FINAL
Preliminary Assessment Report
Army Aviation Support Facility #2
Fairchild Air Force Base, Washington

Perfluorooctane-Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

October 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
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFB	Air Force Base
AFFF	aqueous film-forming foam
amsl	above mean sea level
AOI	area of interest
ANG	Air National Guard
ARFF	Airport Rescue and Fire Fighting
ARNG	Army National Guard
AST	aboveground storage tank
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	conceptual site model
DOH	Washington State Department of Health
Ecology	Washington Department of Ecology
EDR™	Environmental Data Resources, Inc.™
EP	Earth Point
FAA	Federal Aviation Adminstration
FTA	fire training area
HA	Health Advisory
MDG	Matrix Design Group, Inc.
MH	Mead and Hunt
NOAA	National Oceanic and Atmospheric Administration
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
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
USAF	United States Air Force
USDA	United States Department of Agriculture
USDOA	United States Department of the Army
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank
VSI	Visual Site Inspection

WAANG	Washington Air National Guard
WAARNG	Washington Army National Guard
WMD	Washington Military Department
WRIA	Water Resource Inventory Area

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 Army Aviation Support Facility (AASF) #2 at Fairchild Air Force Base (AFB), Washington, to assess potential PFAS release areas and exposure pathways to receptors. The Washington ARNG (WAARNG) AASF #2 consists of 18,706 square feet of office and maintenance space within Hangar 1029. Hangar 1029 encompasses 47,500 square feet of total space owned by the United States Air Force (USAF) that is also occupied by the Washington Air National Guard (WAANG). Hangar 1029 is equipped with a fire suppression system that is operated and maintained by the WAANG. The WAANG has operated at Fairchild AFB since 1976 and the WAARNG has operated at Fairchild AFB since 2006 (OWH, 2016; Lackey, 2017). The WAARNG currently operates in Hangar 1029 (since 2011) and Building 4401 (Armed Forces Reserve Center) and formerly operated at Hangar 1001 from 2006 to 2011. However, this PA only encompasses Hangar 1029.

The performance of this PA included the following tasks:

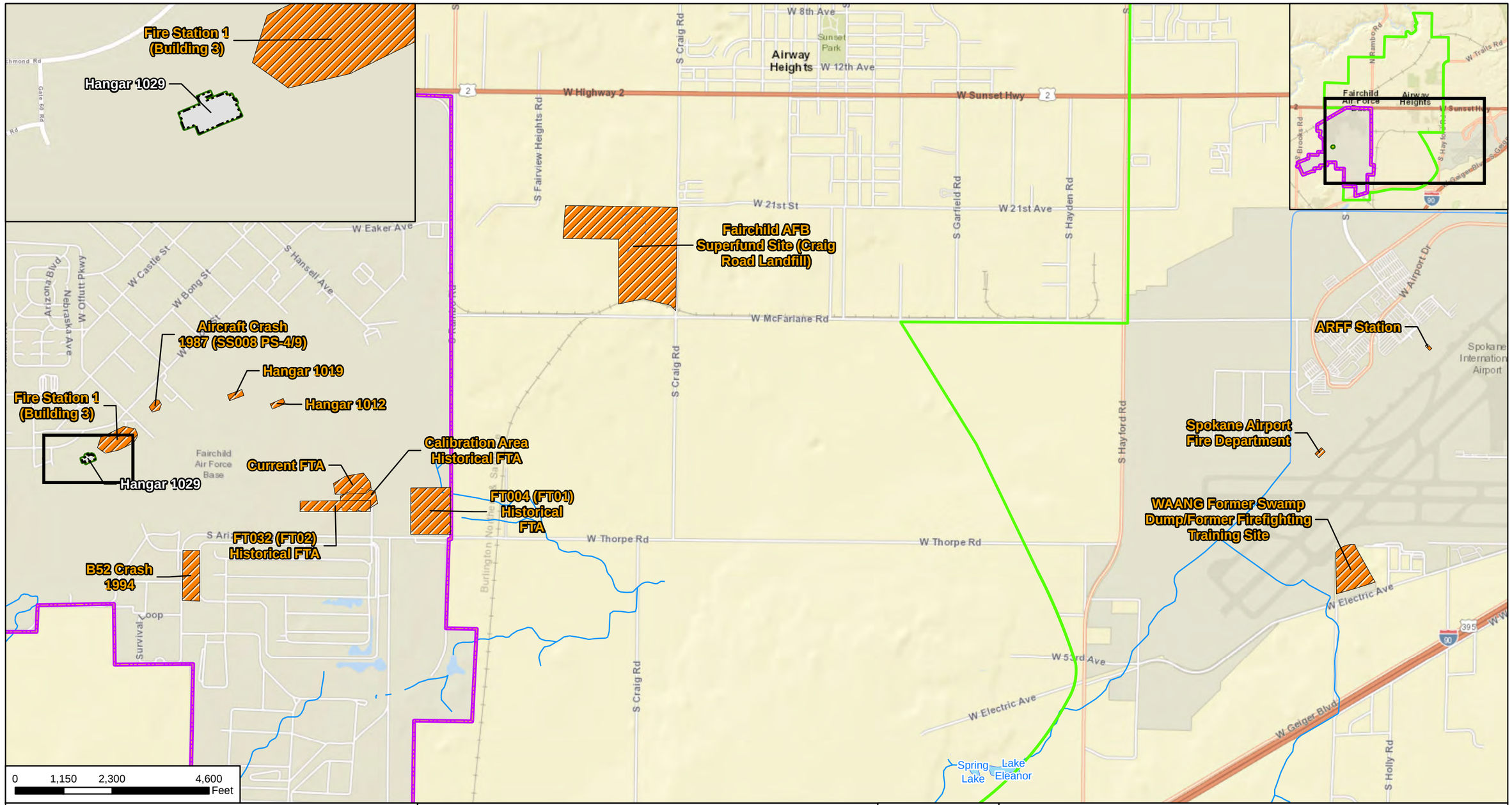
- Reviewed available administrative record documents and Environmental Data Resources, Inc.™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 30 October 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed; and,
- Interviewed current AASF #2 and Washington Military Department (WMD)-affiliated personnel during the site visit including: AASF #2 Commander; WMD Environmental Manager (in role since October 2019); WAANG Environmental Engineer (at AASF #2 since June 2019); WAARNG Aviation Safety Officer (at Fairchild AFB since 2006); and WAANG Real Property Manager (at Fairchild AFB since 1982).

No Areas of Interest (AOI) related to potential PFAS releases were identified at the AASF #2 during the PA. The summary of PA findings is shown on **Figure ES-1**.

Based on US Environmental Protection Agency's (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data (samples collected between 2013 and 2016), no PFAS were detected in a public water system above USEPA's Health Advisories (HAs) within 20 miles of the AASF #2, including the City of Spokane and Spokane County's drinking water systems, which were sampled in 2015 (USEPA, 2017b). The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed from 2013-2016 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. Drinking water for the City of Airway Heights, located approximately 3 miles to the northeast of the AASF #2, has been impacted by PFAS that were first detected in May 2017 (**Section 5**). USEPA's UCMR3 data does not document that samples were collected from the City of Airway Heights' public water system (USEPA, 2017b). Releases of PFAS from Fairchild AFB have been evaluated by the USAF (USAF, 2017a, 2017b, 2019). In 2015, a PA of PFAS was performed at Fairchild AFB comprehensive of PFAS releases associated with historical Fairchild AFB activities (CH2M, 2015).

The WAANG is responsible for the maintenance and testing of the fire suppression system in Hangar 1029 and for releases associated with the maintenance of the system. Based on the documented absence of the WAARNG's storage, use or release of PFAS-containing materials at

AASF #2 since WAARNG began operations at this facility in 2011, evidence does not indicate that current or former ARNG activities contributed PFAS contamination to soil, groundwater, surface water, or sediment at the facility or adjacent areas. AASF #2 will not move forward in the Comprehensive Environmental Response, Compensation, and Liability Act process.



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PROJECT	Preliminary Assessment for PFAS at AASF #2 - Fairchild AFB, WA			
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SCALE	1:27,600	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/16/2020

Legend

- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Fairchild AFB Boundary
- USAF PFAS Sampling Area 2017-2019
- Water Body
- River/Stream
- Canal/Ditch

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Summary of Findings

AECOM
12420 Milestone Center Drive
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Figure ES-1

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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 will vary. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued lifetime 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 materials at the AASF #2 (also referred to as the “facility”) located at Fairchild Air Force Base (AFB), in Spokane County, Washington, 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 of where PFAS may have been released into the environment at the AASF #2. 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 1-day site visit on 30 October 2019 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed; and,
- Interviewed current AASF #2 and Washington Military Department (WMD)-affiliated personnel during the site visit including: AASF #2 Commander; WMD Environmental Manager (in role since October 2019); WAANG Environmental Engineer (at AASF #2 since

June 2019); WAARNG Aviation Safety Officer (at Fairchild AFB since 2006); and WAANG Real Property Manager (at Fairchild AFB since 1982).

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 as follows:

- **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 release(s) at the facility identified during the site visit.
- **Section 4** – **Emergency Response Areas:** describes areas of potential PFAS release(s) at the facility, specifically in response to emergency situations.
- **Section 5** – **Adjacent Off-Site Sources:** describes sources of potential PFAS release(s) 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 each Area of Interest (AOI).
- **Section 7** – **Conclusions:** summarizes the data findings and presents the conclusions 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 AASF #2 is located at Fairchild AFB, approximately 12 miles southwest of the City Spokane, in Spokane County, Washington. AASF #2 consists of 18,706 square feet of office and maintenance space within a 47,500 square-foot building identified as Hangar 1029. This hangar, constructed in the 1950s and completely renovated in 2002, is owned by the US Air Force (USAF) and also occupied by the WAANG (CH2M, 2015). Hangar 1029 is situated along the northwestern end of the flight line in the central-western portion of Fairchild AFB (US Department of the Army [USDOA], 2014; Spokane County, 2019a).

Fairchild AFB is an active AFB, encompassing over 4,200 acres, and provides refueling and bomber support for airlift missions (Matrix Design Group, Inc. [MDG], 2009). In the early 1940s, the City of Spokane donated land to the US Government for its development of the Spokane Army Air Depot, which was assigned to the repair of damaged aircraft during World War II from 1942 to 1946 (MDG, 2009; City of Airway Heights, 2020). In 1947, the installation was assigned to the USAF, and by 1957, its mission began as an air refueling. As of 1994, Fairchild AFB is the USAF's largest air refueling wing (MDG, 2009).

The WAARNG began operating the AASF #2 at Fairchild AFB in 2006 at Hangar 1001, which was constructed in 1955 and used as an aircraft maintenance hangar located along the northeastern

side of the flight line (WMD, 2007). In 2011, the WAARNG moved its operations to Hangar 1029. Prior to 2006, the WAARNG operated at Geiger Field, the former name of the present-day Spokane International Airport, located 3.5 miles to the southeast (Carter, 2006; Lackey, 2017).

Several units and missions are active at Fairchild AFB, served by the USAF, the WAARNG, and the WAANG. AASF #2 serves the WAARNG and the WAANG (MDG, 2009). The WAANG has operated at Hangar 1029 since 1976 under license with the ARNG National Guard Bureau. The WAARNG's permit with the USAF is currently expired (as of the date of the site visit); however, according to interviewed facility personnel, the USAF has allowed for the WAARNG's continued operations on-site (USDOA, 2014; USAF, 2014; OWH, 2016; Lackey, 2017). The mission of the AASF #2 is to provide aircraft, aircraft support, and training for WAANG pilots, operating/maintaining of helicopters (Carter, 2006; USDOA, 2014).

1.5 Facility Environmental Setting

AASF #2 is situated on the northwestern end of Fairchild AFB, immediately adjacent to the flight line. Nearby Spokane County municipalities include the City of Medical Lake (2 miles to the southwest of the AASF #2) and the City of Airway Heights (3 miles to the northeast of the AASF #2). The Spokane International Airport is located 3.5 miles to the southeast of the AASF #2. The facility is shown on **Figure 1-1**.

The facility and the surrounding area are fairly flat, at an average elevation of 2,440 feet above mean sea level (amsl).

1.5.1 Geology

The facility is located in a geologic area characterized as older glacial drift of the Pleistocene geologic epoch of the Cenozoic era (US Geological Survey [USGS], 2019). Major lithologic constituents of older glacial drift are unconsolidated clay and silt and unconsolidated gravel and sand from glacial till/outwash (USGS, 2019). This geologic feature is found interspersed with the predominant geologic feature of eastern Washington, the Miocene volcanic rocks, found beneath areas of Fairchild AFB (USGS, 1994, 2019). Major lithologic constituents of Miocene volcanic rocks are igneous basalt (USGS, 2019).

The facility is situated in a historically volcanic area of the Pacific Northwest, known as the Columbia Plateau physiographic province, west of the Rocky Mountain System (US Department of the Interior [USDOI], 2019). This physiographic province extends north into Canada and south into southern California. The Columbia Plateau regional aquifer system, found mostly throughout southeastern Washington (but also extending into northeastern Oregon and western Idaho), covers an area of approximately 50,600 square miles (USGS, 1994). This aquifer system is comprised of three basalt formations — Saddle Mountains Basalt, Wanapum Basalt, and Grande Ronde Basalt (increasing in geologic age with depth, respectively) — collectively known as the Columbia River Basalt Group. Unconsolidated deposits (with thicknesses ranging from 200 to 2,000 feet) overlie basalt formations of the Miocene basaltic-rock (with thicknesses up to 15,000 feet thick), yielding the most productive aquifer for groundwater. Two of the three basalt formations (Grande Ronde Basalt and Wanapum Basalt) are found throughout Spokane County, but at thicknesses less than what is found towards the center of the basalt group (i.e., southwest of Spokane County).

1.5.2 Hydrogeology

Soils beneath the facility consist of the Phoebe dry-Bong complex soil series (US Department of Agriculture [USDA], 2019). This soil series is characterized as being well drained with a moderate water capacity found on outwash plains (USDA, 2016). Parent material of this soil series is

comprised of sandy glaciofluvial deposits with a minor amount of volcanic ash and loess in the upper profile (USDA, 2016).

Wells in the Columbia Plateau regional aquifer system are commonly drilled to several hundred feet below the top of the saturation zone (USGS, 1994). Compared to the Miocene basaltic-rock aquifer yielding approximately 1.5 gallons of water per minute, the unconsolidated-deposit aquifer yields 0.5 gallon of water per minute (per foot of saturated material). Pre-Miocene igneous, metamorphic, and consolidated sedimentary rocks comprise the bedrock underlying the Columbia River Basalt Group (USGS, 1994). Groundwater in the region of the AASF #2 is limited to climate and geology; the availability of groundwater is limited during summer months due to the cool, wet climate during winter months and the fairly warm, dry climate during summer months (Washington State Department of Ecology [Ecology], 2012).

The Columbia River Basalt Group aquifers, which underly the West Plains plateau found south of the Spokane River (east of the AASF #2), supply water to Fairchild AFB and other communities in the surrounding area (Ecology, 2012). Fairchild AFB obtains its drinking water supply from five groundwater wells located approximately 8 miles to the northeast of the base (CH2M, 2015). Fairchild AFB's water system is a Group A Community water system, where water is sourced from seven source areas within the Spokane Valley Rathdrum Prairie aquifer (Washington State Department of Health [DOH], 2020). Fairchild AFB also has an emergency connection (aka intertie) to the City of Spokane's drinking water system when its primary well sources are not accessible (active since 2002) (CH2M, 2015; DOH, 2020). The Spokane Valley-Rathdrum Prairie Aquifer was designated a "sole source aquifer" in 1978 by USEPA for the City of Spokane (water is drawn from the Spokane River) (MDG, 2009; Spokane County, 2015). The City of Airway Heights—east of Fairchild AFB—obtains its water from the Wanapum Basalt Aquifer as well as the City of Spokane's supply during dry seasons, supplying water to 1,572 connections (MDG, 2009; Amec, 2019b).

The Spokane Valley-Rathdrum Prairie Aquifer is an unconfined aquifer covering an area of 370 square miles east of the AASF #2. Thick layers of coarse-grained sediments consisting of gravels, cobbles, and boulders comprise the aquifer (USGS, 2005). The Spokane Valley-Rathdrum Prairie Aquifer discharges into the Spokane and Little Spokane Rivers (east of the AASF #2), in addition to well withdrawals (USGS, 2005). Groundwater recharge generally occurs by infiltration of precipitation, snowmelt, irrigation water, subsurface inflow, and leakage from nearby/overlying surface waterbodies (USGS, 2005).

No groundwater wells (drinking or monitoring) are located at the facility. Ecology documents several resource protection and decommissioned wells (owned by the USAF) scattered across Fairchild AFB, including in the vicinity of the AASF #2 (Ecology, 2020a). Recorded logs document these wells were completed between 1988 and 2016, drilled to depths ranging from 12 to 61 feet below ground surface (bgs) (Ecology, 2020a). Additionally, numerous monitoring wells are scattered across Fairchild AFB, with the nearest well to the AASF #2 located approximately 1,000 feet to the northeast and hydrologically down-gradient (Amec, 2019a). Groundwater measurements collected from monitoring wells in 2017 across Fairchild AFB indicate shallow groundwater flows generally to the east, within the central area of the base (south of the flight line and beneath the AASF #2) and to the northeast/north in the northern portion of the base (north of the flight line) (Amec, 2019a). Depth to groundwater measured at the monitoring wells ranged from 3.4 to 12 feet bgs (Amec, 2019a). Groundwater elevations measured at the monitoring wells were recorded generally at 2,400 feet amsl (Amec, 2019a). The closest groundwater monitoring well to the AASF #2 was installed to a depth of 18 feet bgs, with a groundwater elevation of 2,439 feet amsl (Amec, 2019a). Groundwater wells are shown on **Figure 1-2**, with the exception of wells included in the State's database (Ecology, 2020a). For completeness, wells reported by the State are included on **Figure A-1** (**Appendix A**).

Based on USEPA's UCMR3 data (samples collected between 2013 and 2016), no PFAS were detected in a public water system above USEPA's HAs within 20 miles of the facility, including the City of Spokane and Spokane County's drinking water systems, which were sampled in 2015 (USEPA, 2017b). The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed from 2013-2016 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. However, drinking water for the City of Airway Heights has been impacted by PFAS that were first detected in May 2017 (**Section 5**) (Agency for Toxic Substances Disease Registry (ATSDR), 2019).

1.5.3 Hydrology

The facility and the majority of Fairchild AFB lie within the Upper Hog Canyon Creek watershed, a drainage area delineated within the Palouse Watershed. As shown on **Figure 1-3,** portions of Fairchild AFB also lie within the Nine Mile Reservoir-Spokane River Watershed, the Deep Creek Watershed, and the Headwaters Deep Creek Watershed (Ecology 2012, 2017, 2020b). With the exception of No Name Creek (described further below), most streams surrounding the installation drain to the Palouse River (50 miles south of the facility) (Ecology, 2012).

No surface waterbodies (lakes, ponds, or wetlands) are located within, and no surface water features (rivers, streams, or creeks) flow through the facility property boundary. Surface waterbodies and some wetland features are located within the southern boundary area of Fairchild AFB and to the west of the Fairchild AFB boundary (USEPA, 2017a; US Fish and Wildlife Services [USFWS], 2018; Earth Point [EP], 2019). The main surface water runoff pathway at Fairchild AFB is No Name Creek, located adjacent to the east of the central-eastern base boundary, originating from a stormwater retention pond on-base along the central-eastern boundary (CH2M, 2015).

Precipitation falling onto the facility would flow as sheet flow on the pavement and enter the stormwater system surrounding the hangar building at the flight line, or infiltrate the unpaved, grassy areas adjacent to the north and west of the hangar building (CH2M, 2015). Stormwater collected in the stormwater conveyance system discharges into the on-base stormwater retention pond, which discharges off-base to No Name Creek, ultimately flowing for approximately 1 mile in an easterly direction and infiltrating the ground (CH2M, 2015). Surface water runoff at the facility and surrounding area would generally occur during heavy precipitation events, where precipitation exceeds the infiltration rate.

1.5.4 Climate

Climate in the region of the facility is characterized by warm, dry summers and cool, wet winters, ranging from sub humid temperatures in the mountains and semiarid temperatures in the valley, due to its proximity to the Rocky Mountains; average precipitation in Spokane County ranges from 16 to 18 inches annually (USGS, 2005). Precipitation in this region generally falls as snow in the fall/winter (November through March) (UGS, 2005). Precipitation volumes increase moving east, towards the Rocky Mountains.

Temperatures recorded for 2019 at the nearest climatological station to the AASF #2 (the Spokane International Airport) ranged from an average low of 21 degrees Fahrenheit (°F) in February to an average high of 73°F in August (National Oceanic and Atmospheric Administration [NOAA], 2020).

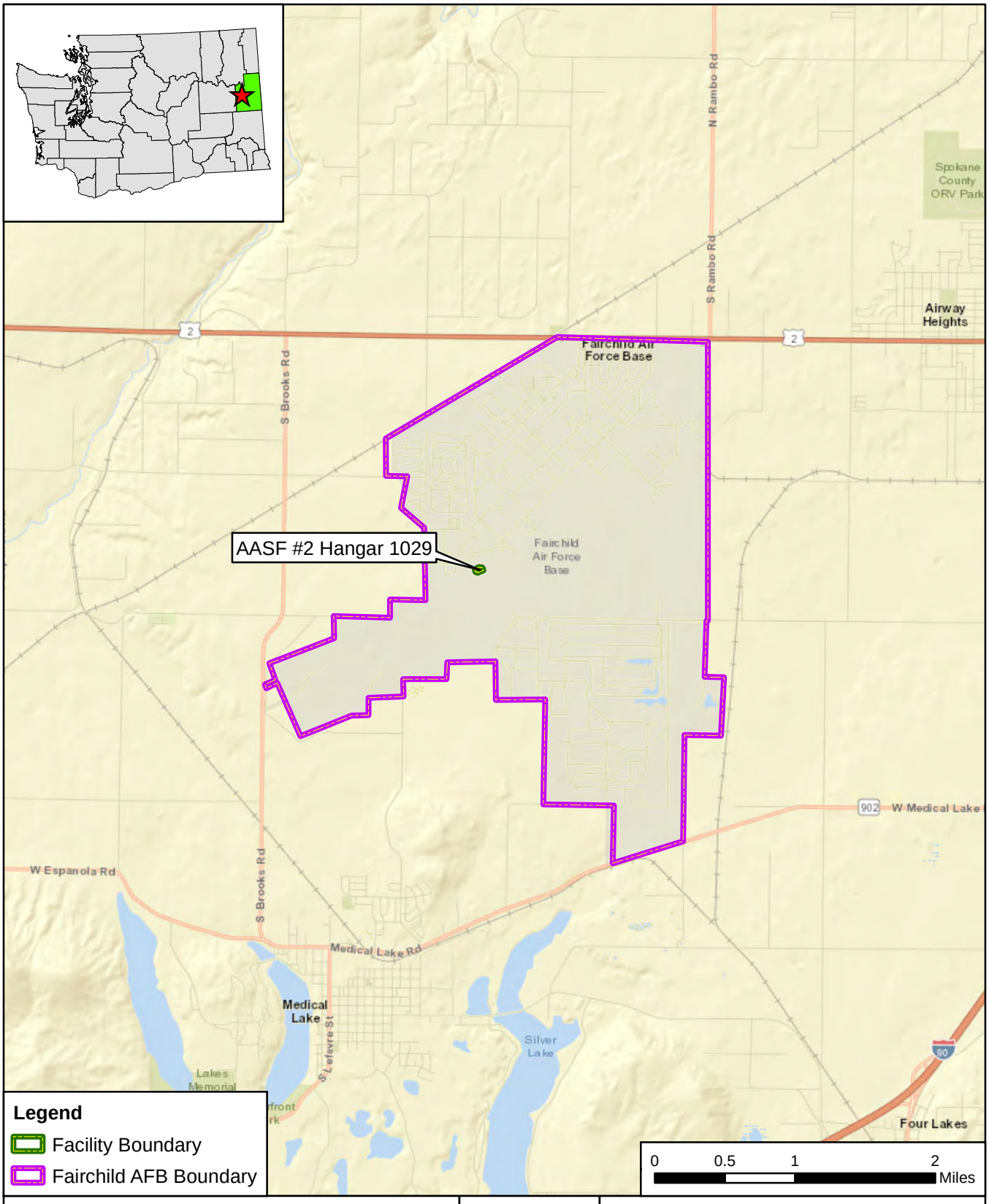
1.5.5 Current and Future Land Use

AASF #2 occupies 18,706 square feet of office and hangar maintenance space within a 47,500 square foot building identified as Hangar 1029. This hangar is owned by the USAF and is also occupied by the WAANG. This hangar is located adjacent to the north of the Fairchild AFB flight

line in the western portion of the AFB. Fairchild AFB, which is comprised of multiple parcels under its own jurisdiction within Spokane County, is zoned as Military (Spokane County, 2019a; MDG, 2009). Fairchild AFB is developed with an airfield consisting of a northeast/southwest-oriented flight line and numerous hangars and associated mission support buildings, a munitions storage area, dormitories, and family housing, in addition to daycares, schools, hospitals/clinics, and shopping centers. Fairchild AFB is completely fenced-in and closed to the public, only accessible via four controlled gates (MDG, 2009).

Fairchild AFB is surrounded by rural, agricultural, mineral lands, and residential properties, with some light industrial properties to the east/southeast (Spokane County, 2019a). The nearest wastewater treatment facility, which is approximately 2 miles to the east of Fairchild AFB, is located in the City of Airway Heights. The City of Spokane's wastewater treatment plant–which Fairchild AFB's on-site utilities are connected to–is located approximately 9 miles to the northeast of Fairchild AFB.

Plans for the future use of Hangar 1029 are unknown. However, given the building lease between the USAF and the WAARNG, the mission of the WMD at AASF #2, and the military's purpose/future plans for Fairchild AFB, it is unlikely that the land use will change (MDG, 2009). Similarly, surrounding land use is not expected to change.



CLIENT	ARNG			
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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-1

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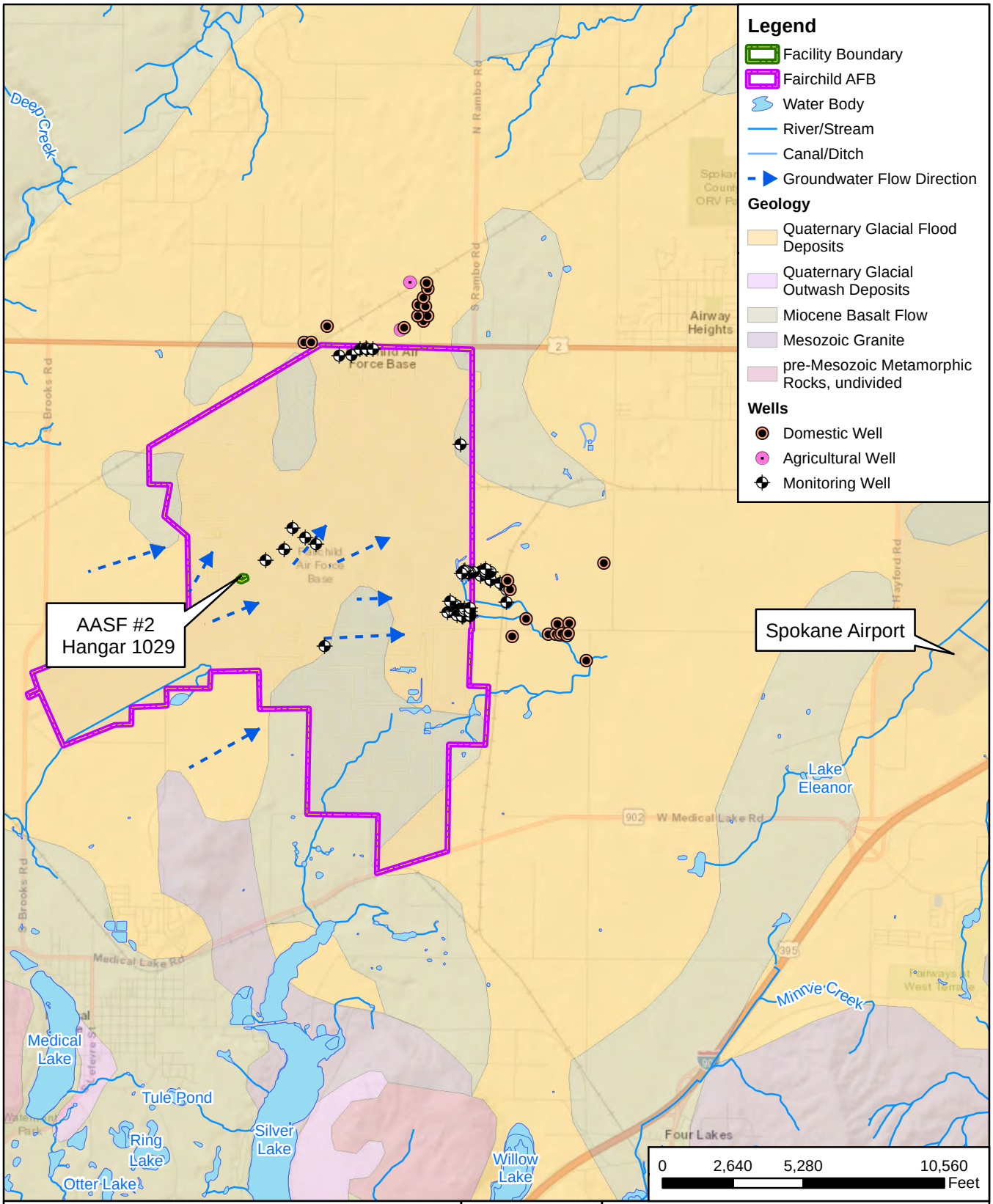

CLIENT	ARNG			
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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-2

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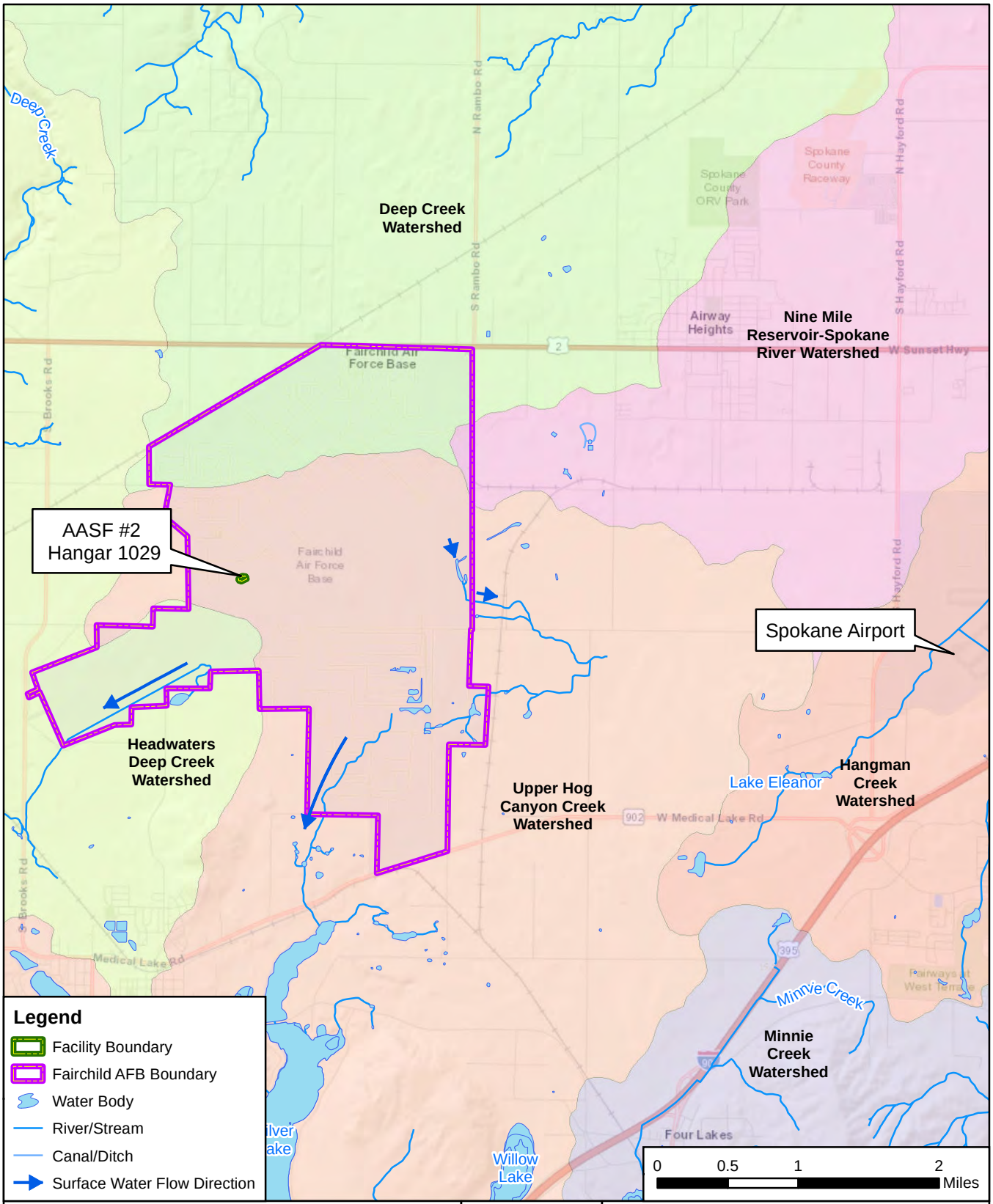

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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

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Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-3

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2. Fire Training Areas

No FTAs associated with the WAARNG's activities, where PFAS were potentially released, were identified during the PA at or in the immediate vicinity of the AASF #2. The WAARNG has no firefighting units at the facility. Interview records are provided in **Appendix B**.

The Fairchild AFB Fire Department is responsible for responding to all fires at Fairchild AFB, including structure, aircraft, fuel, and other types. Descriptions of FTAs not associated with the WAARNG are provided in **Section 5**.

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**. One non-FTA was identified at the AASF #2 during the PA. A description of the non-FTA is presented below, and the non-FTA is shown on **Figure 3-1.**

3.1 Hangar 1029

WAARNG AASF #2, has occupied 18,706 square feet of a total 47,500 square foot building identified as Hangar 1029 since 2011. A portion of Hangar 1029 is also occupied by the WAANG. Hangar 1029, constructed in the 1950s and completely renovated in 2002, is owned by the USAF (CH2M, 2015; USDOA, 2014). The hangar is equipped with a fire suppression system and AFFF aboveground storage tanks (ASTs). The hangar includes office space in the northwestern corner, a helicopter maintenance hangar in the central and eastern portions, a mezzanine level with offices and storage rooms above the maintenance area, and a storage room (Room 139) adjacent to the north-central portion of the hangar (CH2M, 2015).

The WAARNG occupies 18,706 square feet of maintenance hangar space in the eastern portion of the hangar and office space in the northwestern corner (USAF, 2014). The WAANG occupies 22,464 square feet in the western portion of the hangar, office space in the northwestern corner, and a portion of the exterior adjacent flight line area for helicopter takeoff/landing (USDOA, 2014). The remaining 6,330 square feet of space in the central portion of the hangar is used for aircraft maintenance (USDOA, 2014). The exterior area surrounding Hangar 1029 is completely paved, with exception of grassy areas to the north and west.

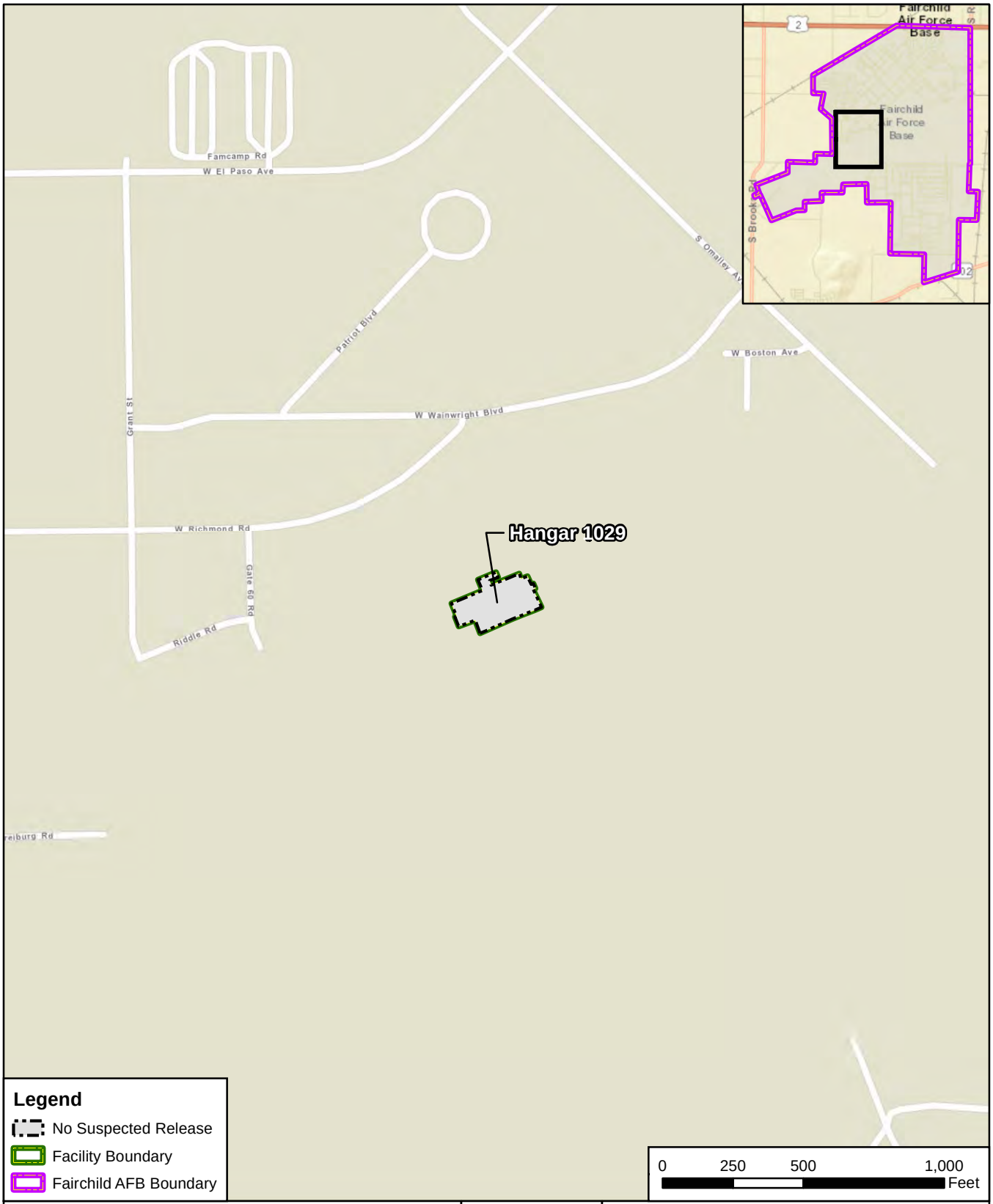
Based on review of available historical aerial photographs and other available records, development of the hangar dates back to 1955 (EDR™, 2019a; CH2M, 2015). The area surrounding Hangar 1029 was developed as the present-day Fairchild AFB beginning in 1942, and additional development continued through at least the early 2000s; expansion of the airfield adjacent to the south of the AASF #2 is apparent by at least 1950 through at least 1972 (EDR™, 2019a; Amec, 2019a). Hangar 1029 was originally developed as a single structure in 1955, with additions developed sometime after 1995 that included the present-day mechanical room (equipped with the fire suppression system) to the north of the hangar and expansion of the hangar to the south along the flight line by at least 2006 (EDR™, 2019a). By the 2006 aerial photograph, Hangar 1029 and surrounding area appear to be in a similar configuration as observed during the site visit (EDR™, 2019a).

Hangar 1029's fire suppression system was installed in 1995 and is equipped with AFFF. The AFFF is stored in two 600-gallon steel ASTs inside the mechanical room (Room 139) adjacent to the north of the hangar. Four 55-gallon poly totes of Ansulite C6 3% AFFF concentrate are stored on the concrete floor of the mechanical room. According to WAANG personnel, the WAANG operates and maintains the fire suppression system, while the USAF provides the AFFF concentrate, as needed. The USAF, through implementation of its Fire Preventative Maintenance Program, tests the fire suppression system (and all others on-base) at varying frequencies (ranging from monthly, to every 2 years, to every 10 years). According to WAANG facility personnel, the USAF replaced the AFFF during a single occurrence in 2017; no releases were documented to have occurred during replacement.

Floor drains within the hangar are routed to an underground vault located at Building 1048 on-base (the pump house) that ultimately discharge to a self-contained central collection system on-base that consists of a 340,000-gallon underground storage tank (UST/oil-water separator)

managed by USAF. Contents of the USAF's waste UST are either pumped out or discharged to the City of Spokane's wastewater treatment system (CH2M, 2015). According to interviews with facility personnel who have been onsite since 2006 and review of the 2015 PA for Fairchild AFB, AFFF has not been discharged from the fire suppression system at Hangar 1029 since its installation in 1995 (CH2M, 2015).

Several ABC fire extinguishers (non-PFAS-containing), which are purchased and maintained by the WAANG, are located throughout the office area of AASF #2.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF #2 - Fairchild AFB, WA			
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SCALE	1:6,000	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

Non-Fire Training Areas

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Figure 3-1

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4. Emergency Response Areas

Based on interviews conducted with facility personnel on-site since 2006, no emergency response actions using AFFF have occurred at the AASF #2. Emergency responses at adjacent areas by others (i.e., Fairchild AFB) are summarized in **Section 5**.

5. Adjacent Sources

Adjacent sources of PFAS contamination were identified during the PA (EDR™, 2019b). The USAF conducted a PFAS SI at Fairchild AFB between 2017 and 2019 that included soil and groundwater sampling both on- and off-base (Amec, 2019a, 2019b). The USAF and ATSDR are currently performing on-going investigations and exposure assessments in the community surrounding Fairchild AFB (ATSDR, 2019). **Table 5-1** summarizes the USAF PFAS SI findings and information about other adjacent sources as shown on **Figure 5-1**.

Table 5-1: Adjacent Sources

Area	Description	Findings
Fairchild AFB Release Areas 1 and 2	The USAF handled AFFF at two former FTAs: FT004 (FT01) and the Calibration Area[1] (CH2M, 2015; Amec, 2019a). At FT004 (FT01), the USAF used AFFF during fire training exercises from the 1960s to 1981. At the Calibration Area, the USAF sprayed AFFF onto an area formerly used as the airfield taxiway, during AFFF equipment testing and calibration (dates/duration is not known). These areas were located approximately 1.5 miles to the southeast and hydrologically downgradient of the AASF #2 and are not likely to have impacted AASF #2.	PFAS were detected in soil and groundwater samples (Amec, 2019a). Groundwater concentrations of PFOS, PFOA, and/or PFOS/PFOA exceeded USEPA's HAs. Soil concentrations of PFOS exceeded screening levels. Soil and groundwater concentrations of PFBS were below the USAF's screening levels (some samples were non-detect).
Fairchild AFB Release Areas 3 and 4	Several aircraft crashes occurred in the 1950s through the 1990s (CH2M, 2015; Amec, 2019a). AFFF was not used by the USAF for extinguishing fires in the 1950s crashes, but unknown quantities of AFFF were used to extinguish fires during a 1987 and a 1994 crash, which both occurred on pervious (grass-covered) areas. The 1987 crash was located less than 0.5 miles to the east and hydrologically downgradient of the AASF #2. The 1994 crash was located less than 1 mile to the southeast and hydrologically cross-gradient of the AASF #2. AFFF impacts in these areas are not likely to have impacted AASF #2.	PFAS were detected in soil and groundwater samples (Amec, 2019a). Groundwater concentrations of PFOS, PFOA, and/or PFOS/PFOA exceeded USEPA's HAs. Soil concentrations of PFOS exceeded screening levels at Release Area 4 only. Soil and groundwater concentrations of perfluorobutanesulfonic acid (PFBS) were below the USAF's screening levels (some samples were non-detect in Release Area 3).
Fairchild AFB Release Area 5	The USAF conducted calibration tests with AFFF equipment on unpaved areas surrounding Fire Station 1 (dates are not known) (CH2M, 2015; Amec, 2019a).	PFAS were detected in soil and groundwater samples (Amec, 2019a). Groundwater concentrations of PFOS,

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Table 5-1: Adjacent Sources

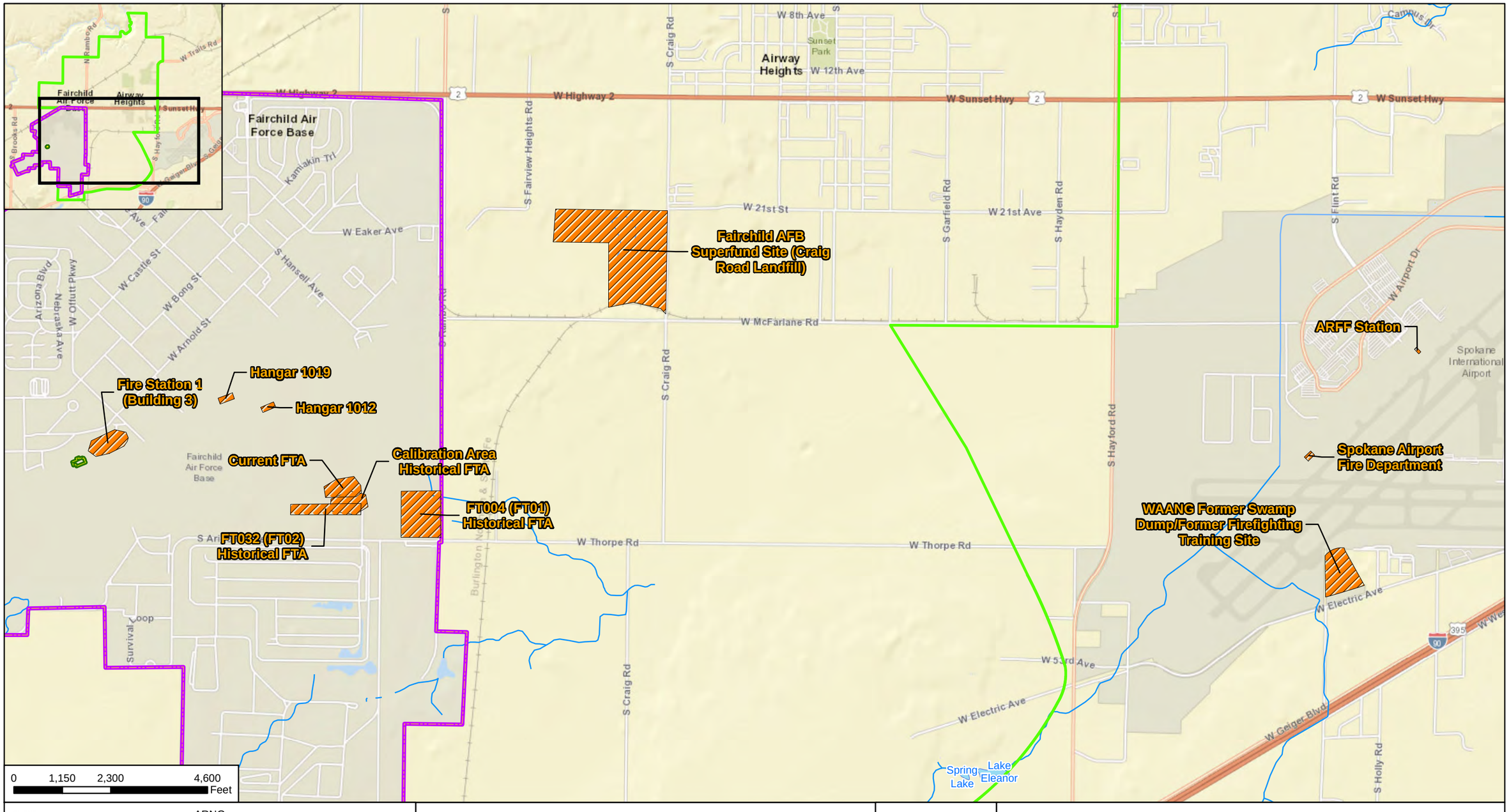
Area	Description	Findings
	This area is located less than 1,000 feet to the east and hydrologically downgradient of the AASF #2 and is therefore not likely to have impacted AASF #2.	PFOA, and/or PFOS/PFOA exceeded USEPA's HAs. Soil concentrations of PFOS exceeded screening levels. Soil and groundwater concentrations of PFBS were below the USAF's screening levels.
Fairchild AFB Fire Suppression Systems	Five hangars are equipped with AFFF fire suppression systems (CH2M, 2015). The hangars are developed with floor drains connected to an oil/water separator located on-base that ultimately discharges to the City of Spokane wastewater treatment system. Two of the five hangars (1012 and 1019) had AFFF discharges from the systems in the early to mid-2000s; however, the AFFF was contained within the hangars. Hangars 1012 and 1019 are located 0.5 miles to the east and hydrologically downgradient of the AASF #2. AFFF releases from these hangars are not expected to have impacted the AASF #2.	Two of the five base hangars had AFFF discharges in the early to mid-2000s; however, the AFFF was contained within the hangars during both incidents (CH2M, 2015).
City of Airway Heights PFAS-Impacted Areas	The City of Airway Heights—in addition to other private residences in the vicinity—located hydrologically down-gradient of Fairchild AFB have been impacted by former PFAS-handling activities (Amec, 2019b; City of Airway Heights, 2019). These areas are located to the east and hydrologically downgradient of the AASF #2. AFFF impacts to the City of Airway Heights' groundwater are not expected to impact the AASF #2.	PFOS/PFOA exceeded USEPA's HAs in 90 of 370 private drinking water wells (Amec, 2019b; USAF, 2017a, 2017b; 2019). PFOS, PFOA, and PFOS+PFOA were detected in three on-base and four off-base monitoring wells at concentrations exceeding USEPA's HAs (Amec, 2019b). PFOS and PFOA detected in two municipal wells in the City of Airway Heights at concentrations exceeding USEPA's HAs. PFOS and PFOA were detected in the City of Airway Heights' wastewater treatment plant effluent (Amec, 2019b).

Table 5-1: Adjacent Sources

Area	Description	Findings
Fairchild AFB Superfund Site – 4 Waste Areas/ Craig Road Landfill (EPA ID WA9571924647)	Four waste areas (including two landfills) encompass 85 acres of the 4,300 acre property used by the USAF to dispose of hazardous wastes, including solvents, paint wastes, plating sludges, and other industrial wastes (USEPA, 2019d). The Craig Road Landfill encompasses 29 acres and is located 2.5 miles east and hydrologically downgradient of the AASF #2 (USEPA, 2019d). The former landfill was used by Fairchild AFB from the 1950s to the 1970s to dispose of municipal/industrial wastes (including paint wastes and solvents). These areas were located to the east and hydrologically downgradient of the AASF #2 and are not likely to have impacted the AASF #2.	Soil and groundwater are contaminated with volatile constituents, including chlorinated hydrocarbons. USEPA issued a Record of Decision outlining cleanup plans in 1993; cleanup is ongoing (scheduled for completion by 2022) (USEPA, 2019d). As of 2013, USEPA determined no evidence of exposure to impacted groundwater at off-site supply wells, although some off-site monitoring wells still reported elevated concentrations (USEPA, 2013; Bay West, 2016).
Spokane International Airport	An Airport Rescue and Fire Fighting (ARFF) station is located at the airport, constructed in 1978, and is staffed by Spokane County (Mead and Hunt [MH], 2014a, 2014b; Prager, 2014). The ARFF station is located approximately 6 miles to the east and hydrologically downgradient of the AASF #2. The Spokane Airport stores 800 gallons of AFFF in ARFF vehicles and an additional 800 gallons in restock supply (Wohlfeil, 2019). Since at least October 2019, however, the Spokane Airport uses a C6 type AFFF and only discharges AFFF from its ARFF vehicles during actual emergencies (Wohlfeil, 2019). Because PFAS-containing MIL-SPEC AFFF has been used at the Spokane Airport, and because the ARFF vehicle testing has occurred (as recommended by the FAA), it is very likely that PFAS releases to the ground have occurred at the Spokane Airport during training events. However, based on its distance and hydrologic location, the Spokane Airport ARFF station is not an off-site concern to the AASF #2.	No known investigations of PFAS have been published.

Table 5-1: Adjacent Sources

Area	Description	Findings
WAANG Spokane Station – Former Swamp Dump/Firefighting Training Site (Facility/Site ID 19894; Cleanup Site ID 1835)	The WAANG Spokane Station (aka WAANG Field Headquarters) is an Ecology Cleanup Site since the early 1990s (Ecology, 2020b). The WAANG Spokane Station is located adjacent to the south of the Spokane International Airport runway, approximately 6 miles to the southeast and hydrologically downgradient of the AASF #2. The WAANG has operated at this location since the early 1950s. An area covering six acres adjacent to the west of the southwestern portion of the WAANG Spokane Station was reportedly used by the WAANG as a dump from 1960 to 1976, identified currently as a swamp based on its vegetative characteristics (Century West Engineering Corporation [CW], 1993 Ecology, 1996). Additionally, this area was also reportedly used by the WAANG as a firefighting training site (activities and dates/duration are not documented) (CW, 1993). As of 1993, this area also reportedly served the Spokane International Airport Fire Department (activities and dates/duration are not documented) (CW, 1993). Given the former WAANG's use of the site as a dump and firefighting training site in the 1960s/1970s, when PFAS-containing AFFF and other materials were available, the use of AFFF and disposal of PFAS-containing materials is likely. However, based on its distance and hydrologic location, the WAANG Spokane Station is not an off-site concern to the AASF #2.	No known investigations of PFAS have been published.



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SCALE	1:27,600	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/16/2020

Legend

- Potential PFAS Release
- Facility Boundary
- Fairchild AFB Boundary
- USAF PFAS Sampling Area 2017-2019
- Water Body
- River/Stream
- Canal/Ditch

N

Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings from interviews with facility personnel, on-Post observations, and online research, no AOIs were identified at the AASF #2. A Conceptual Site Model (CSM) identifies three components necessary for potentially complete exposure pathways related to a site: (1) source, (2) pathway, and (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

No PFAS sources (or exposure pathways) were identified to originate at the AASF #2 or from PFAS-handling activities associated with the facility. As presented in **Section 5**, complete exposure pathways for PFAS in drinking water are attributed to off-site sources at Fairchild AFB that are not associated with AASF #2.

7. Conclusions

This report presents a summary of available information gathered during the PA on the use and storage of AFFF and other PFAS-related activities at AASF #2 at Fairchild AFB in Spokane, Washington. The PA findings are based on the information presented in **Appendices A** and **B**.

7.1 Findings

Based on information obtained during interviews conducted with facility personnel, on-Post observations, and reviewed documentation, no AOIs related to PFAS release(s) were identified at the AASF #2. While adjacent PFAS sources associated with Fairchild AFB FTAs and emergency response areas were identified, evidence obtained during the PA does not support that current or former ARNG facility activities have contributed to PFAS contamination in soil, groundwater, surface water, or sediment for any receptor. A summary of PA findings is presented in **Figure 7-1**.

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, or 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. 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 (1969 to present), and a reliance on personal recollection. There is also a possibility the PA has missed a 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 information regarding the use and storage of PFAS were reviewed, retired and current personnel were interviewed, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected. **Table 7-1** summarizes the uncertainties associated with the PA.

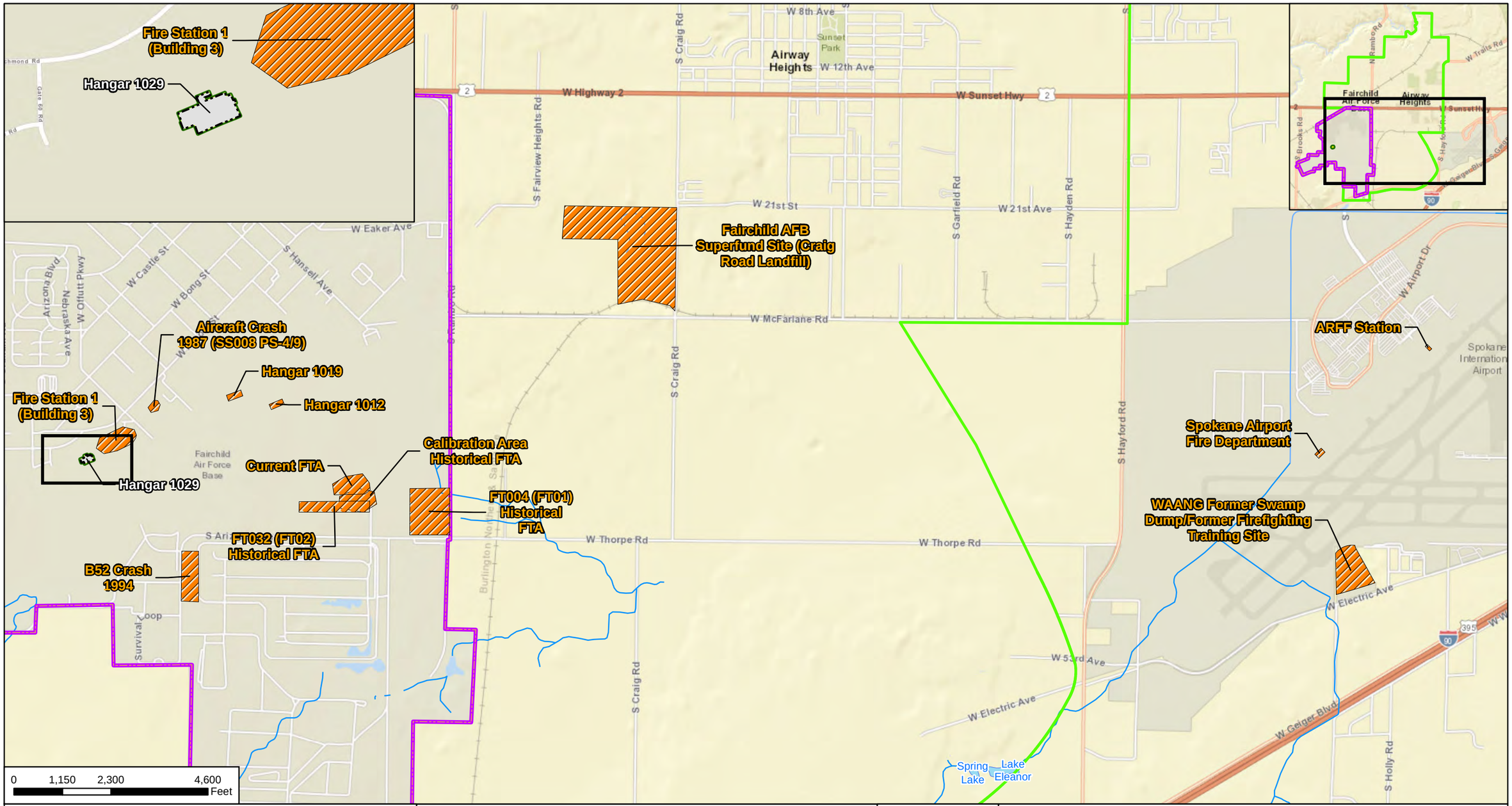
Table 7-1: Uncertainties

Area	Source of Uncertainty
WAANG Spokane Station – Former Swamp Dump/Firefighting Training Site (Ecology Facility/Site ID 19894; Cleanup Site ID 1835)	The WAANG has operated south of the Spokane International Airport since the early 1950s. Limited uncertainty exists with regard to WAANG's use of the property for dumping wastes and conducting firefighting training in the 1960s/1970s.
Spokane International Airport	The airport has been in operation since 1960. A Fire Department is located onsite. ARFF equipment and AFFF are located at the ARFF Station. Limited uncertainty exists with regard to the Fire Department's frequency of AFFF training events, ARFF equipment testing, AFFF releases, in addition to AFFF release areas.

Area	Source of Uncertainty
Fairchild AFB – FTAs	Fairchild AFB has been in operation since 1942. AFFF was handled and released at numerous FTAs on-base. Limited uncertainty exists with regard to the quantity of AFFF use, concentration of AFFF, and frequency of AFFF release events.
Fairchild AFB – Hangar Fire Suppression Systems	Fairchild AFB has been in operation since 1942. Several hangars are equipped with fire suppression systems and two hangars are documented to have had AFFF releases that were contained. Limited uncertainty exists with regard to the actual containment of the AFFF and offsite migration.
Fairchild AFB Superfund Site – 4 Waste Areas/Craig Road Landfill (EPA ID WA9571924647)	Fairchild AFB used an area east of the base to dispose of hazardous wastes (including municipal/industrial wastes) in landfills during unspecified time periods. Limited uncertainty exists with regard to the types of materials disposed of.

7.3 Potential Future Actions

The WAANG is responsible for the maintenance and testing of the fire suppression system at Hangar 1029 and releases associated with the maintenance of the system. Based on the documented absence of the WAARNG's storage, use or release of PFAS-containing materials at AASF #2 since WAARNG began operations at this facility in 2011, no AOIs were identified during the PA. Evidence does not indicate that current or former ARNG activities contributed PFAS contamination to soil, groundwater, surface water, or sediment at the facility or adjacent areas. AASF #2 will not move forward in the CERCLA process.



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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/16/2020

Legend

- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Fairchild AFB Boundary
- USAF PFAS Sampling Area 2017-2019
- Water Body
- River/Stream
- Canal/Ditch

N

Summary of Findings

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Figure 7-1

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Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for AASF #2 at Fairchild AFB include:

State Database Wells

- Figure A-1: State Database Wells & Map Key

Adjacent Source Studies

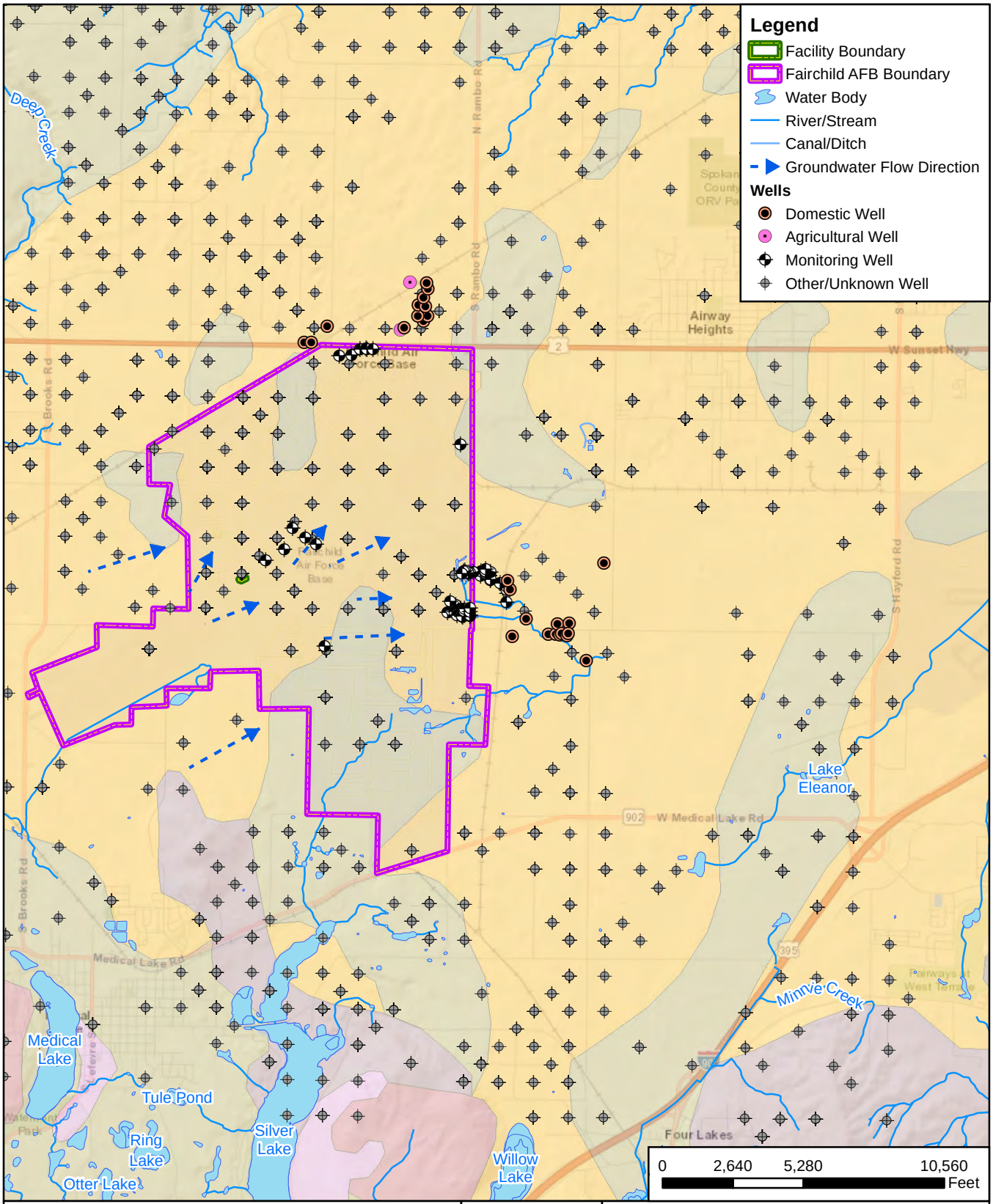
- 2019, Amec Final SI AFFF Release Areas, Fairchild AFB
- 2019, Amec Final SI Addendum and TCRA Report, AFFF Release Areas, Fairchild AFB
- 2018, Ecology NFA Fairchild Former FTA
- 2015, CH2M Hill Final PFAS PA, Fairchild AFB

Facility Lease Agreements

- 2014, USDOA Army License AASF 2 Fairchild
- 2014, USAF Permit to DOA AASF 2 Fairchild

Environmental Data Resources

- 2019, EDR™ Report AASF #2 Fairchild AFB



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at AASF #2 - Fairchild AFB, WA			
REVISED	9/16/2020	GIS BY	MS	9/16/2020
SCALE	1:63,360	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

State Database Wells

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure A-1

C:\Users\stankevichm\OneDrive - AECOM Directory\ARNG_PFAS_GIS_60552172\MXDs\WA\Fairchild_AASF2_Figures\Fig_A-1_Fairchild_AASF2_Groundwater_Eco_Well_Logs.mxd

Appendix B

Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Environmental Manager

Facility: WA AASF #2 (Fairchild AFB, Spokane, WA)
Interviewer: [redacted]
Date/Time: 10/30/2019

Interviewee: [redacted] **Title:** Environmental Engineer, 141st Civil Engineer Squadron, WA Air National Guard **Phone Number:** ([redacted] **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

1. **Roles or activities with the Facility/years working at the Facility.**

Environmental Engineer for the WA Air National Guard since June 2019. Works closely with the Environmental Program of Fairchild AFB.

2. **Where can I find previous facility ownership information?**

Not aware of documents available pertaining to environmental for the facility. There could be documents regarding the landfill and groundwater monitoring. Discussions with onsite facility personnel are best.

3. **What can you tell us about the history of PFAS including aqueous film forming foam (AFFF) at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.**

Maintenance
Fire Training Areas
Firefighting (Active Fire)
Crash
Fire Suppression Systems (Hangers/Dining Facilities)
Fire Protection at Fueling Stations
Non-Technical/Recreational/ Pest Management
Metals Plating Facility
Waterproofing Uniforms (Laundry Facilities)
Other

Not aware of past AFFF uses onsite. No fire training in the past or currently onsite. None of these listed activities were historically or are currently onsite, with exception for maintenance (of helicopters). Fire training and AFFF use occurred in surrounding areas of Fairchild AFB.

4. Fill out CSM Information worksheet with the Environmental Manager.

5. **Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing the AFFF/suppression system? Do you have "As Built" drawings for the buildings?**

AFFF fire suppression systems in Hangar 1029.
No As-built drawings available.

6. **Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam? If retrofitted, when was that done?**

Yes, there is an AFFF fire suppression system in Hangar 1029 – installed in 1995.

7. **How is AFFF procured? Do you have an inventory/procurement system that tracks use?**

The USAF provides WAANG with AFFF for the fire suppression system as needed.

8. **What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?**

Ansulite C6 3%

9. **Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?**

The AFFF is stored (prior to use) in 55-gallon poly totes inside the small building where the fire suppression system aboveground storage tanks (ASTs) are located – Building 131. During the site visit, four poly totes were observed.

10. **How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?**

No fire training onsite.

11. **When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?**

Not applicable – no fire training, no retention ponds onsite.

12. **Can you recall specific times when city, county, and/or state personnel came on-post for training? If so, please state which state/county agency or military entity? Do you have any records, including photographs to share with us?**

Not applicable – no fire training.

13. **Did military routinely or occasionally fire train off-post? List the units that you can recall used/trained at various areas.**

The USAF conducts fire training at multiple locations on Fairchild AFB.

14. **Did individual units come with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?**

Not aware.

15. **Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?**

No crashes at the site. There were several aircraft crashes on Fairchild AFB in the past resulting in large fires.

16. **Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?**

No fuel spill logs.
Not aware regarding AFFF use in the past. AFFF not currently used onsite other than in the fire suppression system.

17. **Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?**

No.

18. **Are there mutual aid/use agreements between county, city, and local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement?**

The Fire Department on Fairchild AFB is called.

19. **Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste treatment plants, and AFFF ponds)?**

Not aware. No firefighting has occurred onsite and does not currently.

20. **Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?**

Not aware.

21. **Are there past studies you are aware of with environmental information on plants/animals/ groundwater/soil types, etc., such as Integrated Cultural Resources Management Plans or Integrated Natural Resources Management Plans?**

There is an *Integrated Cultural Resources Management Plan* available for the entire state prepared by the WA Military Department. An ICRMP for Fairchild AFB is managed by the USAF (92 CES/CEIE).

22. **What other records might be helpful to us (environmental compliance, investigation records, admin record) and where can we find them?**

PFAS PA Final Report, prepared by USAF.

23. **Do you have or did you have a chrome plating shop on base? What were/are the years of operation of that chrome plating shop?**

Not aware.

24. **Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control? If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?**

N/A

25. **How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?**

USAF handles all procurement/disposal of AFFF.

26. **Do you recommend anyone else we can interview? If so, do you have contact information for them?**

LTC [redacted] – WAARNG AASF #2 Commander
Army Major [redacted] – WAARNG Safety Officer (since 2006 at Fairchild AFB)
[redacted] – Real Property Manager, Air Guard (NGB A4) (since 1982 at Fairchild AFB)

PA Interview Questionnaire - Other

Facility: AASF #2 (Fairchild AFB - Spokane, WA)
Interviewer: [redacted]
Date/Time: 10/30/19

Interviewee: Army Major [redacted] **Title:** – Aviation Safety Officer, WAARNG AASF #2 at Fairchild AFB, WA **Phone Number:** [redacted] **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:

Safety Officer for the WA Army National Guard. Active at Fairchild AFB since 2006.

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?

No fire training at the Army National Guard property at Fairchild AFB. Hangar 1029 is used for repaired and storing helicopters.

Hangar 1029 is equipped with a fire suppression system that uses AFFF. The office area attached to Hangar 1029 is equipped with standard ABC Fire extinguishers.

No foam in helicopters, ever.
Only water drops on wildland fires.
No known AFFF releases in hangar.

Not aware of any firefighting activities occurring at Camp Seven Mile. No Army aircraft accident on camp property that would have required the use of ARFF assets with PFAS. Bucket training has occurred at Camp Seven Mile, but the Army National Guard does not place additives in the water dropped. Water dropped on Camp Seven Mile is taken from the Spokane River at sites that border the property.

The Washington Army National Guard does not have firefighting units and I am not aware of the USAF 36th RQF (UH-1N Helicopters) having buckets.

The key thing with Camp Seven Mile is that the public can access the lands and we have seen civilian firefighting agencies respond to emergencies in the ORV Park that surrounds camp property in the past.

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

Facility: AASF #2 (Fairchild AFB - Spokane, WA)
Interviewer: [redacted]
Date/Time: 10/30/19

Interviewee: [redacted] **Title:** Real Property Manager, WAANG (141st Civil Engineer Squadron) at Fairchild AFB, WA **Phone Number:** [redacted] **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:

Manager of real estate for the WA Air National Guard. Active at Fairchild AFB since 1982.

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?

No fire training at the Air or Army National Guard property at Fairchild AFB. Hangar 1029 is used for repair and storage of helicopters.

Hangar 1029 is equipped with a fire suppression system that uses AFFF, installed in 1997 and completed in 1999. The office area attached to Hangar 1029 is equipped with standard ABC Fire extinguishers.

- four new 55-gal poly totes of AFFF (Ansulite C6 3% AFFF) stored inside Building 131 (room with fire suppression system)
- two 600 gallon ASTs fire suppression system
- Air Guard maintains equipment, Air Force procures materials
- Testing of AFFF fire suppression system conducted under the Air Force Fire Preventative Maintenance Program (monthly, every 2 years, every 10 years – frequency can vary)
- AFFF replaced once, in 2017, by USAF
- Foam is only dispersed from system during a fire emergency. No emergencies to date.

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

Facility: AASF #2 (Fairchild AFB - Spokane, WA)
Interviewer: [redacted]
Date/Time: 10/30/19

Interviewee: LTC [redacted] **Title:** – Commander, WAARNG AASF #2 at Fairchild AFB, WA **Phone Number:** [redacted] **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:

Commander of the WAARNG AASF #2. Unknown time period of role at facility.

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?

No AFFF or any chemical is ever used with WA Army National Guard helicopters in any training location. The Camp Seven Mile military location is used primarily from the closest possible natural water source. No fire training is currently conducted. In previous years any training at the Camp Seven Mile location water would have been obtained from the river right there.

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

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

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

Recorded by: [redacted]

ARNG Contact: [redacted]

Date and Time: 10/30/2019

Method of visit (walking, driving, adjacent): Walking

Source/Release Information

Site Name / Area Name / Unique ID: AASF #2 at Fairchild AFB (Spokane, WA)

Site / Area Acreage: <0.5 acres

Historic Site Use (Brief Description): WA Army National Guard active in helicopter repair and command, and office administration. Located in Hangar 1029 on Fairchild AFB.

Current Site Use (Brief Description): Same as above.

Physical barriers or access restrictions: None

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):

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

Site is located on Fairchild AFB.

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

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

Hangar 1029 is located at the flight line.

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:

Ansulite C6 3%

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

Maintenance of fire suppression system performed by WA Air National Guard. Additionally, testing of AFFF fire suppression system conducted under the Air Force Fire Preventative Maintenance Program (monthly, every 2 years, every 10 years – frequency can vary)

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

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

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

Asbuilt drawings not obtained. A floor drain system leads to a large underground retention tank located at Building 1048 (pump house). From there, the holding tank can be pumped out or discharged to the City of Spokane wastewater treatment system.

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

Yes, because the site consists of only a single building located on the flight line of Fairchild AFB.

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

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

Hangar 1029 is surrounded by a stormwater conveyance drainage system.

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

3a. If so, please note the location:

Yes, numerous groundwater monitoring wells are located throughout Fairchild AFB.

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.

Possibly from NOAA.

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

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

Throughout Fairchild AFB. Historical use of AFFF - fire training, fire fighting of aircraft crashes, fire suppression systems, etc. Documented PFAS contamination in groundwater.

6b. Will off-site reconnaissance be conducted? **(Y) / N** Currenlty being conducted by USAF.

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):

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

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

Area surrounding Hangar 1029 is primarily paved with some vegetation to the north/east.

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

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

No areas in particular observed.

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:

No areas in particular observed - weather was dry during site visit.

Receptor Information

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

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

Secured gated entrances to Fairchild AFB.

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

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:

To the north on Fairchild AFB. Offsite: dispersed to the north, east, south, and west. Cities located to the east.

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

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

To the north on Fairchild AFB. Offsite: Cities located to the east.

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

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

No wetlands onsite (at Hangar 1029). Offsite: wetlands located on Fairchild AFB in the south portion, and to the south, east, and west of the AFB.

Visual Survey Inspection Log

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: WA Army Aviation Support Facility (AASF) #2 (Fairchild AFB – Spokane, WA) – 10/30/2019

Why has this location been identified as a site?

Potential historical use/storage of AFFF

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

AASF # is located on Fairchild AFB with known PFAS contamination in groundwater from historical AFFF use/release (USAF is currently investigating).

Training Events

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

If so, how often? n/a

How much material was used? Is it documented? n/a

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? Varies depending on location

Average rainfall? 16 to 18 inches

Any flooding during rainy season? No

Direct or indirect pathway to ditches? No

Direct or indirect pathway to larger bodies of water? No

Does surface water pond any place on site? No

Any impoundment areas or retention ponds? No

Any NPDES location points near the site? No

How does surface water drain on and around the flight line? Stormwater drains connected to stormwater conveyance system, discharging to a retention pond along eastern Fairchild AFB property boundary, which discharges offsite to the east.

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? East/northeast

Depth to groundwater? 3 to 12 feet bgs

Uses (agricultural, drinking water, irrigation)? Drinking (five onsite wells from offsite aquifer)

Any groundwater treatment systems? No

Any groundwater monitoring well locations near the site? Yes and onsite

Is groundwater used for drinking water? No

Are there drinking water supply wells on installation? Yes (one supplemental used throughout year – but primary drinking water is obtained from offsite sources)

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient Yes

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? No

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

Do we understand the fate of sludge waste? n/a

Is surface water from potential contaminated sites treated? n/a

Equipment Rinse Water

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

n/a – no firefighting conducted at the site (no fire station/fire equipment at the site)

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?

n/a

3. Other?

n/a

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker yes

Construction Worker yes

Recreational User no

Residential yes

Child yes

Ecological yes

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

Site is located on Fairchild AFB. Schools, day cares, hospital, and church are located to the north of the site in the northern portion of the AFB. Offsite east of AFB: Spokane Airport, City of Airway Heights, City of Spokane, agricultural land surrounding AFB.

Documentation

Ask for Engineering drawings (if applicable).

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

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	AASF #2	Fairchild AFB, Washington

Photograph No. 1

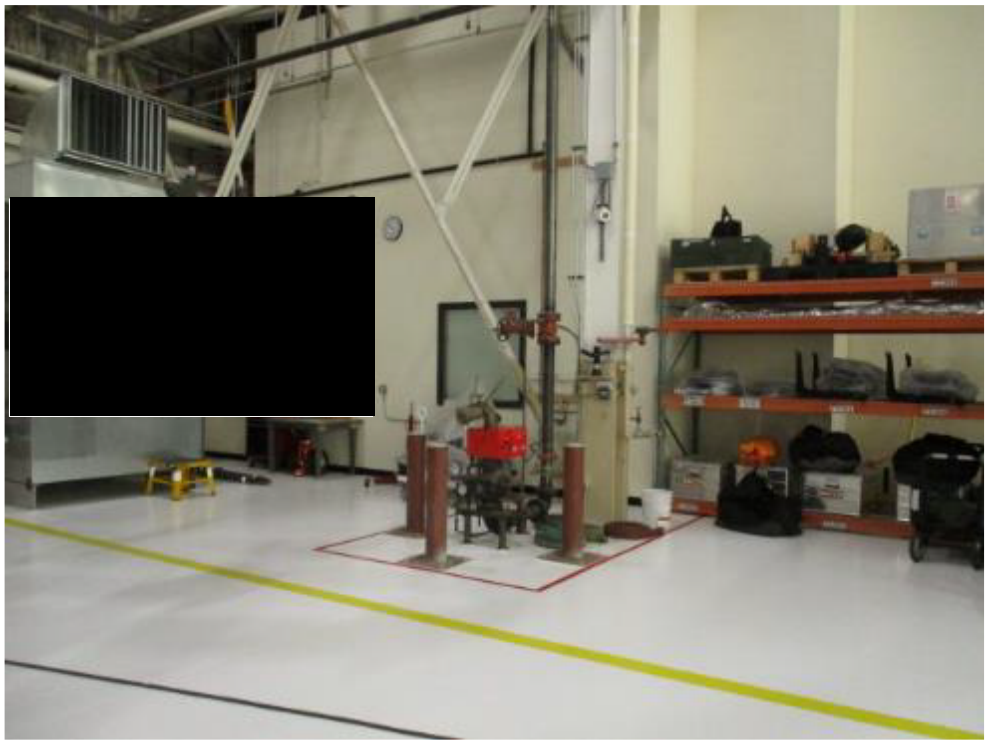
Description:

View of the fire suppression system piping in the western-most portion of Hangar 1029. The fire suppression system is located inside the mechanical room (Room 139) adjacent to the north of the hangar (not pictured). This portion of the hangar is permitted to the Washington Army National Guard.

Photograph No. 2

Description:

View of the fire suppression system piping in the eastern-most portion of Hangar 1029. The fire suppression system is located inside the mechanical room (Room 139) adjacent to the north of the hangar (not pictured). This portion of the hangar is licensed to the Washington Air National Guard.



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	AASF #2	Fairchild AFB, Washington

Photograph No. 3

Description:
View of two 600-gallon steel aboveground storage tanks (ASTs) containing aqueous film forming foam (AFFF) inside the mechanical room (Room 139) adjacent to the north of the hangar area at Hangar 1029.

Photograph No. 4

Description:
View of four 55-gallon poly totes containing aqueous film forming foam (AFFF) concentrate (Ansulite C6 3%) inside the mechanical room (Room 139) adjacent to the north of the hangar area at Hangar 1029. The totes are staged adjacent to the aboveground storage tanks of the hangar's fire suppression system.