FINAL
Preliminary Assessment Report
Bethel Army Aviation Operating Facility and Armory
Alaska

Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA)
Impacted Sites
ARNG Installations, Nationwide

August 2020

Prepared for:

Army National Guard Bureau
111 S. George Mason Drive
Arlington, VA 22204

UNCLASSIFIED

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Acronyms and Abbreviations

°F	degrees Fahrenheit
AAOF	Army Aviation Operating Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AKARNG	Alaska Army National Guard
AOI	area of interest
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	conceptual site model
EDR™	Environmental Data Resources, Inc.™
FSS	Fire Suppression System
FTA	fire training area
HA	Health Advisory
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
SI	Site Inspection
UCMR3	Unregulated Contaminant Monitoring Rule 3
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency

Executive Summary

The Army National Guard (ARNG) is performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. A PA for per- and polyfluoroalkyl substances (PFAS)-containing materials was completed for Bethel Army Aviation Operating Facility (AAOF) and Armory (also referred to as the "facility") in Bethel, Alaska to assess potential PFAS release areas and exposure pathways to receptors. Bethel AAOF provides training and maintenance for the various aviation units that support the Alaska ARNG (AKARNG). The facility includes a hangar and armory, occupied by the AKARNG from 1995 and 2011, respectively, continuing into the present day. Prior to the mid-nineties the AKARNG leased a different building, the Former AKARNG AAOF facility, located a half mile north on a different parcel of airport property. The former facility was occupied by AKARNG prior to obtaining aqueous film forming foam (AFFF) for use in fire suppression. The Bethel Armory is used for administration purposes and has neither served as a firehouse nor housed AFFF in any form.

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a site visit on 30 August 2018 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed current Bethel AAOF personnel during the site visit including the Facility Manager; and,
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

One AOI related to a potential PFAS release was identified at the facility during the PA. The AOI is shown on **Figure ES-1** and described in **Table ES-1** below:

Table ES-1: AOIs at Bethel AAOF and Armory

Area of Interest	Name	Used by	Potential Release Date
AOI 1	Bethel AAOF	AKARNG	Approximately twice in past 10 years (between 2008 and 2018)

Based on potential PFAS releases at AOI 1, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for AOI 1, which presents the potential receptors and media impacted, is shown on **Figure ES-2**. Based on the US Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the USEPA's lifetime Health Advisories (HAs) within 20 miles of the facility. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bethel AAOF, AK			
REVISED	7/8/2020	GIS BY	MS	7/8/2020
SCALE	1:8,400	CHK BY	LC	7/8/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/8/2020

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Summary of Findings

AECOM
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Figure ES-1

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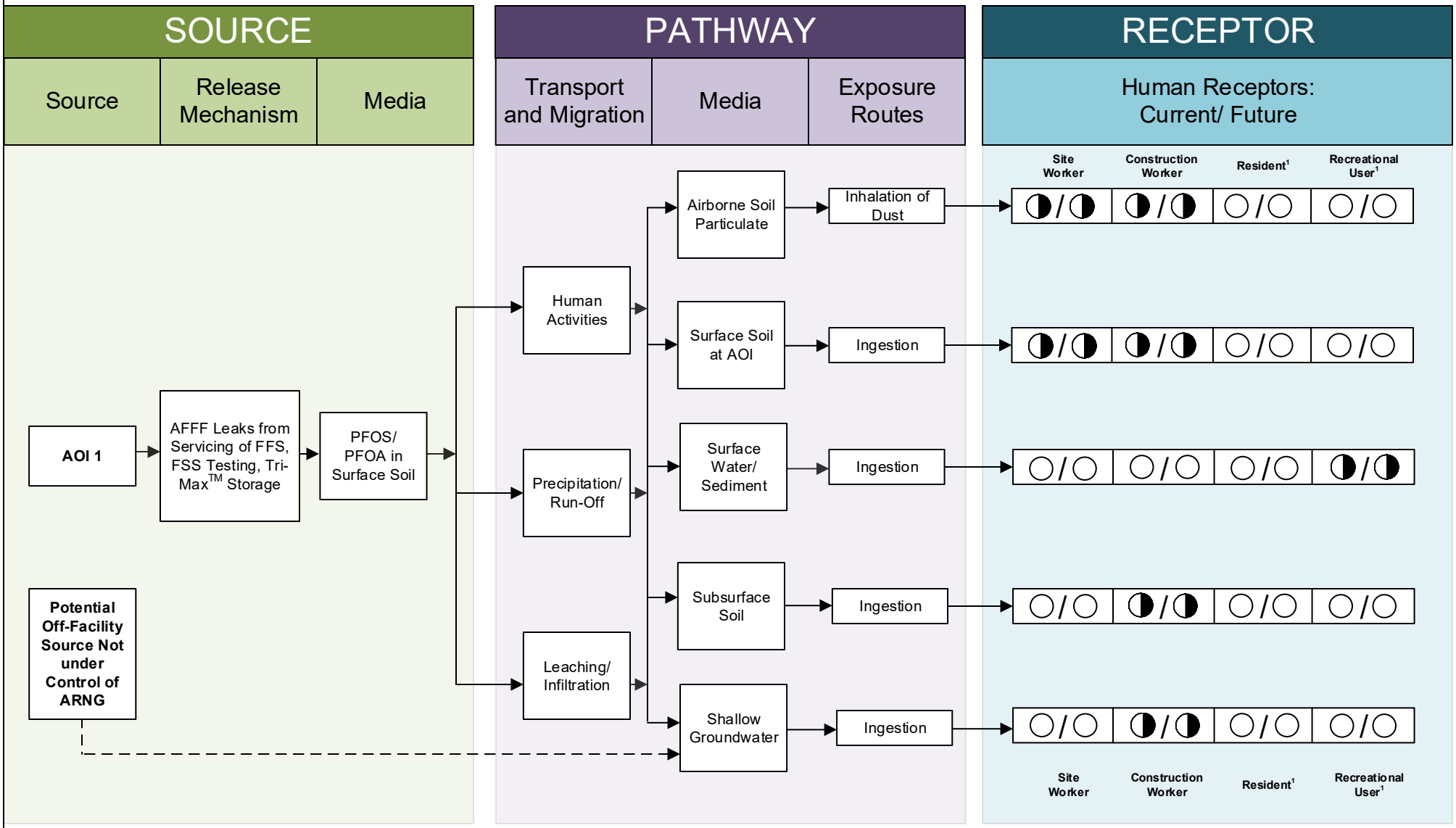


LEGEND

- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Complete Pathway

NOTES

1. The resident and recreational users refer to off-site receptors.

Figure ES-2
Preliminary Conceptual Site Model
Bethel AAOF and Armory, AK

1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG) G9 is the lead agency in performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) at Impacted Sites at ARNG Facilities Nationwide*. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017.

The ARNG is assessing potential effects on human health related to processes at their facilities that used per- and poly-fluoroalkyl substances (PFAS) (a suite of related chemicals), primarily releases of aqueous film forming foam (AFFF) although other sources of PFAS are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of these PFAS compounds in the environment varies. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories (HAs) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined.

This report presents findings of a PA for PFAS-containing at Bethel Army Aviation Operating Facility (AAOF) and Armory (also referred to as the “facility”) in Bethel, Alaska in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300), and Army requirements and guidance.

This PA documents potential locations where PFAS containing materials are stored and have the potential to be released into the environment at or adjacent to the Bethel AAOF and Armory. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components of AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a site visit on 30 August 2018 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed current Bethel AAOF personnel during the site visit including the Facility Manager; and,
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

1.3 Report Organization

This report has been prepared in accordance with the USEPA *Guidance for Performing Preliminary Assessments under CERCLA* (USEPA, 1991). The report sections and descriptions of each are:

- **Section 1** – **Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA.
- **Section 2** – **Fire Training Areas:** describes the fire training areas (FTAs) at the facility identified during the site visit.
- **Section 3** – **Non-Fire Training Areas:** describes other locations of potential PFAS releases at the facility identified during the site visit.
- **Section 4** – **Emergency Response Areas:** describes areas of potential PFAS release at the facility, specifically in response to emergency situations.
- **Section 5** – **Adjacent Sources:** describes sources of potential PFAS release adjacent to the facility that are not under the control of ARNG.
- **Section 6** – **Preliminary Conceptual Site Model:** describes the pathways of potential PFAS transport and receptors at the facility.
- **Section 7** –**Conclusions:** summarizes the data findings and presents the conclusions and uncertainties of the PA.
- **Section 8** – **References:** provides the references used to develop this document.
- **Appendix A** – Data Resources
- **Appendix B** – Preliminary Assessment Documentation
- **Appendix C** – Photographic Log

1.4 Facility Location and Description

The Bethel AAOF and Armory are on the west side of the Bethel Airport, approximately 3 miles from downtown Bethel, the largest community in Alaska's Unorganized Borough with a population of a little over 6,000 persons (**Figure 1-1**). The AAOF is on the western bank of the Kuskokwim River, approximately 65 miles inland from the Bering Sea. The Bethel Census Area contains just over 17,000 inhabitants in an area of some 45,500 square miles (USCB, 2018).

Consisting of two blocks within Lot 1, the Bethel AAOF and Armory are operated by the Alaska ARNG (AKARNG) as an aviation operating facility and a reserve readiness center, respectively. The AAOF is in Block 50 and the Armory in Block 60. The AAOF comprises two buildings, asphalt and concrete pavement, water and fuel/oil storage tanks, gates and fences. The AAOF is connected by taxiway to the Bethel Airport runways. Together, the two facilities occupy 15 acres.

The AAOF was leased for 55 years in 1996 until 2051 and the current 25-year lease for the Armory will expire in 2024. In addition the AKARNG leased the parcel of property where the former AAOF was located (Lot 10B, Block 4). The lease for this facility begun on 6 March 1968 and was set for termination upon the completion of the new AAOF in the early nineties. The Alaska Guard began using AFFF in the mid-1990s, well after AFFF came into wide spread use by the Department of Defense (1970). Given this time frame of use by AKARNG, the former AAOF is not associated with the storage or use of AFFF.

1.5 Facility Environmental Setting

The facility is within the Yukon Delta National Wildlife Refuge, an approximately 30,000-square mile refuge comprising a large section of western Alaska. The refuge is largely unforested, with a 5 percent tree cover existing predominately along the margins of the Yukon and Kuskokwim Rivers. The refuge is home to a vast population of wildlife with over 200,000 water birds (i.e. loons, cranes, and swans) returning here each spring from their winter migration in addition to the terrestrial, amphibious, marine life, and non-migratory bird populations (USFWS, 2018b).

1.5.1 Geology

Alaska is predominately covered by an extensive Quaternary deposit consisting of poorly consolidated fluvial, glaciofluvial, colluvial, eolian, and shallow marine sediments. The nearby Kuskokwim Group to the southeast of the facility typically includes the interbedded greywacke and shale of a flysch deposit, indicating a near-shore marine depositional environment (Wilson et Al., 2015b), but has also been shown to include deeper deltaic deposits and contain material from cherty and volcanic sedimentary provenances (Box et Al., 1993). Because of the multiplicity of source material and depositional environments, the Late Cretaceous age given to the Kuskokwim Group has been interpreted variously by others as slightly older (Early Cretaceous) or slightly younger (Paleocene).

The area is glacial tundra, primarily sedge grasses and fine-grained, poorly sorted, poorly consolidated till deposits. Most soils in the area are silty, acidic, poorly drained, and are unsuitable for urban or agricultural uses. Bethel is within the area of sporadic permafrost, defined as where permafrost underlies 10 – 50 percent of the landscape with a soil temperature range of -5 to 0 degrees Celsius. Permafrost depths in the area range from 300 to 600 feet (INE, 2008).

1.5.2 Hydrogeology

Groundwater is variously available in amounts ranging from great to small due to the sporadic permafrost coverage (**Figure 1-2**). Permafrost hydrologically separates most of the ground in the area, requiring wells to be drilled to a depth of 400 feet or more (Waller, 1957). Clast size of the bedrock exhibits strong control over transmissivity, with coarser material bearing more water. Static groundwater levels, determined from wells drilled in the area (EDR™, 2018), range from 9 to 38 feet below ground surface. An EDR™ report conducted a well search for a 1-mile radius surrounding the facility (**Appendix A**). Using additional online resources, such as state and local Geographic Information System databases, wells were researched to a 4-mile radius of the facility. Various unknown type wells are located in the surrounding area within 4 miles but have an inactive status (USGS, 2019). The permafrost ground creates seasonal fluctuations in rock transmissivity and well production rates. Static water levels are also directly affected by the stages of the river and the tides; water levels in a well near the Bethel Hospital regularly fluctuate approximately 10 feet throughout the year. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS was detected in a public water system above the USEPA HAs within 20 miles of the facility. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

1.5.3 Hydrology

The facility is approximately 2 miles from the western shore of the Kuskokwim River (**Figure 1-3**). The river is mostly channelized but exhibits braiding in places where the loosely consolidated underlying sediment cannot give resistance to the meandering forces of the river. Its convoluted branches range from seventy-five feet to over half a mile wide across its main channel. The tundra

surrounding Bethel is classified by the United States Fish and Wildlife Service as freshwater, sparsely wooded, palustrine wetland, seasonally saturated and in some areas affected by the tidal influences of the Kuskokwim River (USFWS, 2018a). The landscape is dotted with lakes and streams.

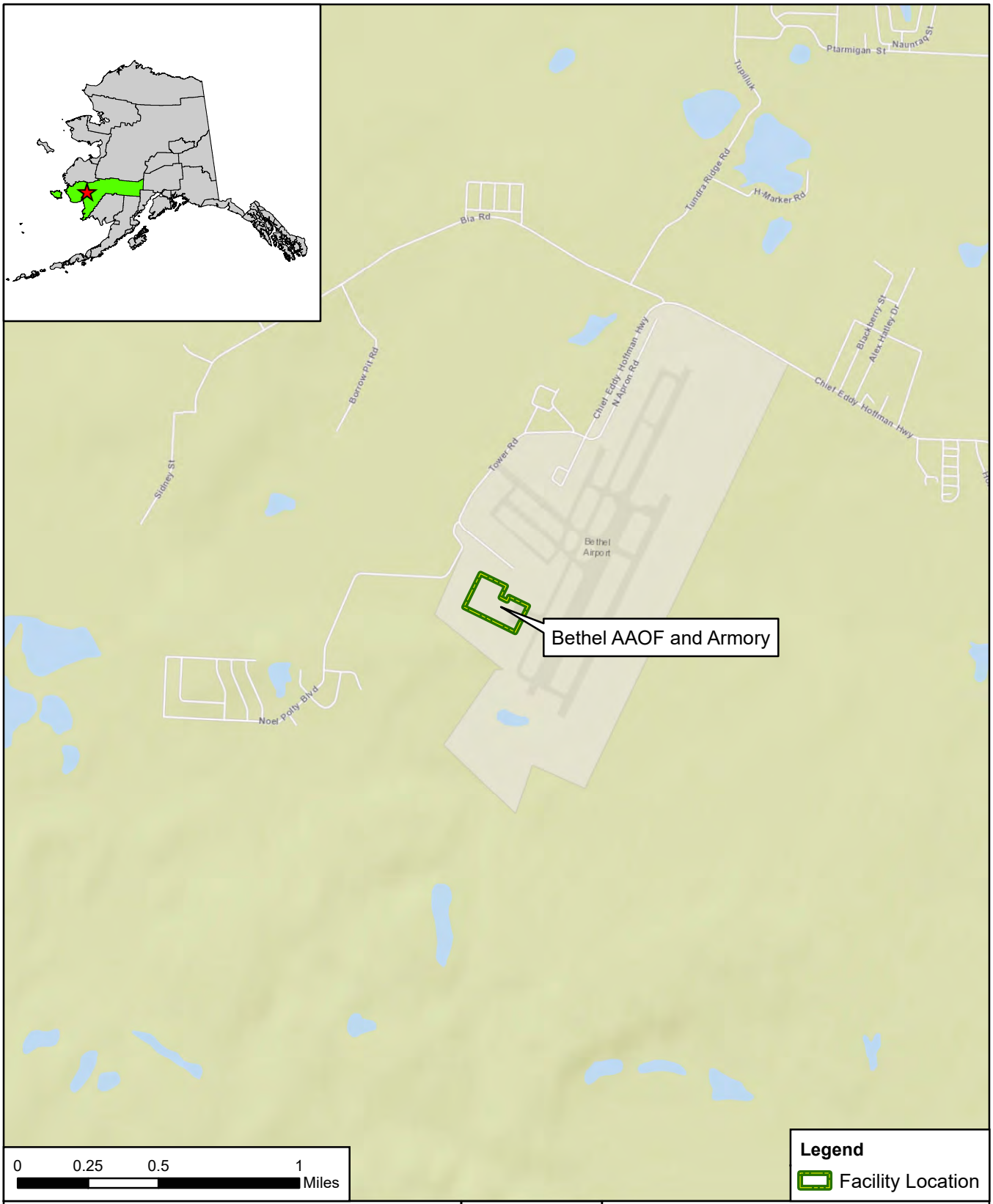
Flooding is the only geophysical hazard of concern in Bethel; earthquakes are possible, but atypical, and the nearest volcano is over 250 miles to the southeast. Flooding typically occurs in spring when thick build-up of river ice experiences rapid warming and in the late summer, when the heaviest rainfall occurs (USACE, 1968). The AAOF lies on the relatively higher topography, which exhibits better drainage and is less susceptible to flooding than the lower lying surrounding lands.

1.5.4 Climate

Bethel's climate is cool during the summer when temperatures tend to be in the 50's and extremely cold during winter when temperatures tend to be zero. The warmest month of the year is July with an average maximum temperature of 63.10°F (degrees Fahrenheit), while the coldest month of the year is January with an average minimum temperature of 0.70°F. The annual average precipitation is 16.18 Inches. Rainfall is evenly distributed throughout the year. The wettest month of the year is August with an average rainfall of 3.02 inches (IDcide, 2018).

1.5.5 Current and Future Land Use

The property is currently under lease by the AKARNG and is operated as an AAOF which services aircraft for the AKARNG. The AKARNG has leased the AAOF parcel from the Alaska Department of Transportation until 2051. Reasonably anticipated future land use is not expected to change from the current land use described above.



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SCALE	1:31,680	CHK BY	LC	5/7/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	5/7/2020

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Facility Location

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Figure 1-1

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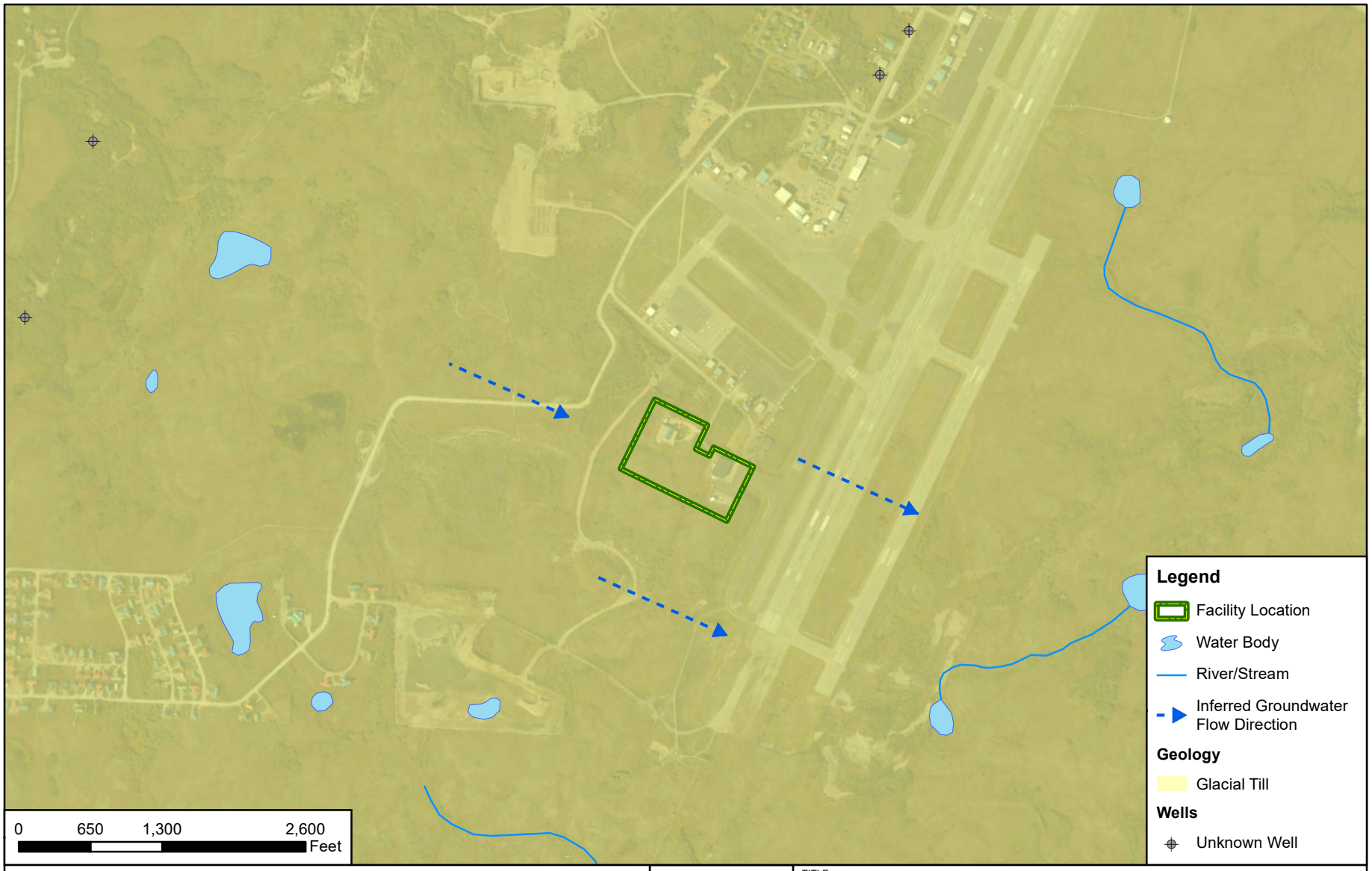

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PROJECT	Preliminary Assessment for PFAS at Bethel, AK			
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SCALE	1:15,600	CHK BY	LC	5/7/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	5/7/2020

TITLE

Groundwater Features

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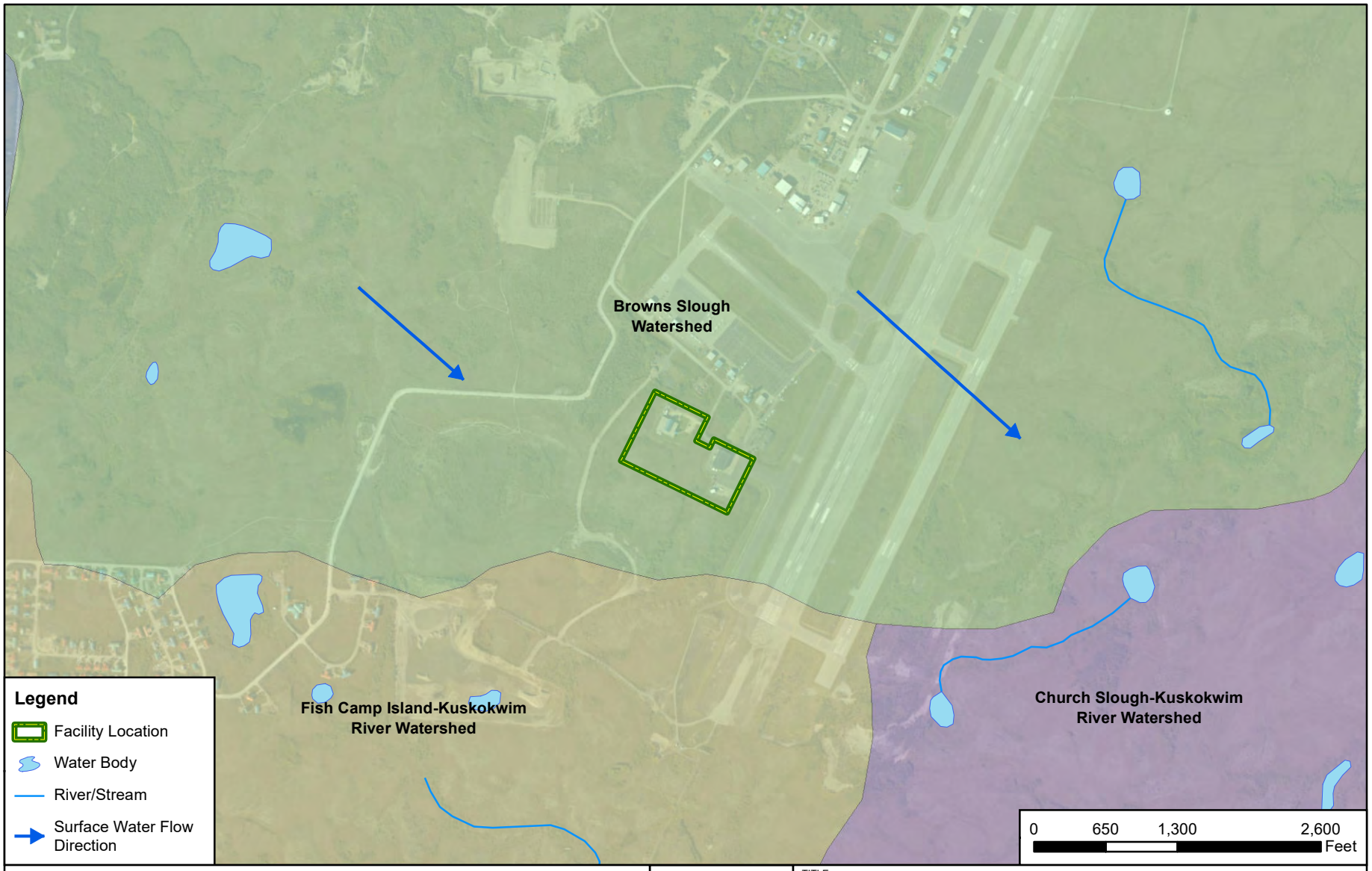
Figure 1-2



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SCALE	1:15,600	CHK BY	LC	5/7/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	5/7/2020

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TITLE

Surface Water Features

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Figure 1-3

2. Fire Training Areas

No FTAs were identified at Bethel AAOF and Armory during personnel interviews or the site visit. FTAs are considered a primary potential release area for PFAS because of the common use of AFFF in training events. The Bethel Municipal Fire Department serves as the first responder to emergencies at Bethel AAOF. Combined agency exercises involving municipal and AKARNG are scheduled annually, but AFFF is not utilized during training activities. One Tri-Max™ crash cart is onsite, and the interviewees assert the cart has not been used or discharged. AKARNG personnel indicated annual training at the facility on Tri-Max™ use is limited to the classroom.

3. Non-Fire Training Areas

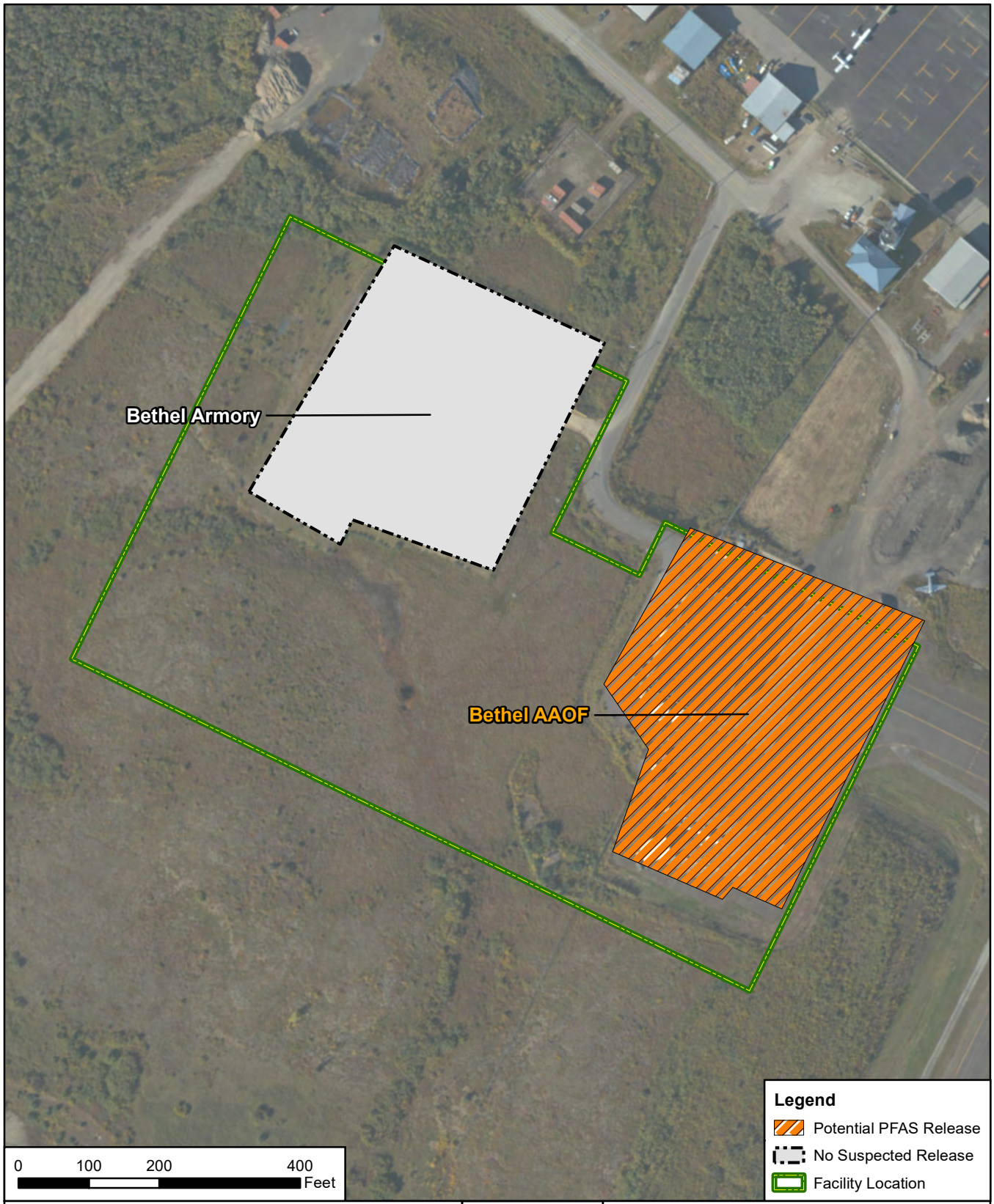
In addition to FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Information on these features obtained during the PA are included in **Appendices A** and **B**. Two non-FTAs were identified during the PA. A description of each non-FTA is presented below, and the non-FTAs are shown on **Figure 3-1**. Photographs of each non-FTA appear in **Appendix C**.

3.1 Bethel AAOF

The Bethel AAOF Hangar (60°46'31.44"N, 161°50'45.91"W) has been continuously occupied by the AKARNG since 1995, a few years after its construction, and is equipped with an AFFF Fire Suppression System (FSS), supplied with AFFF by two 800-gallon tanks. The FSS has had no reported releases; however, the AFFF tank has a leaky sight gauge. The gauge only leaks when checked, and less than one quart of AFFF foam is discharged each time the tank is serviced. Servicing is performed by a third-party company, Frontier Fire. According to interviews with the maintenance lead, the system has been serviced twice in the past ten years. Each release is wet-mopped immediately and disposed of through the facility's drainage system. The facility drainage system is connected to an RGF Environmental sediment/hydrocarbon filter, which does not filter for PFAS, and wastewater is not chemically tested before or after being filtered. A contained septic tank holds the wastewater until it is pumped out by a Bethel municipal service. Documentation was not available on testing of the FSS after installation or any subsequent testing; therefore, Bethel AAOF is considered a potential PFAS release area. Additionally, Tri-Max™ fire extinguishers have been at the facility. Based on interviewees, AKARNG did not train with the Tri-Max™ extinguishers. The contents of the Tri-Max™ units, exact location of their historical storage, and the maintenance schedule are unknown.

3.2 Bethel Armory

The Bethel Armory is adjacent to the northwest of the AAOF hangar (60°46'35.46"N, 161°50'55.07"W). The Bethel Armory has been occupied by the AKARNG since 2011 and is a reserve readiness center and was not investigated during the PA; however, the use and storage of AFFF is unlikely because the Armory provides administrative and organizational support to the AKARNG.



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SCALE	1:2,400	CHK BY	LC	5/6/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/6/2020

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Non-Fire Training Areas

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Figure 3-1

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4. Emergency Response Areas

No instances of emergency response were identified at Bethel AAOF and Armory during the PA based on interviews, online research, and the EDR™ report (EDR™, 2018; **Appendix A**). Interviewees highlighted their history of zero incidents at the facility (**Appendix B**).

5. Adjacent Sources

Three off-site PFAS sources adjacent to the Bethel AAOF and Armory were identified during PA interviews (**Appendix B**) or in the EDR™ report (**Appendix A**). Adjacent sources are shown on **Figure 5-1**.

5.1 Bethel Airport Fire Department

The Bethel Airport Fire Department is maintained by the Alaska Department of Transportation and is required by the Federal Aviation Administration to perform a yearly hydrostatic testing of their equipment; annually since approximately 2012, a single short blast of AFFF is released from the firetruck onto the Fire Department's front ramp. The Bethel Airport Fire Department is hydrologically downgradient from the AAOF and Armory. The type, amount, and concentration of AFFF used during annual nozzle testing are unknown.

5.2 Skyvan Crash

In 1992, a Skyvan crashed approximately 800 feet southeast of the former Bethel AAOF in a patch of grass between two taxiways (60°46'52.18"N, 161°50'19.50"W). The crash was responded to by the Bethel Municipal Fire Department with 500 gallons each of AFFF and water. According to personnel interviews the fire was extinguished in less than 8 minutes. The Skyvan crash area is hydrologically downgradient from the AAOF and Armory. The type and concentration of AFFF used during the emergency response is unknown.

5.3 Former AKARNG AAOF

The former AKARNG Bethel AAOF hangar was operational from the 1960s until the new AAOF was built in the early 1990s. It is located at coordinates 60°46'55.56"N, 161°50'33.19"W, approximately a half mile north of the current AAOF and Armory. The AKARNG did not acquire AFFF until after this former AAOF was decommissioned in the early 1990s, therefore, the former AAOF is not associated with the storage or usage of AFFF.

5.4 Grant Aviation Crash

On 8 July 2019, a Grant Aviation aircraft crash-landed in the grassy drainage ditch between Bethel Airport's two main runways. The crash was responded to by the Bethel Airport Fire Department and the Bethel Municipal Fire Department. According to the spill incident report (**Appendix A**), approximately 80 gallons of 3% AFFF was applied to the aircraft fire at the incident site. The Grant Aviation crash area is hydrologically downgradient from the AAOF and Armory.

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SCALE	1:8,400	CHK BY	LC	7/8/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/8/2020

Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, one non-FTA was identified where PFAS may have been incidentally spilled or discharged to the ground surface: AOI 1 Bethel AAOF. As such, this area is determined to be an AOI and may be a potential PFAS source area. The AOI location is shown in **Figure 6-1**.

The following section describes the CSM components and the specific preliminary CSM developed for AOI 1. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, (3) receptor. If any of these elements are missing, the pathway is considered incomplete. The preliminary CSM for AOI 1 is shown in **Figure 6-2**.

Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of PFAS toxicological study (National Ground Water Association, 2018). Receptors for the facility include site workers, construction workers, recreational users, trespassers, and off-facility residents. The preliminary CSM for the facility indicates which specific receptors could potentially be exposed to PFAS.

6.1 AOI 1: Bethel AAOF

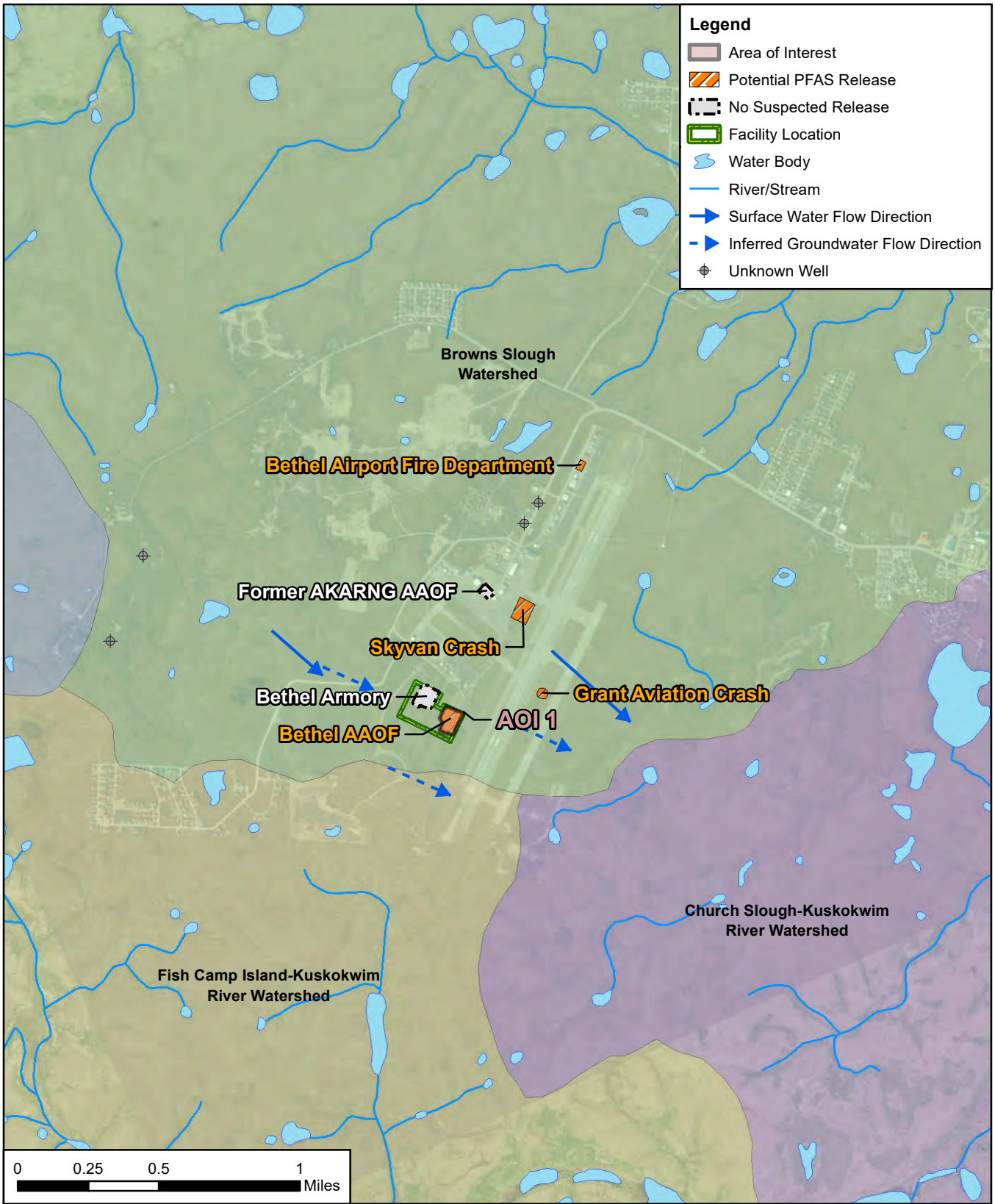
AOI 1 is the Bethel AAOF Hangar where servicing of the hangar's FSS resulted in AFFF releases twice within the past ten years. The sight gauge of the AFFF tank leaked less than one quart of AFFF foam during both servicing incidents. Documentation was not available on testing of the FSS after installation or any subsequent testing. Additionally, Tri-Max™ fire extinguishers have been at the facility. Based on interviewees, AKARNG did not train with the Tri-Max™ extinguishers. The contents of the Tri-Max™ units, exact location of their historical storage, and the maintenance schedule are unknown.

Potential PFAS releases at AOI 1 include AFFF releases during testing, to the hangar floor and the paved surface outside the hangar doors. Also, AFFF releases may have occurred at the historic staging locations of Tri-Max™ fire extinguishers. Each AFFF release resulting from FSS servicing was wet-mopped immediately and disposed of through the facility's drainage system. The facility drainage system is connected to an RGF Environmental sediment/hydrocarbon filter, which does not filter for PFAS. A contained septic tank holds the wastewater until it is pumped out by a Bethel municipal service. This exposure pathway via the drainage system/ septic tank is considered incomplete due to a secondary wastewater treatment process and an indirect pathway to receptors. AOI 1 is surrounded by both paved and unpaved surfaces. Ground-disturbing activities in unpaved surfaces as well as beneath the pavement may result in potential exposure to surface soils via ingestion and inhalation of dust particles for site workers and construction workers. Potential AFFF releases to the paved surfaces could have infiltrated the subsurface via cracks in the pavement or joints between areas that are paved with different materials. Ground-disturbing activities may result in potential exposure to subsurface soils via ingestion for construction workers.

Static groundwater levels, determined from wells drilled in the area (EDR™, 2018), range from 9 to 38 feet below ground surface. It is possible that construction workers under trenching scenarios may encounter shallow groundwater, so the ingestion exposure pathway is considered potentially complete. The City of Bethel provides drinking water supply through two deep groundwater wells located at the Bethel Heights Water Treatment Plant, approximately 2.5 miles northeast (cross-gradient) from the facility (City of Bethel, 2018). The two deep groundwater wells are likely drilled to a depth of 400 feet or more due to the existing permafrost (Waller, 1957) and are unlikely affected by PFAS contamination attributable to the facility. Therefore, the shallow groundwater

ingestion exposure pathway is considered incomplete for site workers, residents, and recreational users.

The facility is approximately 2 miles from the western shore of the Kuskokwim River. Most surface water runoff remains on-site, where it infiltrates into the ground; however, during spring melting, when soils are frozen, surface water can potentially migrate off the facility. Therefore, the ingestion exposure pathways for surface water and sediment are potentially complete for off-facility recreational users. The preliminary CSM for AOI 1 is shown on **Figure 6-2**.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bethel AAOF, AK			
REVISED	7/8/2020	GIS BY	MS	7/8/2020
SCALE	1:31,680	CHK BY	LC	7/8/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/8/2020

N

Area of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-1

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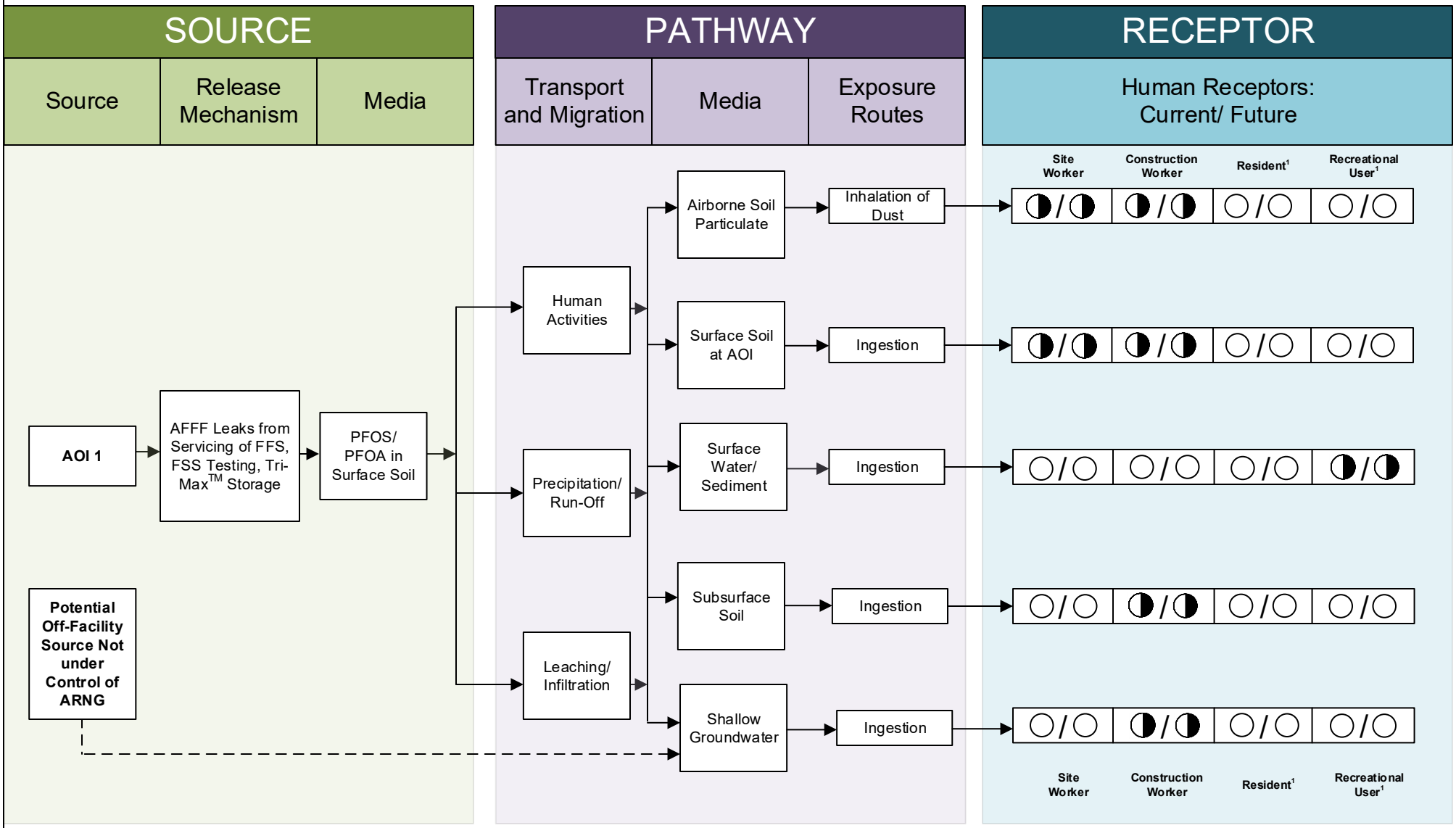

LEGEND

- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Complete Pathway

NOTES

1. The resident and recreational users refer to off-site receptors.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 Bethel AAOF

7. Conclusions

This report presents a summary of available information gathered during the PA on PFAS-related activities at Bethel AAOF and Armory. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

One AOI related to a potential PFAS release was identified at Bethel AAOF and Armory during the PA. The AOI is shown on **Figure 7-1** and described in **Table 7-1** below:

Table 7-1: AOIs at Bethel AAOF and Armory

Area of Interest	Name	Used by	Potential Release Date
AOI 1	Bethel AAOF	AKARNG	Approximately twice in past 10 years (between 2008 and 2018)

Based on potential PFAS releases at AOI 1, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for AOI 1 is shown on **Figure 6-2**, which presents the potential receptors and media impacted.

The following areas discussed in **Section 2** through **Section 4** were determined to have no suspected PFAS releases to the environment (**Table 7-2**).

Table 7-2: No Suspected Release Areas

No Suspected Release Area	Used by	Rationale for No Suspected Release Determination
Bethel Armory	AKARNG	The use and storage of AFFF is unlikely because the Armory provides administrative and organizational support to the AKARNG.

7.2 Uncertainties

A number of information sources were investigated during this PA to determine the potential for PFAS-containing materials to have been present, used, or released at the facility. Historically, documentation of PFAS use was not required because PFAS were considered benign. Therefore, records were not typically kept by the facility or available during the PA on the use of PFAS in training, firefighting, other non-traditional activities, or on its disposition.

The conclusions of this PA are based on all available information, including: previous environmental reports, EDRs™, observations made during the VSI, and interviews. Interviews of personnel with direct knowledge of a facility generally provided the most useful insights regarding a facility's historical and current PFAS-containing materials. Sometimes the provided information is vague or conflicts with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (mid-1990s), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a potential source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and potential storage of PFAS were reviewed, retired and current personnel were interviewed, multiple persons

were interviewed for the same potential source area, and the facility was visually inspected. The following **Table 7-3** summarizes the uncertainties associated with the PA.

Table 7-3: Summary of Uncertainties

Location	Source of Uncertainty
Bethel Municipal Wastewater Treatment Plant	No or limited information was available on the treatment of wastewater once removed from AKARNG property by municipal services.
Bethel Airport Fire Department	The type, amount, and concentration of AFFF used during annual nozzle testing are unknown.

7.3 Potential Future Actions

Interviews and records (covering mid-1990s to present) indicate that ARNG activities may have resulted in a potential PFAS release at the one AOI identified during the PA. Based on the preliminary CSM developed for the AOI, there is potential for receptors to be exposed to PFAS contamination in media at or near the facility. **Table 7-4** summarizes the rationale used to determine if the AOI should be considered for further investigation under the CERCLA process and undergo an SI.

ARNG will evaluate the need for an SI at Bethel AAOF and Armory based on the potential receptors, the potential migration of PFAS contamination off the facility, and the availability of resources.

Table 7-4: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1: Bethel AAOF	60°46'31.44"N, 161°50'45.91"W	Leakages of AFFF from servicing and testing of the FSS; Tri-Max™ Storage	Proceed to an SI, focus on soil, groundwater, surface water, sediment

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bethel AAOF, AK			
REVISED	7/8/2020	GIS BY	MS	7/8/2020
SCALE	1:8,400	CHK BY	LC	7/8/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/8/2020

N

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 7-1

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Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for Bethel AAOF include:

Leases

- 1995 Lease Lot 1 Block 50 – No. ADA-07201
- 2009 Lease Lot 1 Block 60 – No. ADA-08647

Maps

- 2005 Bethel AAOF Site Plan. Clarus Environmental Services.

Phase I Report

- 1999 Phase I Environmental Baseline Survey for Former Bethel AAOF Hangar. Ogden Environmental and Energy Services Company, Inc.

Permits and Certifications

- 2010 No Exposure Certification for Exclusion from APDES Storm Water Permitting
- 2013 Notice of Termination for Multi-Sector General Permit

Manuals

- 1998 Bethel AAOF Phase II Operations and Maintenance Manual. Meridian Systems, Inc.

EDR™ Report

- 2018 The EDR Radius Map™ Report with GeoCheck®; Aerial Photo Decade Package; & Certified Sanborn Map Report; Target Property Nome AAOF, 227 Airport Road, Nome, Alaska 99762. Inquiry Number: 5509593.2s

Spill Incident Report

- 2020 Site Report. ADOT&PF Bethel Airport Grant Aviation Plane Crash PFAS

Appendix B

Preliminary Assessment Documentation

Appendix B.1
Interview Records

Bethel

PA Interview Questionnaire - Other

Facility: BETH 2
Interviewer: [redacted]
Date/Time: 8/30/18 11:30 am

Interviewee: [redacted] **Title:** Facility Commander **Phone Number:** **Email:**	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N [redacted] Airport Manager - hist. document D.O.T.

Roles or activities with the Facility/Years working at the Facility:

since June 4th, 2018 ← whole crew, 4 people all now)

has worked for [redacted] in Bethel as a Civilian

No crashes witnessed during that time

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

TRIMAX - [redacted] does not touch it. probably past it's service.

probably slide show training 1x/year, maybe focused on mechanics.

Here, fuel is purchased from civilians, who do fueling on-site bring their own fire suppression system on fuel truck.

2-3 companies Crowley Delta Western ← typical use

Now known incidents on site.

Known Uses	
Use	
Procurement	
Disposition	
Storage (Mixed)	
Storage (Solution)	
Inventory, Off-Spec	
Containment	
SOP on Filling	yes
Leaking Vehicles	
Nozzle and Suppression System Testing	
Dining Facilities	
Vehicle Washing	
Ramp Washing	
Fuel Spill Washing and Fueling Stations	
Chrome Plating or Waterproofing	

PA Interview Questionnaire - Other

Facility: BETHEL AAOF - re: Bethel crash mid 1990s ish
Interviewer: [redacted]
Date/Time:

Interviewee: [redacted] **Title:** CW4 **Phone Number:** [redacted] **Email:**	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N

Roles or activities with the Facility/Years working at the Facility:

- Maintenance Officer while @ Bethel AAOF
- 6 yrs @ 1990 - 1996
- ~~Otd~~ Worked in old Bethel Hangar
- (AKARNG had [redacted] in Twin Otters)

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

- Sky Van - he was sitting in the Mark Air Dining Facility and watched the crash.
- Caught on fire - w/in 10 seconds ranging Fire - No fire truck @ the air field - Bethel City Fire Department responded from downtown.
- Tried to contact ~~old Fire~~ [redacted] Formerly AKARNG & Bethel Fire Dept

Known Uses	
Use	
Procurement	
Disposition	
Storage (Mixed)	
Storage (Solution)	
Inventory, Off-Spec	
Containment	
SOP on Filling	
Leaking Vehicles	
Nozzle and Suppression System Testing	
Dining Facilities	
Vehicle Washing	
Ramp Washing	
Fuel Spill Washing and Fueling Stations	
Chrome Plating or Waterproofing	

PA Interview Questionnaire - Other

State employee Dept military; veterans Affairs
Natl guard Hangar
Facility: BETH 2 p1/2
Interviewer: [redacted]
Date/Time: 8/30/18

Works for DMVA, FMO

Interviewee [redacted]	Can your name/role be used in the PA Report? (Y) or N
Title: Maintenance lead	Can you recommend anyone we can interview?
Phone Number:	Y or N
Email:	

Roles or activities with the Facility/Years working at the Facility:

90-93 maintenance Mech 1 out of 3 @ old hangar, BETH fuel spills in ops from 60s to 90s	2010-Now (2018)

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

	Known Uses
Not worried about accidental/tragic leaks in this Hangar, NOT on ground, leaky gate valve for sight gague, East tank, drips on floor/tray, is mopped up immediately. ONLY leaks when checking the sight gauge. Been leaking since he's been here ~2010	Use
→ BETH (old hangar) pro's just water suppression system	Procurement
	Disposition
	Storage (Mixed)
	Storage (Solution)
	Inventory, Off-Spec
	Containment
	SOP on Filling
	Leaking Vehicles
Frontier Fire does system inspections	Nozzle and Suppression System Testing
	Dining Facilities
USE - NOT used on accident, ONly responds to inside Hangars & on outside property.	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
State responds to crash. (DOT) call 911 if incident.	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other [redacted]

Facility: [redacted]
Interviewer: [redacted]
Date/Time: 4/30/18

Don't remember people testing w/trimax.

Only 1 trimax on site → [redacted] sets switched by Feds - ask

Trimax - Never leaked. Don't practice w/it. It is the Nat'l guard's.

H_2O system in Offices

Never seen use of Foam inside or outside.

Q: ARMORY - was it used as a fire house?

D/b: New armory - not used for fire trucks/ Fire house ops.

Armory is H_2O system, Moved in in 2011

★ While in old hangar, X on map where aircraft ~92/93 loaded w/fuel drums crashed. Big fire, Skyvan

Bethel P1/2

PA Interview Questionnaire - Other

Facility: Hangar 2
Interviewer: [redacted]
Date/Time: 8/21/2018

Interviewee: [redacted] **Title:** D.O.T. Airport Manager **Phone Number:** [redacted] Office **Email:** [redacted]	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N _____

Roles or activities with the Facility/Years working at the Facility:

'90 - started getting foam deliveries when he started part time

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

Last time was in Mid 90's - Skywan filled w/ fuel on takeoff

[redacted] present used foam before 139 regs

2 small 500 gal each 1 w/ foam

1 w/ H_2O.

Extinguished under 8 mins

Q: Training events combined w/ agencies

A: Have had some w/ guard past 3 years only under

→ Only use foam when needed expensive. Got rid of foam that did not meet FAA spec

Shipped out w/ contaminated liners →

Known Uses
Use
Procurement
Disposition
Storage (Mixed)
Storage (Solution)
Inventory, Off-Spec
Containment
SOP on Filling
Leaking Vehicles
Nozzle and Suppression System Testing
Dining Facilities
Vehicle Washing
Ramp Washing
Fuel Spill Washing and Fueling Stations
Chrome Plating or Waterproofing

Bethel P2/2

PA Interview Questionnaire - Other

Facility: Hangar 2
Interviewer: [redacted]
Date/Time: 4/30/2018

[redacted]

Did not use for training

Currently use when FAA comes out to inspect - demonstrate use short blast on their Front Ramp
Last 5-6 years, 1x year
1 truck, 1 short blast

Btw AK AIR & Maintenance to South next door

Drinking water 400' under permafrost
H_2O from airport N to Brown Slough, where sewer is disposed of.

FAA, AK AIR, State troopers have private wells, they only serve individual buildings off AIRPORT
→ ON site
→ ON N side of AK AIR Building

→ near their bldg?

→ 1:30 PM

PA Interview Questionnaire - Other

Facility: Hangar 1 47430
Interviewer: [redacted]
Date/Time: 8/28/18

P 1/1

Interviewee: [redacted] **Title:** **Phone Number:** **Email:**	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N

Roles or activities with the Facility/Years working at the Facility:

Airfield safety officer for Bryant
Was Safety director past 10 years for Army

PFAS Use: Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

[redacted] doing facility inspections

IN Bethel, DID not release AAFF
May '01 – July '04
in Bethel, F.D. would have responded to Bethel, NOT Airport MUNI

[redacted] -> Bethel
start 2009 -> IN Bethel had 1 brought it back to town to refill
left in 2009
[redacted]
Don't Know if discharged, never saw discharged first hand

Known Uses	
Use	
Procurement	
Disposition	
Storage (Mixed)	
Storage (Solution)	
Inventory, Off-Spec	
Containment	
SOP on Filling	
Leaking Vehicles	
Nozzle and Suppression System Testing	
Dining Facilities	
Vehicle Washing	
Ramp Washing	
Fuel Spill Washing and Fueling Stations	
Chrome Plating or Waterproofing	

AASF -> Don't remember any extinguishing @ Hangar 6 or 8 se Aug 04 - April '06

OR @ Bethel May 01 - July 2004 talked about trans, but never used

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

BETH 2

Names(s) of people performing VSI: [redacted]

Recorded by: [redacted]

ARNG Contact: [redacted]

Date and Time: 8/30/18 1000 am

Method of visit (walking, driving, adjacent): Taxi then walk

Source/Release Information

Site Name / Area Name / Unique ID: BETH 2 Nat'l guard hanga

Site / Area Acreage: Real estate doc

Historic Site Use (Brief Description): always used by Nat'l guard as a hanger built in 95

Current Site Use (Brief Description): Hanga ! Guard Office

Physical barriers or access restrictions: well secure door., had a ring-in system no fence out front

1. Was PFAS used (or spilled) at the site/area? **Y / N**

1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):
small leak inside

2. Has usage been documented? **Y / N**

2a. If yes, keep a record (place electronic files on a disk):

3. What types of businesses are located near the site? **Industrial / Commercial / Plating / Waterproofing / Residential**

3a. Indicate what businesses are located near the site
AIRFIELD

4. Is this site located at an airport/flightline? **Y / N**

4a. If yes, provide a description of the airport/flightline tenants:

Where do Drums go? what/how Clean up of leaks?

photo W
photo E inside Hanger, 1 corner
W ~~Fire Supp. Pipes~~ Ce
W "
Multiple leaks in pipes "everywhere"
W "
3% AFFF

Visual Survey Inspection Log

Other Significant Site Features:

1. Does the facility have a fire suppression system? Y / N

1a. If yes, indicate which type of AFFF has been used:

3% AFF sea host / Natural foam 3%
chemguard

1b. If yes, describe maintenance schedule/leaks:

Don't test it - certified by Frontier every year

1 full time helicopter

1c. If yes, how often is the AFFF replaced:

Not replaced or topped off.

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

RGF unit, takes out hydrocarbons, then into sewer system. [redacted] would be in charge of re-order

Tank gets picked up

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? Y / N

1a. If so, note observation and location:

site is on a built up pad

2. Is there channelized flow within the site/area? Y / N

2a. If so, please note observation and location:

adjacent ditch off pad

3. Are monitoring or drinking water wells located near the site? Y / N

3a. If so, please note the location:

Maybe a Monitoring well

water is trucked in, sewer is pumped out

4. Are surface water intakes located near the site? Y / N

4a. If so, please note the location:

5. Can wind dispersion information be obtained? Y / N

5a. If so, please note and observe the location.

airport

6. Does an adjacent non-ARNG PFAS source exist? Y / N

6a. If so, please note the source and location.

Airport facilities

6b. Will off-site reconnaissance be conducted? Y / N

Visual Survey Inspection Log

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / N

1a. If so, please describe change (ex. Structures no longer exist):

moved from a different Aviation Bldg from BETH1 to BETH2

2. Is the site/area vegetated? Y / N

2a. If not vegetated, briefly describe the site/area composition:

around cement pad,

3. Does the site or area exhibit evidence of erosion? Y / N @ Hangers

3a. If yes, describe the location and extent of the erosion:

ground sloping @ armory

4. Does the site/area exhibit any areas of ponding or standing water? Y / N

4a. If yes, describe the location and extent of the ponding:

@ ~~the Hand~~, some standing water currently outside footprint, usually H2O seeps down right away

ditch around pad

Receptor Information

1. Is access to the site restricted? Y / N

1a. If so, please note to what extent:

access to bldg is restriction

2. Who can access the site? **Site Workers / Construction Workers / Trespassers / Residential / Recreational Users / Ecological** visitors

2a. Circle all that apply, note any not covered above:

3. Are residential areas located near the site? Y / N

3a. If so, please note the location/distance:

4. Are any schools/day care centers located near the site? Y / N

4a. If so, please note the location/distance/type:

5. Are any wetlands located near the site? Y / N

5a. If so, please note the location/distance/type: maybe

Some standing water occasionally, but drains pretty well according to [redacted]

Visual Survey Inspection Log

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

(3/4 full) ?

E 3 drums

N? System next to 3 drums

emergency switch — N Diesel pump Behind

4 photos N Tanks, 800 gal ~3/4 full, leaky valve if used to see level

★ → Leaks of grease, NOT pressurized

Smoke sensor, not heat

Is there a sensor, not clear

[redacted] may have the operator's manual

~E Water tank

~S Lowlands, standing H_2O sloughing in front of Armory

~E View of fence, land btw Armory & Hanger 2

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Bethel AAOF

Why has this location been identified as a site?

Historically held TRI-MAX 30 AFFF crash carts, and hangar is equipped with AFFF FSS which has a leaky gauge, that leaks only when checked.

Are there any other activities nearby that could also impact this location?

There is a fire department that tests their AFFF form their truck once a year by spraying on the front ramp a short blast. This is approx. 1 mile north. Additionally, a 1992 skyvan crash resulted in the discharge of 500 gal. each of water and AFFF approx. 800 yards north.

Training Events

Have any training events with AFFF occurred at this site? No.

If so, how often?

How much material was used? Is it documented?

Identify Potential Pathways:

Do we have enough information to fully understand over land surface water flow, groundwater flow, and geological formations on and around the facility? Any direct pathways to larger water bodies?

Surface Water:

Surface water flow direction? South/east into the Kuskokwim River

Average rainfall? 16.18 inches

Any flooding during rainy season? Coastal floodplain sometimes floods

Direct or indirect pathway to ditches? Yes

Direct or indirect pathway to larger bodies of water? Indirect pathway to Kuskokwim River

Does surface water pond any place on site? Yes, there are several kettle lakes in the area

Any impoundment areas or retention ponds? There are natural lakes nearby.

Any NPDES location points near the site? N/A

How does surface water drain on and around the flight line? Radially

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? South/East into Kuskokwim river

Depth to groundwater? Approx. 9 - 40 Feet. (meltwater and permafrost drastically affect groundwater levels)

Uses (agricultural, drinking water, irrigation)? Groundwater is drawn from 400 feet bgs

Any groundwater treatment systems? No

Any groundwater monitoring well locations near the site? Maybe

Is groundwater used for drinking water? Yes, but it must be treated

Are there drinking water supply wells on installation? No

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient . No

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? No, but the City of Bethel treats their water.

If so, do we understand the process and which water is/was treated at the plant?

Do we understand the fate of sludge waste?

Is surface water from potential contaminated sites treated?

Equipment Rinse Water

1. Is firefighting equipment washed? Where does the rinse water go?

Only the airport has fire fighting equipment that is tested.

2. Are nozzles tested? How often are nozzles tested? Where are nozzles tested? Are nozzles cleaned after use? Where does the rinse water flow after cleaning nozzles?

TRI-MAX carts are not tested here.

3. Other?

Identify Potential Receptors:

Site Worker

Construction Worker

Preliminary Assessment – Conceptual Site Model Information

Recreational User

Residential

Child

Ecological

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?

Documentation

Ask for Engineering drawings (if applicable).

Has there been a reconstruction or changes to the drainage system? When did that occur?

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

Photograph No. 1

Description:

Bethel AKARNG Hangar, facing southeast.

Date Taken:

30 August 2018

Photograph No. 2

Description:

Bethel AKARNG Armory, facing northwest.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

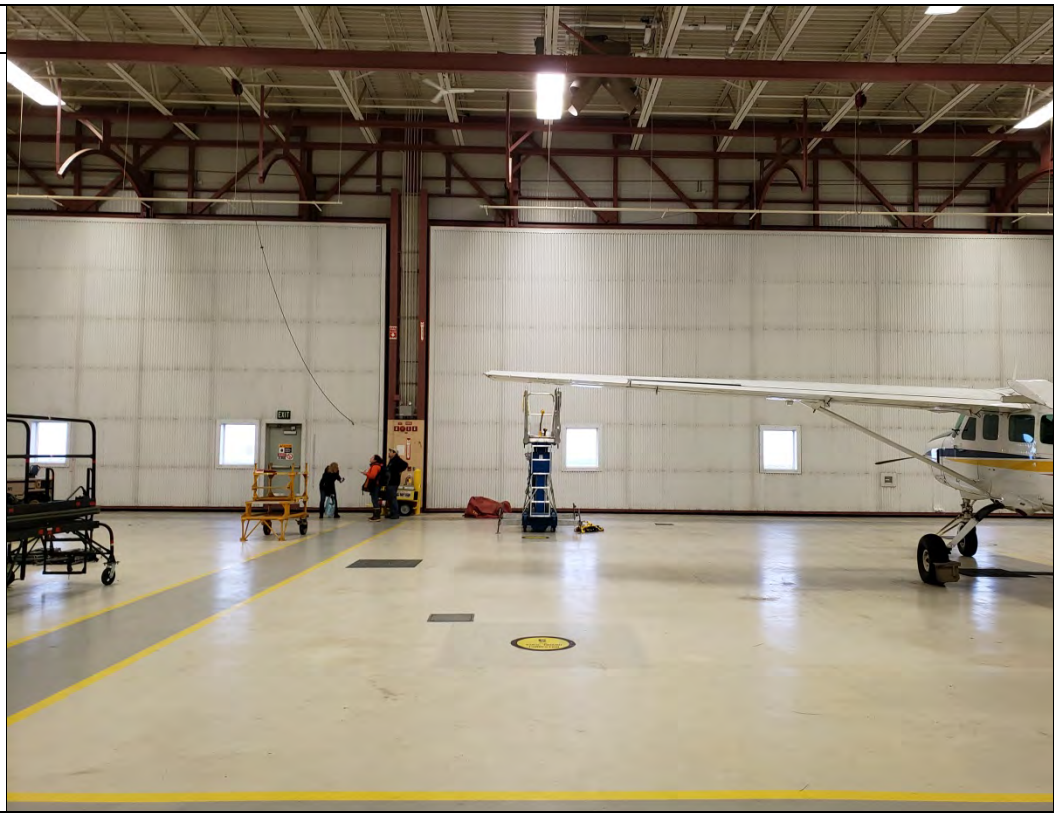
Photograph No. 3

Description:

TRI-MAX location inside the Bethel AAOF Hangar, facing southeast.

Date Taken:

30 August 2018



Photograph No. 4

Description:

AFFF drum inside the Bethel AAOF Hangar.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

Photograph No. 5

Description:

AFFF drums inside the Bethel AAOF Hangar.

Date Taken:

30 August 2018

Photograph No. 6

Description:

Valve system for the AFFF Fire Suppression System inside the Bethel AAOF Hangar.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

Photograph No. 7

Description:

Diesel pump for the AAFF Fire Suppression System inside the Bethel AAOF Hangar.

Date Taken:

30 August 2018

Photograph No. 8

Description:

Two 800 gallon tanks of AFFF that supply the Fire Suppression System. Photo shows the leaky sight valve on the right tank.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

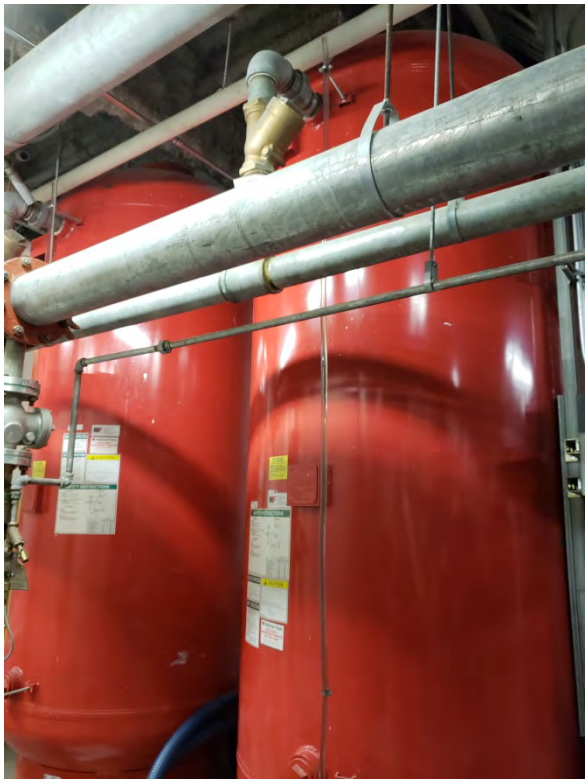
Photograph No. 9

Description:

Tops of the AFFF tanks and the sight gauge valves (clear tube) at ¾ full.

Date Taken:

30 August 2018



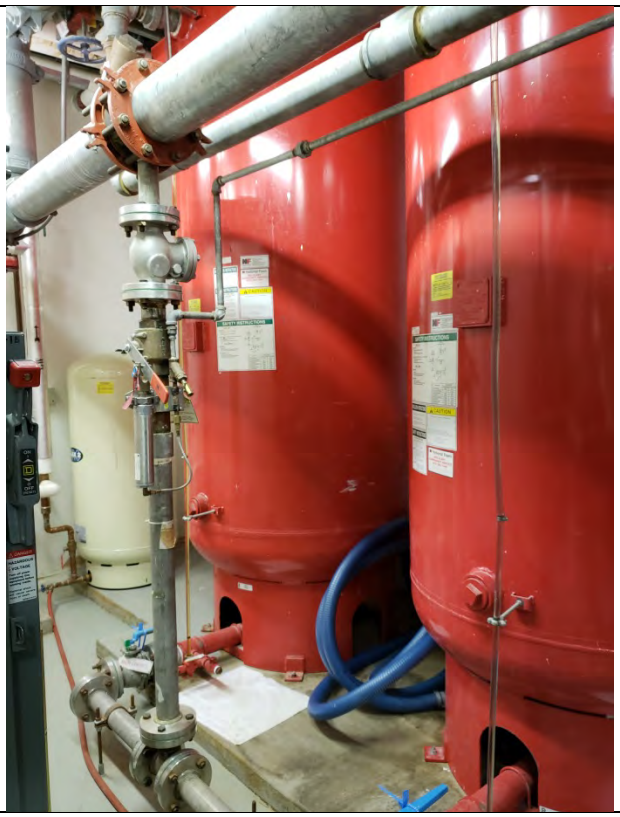
Photograph No. 10

Description:

Left AFFF tank and surrounding system components.

Date Taken:

30 August 2018



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

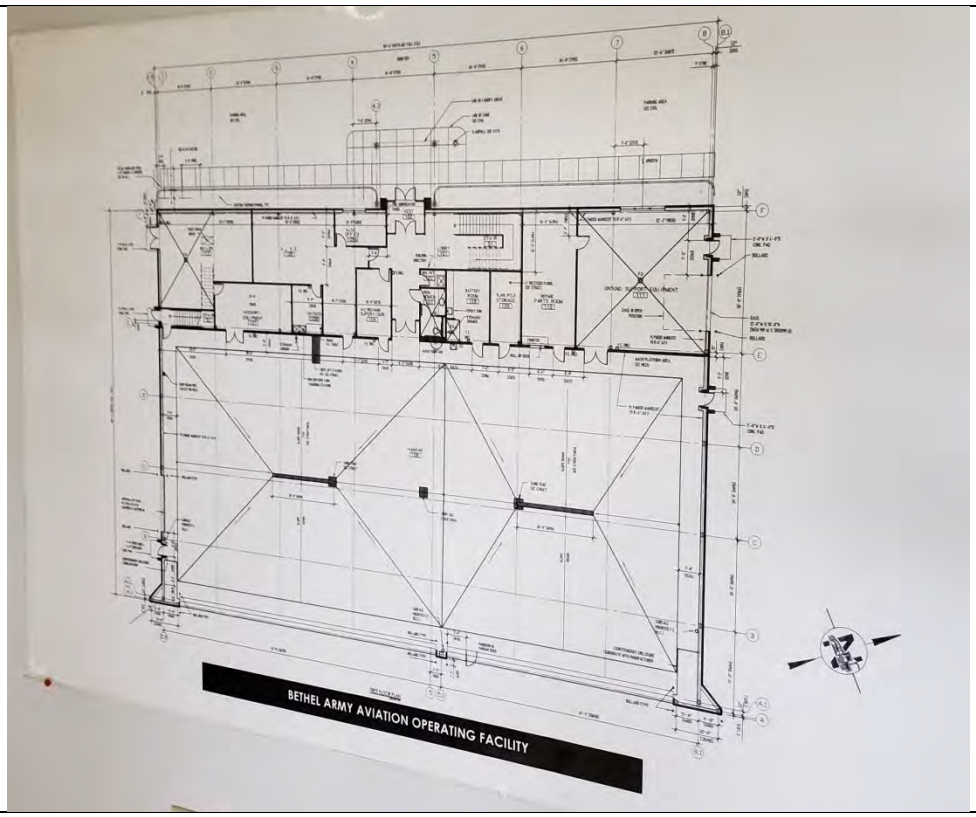
Photograph No. 11

Description:

As-built of the Bethel AAOF.

Date Taken:

30 August 2018



Photograph No. 12

Description:

Floor drain inside the Bethel AAOF Hangar, plugged in 2016.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

Photograph No. 13

Description:

Hangar floor drain outlet, disconnected in 2016, facing southwest.

Date Taken:

30 August 2018

Photograph No. 14

Description:

Southeast side of AAOF, facing northeast.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

Photograph No. 15

Description:

Northeast side of AAOF, facing northwest.

Date Taken:

30 August 2018

Photograph No. 16

Description:

Northeast side of AAOF, facing north.

Date Taken:

30 August 2018

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bethel AAOF	Bethel, Alaska

Photograph No. 17

Description:

Former AKARNG AAOF hangar, facing south.

Date Taken:

30 August 2018