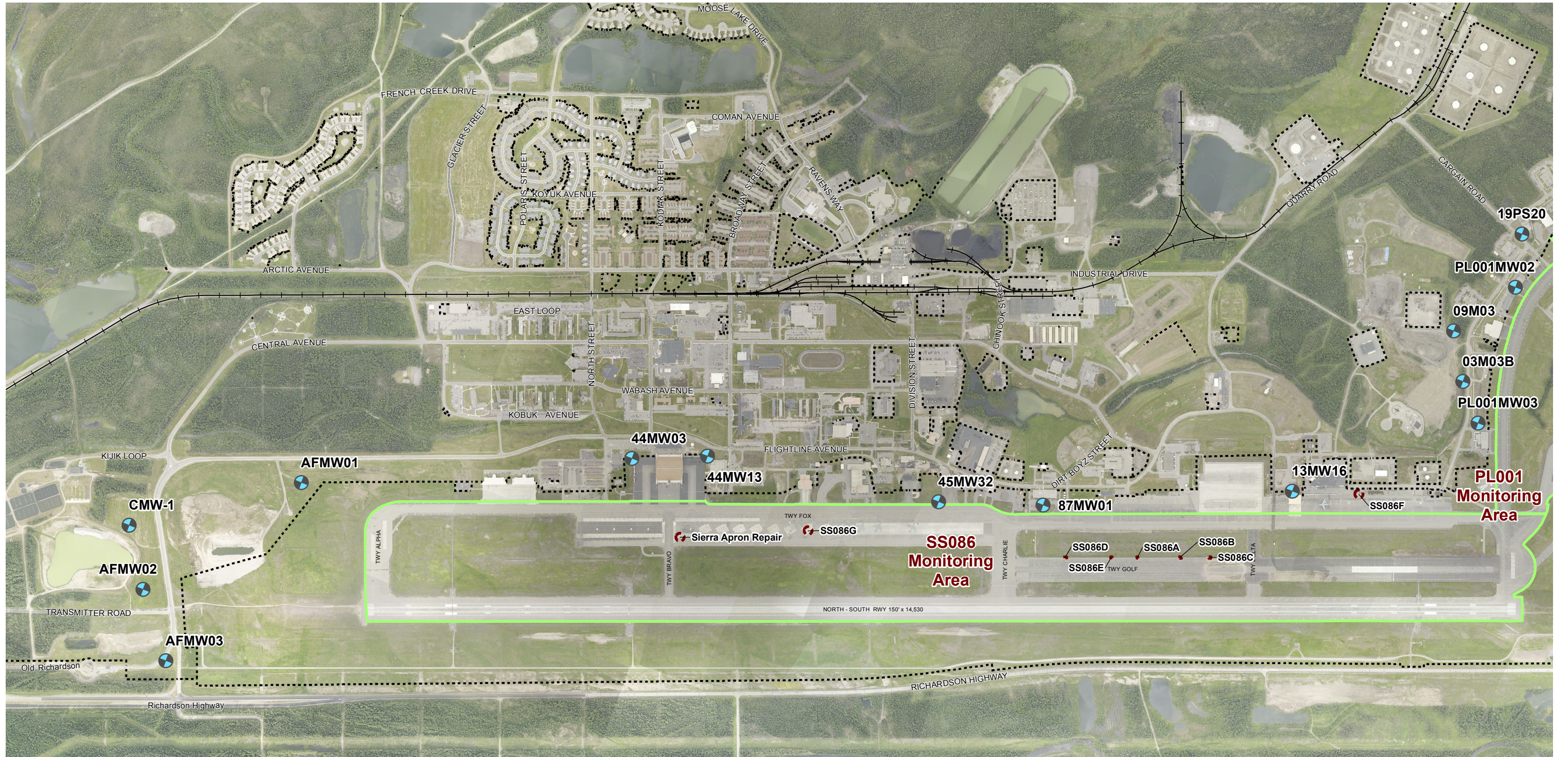
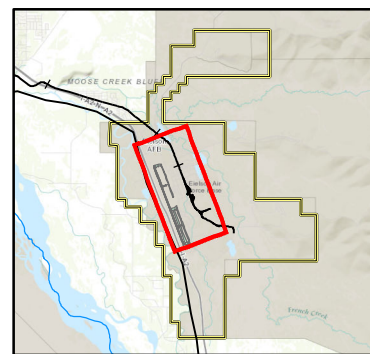
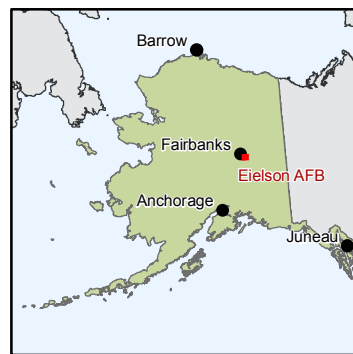


Image Source: GeoBase, 2012



- Existing Monitoring Well
- Fence
- SS086 Subsite Location
- PL001 and SS086 Monitoring Boundary

←
Approximate
Regional
Groundwater
Flow Direction
(2013 IWMP)



1 inch = 1,250 feet
WGS 1984 UTM Zone 6N



SS086 MONITORING AREA PROPOSED LONG TERM MONITORING LOCATIONS			
EIELSON AIR FORCE BASE, ALASKA			
JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO.:
	31 JAN 2017	K. MAHER	A-3

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APPENDIX B
Conceptual Site Models

Human Health Conceptual Site Model Scoping Form

Site Name:

File Number:

Completed by:

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input checked="" type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: <input type="text" value="Contamination is most likely resulting from the previous Type I HRS and the burial of POL soaked rags"/> |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Spills | <input checked="" type="checkbox"/> Direct discharge |
| <input checked="" type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input checked="" type="checkbox"/> Other: <input type="text" value="Burial of contaminated material."/> |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|-------------------------------------------------------------------|------------------------------------------------------|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: <input type="text"/> |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--------------------------------------------------------------------------|-------------------------------------------------------|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input checked="" type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: <input type="text"/> |

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

If the box is checked, label this pathway complete:

Complete

Comments:

DRO, benzo(a)pyrene, and 1,2,4-trimethylbenzene exceed their clean-up levels in soil from 1 to 14 feet bgs.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

PAHs (benzo[a]pyrene) are able to permeate the skin.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

If both boxes are checked, label this pathway complete:

Complete

Comments:

GRO, DRO, benzene, and benzo(a)pyrene exceed their clean-up levels. Although per- and polyfluoroalkyl substances (PFAS) were detected within the PL001 Monitoring Area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

No surface water bodies could be affected by any of the subsites.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

Although PAHs have the ability to bioaccumulate, this developed site is not likely to be used for hunting, fishing, or harvesting wild or farmed foods.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

GRO and 1,2,4-trimethylbenzene exceed their clean-up levels in soil at 14 feet bgs.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



If both boxes are checked, label this pathway complete:

Complete

Comments:

Volatile contaminants are present, and future buildings cannot be ruled out.

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:



Comments:

Benzo(a)pyrene is able to permeate the skin and is exceeds its cleanup level in groundwater. Although PFAS were detected within the PL001 Monitoring Area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:



Comments:

Benzene exceeds its cleanup level in groundwater and is a volatile of concern.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:

Comments:

Benzo(a)pyrene exceeds its cleanup level in shallow soil, but nuisance dust is not present due to vegetative cover.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:

Comments:

No surface water bodies could be affected by any of the subsites.

4. Other Comments (*Provide other comments as necessary to support the information provided in this form.*)

Although PFAS were detected within the PL001 Monitoring Area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: PL001 (Former Hydrant Refueling System), Eielson AFB
ADEC File No. 107.38.106

Completed By: Jacobs Engineering Group Inc.
 Date Completed: 02 November 2016

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Check the media that could be directly affected by the release.	(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.
Media	Transport Mechanisms
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).	(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.	(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.						
Exposure Media	Exposure Pathway/Route	Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust	F	C/F	C/F	C/F			
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	F	C/F	C/F	C/F			
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust	F	C/F	C/F	C/F			
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

Human Health Conceptual Site Model Scoping Form

Site Name: SS086 (Airfield), Eielson AFB

File Number: 107.38.110

Completed by: Jacobs Engineering Group Inc.

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|-------------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> USTs | <input checked="" type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input checked="" type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input checked="" type="checkbox"/> Other: Aircraft |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input checked="" type="checkbox"/> Other: Additional sources are unknown; may be attributed to handling or disposal of aircraft fuel. |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|-------------------------------------------------------------------|-------------------------------------------------|
| <input checked="" type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input checked="" type="checkbox"/> Other: This is an interim action and dependent on current land use. |

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

If the box is checked, label this pathway complete:

Complete

Comments:

PAHs were identified in surface and subsurface soil. The source areas have not been fully delineated due to their adjacency to the flight line. DRO and GRO are present in exceedance of cleanup levels in soil between 0 and 15 feet below ground surface.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

PAHs are potentially of concern for dermal absorption and found in soil on site.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

If both boxes are checked, label this pathway complete:

Complete

Comments:

Although contamination for the COCs listed in this decision document are not reported in previous groundwater samples from the SS086 subsites, recent sampling efforts in the main cantonment area of Eielson and downgradient of the SS086 Monitoring Area have identified per- and polyfluoroalkyl substances (PFAS). A separate effort will occur to assess their extent under CERCLA.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

There is no surface water at this site.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

Site is on an airport taxiway and is not used for hunting, subsistence, or farming.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Neither DRO nor GRO are volatile compounds.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

There are no buildings at this site.

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

Although contamination for the COCs listed in this decision document are not reported in previous groundwater samples from the SS086 subsites, recent sampling efforts in the main cantonment area of Eielson and downgradient of the SS086 Monitoring Area have identified PFAS. A separate effort will occur to assess their extent under CERCLA.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

There are no buildings onsite.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:

Comments:

Although nonvolatile compounds have been found in surface soil, the site is unlikely to have dust problems since it is paved or vegetated.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:

Comments:

There is no sediment at the site.

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

Although contamination for the COCs listed in this decision document are not reported in previous groundwater samples from the SS086 subsites, recent sampling efforts in the main cantonment area of Eielson and downgradient of the SS086 Monitoring Area have identified PFAS. A separate effort will occur to assess their extent under CERCLA.

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: SS086 (Airfield), Eielson AFB
ADEC File No. 107.38.110

Completed By: Jacobs Engineering Group
 Date Completed: 02 November 2016

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Check the media that could be directly affected by the release.	(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.
Media	Transport Mechanisms
<input checked="" type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to subsurface <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).	(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.	(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.						
Exposure Media	Exposure Pathway/Route	Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input checked="" type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust	F	C/F	C/F	C/F			
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	F	C/F	C/F	C/F			
<input type="checkbox"/> air	<input type="checkbox"/> Inhalation of Outdoor Air <input type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

APPENDIX C

COC Result Summary for PL001 and SS086

**Table C-1
COC Result Summary for PL001**

Location	No. of Samples	Media	Analyte	Cleanup Level ¹	Lowest Concentration	Highest Concentration
PL001 Subsite A/H/J/K	12	Soil (mg/kg)	No COCs Found Above Cleanup Levels			
	12	Groundwater (mg/L)	No COCs Found Above Cleanup Levels			
PL001 Subsite B/I	7	Soil (mg/kg)	No COCs Found Above Cleanup Levels			
	7	Groundwater (mg/L)	No COCs Found Above Cleanup Levels			
PL001 Subsite C	4	Soil (mg/kg)	No COCs Found Above Cleanup Levels			
	4	Groundwater (mg/L)	1-Methylnaphthalene	0.011	ND [0.000051]	0.013
			Naphthalene	0.0017	ND [0.00005]	0.015
			1,2,4-Trimethylbenzene	0.056	ND [0.00011]	0.034
PL001 Subsite D/E	6	Soil (mg/kg)	Benzo(a)anthracene	0.70	ND [0.0027]	0.76
	6	Groundwater (mg/L)	Benzo(a)anthracene	0.00030	ND [0.0026]	0.76
			Benzo(a)pyrene	0.00025	ND [0.000049]	0.00025
			Benzo(b)fluoranthene	0.0025	ND [0.000052]	0.00038
PL001 Subsite F	4	Soil (mg/kg)	No COCs Found Above Cleanup Levels			
	4	Groundwater (mg/L)	DRO	1.5	0.24	3.4
			Naphthalene	0.0017	ND [0.00005]	0.0045
			1,2,4-Trimethylbenzene	0.056	0.00055	0.068
PL001 Subsite G/L	6	Soil (mg/kg)	GRO	300	ND [0.17]	2600
			DRO	250	ND [2.7]	830
			Benzene	0.022	ND [0.017]	0.064
			Ethylbenzene	0.13	ND [0.017]	2.8
			1-Methylnaphthalene	0.41	ND [0.0013]	1.3
			2-Methylnaphthalene	1.3	ND [0.0013]	2.0
			Naphthalene	0.038	ND [0.0013]	4.2
			Xylenes	1.5	ND [0.017]	41
	6	Groundwater (mg/L)	GRO	2.2	ND [0.005]	3.6
			Benzene	0.0046	ND [0.00010]	0.0062
			Ethylbenzene	0.015	ND [0.00010]	0.14
			Naphthalene	0.0017	ND [0.00005]	0.031
			1,2,4-Trimethylbenzene	0.056	ND [0.00011]	0.13
PL001 Subsite M	7	Soil (mg/kg)	DRO	250	ND [2.7]	350
			Naphthalene	0.038	ND [0.0013]	0.12
			1,3,5-Trimethylbenzene	0.66	ND [0.020]	1.4
	7	Groundwater (mg/L)	GRO	2.2	ND [0.005]	3.7
			DRO	1.5	ND [0.025]	46
			Ethylbenzene	0.015	ND [0.00010]	0.032

**Table C-1 (Continued)
COC Result Summary for PL001**

Location	No. of Samples	Media	Analyte	Cleanup Level ¹	Lowest Concentration	Highest Concentration
			1-Methylnaphthalene	0.011	ND [0.000051]	0.11
			Naphthalene	0.0017	ND [0.00005]	0.22
			1,2,4-Trimethylbenzene	0.056	ND [0.00011]	0.15
			1,3,5-Trimethylbenzene	0.060	ND [0.00012]	0.24
			Xylenes	0.190	ND [0.00010]	0.28
PL001 Monitoring Area ²	4	Soil ² (mg/kg)	No COCs Found Above Cleanup Levels			
	6	Groundwater ³ (mg/L)	No COCs Found Above Cleanup Levels			

Notes:

¹18 AAC 75 Tables B1 and B2, under 40-inch zone migration to groundwater, and Table C, groundwater cleanup levels (ADEC 2018).

²PL001 monitoring area soil results from wells installation of PL001MW03, 03M03B, 09M03, PL001MW02, and MW-BKG-07.

³PL001 monitoring area wells include PL001MW02, PL001MW03, 09M03, 03M03B, and MW-BKG-07.

[] = limit of detection

BOLD indicates a result that exceeded the cleanup level.

For definitions, refer to the Acronyms and Abbreviations section.

**Table C-2
COC Result Summary for SS086**

Location	No. of Samples	Media	Analyte	Cleanup Level ¹	Lowest Concentration	Highest Concentration
Sierra Apron Repair	9	Soil (mg/kg)	DRO	250	2.04	482
			No other COCs found above cleanup levels			
Tanker Row	15	Soil (mg/kg)	DRO	250	5.27	14,200
			GRO	300	11.4	1,740
Taxiway Golf	12	Soil (mg/kg)	No COCs Found Above Cleanup Levels			
Taxiway F	20	Soil (mg/kg)	DRO	250	ND [10.5]	14,200
			GRO	300	ND [4.74]	1,740
SS086 monitoring area ²	6	Soil ² (mg/kg)	No COCs found above cleanup levels			
	8	Groundwater ³ (mg/L)	No COCs found above cleanup levels			

Notes:

¹18 AAC 75 Tables B1 and B2, under 40-inch zone migration to groundwater, and Table C, groundwater cleanup levels (ADEC 2018).

³SS086 monitoring area soil results from wells installation of wells AFMW01, AFMW02, and AFMW03.

³SS086 monitoring area wells include 13MW16, 87MW01, 45MW32, 44MW13, 44MW03, AFMW01, CMW-1, AFMW02, and AFMW03.

[] = limit of detection

BOLD indicates a result that exceeded the cleanup level.

For definitions, refer to the Acronyms and Abbreviations section.

APPENDIX D
Responses to Comments

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

December 4, 2017

Reviewer: Alaska Department of Environmental Conservation
Recommended By: John O'Brien, Kim DeRuyter, & Monte Garrouette

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
1.		General	Please note that DEC has promulgated new cleanup levels effective in November 2016. Please confirm that the PALs and any conclusions about contamination nature and extent are consistent with the most recent clean up levels.	Noted. Additionally, the historic results presented in source evaluation reports from 2012 through the time of this DD were compared to the updated cleanup levels. Results prior the SERs from other sources such as construction reports were not part of this evaluation.	Accept
2.		General	Please add PFCs (PFOS, PFOA) to the COC lists for these source areas. We suggest adding text describing multiple discoveries of contamination this past summer during F35 infrastructure construction which have been particularly dense in the South Loop Area.	Based on the discussion that occurred during the January 11, 2018 comment resolution meeting, PFAS will not be included as COCs in this interim decision document. The following text will be added to the end of the first paragraph on page 3-1 to general describe how PFAS in the PL001 monitoring area will be addressed: “Although PFAS were detected within the PL001 Monitoring Area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.”	Accept

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
3.		General	It is highly unusual that a source area (ST20) with its own separate Decision Document is within source area PL001, one of the source areas that is the subject of the Decision Document under review. A thorough discussion of this situation is warranted. It might be suggested that ST20 become a sub-site of PL001. This would require an ESD.	<p>Based on the discussion that occurred during the January 11, 2018 comment resolution meeting, no changes to this decision document are needed at this time.</p> <p>The USAF and ADEC will revisit the status of ST020 at a later date if long term management of ST020 is transferred to the State-Eielson Air Force Base Petroleum Site Restoration Agreement.</p>	Accept
4.		General	LUCs should include notification to ADEC of any groundbreaking or dewatering activities.	<p>Accepted.</p> <p>Activities that occur within the PL001 and SS086 monitoring areas will be managed according to the <i>Air Force Land-Use Control Implementation Plan</i> (LUCIP) that requires this notification.</p> <p>Page 6-1 text includes the citation to the LUCIP as follows:</p> <p style="padding-left: 40px;">“LUCs will be implemented in accordance with the <i>Air Force Land-Use Control Implementation Plan</i> (LUCIP).”</p> <p>Additionally, page 6-4 of the Land-Use Controls section identifies:</p> <p style="padding-left: 40px;">“Implementation of these LUCs will replace interim LUCs and will meet the requirements of the <i>Settlement Agreement (IC/LUC)</i> between the USAF, ADEC and the US. Environmental Protection Agency (EPA).”</p>	Accept

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
5.	Section 1.0		There is usually an introduction which would explain the location, broad category of COCs (POL and PFCs) and regulatory authority. It should also explain why this is an Interim DD	Accepted. Four paragraphs of introductory text will be added to the beginning of Section 1 to provide an overview of the AFB and regulatory oversight. Additionally, the following text will be added as the first paragraph of Section 4: “This interim DD presents the selected remedies for petroleum-related contamination in soil and groundwater within Source Areas PL001 and SS086. This interim DD is needed because the full extent of contaminated soil and groundwater could not be established or active treatment options implemented on the runway and taxiways without critically disrupting the Eielson AFB mission.”	Accept
6.	1-2	1.2	This could be beefed up a bit with some language about the fact that EAFB is and NPL site and EPA is the lead regulator providing oversight of CERCLA regulated contaminants, however the sites covered in this DD SS086 and PL001 fall under the Petroleum Exclusion. Therefore ADEC is the lead regulator, etc.	Accepted. Four paragraphs of introductory text will be added to the beginning of Section 1 to provide an overview of the AFB and regulatory oversight.	Accept
7.	2-2	2.1.2	This section should be re-titled for consistency with Section 2.1.1 title. Part 2 could be organized better by presenting all information for each source area in one subsection instead of jumping back and forth between the two source areas.	Accepted. Section 2.1.2 will be retitled “Source Area SS086” for consistency with Section 2.1.1 Section 2 will be organized so that the complete PL001 subsections occur first followed by the complete SS086 subsections.	Accept

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
8.	2-2	2.1.2	The location information in this section should reference a map figure.	Accepted. A reference to Figure A-2 will be added to end of the second sentence of Section 2.1.2.	Accept
9.	2-3 to 2-7	2.1.3	The location information in this section should reference a map figure.	Accepted. Figure references will be added as follows: A reference to Figure A-3 will be added to end of the first, second, third, and fourth sentences of Section 2.1.3. A reference to Figure A-2 will be added to the first sentence of the first paragraph on page 2-3 A reference to Figure A-2 will be added to the first sentence of the second paragraph on page 2-4 A reference to Figure A-2 will be added to the first sentence of the second paragraph on page 2-5 A reference to Figure A-3 will be added to the end of the paragraph on page 2-6 A reference to Figure A-3 will be added to the first sentence of the second paragraph on page 2-7	Accept
10.	3-2	3.2	Please add PFCs (PFOS, PFOA) to the COC lists for these source areas.	This issue was discussed during the January 11, 2018 comment resolution meeting. It was determined that no changes to this decision document are needed for this comment. Please see the response for Comment #2.	Accept

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
11.	4-1	4	“This DD presents the final selected remedies...” – would this be final or <i>interim</i> ?	Accepted. This is an interim decision document intended to be in place until land use changes or new information is identified that calls into question the protectiveness of the interim remedies. The text “Final selected remedies” will be revised to state “interim selected remedies”. Other additions of “interim” will be added as needed to clarify the type of DD.	Accept
12.	4-1	4	“By signing this DD, ADEC agrees that the selected remedies comply with state law” Please revise to “...remedies <i>when properly executed</i> will comply with state law.”	Accepted. The text of the third sentence of the first paragraph on page 4-1 will be revised as suggested.	Accept
13.	4-1	4.1	The selected remedies should be reviewed after the COC list is complete.	Accepted. Based on the response to Comment #1 and Comment #2, there are no changes to the presented COC list and no changes needed to the selected remedies.	Accept
14.	4-1	4.1	Monitoring isn't a remedy. The remedy selected appears to be in-situ attenuation.	Accepted. The bulleted list of selected remedies will be revised as follows: <ul style="list-style-type: none"> ● “Monitored natural attenuation of groundwater at PL001 and SS086 points of compliance until cleanup levels are achieved. – Establish groundwater monitoring areas that incorporate the entire south loop and main runway area. – Establish points of compliance for 	Accept

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
				<p>groundwater monitoring downgradient of the PL001 and SS086 monitoring areas.</p> <ul style="list-style-type: none"> • Maintain institutional controls (ICs) prohibiting the use of, and restricting the access to, groundwater or soil until cleanup is complete.” <p>Revisions will be made to the text of Section 4-1 for consistency with the revised selected remedy bullets.</p>	
15.	4-1	4.1	<p>“The monitoring area groundwater will be monitored to determine if contaminants from specific subsites are migrating out of the south loop (PL001) or main runway (SS086) areas.” Points of compliance and sentinel wells should be established.</p>	<p>Accepted.</p> <p>Changes through-out the document and figures will occur to reference points of compliance instead of a monitoring well network.</p>	Accept
16.	4.1	4-2	<p>The text suggest that the plume is not stable or decreasing and migration off site is anticipated. Is this correct? If so an active remedy may be necessary. Is VI a concern for buildings along the eastern side of the runway?</p>	<p>Accepted.</p> <p>The small groundwater plumes present at PL001 are thought to be stable because the primary source of contamination is no longer present. The text of the fifth sentence of the third paragraph on page 4-2 will be revised as follows:</p> <p style="padding-left: 40px;">“Groundwater monitoring shall be conducted annually unless the USAF and ADEC agree to a different monitoring frequency.”</p> <p>VI is not a concern for buildings along the eastern side of the runway. All soil exceedances discovered at SS086 are greater than 30’ from any potentially impacted facility. Groundwater contamination has not been identified in these areas associated with the SS086 subsites.</p>	Accept

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
17.	4.4	4-4	RAOs need to be specific. Suggest combining the RAO section with the cleanup levels section proceeding it and specify that the RAOs are the cleanup levels listed in the tables	<p>Accepted.</p> <p>The RAOs will be revised as follows:</p> <ul style="list-style-type: none"> • “Restrict the use of soil above the DD cleanup levels within the PL001 or SS086 monitoring boundary. • Restrict the use of groundwater above the DD cleanup levels within the PL001 or SS086 monitoring boundary. • Prevent human exposure to soil and groundwater contamination above PL001 or SS086 DD cleanup levels.” 	Accept
18.	5	Appendix B	The CSM states that there is no known contamination in groundwater. Should this statement be re-evaluated in light of recent PFC groundwater contamination issues?	<p>This issue was discussed during the January 11, 2018 comment resolution meeting. It was determined that no changes to this decision document are needed for this comment. Please see the response for Comment #2.</p> <p>Revised Response:</p> <p>The PL001 and SS086 CSM Scoping forms found in Appendix B of the DD will be revised as follows:</p> <p>PL001 CMS Scoping Form: The text of Section 2 box 2b will be revised as follows:</p> <p style="padding-left: 40px;">“GRO, DRO, benzene, and benzo(a)pyrene exceed their clean-up levels.</p> <p style="padding-left: 40px;">“Although per- and polyfluoroalkyl substances (PFAS) were detected within the PL001 Monitoring Area boundaries as part of a recent</p>	<p>Disagree. Although the PFOS/PFOA will not be addressed under this DD, the CSM should not ignore it.</p> <p>Note: Revised Response was accepted via email on 8 February 2018.</p>

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
				<p>construction project, a separate effort will occur to assess their extent under CERCLA.”</p> <p>The text of the first box in Section 3 will be revised as follows:</p> <p>“Benzo(a)pyrene is able to permeate the skin and exceeds its cleanup level in groundwater.</p> <p>“Although PFAS were detected within the PL001 Monitoring Area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.”</p> <p>The following text will be added to the CSM Scoping Form Section 4 (Other Comments):</p> <p>“Although PFAS were detected within the PL001 Monitoring Area boundaries as part of a recent construction project, a separate effort will occur to assess their extent under CERCLA.”</p> <p>SS086 CMS Scoping Form:</p> <p>The text of Section 2 box 2b will be revised as follows:</p> <p>“Although contamination for the COCs listed in this decision document are not reported in previous groundwater samples from the SS086 subsites, recent sampling efforts in the main cantonment area of Eielson and downgradient of the SS086 Monitoring Area have identified</p>	

**DEC Comments on Interim Decision Document PL001 and SS086
Eielson Air Force Base, Alaska**

Comment No.	Page	Section	Comment / Recommendation	Response	DEC Accept/ Disagree
				<p>per- and polyfluoroalkyl substances (PFAS). A separate effort will occur to assess their extent under CERCLA.”</p> <p>The text of the first box in Section 3 will be revised as follows:</p> <p>“Although contamination for the COCs listed in this decision document are not reported in previous groundwater samples from the SS086 subsites, recent sampling efforts in the main cantonment area of Eielson and downgradient of the SS086 Monitoring Area have identified PFAS. A separate effort will occur to assess their extent under CERCLA.”</p> <p>The following text will be added to the CSM Scoping Form Section 4 (Other Comments):</p> <p>“Although contamination for the COCs listed in this decision document are not reported in previous groundwater samples from the SS086 subsites, recent sampling efforts in the main cantonment area of Eielson and downgradient of the SS086 Monitoring Area have identified PFAS. A separate effort will occur to assess their extent under CERCLA.”</p>	
19.	Table C-1 and C-2	Appendix C	Please add PFCs (PFOS, PFOA) to the COC lists for these source areas.	This issue was discussed during the January 11, 2018 comment resolution meeting. It was determined that no changes to this decision document are needed for this comment. Please see the response for Comment #2.	Accept