FINAL
Preliminary Assessment Report Army Aviation Support Facility #2, Wheeling, West Virginia

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
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSM	conceptual site model
EDR™	Environmental Data Resources, Inc.™
FTA	fire training area
HA	Health Advisory
HAZMAT	hazardous materials
NGWA	National Ground Water Association
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppt	parts per trillion
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
USGS	United States Geological Survey
USPFO	United States Property and Fiscal Office
WVARNG	West Virginia Army National Guard
WVDEP	West Virginia Department of Environmental Protection
WVGES	West Virginia Geological and Economic Survey

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 Wheeling Army Aviation Support Facility (AASF) #2 (also referred to as the "facility") in Wheeling, West Virginia, to assess potential PFAS release areas and exposure pathways to receptors. AASF #2 is constructed on a parcel of land owned by the Ohio County Commission and leased to the West Virginia ARNG (WVARNG). According to the lease document, the lease began on 14 December 1988 and is eligible for a term of 99 years, until 13 December 2087.

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 3 October 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed current and retired AASF #2 personnel including the facility commander, operations staff, and personnel who are also local volunteer firefighters; and
- Identified areas of interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential PFAS source-pathway-receptor linkages for each AOI.

Two AOIs (referred to as "AOI 1" and "AOI 2") related to potential PFAS release were identified at AASF #2 during the PA. The AOIs are shown on **Figure ES-1** and described in **Table ES-1** below.

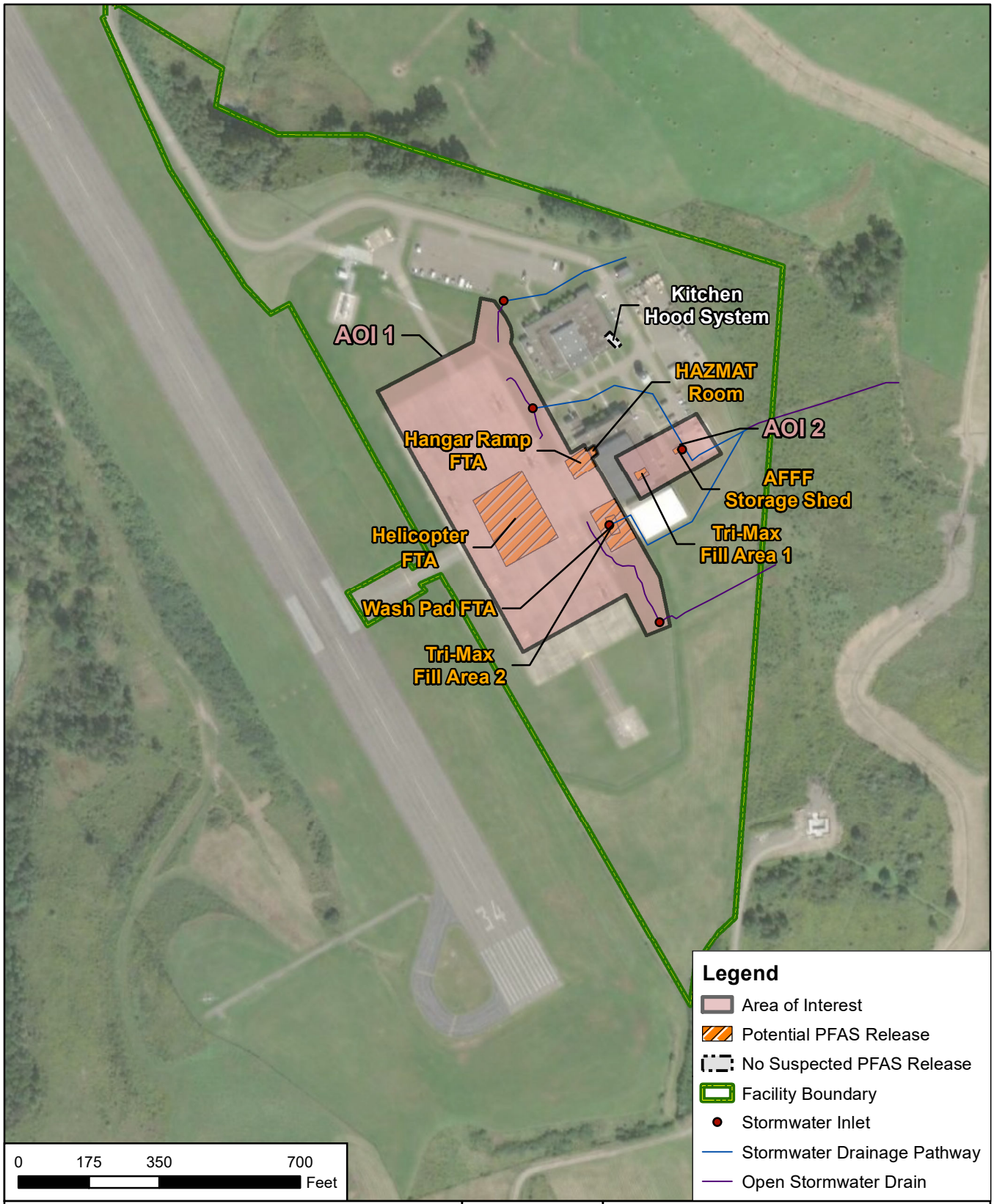
Table ES-1: AOIs at Wheeling AASF #2

Area of Interest	Name	Used by	Potential Release Date
AOI 1	FTAs, Surface Drainage Path, HAZMAT Room, and Tri-Max™ Fill Area 2	AASF #2 Personnel, Airport Employees, Local Fire Department Personnel, and Visiting Drill Soldiers	2000-2013
AOI 2	AFFF Storage Shed and Tri-Max™ Fill Area 1	AASF #2 Personnel	2000-2013

Based on potential PFAS releases at the AOIs, there is a potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for AASF #2, which presents the potential receptors and media impacted, is shown on **Figure ES-2.** The Short Creek Landfill and the Wheeling Ohio County Airport were identified as potential off-facility, adjacent sources of PFAS.

Based on the US Environmental Protection Agency's (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, no PFAS were detected in a public water system above the USEPA lifetime Health Advisory within 20 miles of the facility (USEPA, 2017). 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.



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SCALE	1:4,200	CHK BY	MM	6/8/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	6/8/2020

Summary of Findings

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Figure ES-1

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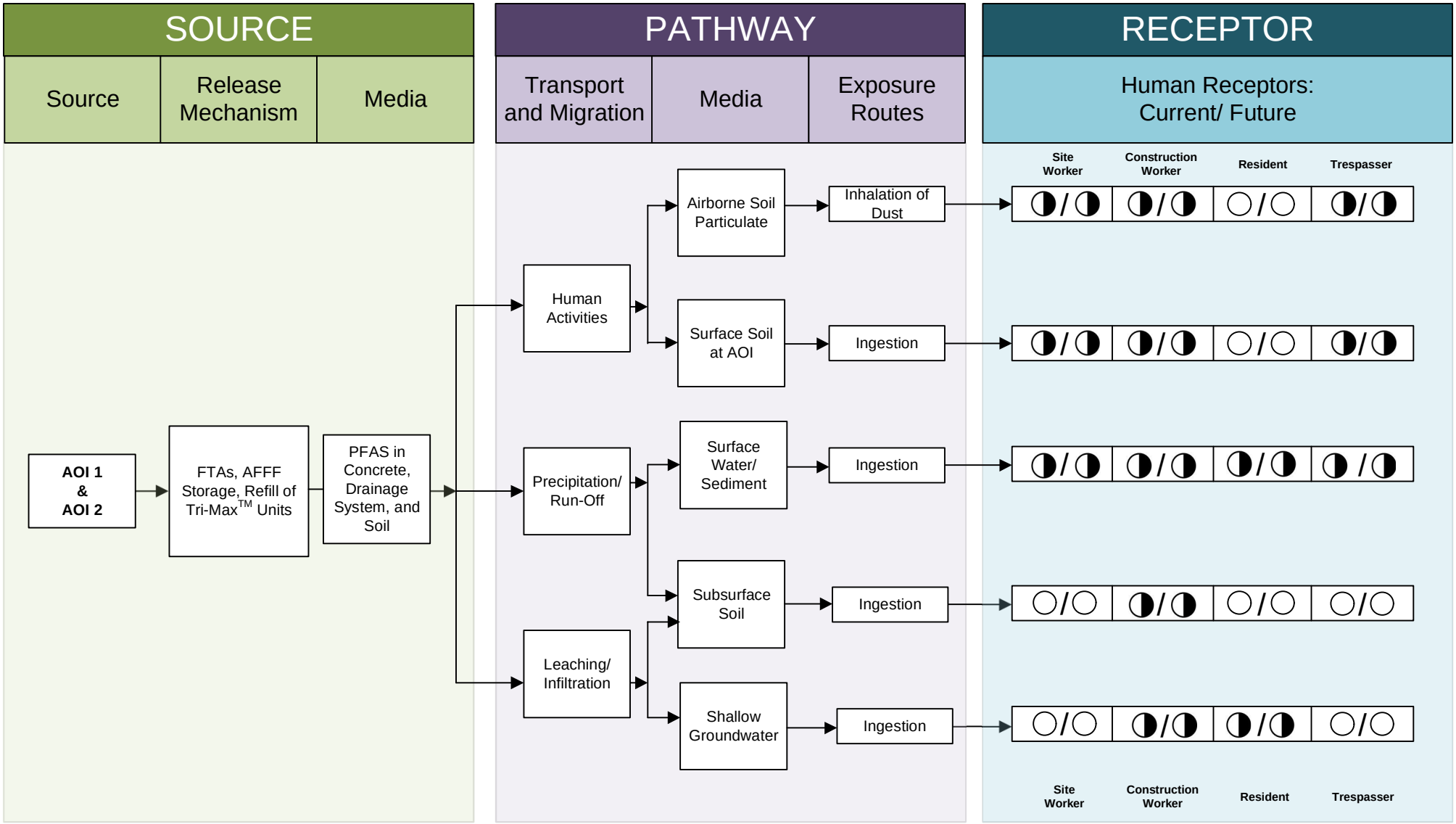


LEGEND

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

Notes:
1. The residential receptor refers to an off-facility receptor.
2. Human consumption of agricultural products or fish potentially affected by PFAS is possible.

Figure ES-2
Preliminary Conceptual Site Model
Wheeling AASF #2, West Virginia

1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG) G9 Division 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 facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily in the form of aqueous film forming foam (AFFF) released as part of firefighting activities, although other PFAS sources 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 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 lifetime Health Advisories (HAs) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water (USEPA, 2016a; USEPA, 2016b). The HA is 70 parts per trillion (ppt) for PFOS and PFOA, individually or combined.

This report presents the findings of a PA for PFAS-containing materials at Wheeling Army Aviation Support Facility (AASF) #2 (also referred to as the “facility”) in Wheeling, West Virginia, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; USEPA, 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations [CFR] Part 300; USEPA, 1994), and Army requirements and guidance.

This PA documents potential locations where PFAS may have been released into the environment at 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 site visit on 3 October 2019 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed current and retired AASF #2 personnel including the facility commander, operations staff, and personnel who are also local volunteer firefighters during the site visit; and
- Identified areas of interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential PFAS source-pathway-receptor linkages 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 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 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 PFAS transport and receptors for the AOIs and 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

AASF #2 occupies 38.14 acres in Wheeling, West Virginia (**Figure 1-1**). The facility is located adjacent to the Wheeling Ohio County Airport, east of Runway 34. Aside from the airport and runways to the northwest, AASF #2's immediate surroundings are primarily forest and agricultural land. The nearest urban area is the city of Wheeling, located 8.5 miles southwest of the facility.

AASF #2 is located on a portion of land the West Virginia National Guard leased from the Ohio County Commission for a term of 99 years, beginning 14 December 1988. The facility was fully operational starting in 1996.

1.5 Facility Environmental Setting

Wheeling AASF #2 is located in Ohio County, West Virginia, directly south of the Brooke County border. The facility is located northeast of the city of Wheeling and southeast of the residential community, Windsor Heights. The facility is approximately 643 feet above mean sea level (US Climate Data, 2019). This area of West Virginia is considered part of the Allegheny Plateau, which formed during the last glacial recession through the levelling of terrain beneath the retreating ice sheet. Typical surface features in the surrounding area include steep hillslopes and ravines formed through post-glacial erosional processes (US Geological Survey [USGS], 1981). The facility and Wheeling-Ohio County Airport sit atop one of these plateaus.

1.5.1 Geology

The facility is located in a region where the soil is shallow and acidic, with a pH range of 4.5 to 5 (USGS, 1981). Soil is described as well drained, with immediate water holding capacity and primarily composed of silt loam (EDR™, 2019). The exposed geologic group in this portion of Ohio county is from the Paleozoic era, specifically, the Pennsylvanian period. The primary rock types are sandstone, shale, clay, coal, and limestone (West Virginia Geological and Economic Survey [WVGES], 2011). To the west of the facility, approaching the Ohio River, alluvial deposits are the primary geologic feature (USGS, 1981).

1.5.2 Hydrogeology

Sands and gravel form an alluvial aquifer above bedrock in Wheeling, West Virginia (National Ground Water Association [NGWA], 2018). The depth to water in this area is approximately 30 feet below ground surface (USGS, 2019). Beneath the alluvial aquifer is the Upper Pennsylvanian Sedimentary Bedrock Aquifer (USGS, 2001). The hydraulic gradient is such that groundwater flows west from the surrounding hills and valleys in Ohio County toward the Ohio River, as shown on **Figure 1-2** (USGS, 1997).

In the Upper Ohio South Watershed, where AASF #2 is located, both groundwater and surface water are used for public water supply in Ohio, Brooke, Marshall, and Wetzel counties. 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 GIS databases, wells were researched to a 4-mile radius of the facility. According to the EDR™ Radius Map Report, there are two wells of unknown type within 1 mile of the facility; one located northwest of AASF #2 and the other located south of the facility, near a residential property (**Figure 1-2**). It is unknown if these wells are potable, domestic, or non-potable (EDR™, 2019). According to the USGS National Water Information System Mapper, there are two active USGS monitoring wells located within a 4-mile radius of the facility; one 3.8 miles north of the AASF and the other 2.7 miles northeast (USGS, 2020). Additional inactive USGS monitoring wells were identified within 4 miles and are shown on **Figure 1-2**. GIS data for wells within a 4-mile radius of the facility was unavailable at the city, county, state, and national levels. Therefore, it is possible that additional unidentified public or private wells may be located within 4 miles of the facility.

Based on the USEPA's Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, no PFAS were detected in a public water system above the HA within 20 miles of the facility (USEPA, 2017). The HA is 70 ppt 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

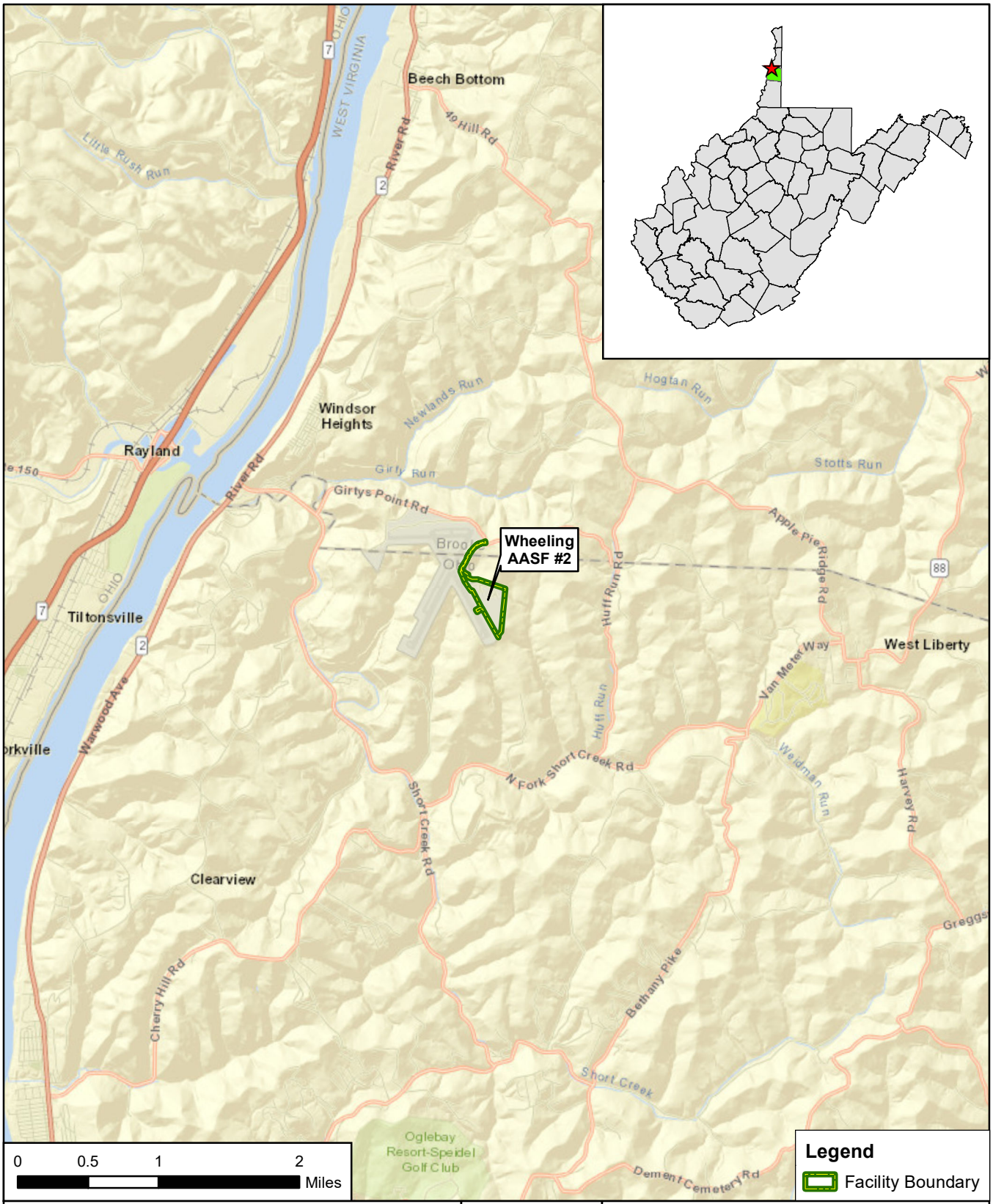
The major water feature near the facility is the Ohio River, which is located approximately 2 miles west of the facility boundary. The Ohio River is used for recreational activities and public water supply. The Ohio River begins in Pittsburgh, Pennsylvania, at the union of the Allegheny and Monongahela Rivers. From its origin in Pittsburgh, the river flows southwest, ending at the borders of Kentucky, Illinois, and Missouri, when it meets with the Mississippi River. Wheeling, West Virginia is within the Upper Ohio South Watershed, one of many watersheds of the Ohio River. The Upper Ohio South Watershed extends from Brooke County to the south through Ohio and Marshall Counties, ending in Wetzel County (West Virginia Department of Environmental Protection [WVDEP], 2013). Around the facility, water flows downhill to ravines, joining the primary tributary for the area, Short Creek. Short Creek is approximately 1 mile south of the facility and flows northwest, where it joins the Ohio River (**Figure 1-3**).

1.5.4 Climate

Wheeling, West Virginia has a continental climate (USGS, 1981). As such, Wheeling gets four distinct seasons, with moderately severe winters and warm, rainy summers. The amount of precipitation between the seasons is about equal (USGS, 1981). Climate data for Wheeling records the average annual high temperature as 63.2 degrees Fahrenheit (°F), the average annual low temperature as 42.7°F, and the average annual rainfall as 40.4 inches (US Climate Data, 2019).

1.5.5 Current and Future Land Use

AASF #2 currently resides on a portion of land leased from the Ohio County Commission under the terms of a 99-year lease. The facility has been an operational military facility for an active ARNG unit since 1996, following the completion of construction. The unit at this facility provides support for helicopter operation and maintenance. Future land use is not anticipated to change.



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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	10/30/2019

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Facility Location

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Figure 1-1

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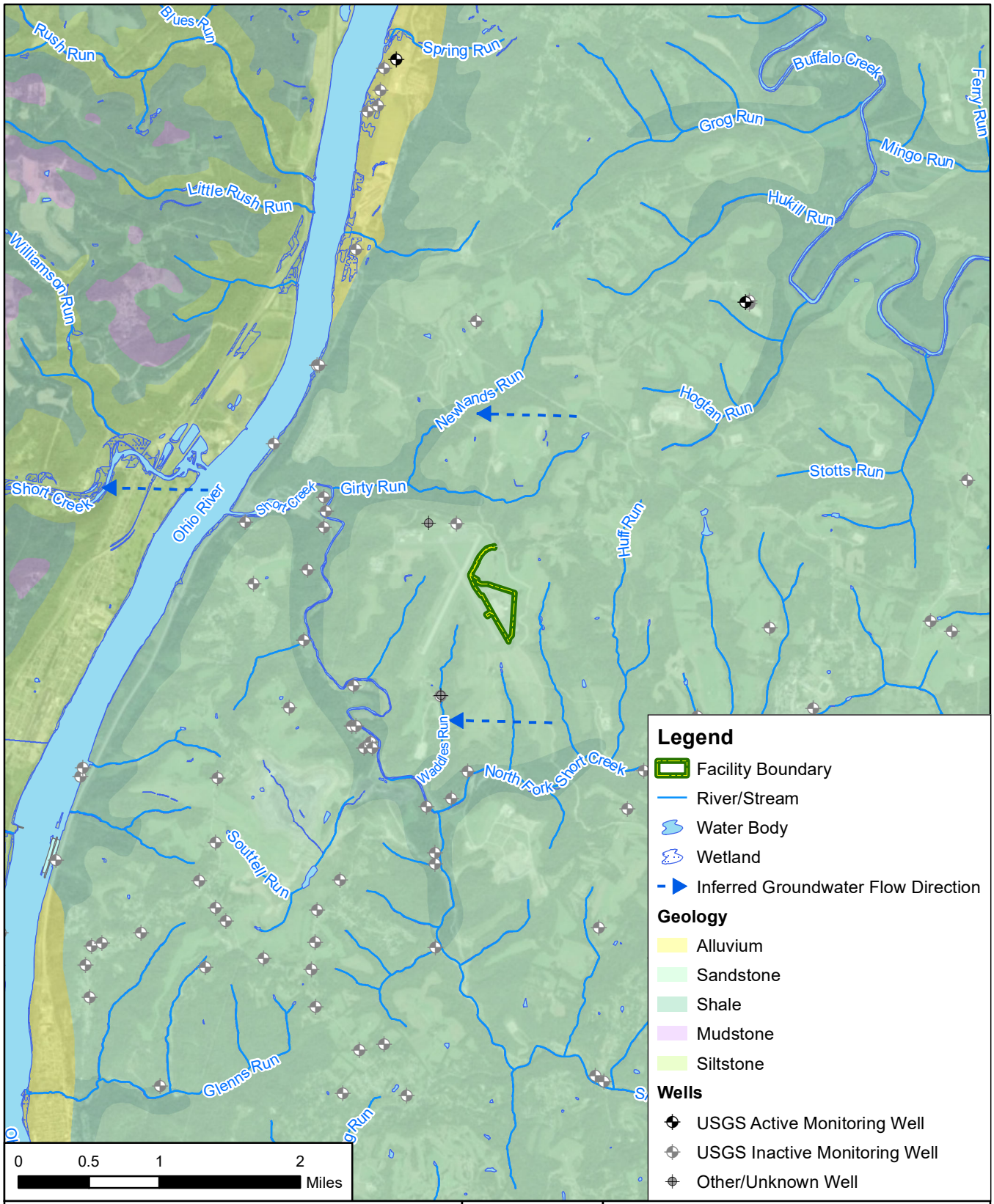

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Groundwater Features

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Figure 1-2

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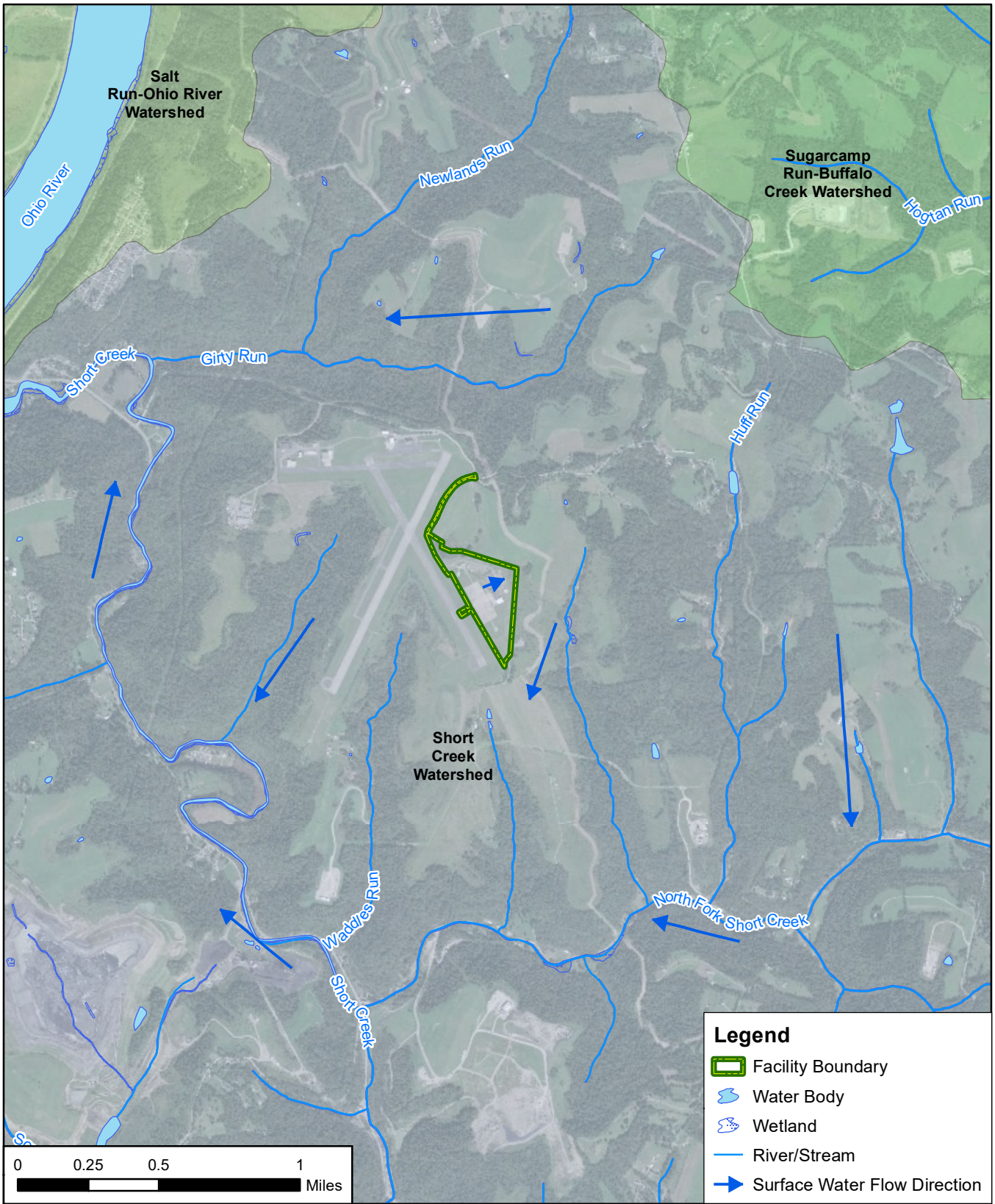

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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	1/9/2020

Surface Water Features

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Figure 1-3

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2. Fire Training Areas

Three FTAs were identified at AASF #2 during the PA through interviews. The exact dates of the fire training activities are unknown because interviewee recollection varied, but there was general consensus that training events using AFFF occurred at the facility. Tri-Max™ was acquired by the facility around 2000 and was utilized until about 2013. According to a 2005 ARNG survey on fire extinguishing foam use at AASF #2 in **Appendix A**, there were ten Tri-Max™ extinguishers at the facility. One interviewee recalls Tri-Max™ being removed when Purple K fire extinguishers were introduced in 2013/2014, and the removed AFFF likely being turned in to the US Property and Fiscal Office (USPFO). A description for each FTA is presented below, and the areas are shown in **Figure 2-1**.

2.1 Hangar Ramp FTA

During the time AFFF was kept on-site, annual fire training was conducted with extinguishers equipped with AFFF on the ramp in front of the hangar doors. On one occasion, shortly after AFFF was brought on by the Guard, there was a brief demonstration held at AASF #2 along the wall of the hangar. AFFF was sprayed on the wall to demonstrate how the foam sticks to surfaces during firefighting activities. Following this event, foam was left to dissipate on its own without being washed away. Interviewees present for the demonstration recalled the foam dissipating on the wall and paved ground before it could reach a drain. Though this demonstration was only held on one occasion, since foam was left to dissipate on its own, the foam may have leeched into the wall or pavement where it was sprayed at AASF #2.

This location, shown on **Figure 2-1**, is also where the annual barrel burn trainings took place. To interviewee recollection, barrel burn training at this location may date back to 2005. During these trainings, there were occasional outside participants from the airport, local fire departments, as well as drill soldiers sent to AASF #2 for drill around the time of the Safety Stand-Down. One such event was held in September 2010, as seen in the invitation email presented in **Appendix A**. During these annual trainings, a 55-gallon drum that had been cut in half was filled with water and JP8 fuel. This jet fuel was then ignited, and AFFF foam was used to extinguish the flames. At least one tank of AFFF was used in each training, and up to 50 soldiers, including drill soldiers at the facility for safety day, participated at once. After training was over, foam would be allowed to dissipate on its own without being rinsed away. The foam released likely infiltrated surface soils in the area, as it would collect in the grass or travel down one of the stormwater inlets in the grass on either side of the ramp. The hangar ramp FTA is considered a potential PFAS release area.

2.2 Wash Pad FTA

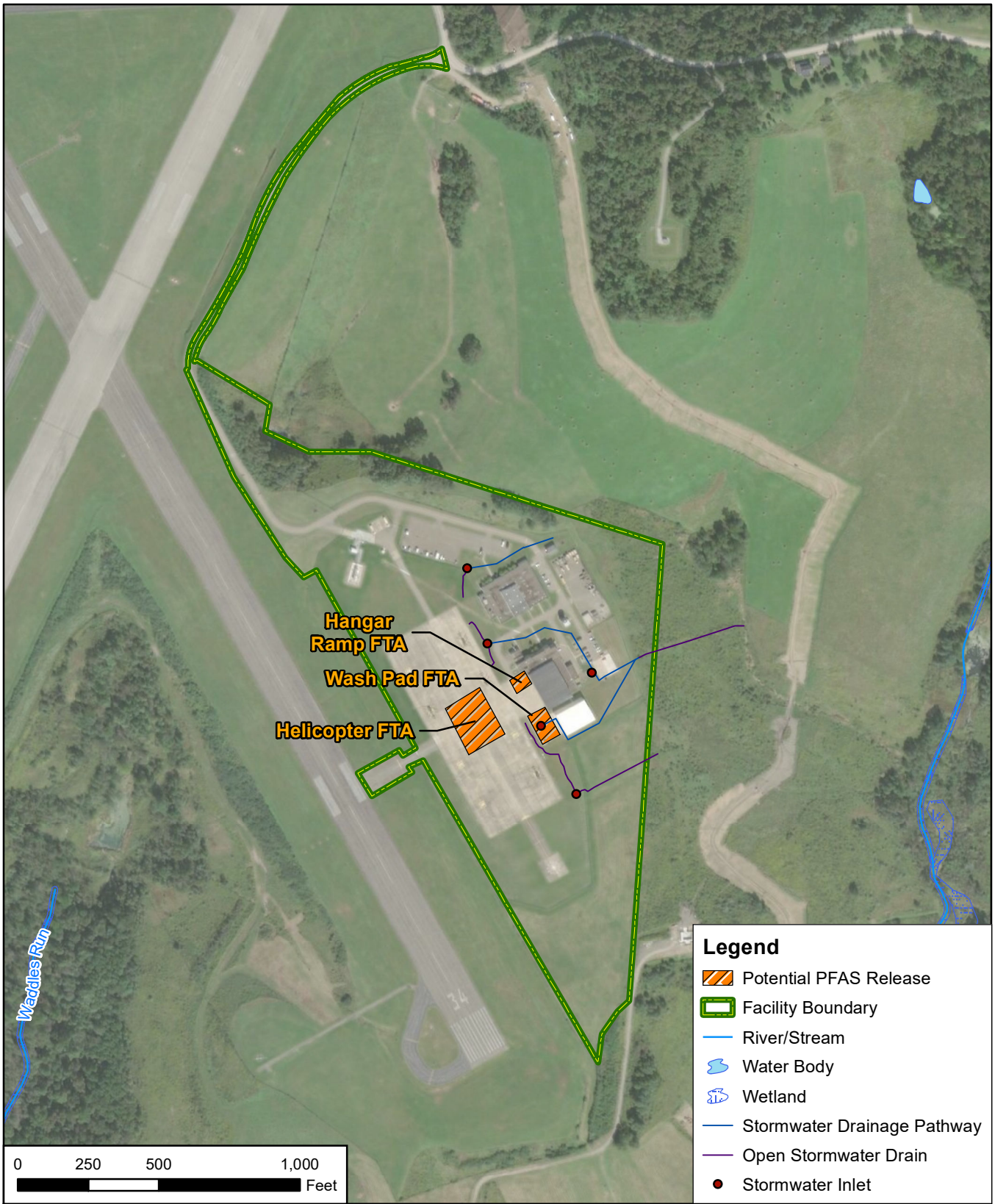
The wash pad at AASF #2 is one of two areas where Tri-Max™ extinguishers were refilled with AFFF. Buckets of AFFF were stored in spill containment buckets at collection points but were occasionally brought to the wash pad when refilling was necessary. If AFFF was spilled during refills, it would have been sprayed with water and washed down the wash pad drain. There is no interviewee recollection of spills at the location. The wash pad location is shown on **Figure 2-1**.

Interviewees could not recall the timeframe; however, for two years, the wash pad was used for fire training activities with AFFF. During these exercises, an ARNG truck would be parked on the wash pad and sprayed down with AFFF to demonstrate how the foam sticks to surfaces and how to properly use the extinguisher. During these events, the foam was contained to the wash pad. Prior to 2006, drainage from the wash pad went to the oil-water separator and then to a surface water outflow on-site. After 2006, the AASF #2 wash pad was connected to municipal sewage; therefore, AFFF released at the wash pad would have gone to the municipal water treatment plant, located approximately 9 miles southwest of the facility, if the drainage valve were in proper

operating position. Due to a lack of information on when these two fire training activities occurred and uncertainty whether the valve were in the correct position to direct liquids to municipal sewage, the path AFFF would have taken is uncertain. Therefore, it is equally likely the AFFF would have infiltrated surface water via outflow from the site prior to 2006, or that it would have made its way to the municipal water treatment plant. Therefore, the wash pad FTA is a potential PFAS release area.

2.3 Helicopter FTA

On one occasion, a fire training exercise was conducted where AFFF was sprayed on the tail of a helicopter to familiarize personnel with the process of using Tri-Max™ extinguishers. This training occurred in the center of the landing pads at AASF #2 (**Figure 2-1**). Aircraft were relocated for the duration of the exercise, and approximately one Tri-Max™ unit was expended. Following training, foam was rinsed off the helicopter's tail, then left to dissipate on its own. It is possible that foam from this FTA traveled to a grassy area and infiltrated the surface soil or followed on-site drainage pathways to stormwater inlets in the grass. Therefore, the helicopter FTA is considered a potential PFAS release area. Based on interviewee recollection, it is believed this event occurred in the early 2000s, prior to 2006.



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SCALE	1:6,000	CHK BY	MM	5/28/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/28/2020

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Fire Training Areas

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Figure 2-1

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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**. Five non-FTAs were identified during the PA. Descriptions of the non-FTAs are presented below, and the non-FTAs are shown on **Figure 3-1**.

3.1 HAZMAT Room

While AFFF was in-use at AASF #2, 5-gallon buckets of Tri-Max™ were stored in the facility's HAZMAT room. The location of this room is shown on **Figure 3-1**. To interviewee knowledge, no spills occurred in this location; however, due to the potential for unintended spills or releases, this location is considered a potential PFAS release area.

3.2 Kitchen Hood Fire Suppression System

In a separate building at the facility, adjacent to the administrative building (**Figure 3-1**), there is a kitchen containing a fire suppression hood. The contents of this hood have never been released in response to a fire or otherwise, and the fire suppressant is not believed to contain PFAS. Therefore, this area has no suspected PFAS release.

3.3 Tri-Max™ Fill Area 1

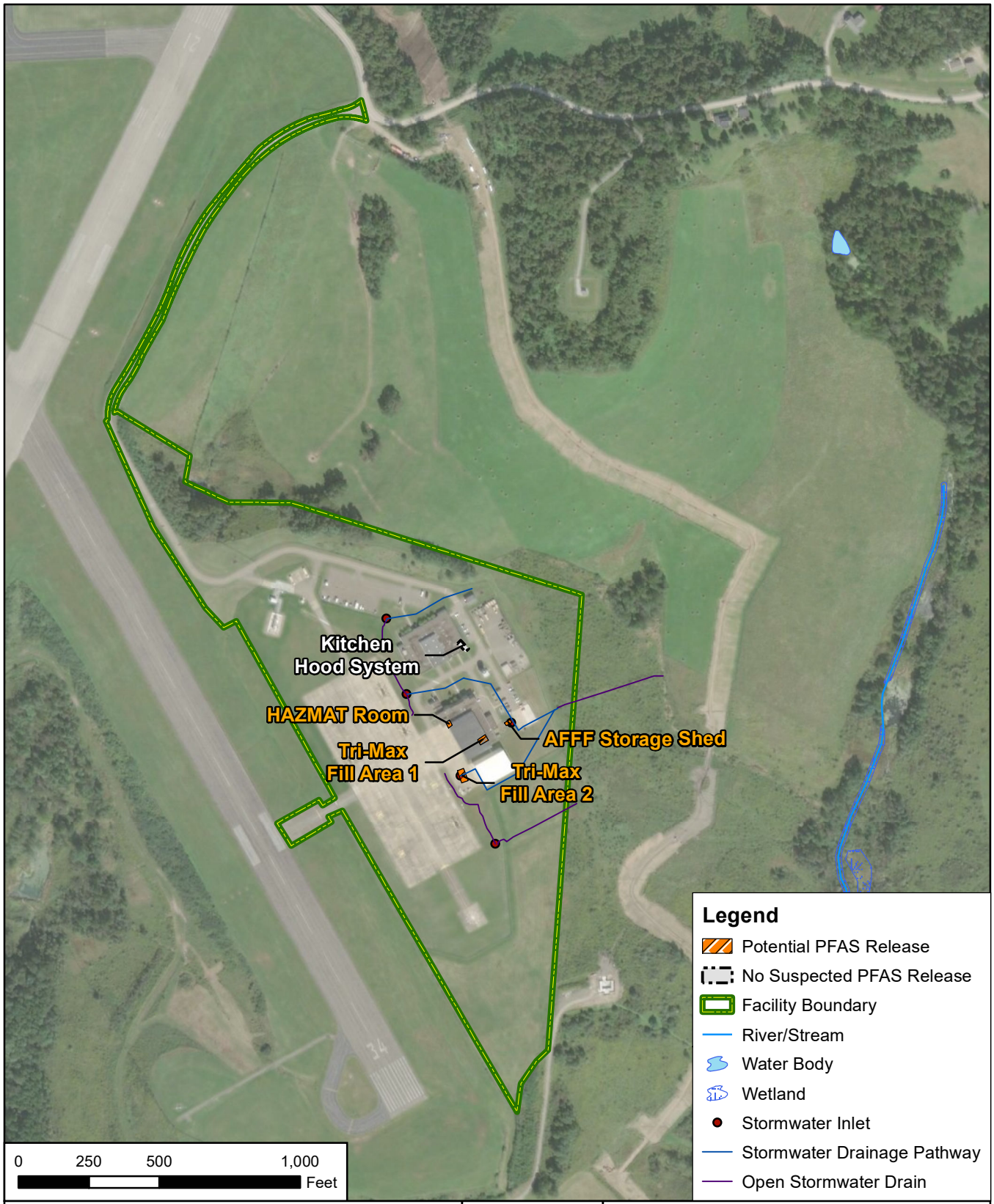
In the southeast corner of the hangar (**Figure 3-1**), an area that was used for filling Tri-Max™ extinguishers inside the hangar is marked out. Interviewees do not recall any instances of spills during the time AFFF was in use at the facility. However, due to the potential for unintended spills or releases, this area is considered a potential PFAS release area.

3.4 AFFF Storage Shed

While AFFF was kept at the facility, a small storage shed was also used to store 5-gallon buckets of AFFF **(Figure 3-1)**. The shed is located within a fenced area adjacent to the parking lot. There is no knowledge of any spills or expended AFFF in this area. However, due to the potential for unintended spills or releases, this location is considered a potential PFAS release area.

3.5 Tri-Max™ Fill Area 2

Tri-Max™ units were filled in the wash pad area, shown on **Figure 3-1**. There is no record or recollection of a spill at this location throughout the time AFFF was kept at the AASF. However, due to the potential for unintended spills or releases, this area is considered a potential PFAS release area.



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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/28/2020

Non-Fire Training Areas

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Figure 3-1

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4. Emergency Response Areas

No emergency response areas were identified within AASF #2 during the PA through interviews. Firsthand knowledge of interviewees extends prior to AASF #2 being operational.

5. Adjacent Sources

Four potential off-facility sources of PFAS located adjacent to AASF #2, not under the control of ARNG, were identified during the PA through interviews. A description of each adjacent source is presented below, and the adjacent sources are shown on **Figure 5-1**.

5.1 Plane Crash Site 1

Between the years 2009 and 2012, there was a civilian plane crash near a runway of the adjacent airport at the northeast corner of airport property (**Figure 5-1**). Interviewees recalled the municipal fire department responding to the scene and determining there was no firefighting action necessary. There was no fire resulting from the crash, and interviewees who were present at the crash recalled that no foam or water were sprayed in response. Due to no known use of AFFF at this location, there is no suspected PFAS release.

5.2 Plane Crash Site 2

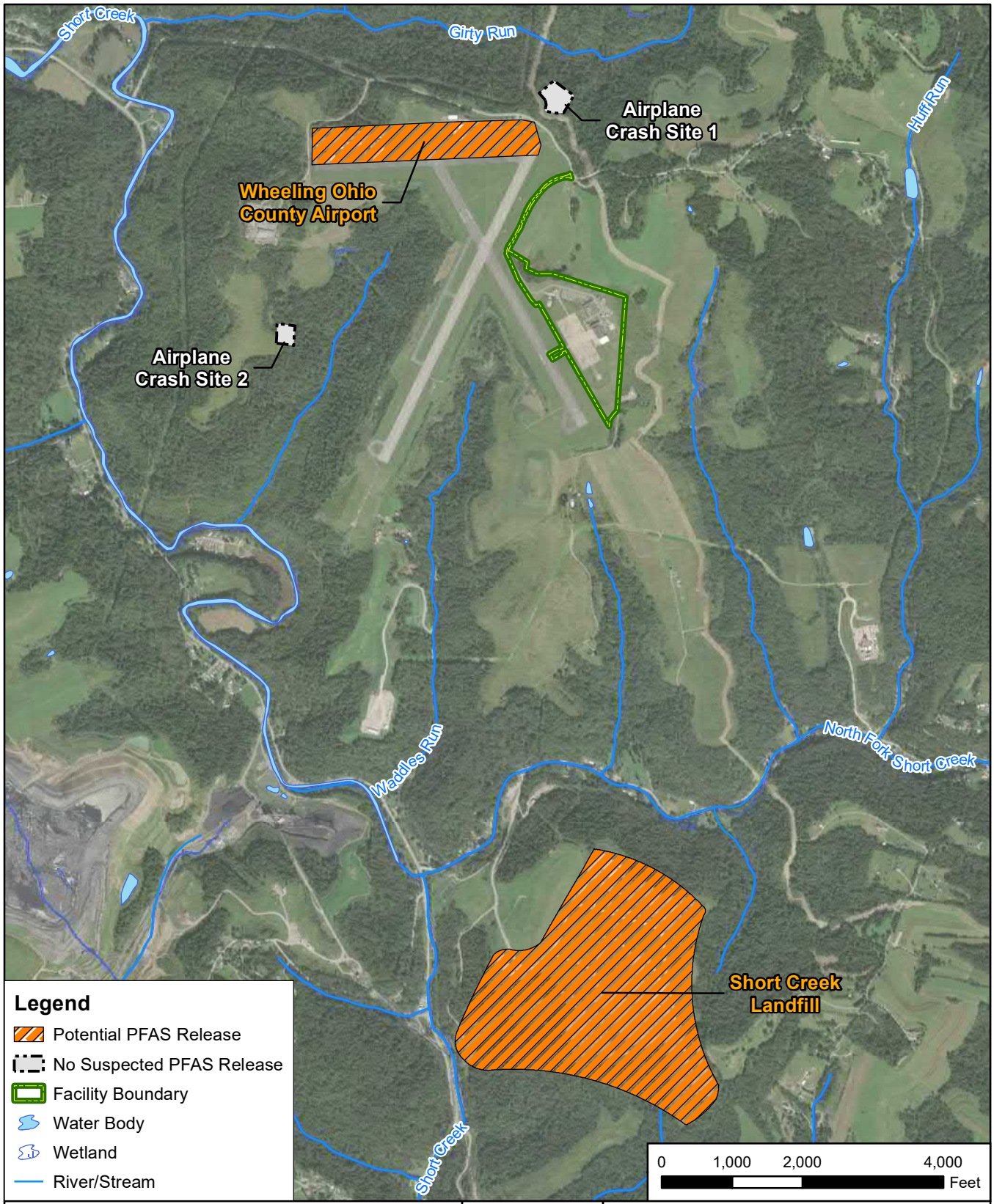
Another crash occurred adjacent to AASF #2 between the years 1996 and 2005 (**Figure 5-1**). A civilian plane crashed west of the adjacent airport's runways. However, according to interviewees who were present at this incident, there was no fire, and therefore, no AFFF response necessary by the municipal fire department responding to the scene. Due to no known use of AFFF at this location, there is no suspected PFAS release.

5.3 Short Creek Landfill

Short Creek Landfill is located approximately 1.7 miles downgradient of the facility and is currently active (**Figure 5-1**). Landfills are not typically a primary potential release area of PFAS, but materials disposed of in landfills may create a secondary source of contamination. Such materials may include sludge from wastewater treatment plants that process PFAS-laden water or products associated with waterproofing uniforms or boots. The exact materials disposed of at Short Creek Landfill are unknown. Due the potential that PFAS-containing materials were disposed of in the landfill, the Short Creek Landfill is considered a potential adjacent source of PFAS. However, because the landfill is located downgradient, it is unlikely that PFAS contamination from the landfill would migrate to the facility.

5.4 Wheeling Ohio County Airport

The Wheeling Ohio County Airport sits approximately 0.6 miles northwest of the facility (**Figure 5-1**). Secondary information from an airport employee contacted by West Virginia ARNG (WVARNG) personnel asserts that there are no AFFF-equipped firetrucks at the airport, and no annual fire training with AFFF. However, due to a lack of robust information on the history of use of AFFF at the airport, there may have been releases at the airport outside of the employee's knowledge. For this reason, the airport is considered a potential adjacent source of PFAS.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Wheeling AASF #2, WV			
REVISED	4/17/2020	GIS BY	GC	4/17/2020
SCALE	1:24,000	CHK BY	MM	4/17/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	4/17/2020

N

Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, two AOIs were identified at AASF #2; AOI 1 is the area encompassing the hangar ramp, wash pad, and helicopter FTAs, HAZMAT Room, and Tri-Max™ Fill Area 2 as well as their surface drainage pathways. AOI 2 includes the AFFF Storage Shed and Tri-Max™ Fill Area 1. The AOIs and potential PFAS release areas are shown on **Figure 6-1**. The following section describes the CSM components and the specific preliminary CSM developed for AOIs 1 and 2. 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.

In general, the potential PFAS exposure pathways are ingestion and inhalation. 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. Receptors at AASF #2 include site workers, construction workers, trespassers, and off-site residents. Although Wheeling AASF #2 is a secure facility and trespassers are generally not anticipated, the trespasser exposure pathway is considered in the preliminary CSMs as a conservative measure. The preliminary CSMs for Wheeling AASF #2 indicate which specific receptors could potentially be exposed to PFAS (**Figure 6-2** and **Figure 6-3**).

6.1 AOI 1: FTAs, Surface Drainage Path, HAZMAT Room, and Tri-Max™ Fill Area 2

AOI 1 consists of the locations of the hangar ramp, the wash pad, the HAZMAT Room, the helicopter FTAs, Tri-Max™ Fill Area 2, and their respective potential surface drainage pathways. First-hand knowledge from interviewees noted that training with AFFF occurred annually for the duration of time AFFF was kept at AASF #2. Interviewees recalled AFFF use at the facility dating prior to 2001 and ending between 2011 and 2013.

Barrel burn fire trainings were conducted annually at the hangar ramp FTA. On one occasion, AFFF was sprayed on a wall of the administrative building adjacent to the hangar. The FTA is located on the paved ramp leading to the facility's hangar. On occasions of barrel burn trainings, AFFF was released to the barrel and surrounding pavement and not rinsed away. Similarly, after AFFF was sprayed on the administrative building's wall, it was not rinsed away, but left to dissipate on the wall and pavement below. Following both of these events, some AFFF likely soaked into the pavement. Foam that did not dissolve into the pavement likely followed on-site surface water pathways across grassy surface drainage path to a stormwater drop inlet 180 feet northwest of the FTA. From the inlet, AFFF would have followed on-facility subsurface drainage to an outfall leading to off-facility surface water drainage.

AFFF from hangar ramp and potential HAZMAT Room releases may have infiltrated surface and subsurface soils along the drainage pathway, leading to a potentially complete pathway for site workers, construction workers, and trespassers in this area of the facility. In addition, PFAS are water soluble; therefore, they may have migrated from subsurface soil to groundwater in the area, leading to a potentially complete pathway for off-facility residents, or construction workers at the facility. AFFF that traveled to the stormwater inlet would have traveled off-facility through pipes and released to surface water drainage. Surface drainage from the facility meets with surrounding water features leading to Short Creek, and eventually the Ohio River. AFFF may have infiltrated stream sediment along these drainage pathways. The surface water and sediment pathways are therefore potentially complete for off-facility residents and recreational users. Human consumption of agricultural products and fish potentially affected by PFAS is possible.

The wash pad FTA is where a truck was sprayed with AFFF on two occasions. During these events, the truck was parked on the wash pad, sprayed with AFFF, and the foam was rinsed off and down the wash pad drain (**Figure 2-1**). Due to the unknown timeframe of these two training events, and uncertainty whether the diversion valve in the wash pad was in the proper position to divert to municipal water treatment, the released AFFF could have followed two separate pathways. One pathway is to the municipal water treatment plant, and one is to the surface water outfall leading from the facility to the east (**Figure 2-1**). As both pathways are possible, in the interest of being conservative, both will be considered as potential exposure pathways in this CSM.

If the wash pad releases occurred prior to 2006, the foam drainage would have been directed through a drain and subsurface drainage paths to an oil-water separator. Since PFAS are water soluble, the water exiting the oil-water separator would still have PFAS contamination and would follow the same path as described for surface water drainage from the hangar ramp release. If one or both releases occurred before 2006, the surface water and sediment pathways would be potentially complete for off-facility residents. If wash pad releases occurred after 2006, and the diversion valve was in the correct position, the foam drainage would have been directed through the wash pad drain and to the municipal water treatment plant. If the valve was not in proper operating position, AFFF would have followed the same path it took prior to the 2006 renovations. If AFFF went to the water treatment plant, pathways for soils, sediment, surface water, and groundwater for site workers, construction workers, off-facility residents, and trespassers would be considered incomplete.

Tri-Max™ Fill Area 2 was also located on the wash pad. There is a potential that PFAS were released while filling Tri-Max™ extinguishers at this location during the time AFFF was stored at the facility. If a spill had occurred, foam would have followed the same release pathway as described for the wash pad FTA.

Following the helicopter fire training event, AFFF could have followed the same paths as described previously for the wash pad FTA and hangar ramp FTA. The foam could have traveled either across paved and unpaved surfaces to the stormwater drain inlets east of the landing pad, flowed down the wash pad drain, or both (**Figure 2-1**).

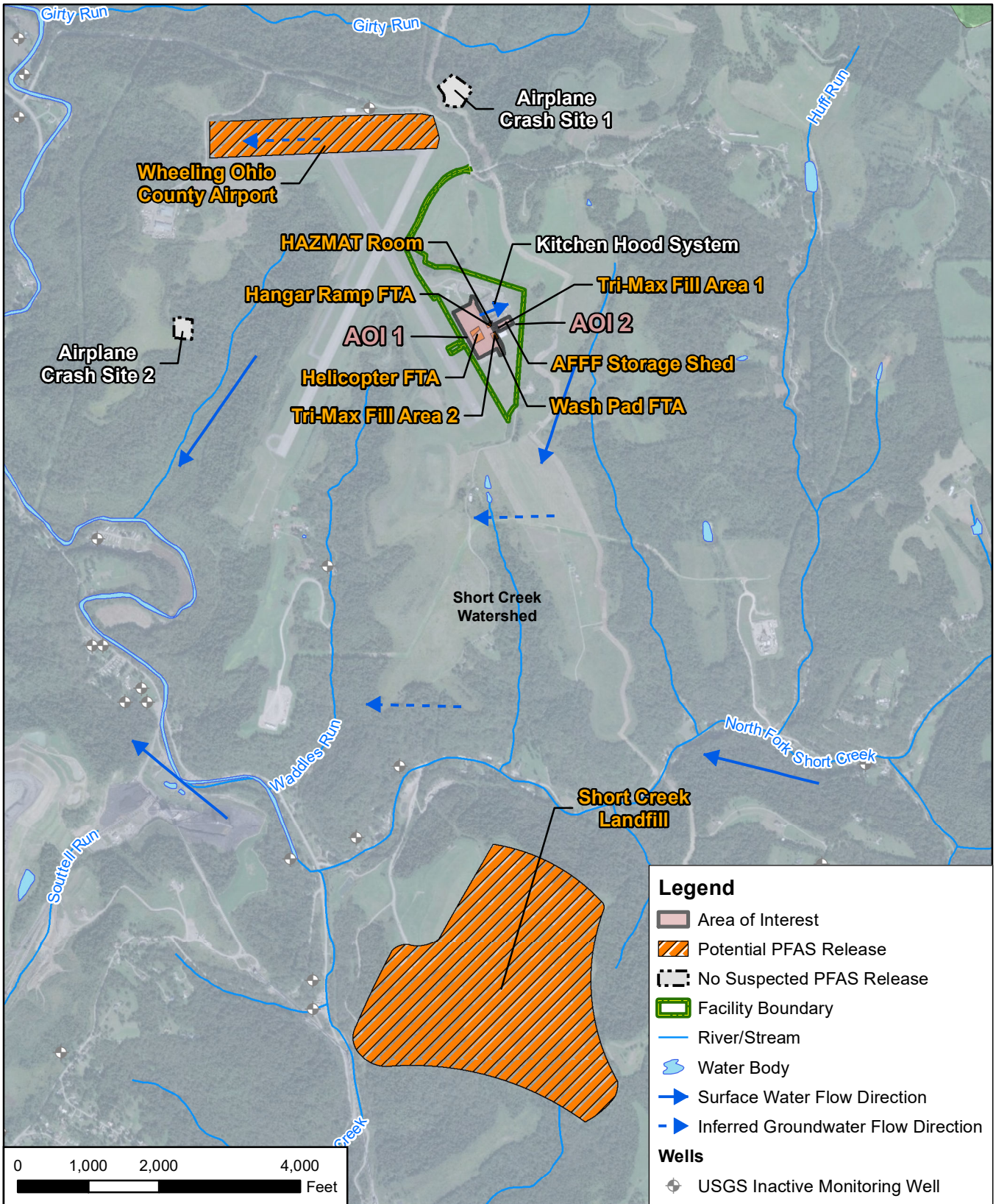
If the foam had traveled across the grassy surface drainage path to the stormwater inlet, it may have infiltrated surface and subsurface soils before continuing through subsurface drainage to off-facility surface drainage. From the drainage pathway, PFAS could be introduced to off-facility surface water and sediment. If AFFF followed this path, the pathways for surface water and sediments would be potentially complete for off-facility residents and recreational users, surface soil would be potentially complete for site workers, construction workers, and trespassers, and the subsurface soil path would be potentially complete for construction workers.

Since interviewee recollection dates the helicopter fire training prior to 2006, if the foam entered the wash pad drain, it would have been released to off-facility surface water drainage, then followed surface water pathways to adjacent creeks and the Ohio River. The potential for AFFF to take this path results in a potentially complete pathway for surface water and sediments to off-facility residents. The preliminary CSM for AOI 1 is shown in **Figure 6-2**.

6.2 AOI 2: AFFF Storage Shed and Tri-Max™ Fill Area 1

AOI 2 consists of an AFFF storage shed and Tri-Max™ fill area 1 on the eastern side of the property near the parking lot. During the time AASF #2 had Tri-Max™ extinguishers at the facility, some 5-gallon AFFF buckets were kept in this shed (**Figure 6-1**). While there were no spills or leaks to interviewee knowledge, this location is considered a potential PFAS release area due to the potential for undocumented spills or releases.

If AFFF leaked from the storage shed, it likely would have either been directed through the facility's stormwater drainage pathway or infiltrated soil at that location. Had the foam entered the stormwater drainage path from an inlet near its location, the AFFF would have traveled through a subsurface pipe to the east, and off the property. From there, the AFFF would follow nearby surface water pathways leading to Short Creek, then the Ohio River. AFFF may have infiltrated stream sediments along these drainage pathways. The surface water and sediment pathways are therefore potentially complete for off-facility residents and recreational users. Human consumption of agricultural products and fish potentially affected by PFAS is possible. AFFF may have infiltrated surface and subsurface soil from a leak or spill in this location, therefore the pathway for surface soil and airborne soil particulates as a result of human activities is potentially complete for site workers, construction workers, and trespassers. Subsurface soil infiltration would mean a potentially complete pathway for construction workers. PFAS may have also migrated from subsurface soil to shallow groundwater resulting from a potential spill or leak of AFFF from the storage shed. The potential for this infiltration of groundwater leads to a potentially complete shallow groundwater pathway for off-facility residents and construction workers. The preliminary CSM for AOI 2 is shown in **Figure 6-3**.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Wheeling AASF #2, WV			
REVISED	6/16/2020	GIS BY	GC	6/16/2020
SCALE	1:24,000	CHK BY	MM	6/16/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	6/16/2020

Areas of Interest

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Figure 6-1

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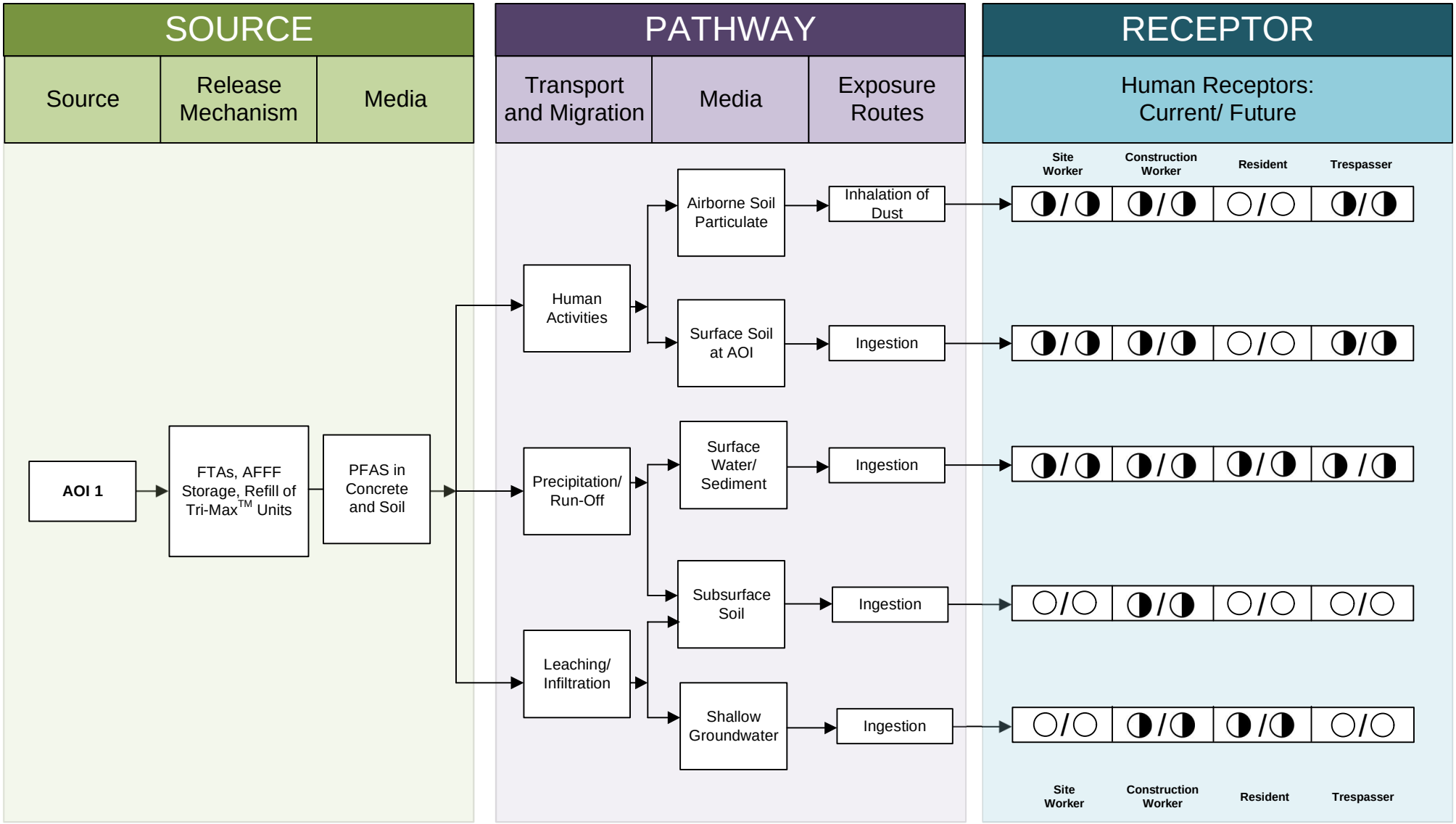
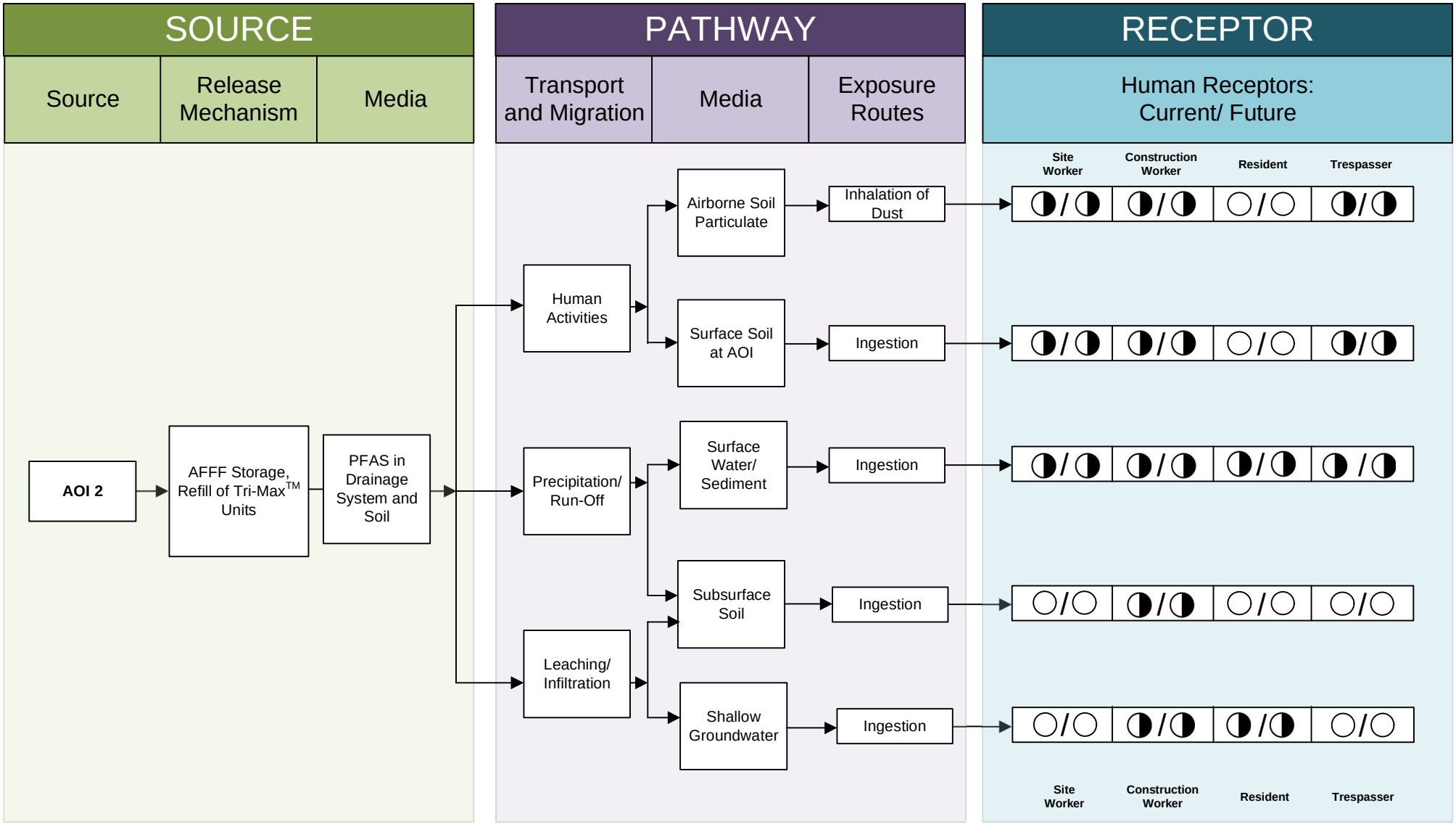


LEGEND

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

Notes:
1. The residential receptor refers to an off-facility receptor.
2. Human consumption of agricultural products or fish potentially affected by PFAS is possible.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1: FTAs, Surface Drainage Path, HAZMAT Room, and Tri-Max™ Fill Area 2



LEGEND

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

Notes:
1. The residential receptor refers to an off-facility receptor.
2. Human consumption of agricultural products or fish potentially affected by PFAS is possible.

Figure 6-3
Preliminary Conceptual Site Model
AOI 2: AFFF Storage Shed and Tri-Max™ Fill Area 1

7. Conclusions

This report presents a summary of available information gathered during the PA on the use of AFFF at AASF #2. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

Two AOIs related to potential PFAS release (**Table 7-1**) were identified at AASF #2 during the PA through interviews with facility personnel (**Figure 7-1**).

Table 7-1 AOIs at Wheeling AASF #2

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	FTAs, Surface Drainage Path, HAZMAT Room, and Tri-Max™ Fill Area 2	AASF #2 Personnel, Airport Employees, Local Fire Department Personnel, and Visiting Drill Soldiers	2000-2013
AOI 2	AFFF Storage Shed and Tri-Max™ Fill Area 1	AASF #2 Personnel	2000-2013

Based on potential PFAS release at the AOIs, there is a potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for AASF #2, which presents the potential receptors and media impacted, is shown on **Figure ES-2**.

The following areas shown in **Table 7-2** and discussed in **Section 3** were determined to have no suspected release.

Table 7-2 No Suspected Release Areas

No Suspected Release Area	Used by	Rationale for No Suspected Release Determination
Kitchen Hood Fire Suppression System	AASF #2	The suppression system is not believed to contain PFAS and there is no recollection of releases since its installation.

Two potential adjacent sources of PFAS, the Short Creek Landfill and the Wheeling Ohio County Airport, were identified near AASF #2. Additionally, two historical plane crash areas were identified; however, the crash areas are not considered potential adjacent PFAS releases because there is no recollection of PFAS being expended in response to those events.

7.2 Uncertainties

The conclusions of this PA are based on all available information, including previous environmental reports, EDR™ Reports, 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. 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.

Sometimes, the provided information was vague. 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 were first used (1969 to present), 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 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 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 7-3** summarizes the uncertainties associated with the PA.

Table 7-3 Uncertainties

Area of Interest	Source of Uncertainty
AOI 1: FTAs, Surface Drainage Path, HAZMAT Room, and Tri-Max™ Fill Area 2	Interviewees do not recall the exact timeframe of these training events.
AOI 2: AFFF Storage Shed and Tri-Max™ Fill Area 1	Uncertainty of personal recollection and lack of documentation.
General	Limited documentation of PFAS use at the facility

It is also unknown whether or to what degree the identified potential off-facility PFAS release areas may affect AASF #2.

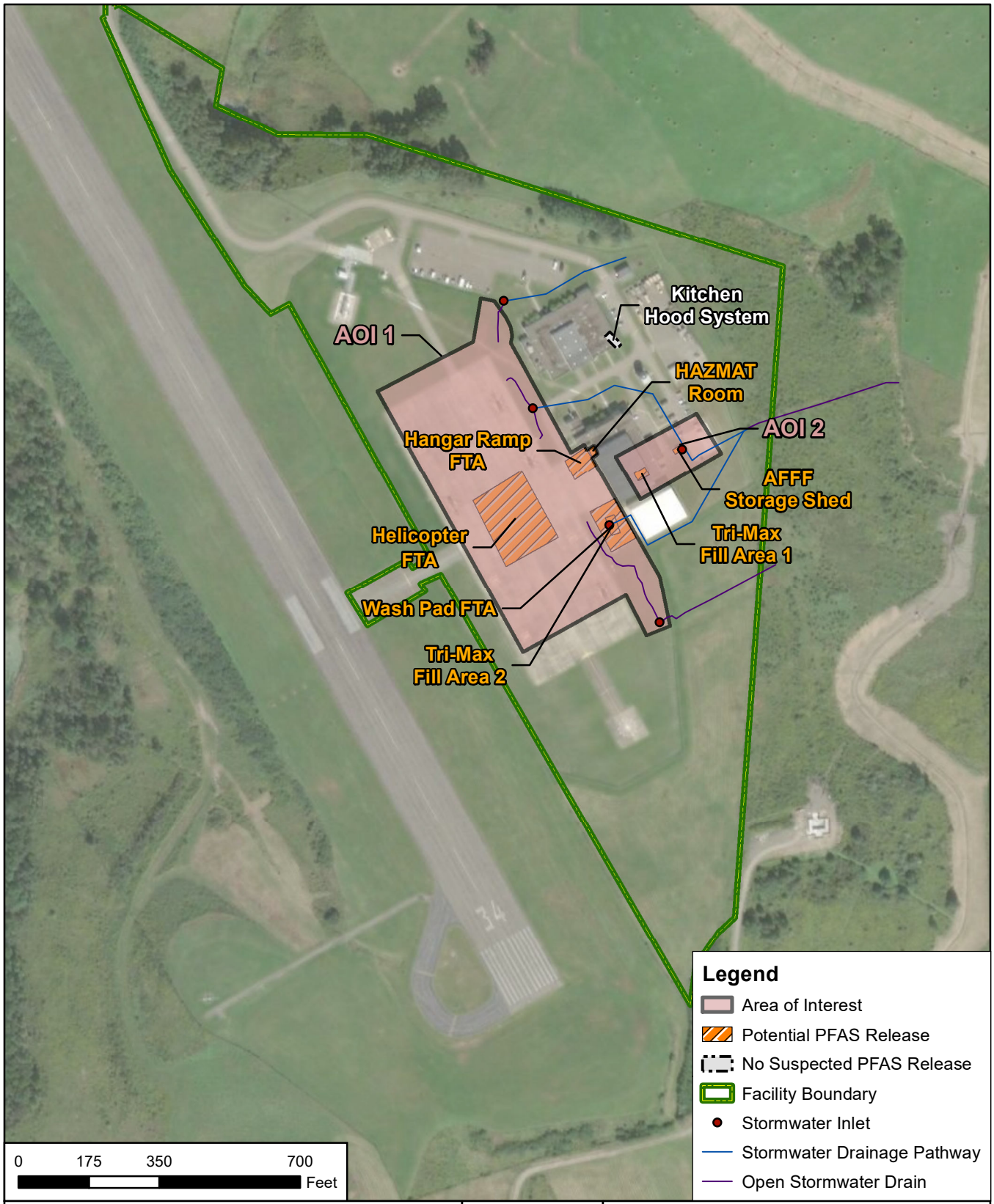
7.3 Potential Future Actions

Interviews and records indicate that former activities at Wheeling AASF #2 may have resulted in potential PFAS releases at two AOIs identified during the PA. Based on the preliminary CSMs developed for the AOIs, there is potential for receptors to be exposed to PFAS contamination in soil, groundwater, surface water, and sediment at or near the facility. **Table 7-4** summarizes the rationale used to determine if the AOIs should be considered for further investigation under the CERCLA process and undergo an SI.

ARNG will evaluate the need for an SI at Wheeling AASF #2 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 FTAs, Surface Drainage Path, HAZMAT Room, and Tri-Max™ Fill Area 2	40°10'27.069"N 80°38'26.929"W	AFFF was used within this AOI for fire training activities; storage of AFFF	Proceed to an SI, focus on soil, surface water, sediment, and groundwater
AOI 2: AFFF Storage Shed and Tri-Max™ Fill Area 1	40°10'25.991"N 80°38'23.846"W	Storage of 5-gallon buckets of AFFF; refilling of Tri-Max™ units	Proceed to an SI, focus on soil, surface water, sediment, and groundwater



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Wheeling AASF #2, WV			
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SCALE	1:4,200	CHK BY	MM	5/28/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	5/28/2020

Summary of Findings

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Figure 7-1

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8. References

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Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for WheelingAASF #2 include:

Wheeling AASF #2 Site Background Documents

- 2005, Fire Foam ASO List Server Survey, 5 January 2005
- 2010, Training Invitation to Local Fire Departments, 31 August 2010

Wheeling AASF #2 Site Property Documents

- 1988, Wheeling AASF #2 Lease Document, 14 December 1988
- 2008, Army Aviation Support Facility #2 Wastewater Re-route: Modified Site plan and Details, Ohio County, West Virginia, July 2008
- 2014, Stormwater Pollution Prevention Plan, December 2014
- 2015, National Pollutant Discharge Elimination System Approval, 12 August 2015
- National Pollutant Discharge Elimination System Monitoring Report
- Wheeling AASF #2 National Pollutant Discharge Elimination System Permit-Annual Certification

Environmental Data Resources, Inc. (EDR)™ Reports

- 2019, Aerial Photo Decade Package, EDR™, 8 October 2019
- 2019, Certified Sanborn Map Report, EDR™, 8 October 2019
- 2019, Radius Map Report with Geocheck, EDR™, 8 October 2019

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Other

Facility: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Interviewee: [redacted] **Title:** 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

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

Williamstown AASF #1 Commander 2014-2018
Wheeling AASF #2 commander 2018-present

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
- No emergency response past 2014	Use
- Not sure when use of AFFF stopped	Procurement
- FTA: sprayed aircraft (not sure of agent)	Disposition
- Annual safety stand-down at camp Dawson (non-tri-max	Storage (Mixed)
- No off-post personnel coming to AASF #2 to train	Storage (Solution)
- Water deluge fire suppression system	Inventory, Off-Spec
- Dry chemical suppression hood system in kitchen	Containment
- AFFF possibly formerly at fueling stations	SOP on Filling
- No firefighting unit, no laundry facilities, no metals plating	Leaking Vehicles
- Not sure where AFFF was stored or when it was removed	Nozzle and Suppression System Testing
- Emergency response is municipal FD (west liberty/clearview)	Dining Facilities
- No fire response at airport that interviewee	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility:_____
Interviewer:_____
Date/Time:_____

remembers
- Municipal FD also serves airport
- On-post water supply is public
  - Most of area is on public water, but could be some wells on farms.

PA Interview Questionnaire - Other

Facility: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Interviewee: [redacted] **Title:** Hazmat Supervisor **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:

At AASF #2 2001-2017
Fuel handler → Hazmat → Hazmat supervisor

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 emergency response w/ AFFF anywhere, facility or adjacent	**Known Uses**
-Stored in buckets in spill containment at collection points	Use
• Stored in container it was shipped in - not transferred	Procurement
- Refilling in wash rack by the hose	Disposition
• If spilled, sprayed w/ water + washed down drain	Storage (Mixed)
-Training: sprayed tanker in wash rack annually (only 2 years)	Storage (Solution)
• 1-time training w/ helicopter - sprayed side of it	Inventory, Off-Spec
• everything contained to wash rack - hosed down	Containment
-One of two crashes (was present for)	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: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Hazmat supervisor cont'd:

- happened around Christmas in ~~2013~~ ~2009-2012
- No firefighting actions necessary
- Pulled plane out of woods
- Municipal FD responded
- Not sure if there was a leak or how it would have been handled

- AFFF brought in before 2001.
  - A retired fuel handler was there when it was brought in, and he still retired in 2001
- Removed ~~in~~ between 2011 & 2013. Taken to AASF #1 & turned in. Replaced w/ existing wheeled extinguishers
- No creative uses of AFFF
- Given to AASF #1 when hydrostatic testing was needed.
- Pressure was recorded weekly.

PA Interview Questionnaire - Other

Facility: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Interviewee: [redacted] Title: Aircraft Inspector/Maintenance Supervisor 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:

Working at AASF #2 1995 - present
Quality Assurance → Aircraft inspector → Maintenance Supervisor

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?

- Acquired Tri-Max in 2004/2005
  - Removed in 2008 (around then)
- No emergency response on-site
- Training with Tri-max has ~~occurred~~ occurred on this facility
  - Total of 3-4 times
  - 1x sprayed on ops wall to show it sticks
  - Sprayed on the tail of an aircraft
    - Rinsed off tail
  - Burn barrel next to hangar
  - 6-10 people sprayed each time
  - Between 2005-2008 (approximately)
- Local FD:
  - Not sure of training on airport side
  - Airport has truck w/ wheels in the front + track in the back. Not sure if it contains foam or water.

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:_____
Interviewer:_____
Date/Time:_____

- County + Airport observed fire training at the AASF #2.
- AFFF generally not washed away during fire training
- Trained with about 1 tri-max annually
- No training off-facility that interviewee remembers
- 4 tri-max's on pads (same location as current yellow barrels
- Storage:
  - 5 gallon buckets
  - Filled on hangar floor - no spills recalled
- Wall spray: dissipated as it ran off the wall, didn't make it to the drain.
- Prior to the AASF being built, the property was likely a field on airport property

PA Interview Questionnaire - Other

Facility: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Interviewee: [redacted] **Title:** Flight Operations **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:

- Volunteer FD since 2009
- At AASF since 2009

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?

- FD has class A/B foam. Assumes they also have AFFF	**Known Uses**
	Use
-Crash at intersection of Table Rock & GCAP	Procurement
• Foam was used	Disposition
-Before 2009, there was an airplane crash- not sure if there was a fire	Storage (Mixed)
	Storage (Solution)
-On AASF #2:	Inventory, Off-Spec
• foam sprayed on fuel truck for training	Containment
• Still had AFFF tri-max's in 2009/10	SOP on Filling
• Used it to spray truck in trainings (on wash rack)	Leaking Vehicles
	Nozzle and Suppression System Testing
- wash rack has valve similar to parkersburg	Dining Facilities
	Vehicle Washing
• Annual training now is a walk-through	Ramp Washing
- location of extinguishers, processes, hazards	Fuel Spill Washing and Fueling Stations
• Remembers one time when AFFF was sprayed (one tank)	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility:_____
Interviewer:_____
Date/Time:_____

- Some tri-max's stored here @ MASF
- No training w/ foam at the airport that interviewee knows of. Fire chief works at airport → interviewee contacted him.
  - There are no fire trucks with foam at the airport

PA Interview Questionnaire - Other

Facility: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Interviewee: [redacted] **Title:** Building Maintenance **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:

Previous crew chief 1996-2018
Building Maintenance 2018- present

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
- AFFF used during barrel burns	Use
· foam on ~~west~~ pad would collect on either side of the ramp on the grassy area or in the drain	Procurement
	Disposition
- Is unsure of when foam was no longer used for training	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: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

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

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

Years at AASF #2: 1996-2015

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?

-Tri-mark brought in around 2004	**Known Uses**
-Used for training (1 a year)	Use
-Training w/ Tri-max annually	Procurement
• at facility on ramp where aircraft is usually parked	Disposition
• 55-gal drum cut in half, JP8 poured in + ignited. Used AFFF foam to put it out	Storage (Mixed)
• At least one tank was used in each training	Storage (Solution)
• M-day drill soldiers participated in these trainings (100 soldiers at facility, ~1/2 participated in fire training).	Inventory, Off-Spec
• Let foam dry on the ramp	Containment
• These trainings were for safety stand-down	SOP on Filling
-Refilling on ramp or wash rack - no spills	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:_____
Interviewer:_____
Date/Time:_____

- Tri-max stored in shed with oil & spill kits
- No metals plating, laundry, or painting facilities
- No kitchen w/ foam suppression
- At least 4 extinguishers on ramp, 2 on hangar, & 1 at fueling station
- Purple K switch in 2013/14. Tri-max removed at that point
  - Not sure who took them
  - Likely USPFO
- No creative uses of AFFF
- Water from hoses is sprayed at aviator's retirements. Not foam

PA Interview Questionnaire - Other

Facility: Wheeling AASF #2
Interviewer: [redacted]
Date/Time: 10/3/19

Interviewee: [redacted] **Title:** Flight Chief **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:

Drilled at AASF 2 1996-2000
Hired at AASF 2 in 2000

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
-8 tri-max on ramp (4 on each side)	Use
- Only remembers one fire training event with the truck and barrel burn	Procurement
- Storage in hazmat room (5 gallon buckets	Disposition
-Sometimes a tri-max extinguisher was temporarily stored in the hangar	Storage (Mixed)
- There was a crash between 1996 + 2005	Storage (Solution)
- Another crash between 2000 and 2005	Inventory, Off-Spec
* No foam was used for either crash; no fires	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:

ARNG Contact:

Date and Time: 10/3/19 1200

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

Source/Release Information

Site Name / Area Name / Unique ID: Wheeling AASF #2

Site / Area Acreage: 39 acres

Historic Site Use (Brief Description): Previously airport property, DOD operated since operational in 1996

Current Site Use (Brief Description): Support helicopter maintenance and operation

Physical barriers or access restrictions: Code access at entrance gate, fence surrounding facility

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):

Fire training ~2000 to ~2013

2. Has usage been documented? Y / (N)

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

There is one documented training activity invitation

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

3a. Indicate what businesses are located near the site

Coal, landfill

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

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

Wheeling Ohio County Airport - NW of facility

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:

Water deluge system

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

N/A

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

N/A

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

N/A

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location: Stormwater intakes lead to surface water outfalls directed off-property

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

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

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

3a. If so, please note the location: 2 unknown wells - could be drinking or monitoring wells. 1 to south of facility, 1 to NW of facility

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

4a. If so, please note the location: 3 surface water intakes 1 east of Southern half of the landing pad, 1 E of Northern half of landing pad, 1 outside of fenced area next to the parking lot.

5. Can wind dispersion information be obtained? Y (N)

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

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

6a. If so, please note the source and location. Adjacent landfill to the north, Wheeling Ohio Airport to the NW.

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):

Wash rack redirected to municipal sewage, early 2000s

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

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

administration buildings, some grassy areas

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

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

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:

Receptor Information

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

1a. If so, please note to what extent: Code access at gate.

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:

2.4 mi east, 1.8 mi west, 1.9 mi North, 2.5 mi South

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

4a. If so, please note the location/distance/type: Elementary school - 3mi west (across river)

Elementary School - 2.2 mi east

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

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

Near the Ohio River

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Wheeling AASF #2

Why has this location been identified as a site? Potential instances of AFFF use have been identified at this location.

Are there any other activities nearby that could also impact this location?
Adjacent airport activities, landfill to the south.

Training Events

Have any training events with AFFF occurred at this site? Yes

If so, how often? Annually ~2000 to ~2013

How much material was used? Is it documented? 1 tank at each training event

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 from the facility, then west

Average rainfall? 40.4 inches

Any flooding during rainy season? No

Direct or indirect pathway to ditches? No

Direct or indirect pathway to larger bodies of water? indirect - Ohio River

Does surface water pond any place on site? No

Any impoundment areas or retention ponds? No

Any NPDES location points near the site? Yes

How does surface water drain on and around the flight line? Surface water drains to one of three storm water inlets on the eastern side of the landing pad

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? West

Depth to groundwater? ~30 ft below ground surface

Uses (agricultural, drinking water, irrigation)? Drinking.

Any groundwater treatment systems? No

Any groundwater monitoring well locations near the site? Possibly - two wells, unknown use.

Is groundwater used for drinking water? Yes, not groundwater on-site

Are there drinking water supply wells on installation? No

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient Possibly - two wells offsite of unknown use.

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?

Fire fighting equipment is not washed

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?

Nozzles are not tested

3. Other? None

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker Surface soil, Airborne soil, & Surface water

Construction Worker Airborne soil, Surface soil, Surface water, subsurface soil

Recreational User N/A

Residential Surface water, grandwater, subsurface soil.

Child N/A

Ecological N/A

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

industry, residences, schools, forests.

Documentation

Ask for Engineering drawings (if applicable). Have drawings for wash rack renovation

Has there been a reconstruction or changes to the drainage system? When did that occur? Yes, the wash rack was redirected to the municipal water treatment plant.

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 1

Description:

Wheeling AASF #2 Ansul fire suppression system in the kitchen.

Photo Date: 10/3/2019

Photograph No. 2

Description:

Storage shed that previously held 5-gallon buckets of AFFF.

Photo Date: 10/3/2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 3

Description:

Hangar's water deluge fire suppression system

Photo Date: 10/3/2019

Photograph No. 4

Description:

View of Wheeling AASF from surface water outfall off-property. Photograph shows location of surface water outfall.

Photo Date: 10/3/2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 5

Description:

Drains at the hangar doors

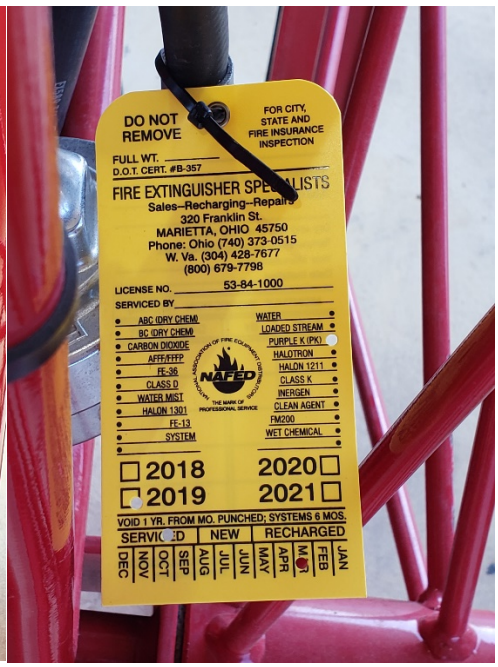
Photo Date: 10/3/2019

Photograph No. 6

Description:

Purple K fire extinguishers that replaced Tri-Max™ at AASF #2.

Photo Date: 10/3/2019



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 7

Description:

Tri-Max™ fill area inside hangar (striped yellow/black marked out area).

Photo Date: 10/3/2019

Photograph No. 8

Description:

Wash pad at AASF #2

Photo Date: 10/3/2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 9

Description:

Hangar ramp FTA. Barrel burn trainings occurred on the concrete in the foreground. AFFF was sprayed on the wall facing the camera.

Photo Date: 10/3/2019

Photograph No. 10

Description:

Helicopter FTA in the center of the landing pad.

Photo Date: 10/3/2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 11

Description:

Hazmat room where AFFF was stored.

Photo Date: 10/3/2019

Photograph No. 12

Description:

Stormwater intake closest to FTAs on the facility.

Photo Date: 10/3/2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Wheeling AASF #2	Wheeling, West Virginia

Photograph No. 7

Description:

Surface water drainage pathway leading to stormwater intake outside of the fence

Photo Date: 10/3/2019