

FINAL

Preliminary Assessment Report Shelbyville AASF, Indiana

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

July 2020

Prepared for:



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

UNCLASSIFIED

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Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
AASF	Army Air Support Facility
ARNG	Army National Guard
bgs	below ground surface
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
gpm	gallons per minute
IED	Installations and Environment Division
INARNG	Indiana Army National Guard
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
SPCC	Spill Prevention, Control, and Countermeasures
UCMR3	Unregulated Contaminant Monitoring Rule 3
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WWTP	waste water treatment plant

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 Shelbyville Army Air Support Facility (AASF) in Shelbyville, Indiana to assess potential PFAS release areas and exposure pathways to receptors. As an air support facility, various types fire prevention measures are common and may include use of AFFF.

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)TM 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 August 2018 and completed visual site inspections at known or suspected PFAS release locations and documented with photographs;
- Interviewed current and former Shelbyville AASF personnel, including:
 - Current Shelbyville AASF Chief Warrant Officer 4
 - Current Shelbyville AASF Environmental Quality Specialist
 - Former Shelbyville AASF Fuel Point Manager
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

One AOI related to a PFAS release, and one AOI related to a potential PFAS release, were identified at Shelbyville AASF, Indiana based on PA data. The AOIs are shown on **Figure ES-1** and described in **Table ES-1** below:

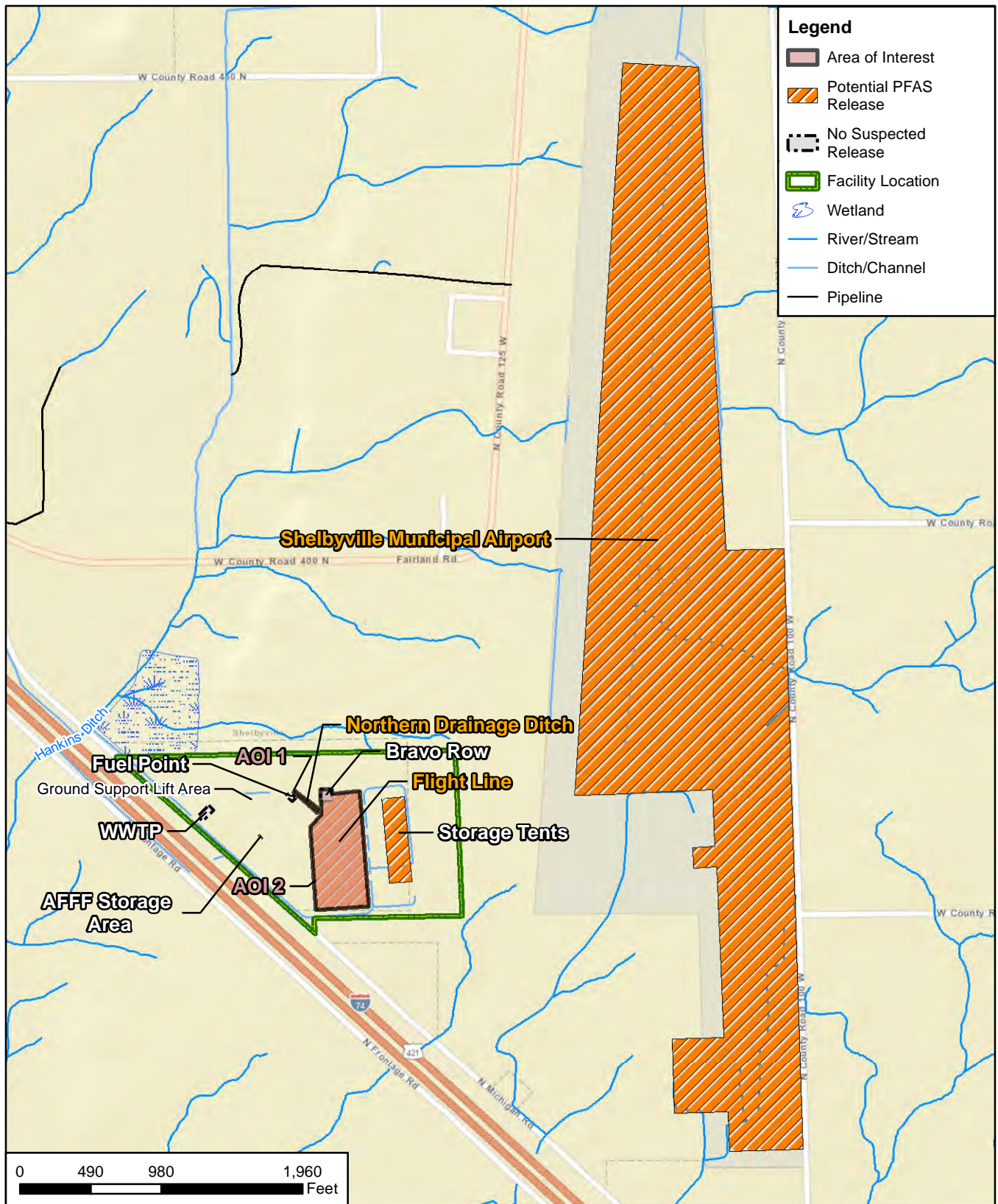
Table ES-1: Areas of Interest



Area of Interest	Name	Used by	Release Date
AOI 1	Northern Drainage Ditch	Indiana Army National Guard (INARNG)	2003; AFFF used for hydrostatic test and weed control
AOI 2	AASF Flight Line	INARNG	Approximately 2003 to 2015; potential leaking of TRI-MAX units along flight line

Information acquired during PA interviews (**Appendix B.1**), internet research, and phone calls, as well as data presented in the Environmental Data ResourcesTM (EDRTM) report (**Appendix A**), indicated that the nearby Shelbyville Municipal Airport exists as a potential adjacent off-facility source of PFAS.

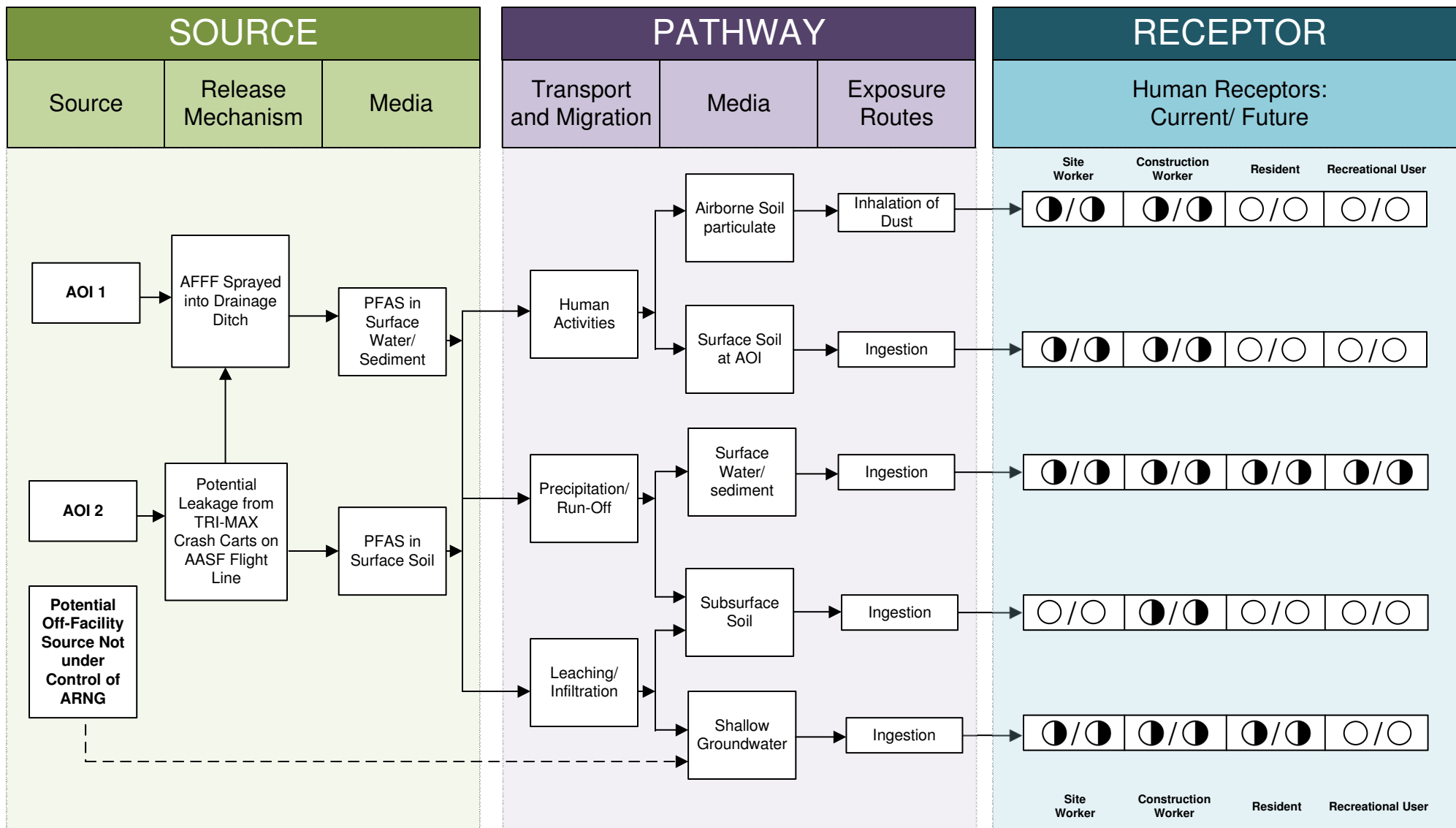
Based on documented and potential AFFF releases at the Shelbyville AASF AOIs, there is potential for exposure to PFAS contamination in soil, groundwater, surface water, and sediment for site and construction workers, off-facility residents, and recreational users. In addition, site and construction workers and off-facility residents using groundwater for drinking water may potentially be exposed to migrating PFAS contamination via the groundwater pathway. Receptors are less likely to be exposed to potential PFAS contamination through soil and air; however, some

PFAS chemicals are water soluble and can migrate readily from soil to groundwater or surface water via leaching and run-off. Therefore, there is a potential for PFAS contamination in soil to migrate to groundwater and surface water systems. The CSM for AOI 1 and AOI 2 is presented in **Figure ES-2**. Monitoring was conducted during 2014 under the EPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) of the public water supply that serves the city of Shelbyville (approximately 4-miles southeast of the facility); PFAS were not detected during this sampling. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.



CLIENT					ARNG		Summary of Findings	
NOTES					Preliminary Assessment for PFAS at Shelbyville AASF, IN			Figure ES-1
REVISED	5/29/2020	GIS BY	MS	5/29/2020				
SCALE	1:11,760	CHK BY	LC	5/29/2020				
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	5/29/2020				

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LEGEND

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

Notes:

1. The resident receptor refers to an off-site resident.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure ES-2
Preliminary Conceptual Site Model
Shelbyville AASF, IN

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 facilities that used per- and poly-fluoroalkyl substances (PFAS) (a suite of related chemicals), 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 these PFAS compounds in the environment varies. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water.

This report presents findings of a PA for PFAS-containing materials at Shelbyville Army Air Support Facility (AASF) near Shelbyville, Indiana 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 [CFR] Part 300), and Army requirements and guidance. This PA Report documents the known fire training areas (FTAs) as well as additional locations where PFAS may have been released into the environment at Shelbyville AASF. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components 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)TM 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 August 2018 and completed visual site inspections at known or suspected PFAS release locations and documented with photographs;
- Interviewed current and former Shelbyville AASF personnel, including:
 - Current Shelbyville AASF Chief Warrant Officer 4
 - Current Shelbyville AASF Environmental Quality Specialist
 - Former Shelbyville AASF Fuel Point Manager;

- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

1.3 Report Organization

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

- **Section 1 – Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA
- **Section 2 – Fire Training Areas:** describes the FTAs at the facility identified during the site visit
- **Section 3 – Non-Fire Training Areas:** describes other locations of PFAS releases at the facility identified during the site visit
- **Section 4 – Emergency Response Areas:** describes areas of AFFF release at the facility, specifically in response to emergency situations
- **Section 5 – Adjacent Sources:** describes sources of PFAS release adjacent to the facility that are not under the control of ARNG
- **Section 6 – Conceptual Site Model:** describes the pathways of PFAS transport and receptors at the facility
- **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 Shelbyville AASF is located off North Michigan Road (which parallels Interstate-74), approximately 4.5 miles north-northwest of the town of Shelbyville, Indiana in Shelby County (**Figure 1-1**). Shelby County is a sparsely populated county of about 44,000 people, with approximately 108 people per square mile. The original footprint of the AASF comprised two parcels of land totaling 20.26 acres purchased from residents of the area in 1970. Two additional parcels of 7.5 acres and 17.6 acres were added to the footprint in 1973 and 1997, respectively. The property has been state-owned since its purchase.

The relatively small, now 45.36-acre AASF, was originally constructed the year after the land was purchased in 1971 (INARNG, 2017), and consists of an aircraft hangar, ground power shop, flight line, fuel farm, containment pad, on-site package wastewater treatment plant (WWTP), administrative offices, chemical storage sheds, personally-owned vehicle parking areas, storage hangars, and a 6-acre flight line (INARNG, 2017). The AASF is bordered to the north by a casino and horsetrack, an industrial manufacturer, and a wood floor refinishing outfit. To the east, south, and west is agricultural land. Historical aerial imagery shows the facility existing as far back as 1973; the nearby industrial complexes are no older than 2005.

1.5 Facility Environmental Setting

Shelbyville AASF is located in the New Castle Till Plains and Drainageways unit of the Central Till Plain physiographic region (Gray, 2001). This unit is characterized by low-relief till plains cross-cut by major tunnel-valleys (areas where glacial meltwater tunneled underneath the glacier leaving behind deposits of till and stratified drift) up to 1 mile wide and 20 miles long (Franzmeier et al., 2004). Shelby County is within the maximum glacial extent of the Wisconsin glacialiation. The area surrounding the AASF is primarily rural agricultural land, with some recreational and industrial land uses close-by.

1.5.1 Geology

The bedrock underlying the site comprises middle Devonian carbonates of the Muscatatuck Group, except where erosion has exposed underlying Silurian carbonates (Schrader, 2005). These carbonates range from lime to dolostone and are separated into an upper and lower sequence by the Waldron Shale. The upper Devonian New Albany Shale that covers most of west-central and western Indiana has been completely eroded at the site location (Fenelon et al., 1994).

The bedrock is unconformably overlain by Pleistocene deposits of the Trafalgar Formation approximately 50 to 100 feet thick (EDR, 2018; Wayne, 1963). These unconsolidated outwash deposits were reworked by the melting glaciers, leaving behind complex strata of clay, silt, sand and gravel that act as aquifers in most of the county. Typically, a thin loess deposit about 10 feet thick overlies the glacial till, often acting as an aquitard.

Structurally, Shelby County lies on the western limb of the Cincinnati Arch, a regional anticline composed of Paleozoic rocks whose extent reaches from Ohio to eastern Indiana and northern Kentucky. The complimentary syncline to the west of the Cincinnati Arch is the Illinois Basin, consisting of Silurian to Pennsylvanian rocks, on whose rising limb Shelby County sits. This limb dips gently southwest, 10 to 20 feet per mile (Fenelon et al., 1994).

1.5.2 Hydrogeology

Most aquifers in the area draw from buried unconsolidated sand and gravel deposits within the New Castle Till Aquifer system (**Figure 1-2**). This system is characterized by thinner intertill sand and gravel layers, which differs from the northern and western parts of the county that are hydrologically separated from meteoric and surface infiltration by the overlying till. These horizontal layers of varying depth and thickness often cross surface drainage basin boundaries subterraneously (Fenelon et al., 1994). System recharge is generally from groundwater in overlying till layers.

Underlying the Till Aquifer system is the Silurian-Devonian aquifer system, composed of the aforementioned carbonates above. These carbonates are divided into an upper and lower aquifer sequence, marked by the presence of the Waldron Shale. Because limestone and dolostone are not considered to have a high primary porosity, the productivity of these aquifers depends on their secondary porosity achieved through jointing and fracturing. The lower sequence, composed entirely of Silurian age rocks, is generally lower in secondary porosity. The Salamonie dolomite is a typical member of this lower sequence, and its siliceous cap renders the aquifer downright unproductive in some places (Greeman, 1981).

Overlying the lower sequence is the Waldron Shale, which acts as an aquitard between the lower sequence and the much more prolific upper aquifer sequence composed of upper Silurian through Devonian Muscatatuck group carbonates. This upper sequence is the primary bedrock aquifer system in much of the East Fork White River Basin and in southern Shelby County due to its

higher secondary porosity. The total thickness of both aquifer sequences ranges from 50 to over 250 feet thick.

Top of bedrock in the area is found at an average of 100 feet below ground surface (bgs), and groundwater wells in the area are typically 50 to 150 feet deep, drawing variously from both the unconsolidated and bedrock aquifers. Static water levels in wells within an eighth of a mile of the AASF are at an average of 20 feet bgs (EDR, 2018). Well pump rates in the area can theoretically reach 250 gallons per minute (gpm) (Bruns and Uhl, 1976), but are more commonly found in the 10 to 60 gpm range, with an average of 15 gpm (EDR, 2018). Groundwater flow is generally southwest, following the dip and fractures of the underlying bedrock (Scott, 2012).

Shelbyville AASF obtains its drinking water from an on-facility well that is centrally located within the facility (**Figure 1-2**). This well was sampled for PFAS in 2017 by the National Guard Bureau; PFOA and PFOS were not detected in any sample. Four of the five detected compounds were detected below their respective reporting limits (Perfluorodecanoic acid, Perfluorododecanoic acid, Perfluorononanoic acid, and Perfluorotridecanoic Acid). Perfluoroundecanoic acid was the only PFAS positively detected, at 11.2 parts per trillion.

Monitoring was conducted during 2014 under the EPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) of the public water supply that serves the city of Shelbyville (approximately 4-miles southeast of the facility); PFAS were not detected during this sampling. 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

Shelby County is situated in the East Fork White River Basin, a large catchment encompassing southeastern Indiana. The closest major river system is the Big Blue River, which flows southwest through Shelbyville. The nearest natural surface water features to Shelbyville AASF are Brandywine Creek and Ed Clark Ditch, both tributaries to the Big Blue River. The gradient of these streams, which trend in a northeast – southwest direction, averages about 5 feet per mile (Bruns and Uhl, 1976). Surface water features surrounding the facility are shown in **Figure 1-3**.

Natural lakes do not occur in Shelby County, but gravel pits, farm ponds, and artificial lakes are quite common (Bruns and Uhl, 1976). The casino and horsetrack to the north of Shelbyville AASF has three artificial ponds, including one at the center of the horsetrack. There is an additional triangular pond west of the site across Interstate-74, and a medium drainage pond on the grounds of a previous temporary military structure, present in historical imagery from 2008 to 2013. Groundwater levels in this particular area are quite shallow, reaching as low as 3 feet bgs (EDR, 2018).

Flooding from the Big Blue River has impacted the City of Shelbyville and the surrounding area as recently and as frequently as 2005, 2011, and 2013 (Fowler, 2017).

Drainage ditches onsite run northwest parallel to North Michigan Road, northwest parallel to the fuel farm (**Section 3.4**), east-west parallel to the vehicle depot on site, and ring around the helicopter storage hangars. Drainage from these ditches is directed to two outfalls which ultimately flow west to Brandywine Creek and Clark Ditch.

1.5.4 Climate

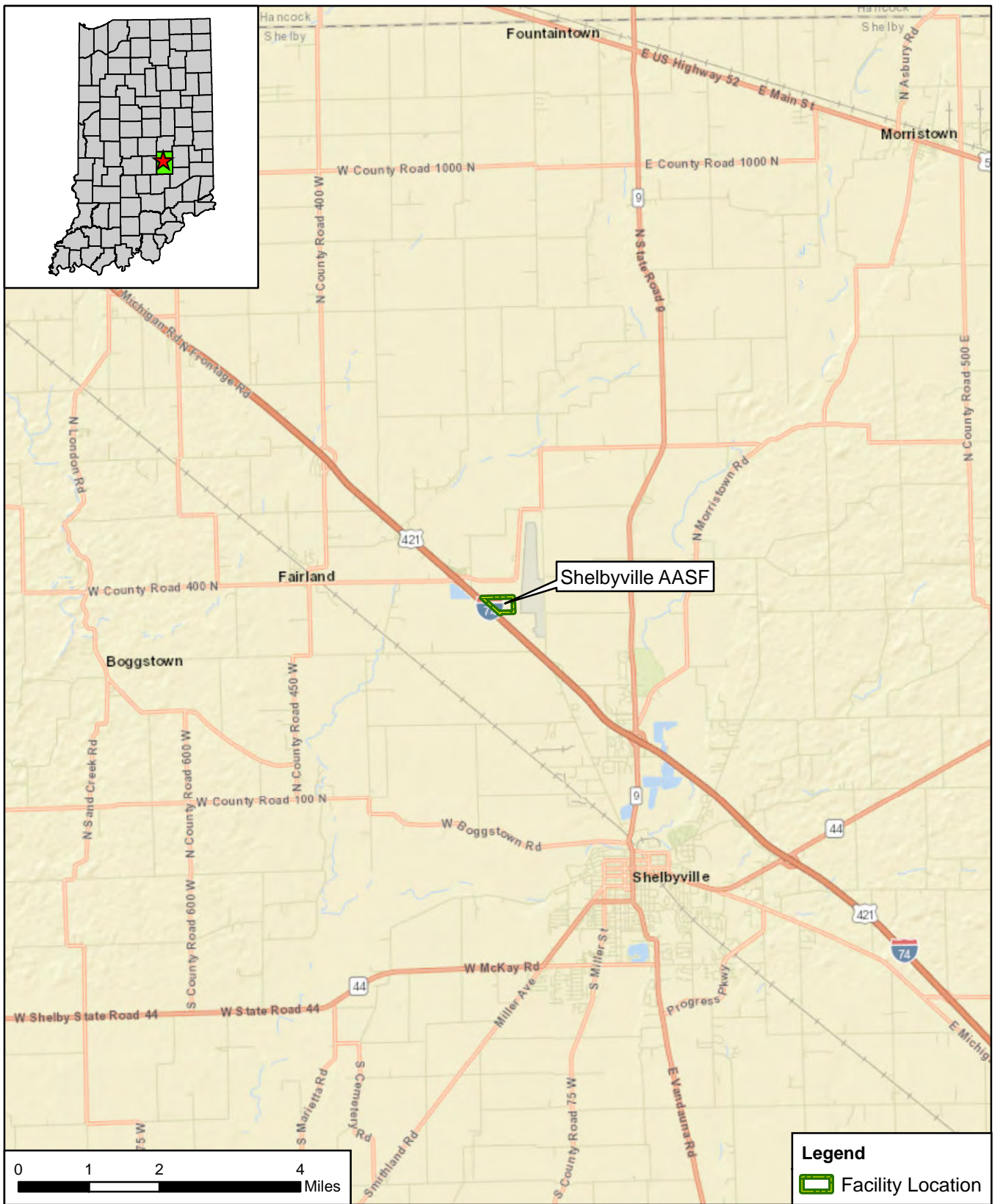
Shelbyville AASF lies in southeastern Indiana, an area categorized as hot-summer humid continental. Average climate data for the past 5 years was found for Shelbyville Municipal Airport, which abuts the facility. The average annual temperature at Shelbyville Municipal Airport is 54.6

°F. Summer has an average maximum temperature of 84.4 °F, with June, July, and August having fairly equal temperatures throughout. Winter has an average minimum temperature of 24.1 °F, with January being the coldest month.

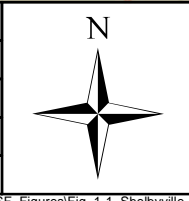
Total annual rainfall is 42.5 inches. Rainfall is fairly evenly distributed throughout the year with an average annual rainfall of 3.5 inches per month. The wettest month, June, receives 5.7 inches of rain, and the driest month, February, receives 2.4 inches of rain. Snow data for the area was unavailable, but the area likely receives snowfall typical for Indiana (NOAA, 2018).

1.5.5 Current and Future Land Use

The Shelbyville AASF is currently owned and operated by INARNG to perform maintenance on aircraft. As described in **Section 1.4**, land surrounding the facility is used for recreation (i.e., casino and horsetrack), industrial complexes, and agriculture. The Shelbyville Municipal Airport is located to the east, adjacent to the facility. About a mile off-facility, there are recreational uses at Brandywine Creek and Clark Ditch (e.g., fishing and swimming). Reasonably anticipated future land use is not expected to change from the current land use.

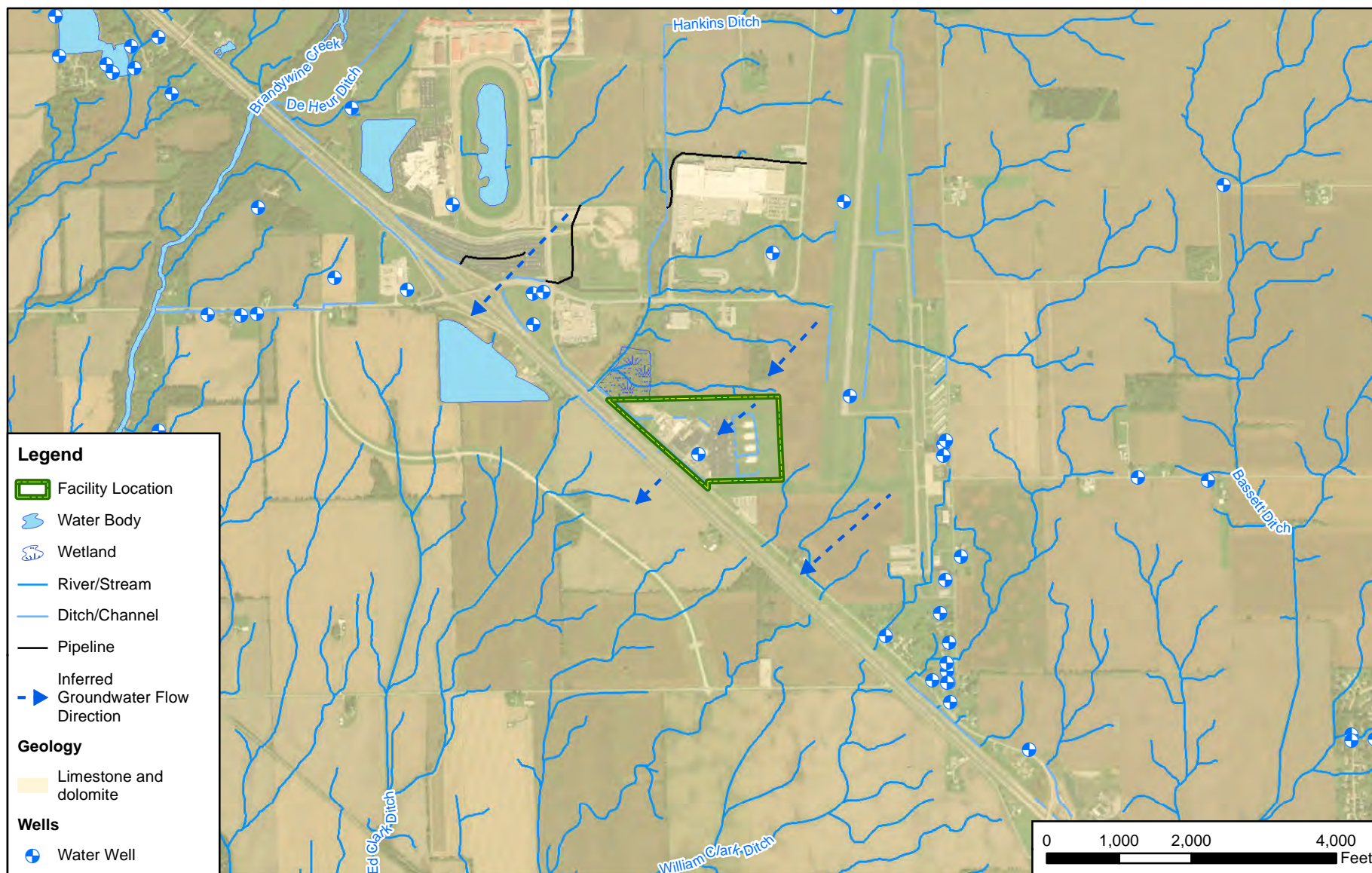




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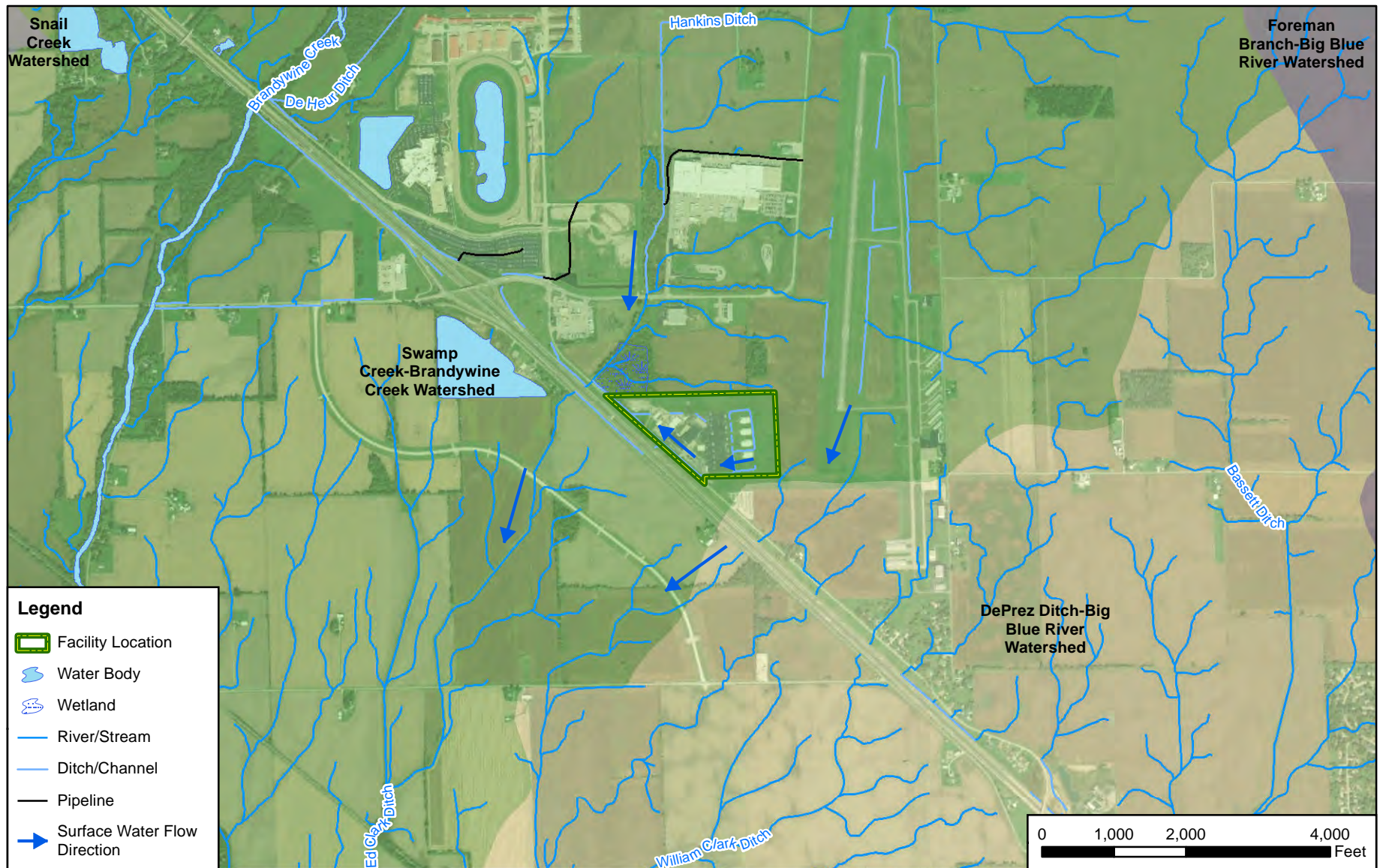
Facility Location	
 12420 Milestone Center Drive Germantown, MD 20876	Figure 1-1

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CLIENT		ARNG					Groundwater Features		
PROJECT		Preliminary Assessment for PFAS at Shelbyville AASF, IN					 12420 Milestone Center Drive Germantown, MD 20876	Figure 1-2	
REVISED	4/22/2019	GIS BY	MS	4/22/2019					
SCALE	1:24,000	CHK BY	LC	4/22/2019					
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	4/22/2019					

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CLIENT		ARNG			
PROJECT		Preliminary Assessment for PFAS at Shelbyville AASF, IN			
REVISED	4/18/2019	GIS BY	MS	4/18/2019	
SCALE	1:24,000	CHK BY	LC	4/18/2019	
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	4/18/2019	

Surface Water Features

12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-3

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2. Fire Training Areas

Two FTAs were identified at Shelbyville AASF during the PA. The two FTAs are located on asphalt pavement. No training with AFFF has been documented at either of the FTAs; all fire suppression was conducted with water or ABC extinguishers. Training at these FTAs has been conducted by the INARNG annually since the 1980s; no outside entities (i.e., non-ARNG) have trained at the FTAs. Approximately 25 5-gallon buckets of AFFF were purchased every 5 years from 2003 to 2015; however, because no training with AFFF occurred onsite, expired batches were either removed by the vendor or given to local fire departments for their training use. A description of each FTA is presented below, and the FTA locations are shown on **Figure 2-1**. Photographs of the FTAs appear in **Appendix C**.



2.1 Fuel Point FTA

The fuel point FTA is located approximately 100 feet to the east of the fuel farm in the rear of the facility, encompassing an area of roughly 3,000 square feet. It is paved with asphalt. Information collected from interviewees indicates that all training at this FTA was accomplished without the use of AFFF.

2.2 Bravo Row Flight Line FTA

This FTA is located on Bravo row in the northwest corner of the flight line (39°34'46.31"N, 85°48'39.76"W). The FTA comprises concrete pads surrounded by asphalt. Crash carts containing sodium bicarbonate are located along the flight line. No training or use of AFFF is documented at this FTA per information collected during interviews.



CLIENT ARNG						TITLE	
PROJECT Preliminary Assessment for PFAS at Shelbyville AASF, IN						Fire Training Areas	
REVISED	4/18/2019	GIS BY	MS	4/18/2019			12420 Milestone Center Drive Germantown, MD 20876
SCALE	1:3,360	CHK BY	LC	4/18/2019			
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	4/18/2019			
						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**. Seven non-fire training areas where AFFF has or may have been released were identified during the PA. During interviews with facility personnel, an “old foam truck” was noted as residing at the AASF from 1989 to 1993 before it was sent to Camp Atterbury. This truck would have been stored in the former firehouse, now the Ground Support Lift Area (**Figure 3-1**). The type of foam, capacity, and usage of the truck were unknown, and there were no documents or knowledge about potential releases. Additionally, a truck mounted system (Ford F-350) was maintained until 2015, when it was dismantled. The AASF Hangar is not equipped with a fire suppression system. A description of each non-FTA is presented below, and the non-FTAs are shown on **Figure 3-1**. Photographs of the non-FTAs appear in **Appendix C**.

3.1 Northern Drainage Ditch

A drainage ditch runs adjacent to the fuel point FTA. It runs east-west and parallel to the northern edge of the paved area of the AASF. The ditch, which ultimately drains to Brandywine Creek (a tributary of the Big Blue River), is filled with cattails and other grasses and shrubs, indicating at least an ephemeral flow of water.

In 2003, nearly 50 gallons of AFFF solution were discharged into the ditch as a dual hydrostatic testing of portable Tri-Max™ units and weed control measure by facility staff. This operation was only performed once. No further training or nozzle testing was performed that resulted in an AFFF discharge into this ditch. It is unknown when the six Tri-Max™ units were acquired, but the testing would indicate that the units were present at least since 1998, as hydrostatic testing is typically performed every 5 years. Land use prior to AASF construction was rural/residential; therefore, storage of AFFF could date back to as far as 1971. The coordinates for the reported discharge point are 39°34'46.22" N, 85°48'41.95"W.

3.2 AASF Flight Line

As a requirement, the AASF would have stationed at least one Tri-Max™ cart on the ramp for every two helicopters parked on the flight line. This practice would have occurred until 2015, when all of the Tri-Max™ units at Shelbyville were sent to Camp Atterbury. It is unknown how early the units were acquired at Shelbyville, but information obtained during interviews positively confirms AASF Tri-Max™ possession as far back as 2003; units may have been present as early as 1998, based on maintenance schedule. No instances of Tri-Max™ usage or leakage were reported on the flight line from current personnel. Prior to approximately 2003 to 2005, Tri-Max™ units would have been stationed outside uncovered year-round. Tenure of interviewees dates back to 1985.

3.3 TRI-MAX 30 Cart Malfunction

In 2004, 13 Tri-Max™ 30 crash carts containing AFFF were received from Camp Atterbury. Historically, Tri-Max™ 30 carts on the facility were stored within tents east of the flight line or stationed by the fuel farm, by the backside of the building in the aircraft wash area, inside the hangar, and at the rental hangar at the Shelbyville Municipal Airport. According to the former Shelbyville AASF Fuel Point Manager during the interviews, the air line on a Tri-Max™ 30 crash cart containing AFFF malfunctioned in 2010, but no product was released. The exact location of the malfunction was not recalled during interviews. No Tri-Max™ 30 carts are currently stored at the AASF.

3.4 AFFF Storage Area

A small storage container located on the northwest face of the AASF main building (39°34'43.54"N, 85°48'45.53"W) houses 20 5-gallon Chemguard 3 percent (%) alcohol-resistant AFFF buckets and one 5-gallon diluted solution of TRI-MAX AFFF. The current Shelbyville AASF Environmental Quality Specialist mentioned during the interviews that no leaks or releases had occurred from the storage area since the beginning of her tenure in 2015. The technician appointed to overseeing the Tri-Max 30 carts from 2003 to 2015 confirmed that there were no leaks onsite during her tenure as well. Data before this period are uncertain.

3.5 Fuel Farm

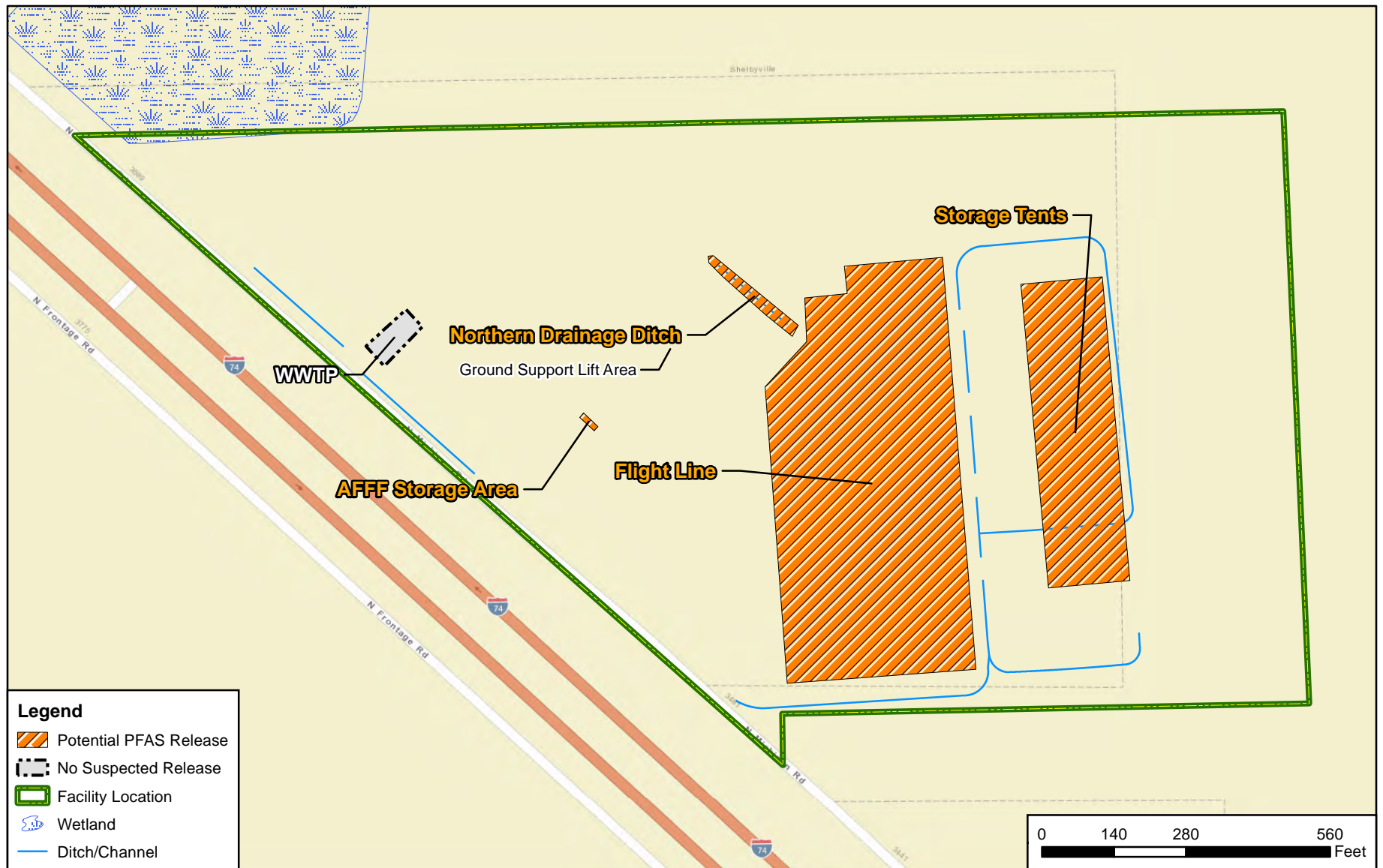
The Fuel Farm services all land vehicles at the AASF. Maintenance vehicles stored at the fuel farm are variously equipped with Purple K powder and sodium bicarbonate fire extinguishers. These materials do not contain PFAS.

3.6 Storage Tents

Four storage tents, located east of the flight line, were constructed sometime between 2003 and 2005. The tents are primarily used for storage and are large enough to house at least one helicopter. When the AASF was in possession of its TRI-MAX carts, they were stored here when not in use. Interviewees reported that no leaks or spills have occurred from the portable units since the storage tents were constructed..

3.7 Waste Water Treatment Plant

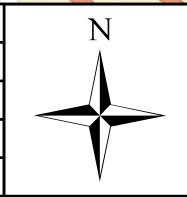
A WWTP was identified during the PA from the site's Spill Prevention, Control, and Countermeasures (SPCC) Plan (INARNG, 2017). It is connected to an oil/water separator. Although no use of AFFF at the WWTP has been identified, WWTPs can be sources of PFAS. Location coordinates of the WWTP are 39°34'45.28"N, 85°48'50.40"W.



Legend

- Potential PFAS Release
- No Suspected Release
- Facility Location
- Wetland
- Ditch/Channel

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Shelbyville AASF, IN			
REVISED	5/29/2020	GIS BY	MS	5/29/2020
SCALE	1:3,360	CHK BY	LC	5/29/2020
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	5/29/2020



TITLE	
Non-Fire Training Areas	
	12420 Milestone Center Drive Germantown, MD 20876
Figure 3-1	

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4. Emergency Response Areas

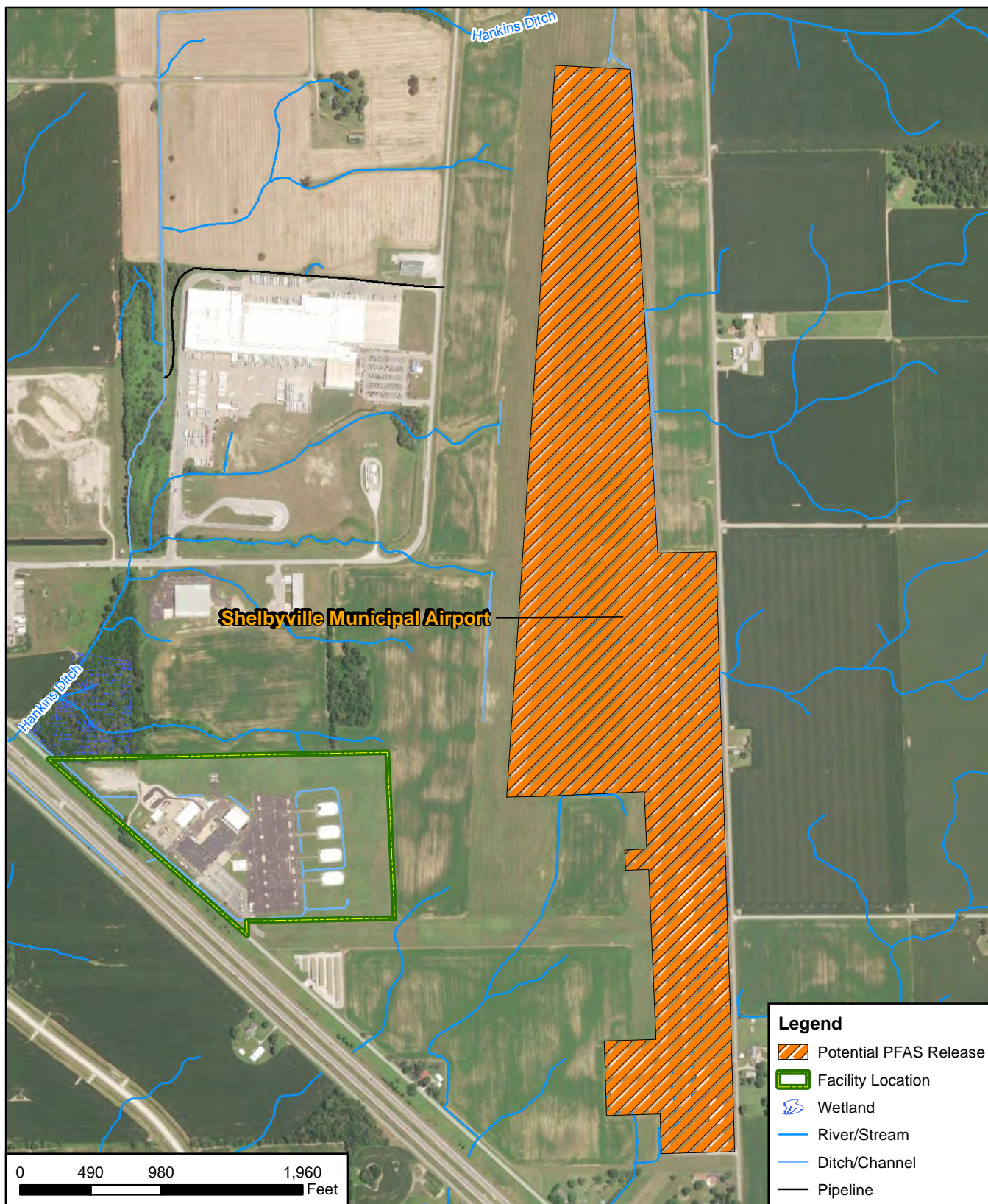
No emergency response locations involving the use of AFFF were identified by current Shelbyville AASF personnel during the PA. The current Shelbyville AASF Chief Warrant Officer's tenure extends back to 1985. Since that time, a few engine flare-ups that were allowed to burn-out have occurred, but there have not been any crashes. The Shelbyville Fire Department has not responded to any fires at the AASF.



5. Adjacent Sources

One adjacent source of PFAS near Shelbyville AASF was identified during the PA. Information acquired during PA interviews (**Appendix B.1**), internet research, and phone calls, as well as data presented in the EDR report (**Appendix A**), was reviewed. The surrounding area is primarily rural agricultural land. A description of the adjacent source is given below and shown on **Figure 5-1**.

5.1 Shelbyville Municipal Airport

The City of Shelbyville provides fire protection for the local municipal airport. Because of this, and because it is known that expired AFFF was given to local fire departments for training, an assumption based on uncertainty can be made that the airport is a potential adjacent source.



CLIENT		ARNG				Adjacent Sources		
NOTES		Preliminary Assessment for PFAS at Shelbyville AASF, IN				 12420 Milestone Center Drive Germantown, MD 20876	Figure 5-1	
REVISED	7/2/2019	GIS BY	MS	7/2/2019				
SCALE	1:11,760	CHK BY	LC	7/2/2019				
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/2/2019				

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6. Preliminary Conceptual Site Model

Based on the PA findings, one release area and one potential release area were designated as AOIs. The AOIs are shown on **Figure 6-1**. The following sections describe the CSM components and the specific CSMs developed for the AOIs. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, and (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 is sparse and continues to be the subject of PFAS toxicological study. Receptors at Shelbyville AASF include site workers, construction workers, and residents and recreators outside the facility boundary. The CSM for the AOIs indicates which specific receptors could potentially be exposed to PFAS and is shown on **Figure 6-2**.

6.1 AOI 1: Northern Drainage Ditch

In 2003, approximately 50 gallons of AFFF were released into soil within a drainage ditch within the boundary of Shelbyville AASF (**Section 3.1**). Based on preliminary data and assumed surface water and groundwater flow directions, the ditch is an AOI.

Ground-disturbing activities (i.e., construction and landscaping) at AOI 1 could result in site and construction worker exposure to potential PFAS contamination via inhalation of dust or ingestion of surface soil.

In their anionic forms, PFAS are water soluble and can migrate readily from soil to groundwater or surface water via leaching and runoff. Given the length of time since the AFFF release, the average precipitation in the area, and the shallowness of groundwater in the area, potential PFAS contamination at AOI 1 may have migrated from surface soil to subsurface soil, groundwater, and nearby surface water bodies via infiltration. Intrusive activities by construction workers may expose them to potentially PFAS contaminated subsurface soil by ingestion.

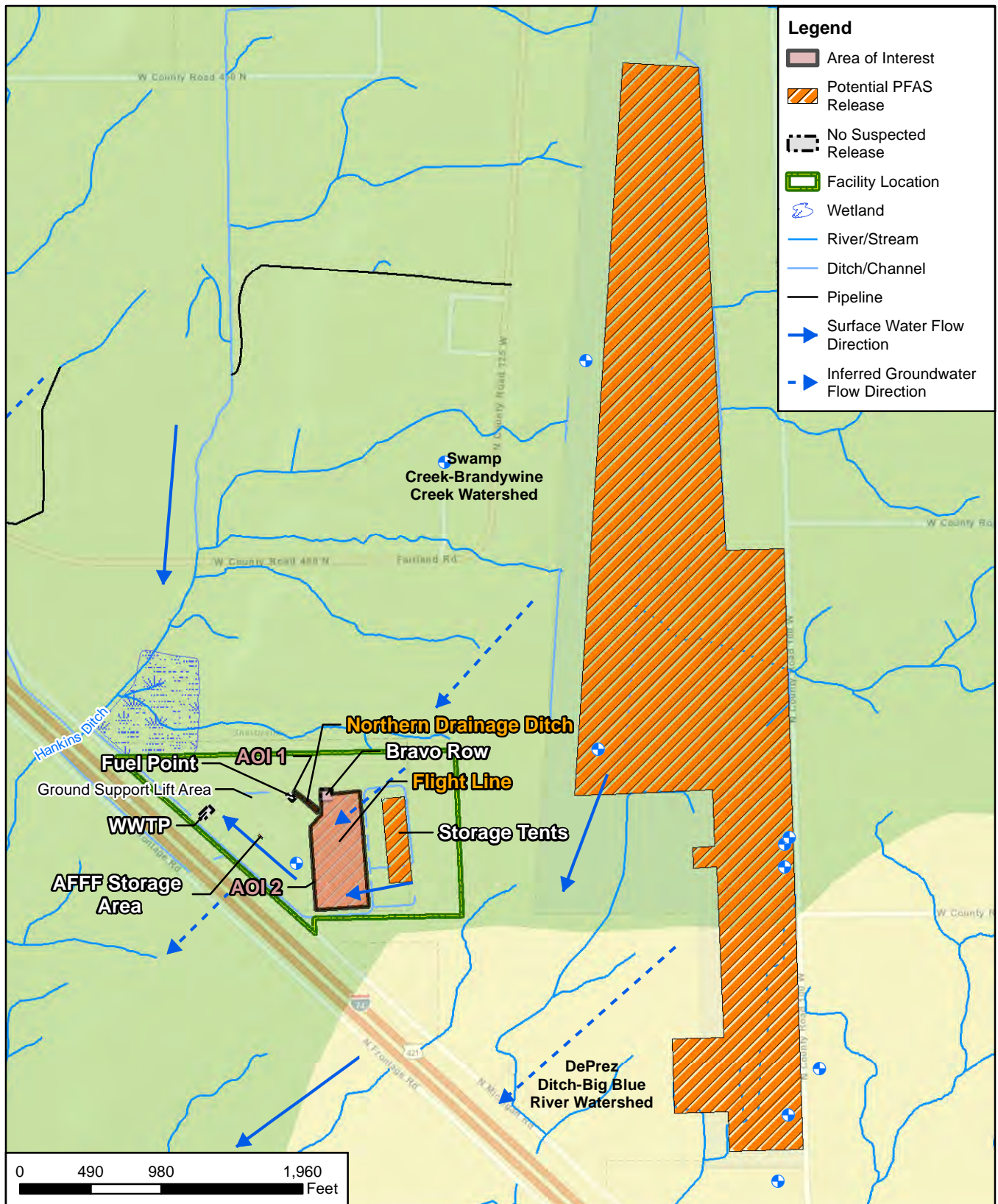
The drainage ditch has persistent vegetation indicating enough water flow is present to sustain plant life. Brandywine Creek and Clark Ditch lay to the west of the AASF, about a mile off-facility. According to the site SPCC Plan, the drainage ditch discharges directly into an outfall that flows west and into these tributaries of the Big Blue River. Therefore, the ingestion exposure pathways for surface water and sediment are potentially complete for residents and recreational users of the Brandywine Creek and Clark Ditch (e.g., fishing and swimming).



Groundwater levels on-site are approximately 20 feet bgs but can reach as shallow as 3 feet bgs as close as within a ½-mile of the facility. Typically, Shelby County's argillaceous till strata protects the sand and gravel aquifer from infiltrating meteoric water, but the shallowness of the groundwater at the AASF location could potentially preclude that. Leachate from AOI 1 may have infiltrated into the groundwater aquifer before flowing southwest towards the facility's drinking water well for the facility and off-facility residential farmsteads. Therefore, the groundwater ingestion pathway is potentially complete for site workers, construction workers, and off-facility residents.

6.2 AOI 2: AASF Flight Line

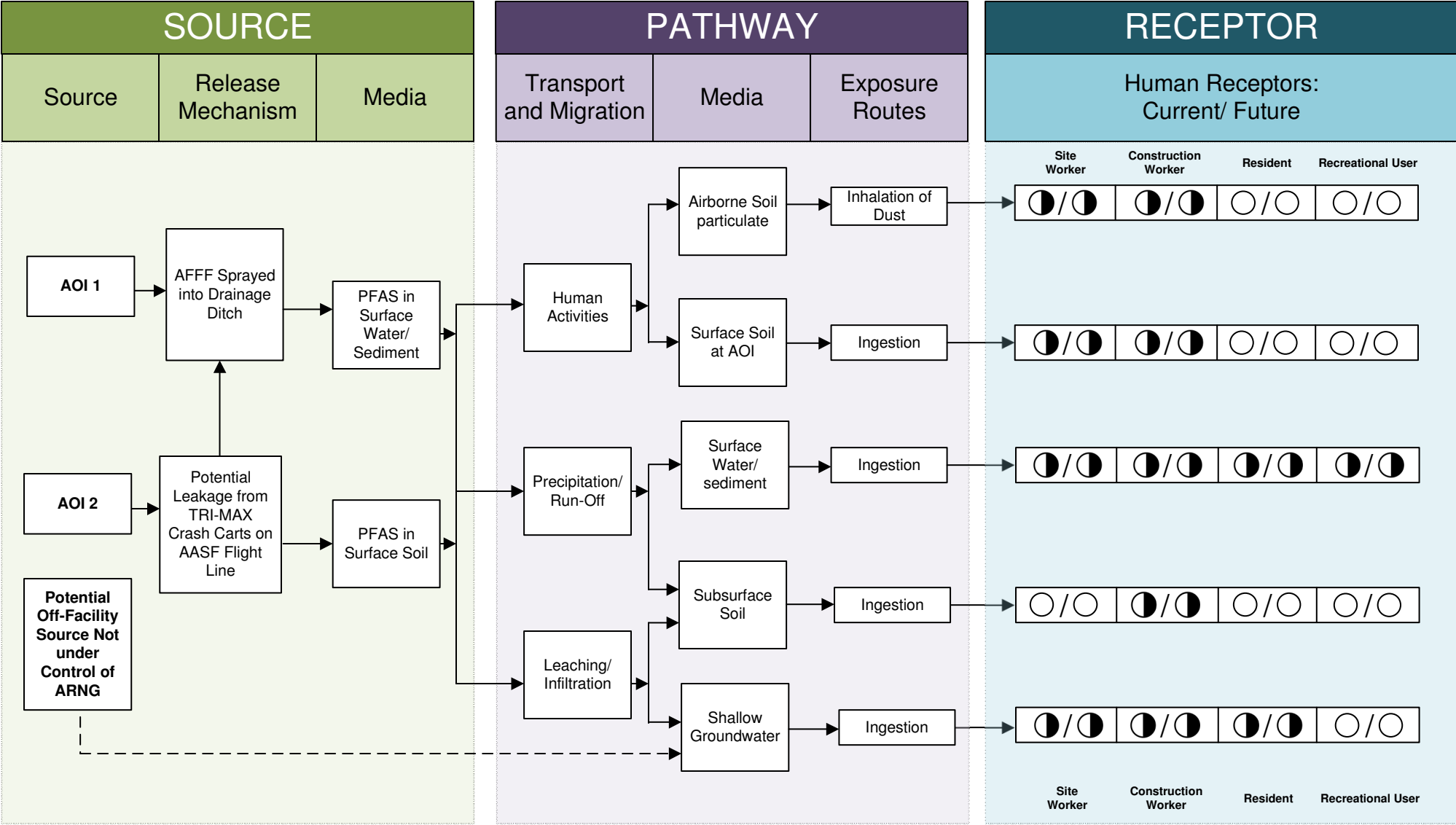
No instances of Tri-Max™ usage or leakage were reported on the flight line from current personnel; however, given the length of time Tri-Max™ units were present on the flight line (at least 12 years) and the uncertainty of how Tri-Max™ units were stored during the winter, it is possible that units

leaked AFFF onto the ramp surface. Surface flow from the Flight Line flows west into storm drains located within the tarmac, ultimately draining into the Northern Drainage Ditch (AOI 1), located northwest of the flight line. Storm drains may not capture all surface flow across the Flight Line, therefore, the possibility of PFAS contamination flowing from the Flight Line into surface soil on the western side of the Flight Line is possible. PFAS may also have infiltrated into subsurface soil and groundwater. The potable well that supplies the AASF is located immediately downgradient from AOI 2 (**Figure 6-1**). Because of these factors, the exposure pathways and receptors are the same as for AOI 1, as shown on the CSM diagram presented in **Figure 6-2**.



CLIENT ARNG						Areas of Interest	
NOTES Preliminary Assessment for PFAS at Shelbyville AASF, IN						<div> 12420 Milestone Center Drive Germantown, MD 20876</div> <div>Figure 6-1</div>	
REVISED	5/29/2020	GIS BY	MS	5/29/2020			
SCALE	1:11,760	CHK BY	LC	5/29/2020			
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	5/29/2020			

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LEGEND

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

Notes:

1. The resident receptor refers to an off-site resident.

2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-2
Preliminary Conceptual Site Model
Shelbyville AASF, IN

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 Shelbyville AASF. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

Two AOIs related to PFAS release was identified at Shelbyville AASF based on PA data. The AOIs are shown on **Figure 7-1** and described in the **Table 7-1** below:

Table 7-1: Areas of Interest

Area of Interest	Name	Used by	Release Date
AOI 1	Northern Drainage Ditch	INARNG	2003; AFFF used for hydrostatic test and weed control
AOI 2	AASF Flight Line	INARNG	Potential for leakage over at least 12 year period (c. 2003 – 2015)

Based on the documented AFFF release at AOI 1, and possible release at AOI 2, there is potential for exposure to PFAS contamination in soil, groundwater, surface water, and sediment for site and construction workers, and off-facility residents and recreational users. In addition, site and construction workers and residents using the groundwater surrounding and on the facility for drinking water may potentially be exposed to migrating PFAS contamination via the groundwater pathway. Receptors are less likely to be exposed to potential PFAS contamination through soil and air; however, some PFAS chemicals are water soluble and can migrate readily from soil to groundwater or surface water via leaching and runoff.

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 disposition and use of PFAS in training, firefighting, other non-traditional activities.

The conclusions of this PA are based on all available information, including: previous environmental reports, EDRs™, observations made during the VSI, and interviews. Interviews of personnel with direct knowledge of a facility generally provided the most useful insights regarding a facility's historical and current PFAS-containing materials. Sometimes the provided information is vague or conflicts with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS were first used (early 1970s), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a potential source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and potential storage of PFAS were reviewed, retired and current personnel were interviewed, multiple persons were interviewed for the same potential source area, and the facility was visually inspected.

Table 7-2 summarizes the uncertainties associated with the PA:

Table 7-2: Sources of Uncertainty

Area of Interest	Source of Uncertainty
Old Foam Truck	An old foam truck resided at the facility in the old firehouse, now the Ground Support Lift Area, from 1989 to 1993, before it went to Camp Atterbury. Storage, use, and type of foam are unknown.
AFFF Storage Area	According to the former and current Environmental Quality Specialists, there were no AFFF leaks from the small storage container during either of their tenures (2003 to 2015 and 2015 to present, respectively), but no data was available regarding potential leaks prior to 2003.
TRI-MAX Acquisition	No information was available during the PA regarding when Shelbyville AASF first acquired their Tri-Max™ units. Hydrostatic testing performed in 2003 suggests the units were present at least since 1998 based on standard maintenance practices; however, a definitive date is unknown.
Shelbyville Municipal Airport	Expired AFFF was given to the local fire department in the City of Shelbyville, which provides fire protection for the Airport; it is not known if or when the AFFF was used for training.

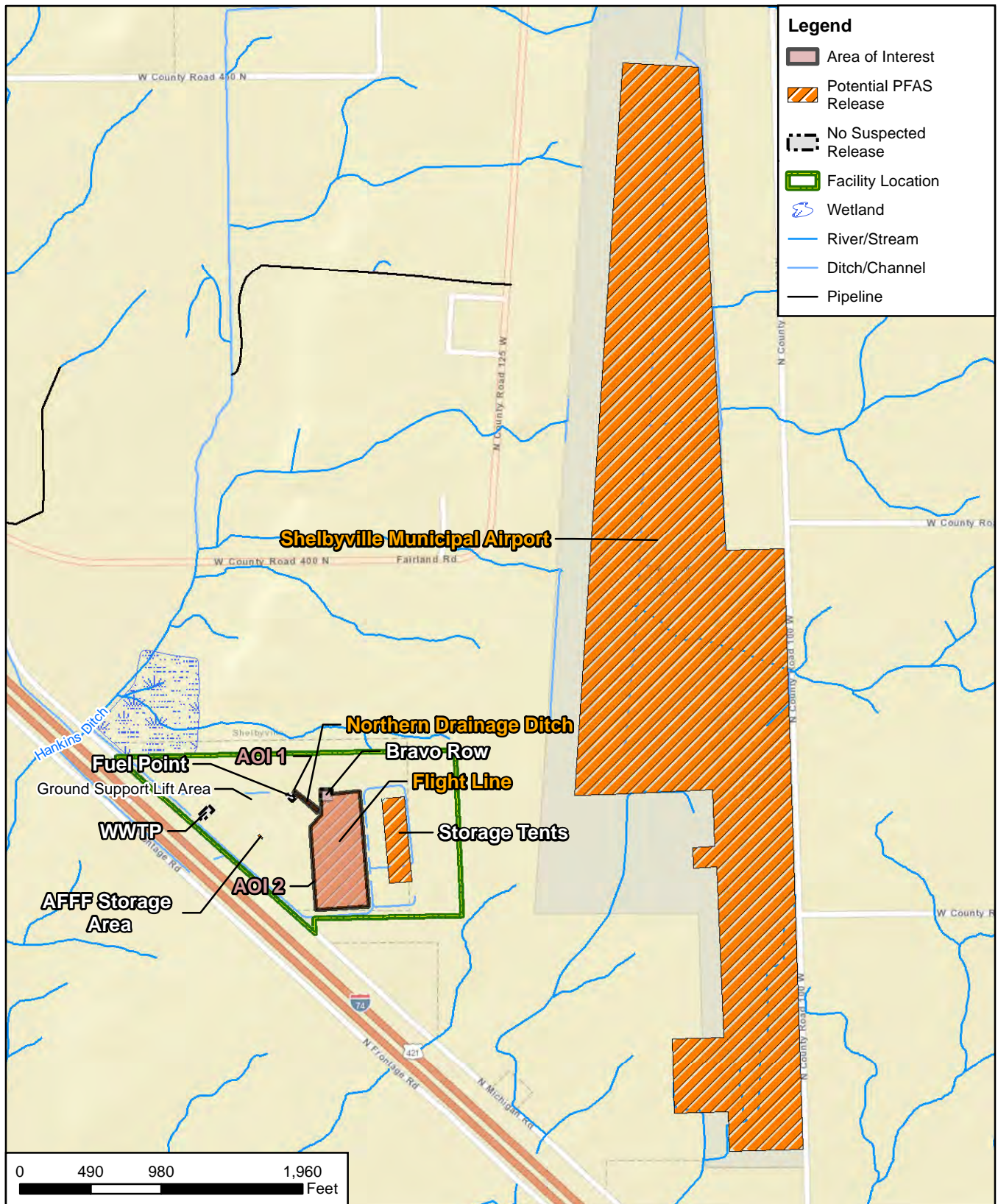
7.3 Potential Future Actions



Interviews and records indicate that former ARNG activities may have resulted in potential PFAS releases at the AOIs identified during the PA. Based on the CSM developed for the AOIs, there is potential for receptors to be exposed to PFAS contamination in soil, groundwater, surface water, and sediment at these AOIs. **Table 7-3** summarizes the rationale used to determine if the AOIs should be considered for further investigation under the CERCLA process and undergo a SI.

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

Table 7-3: PA Findings Summary

Areas of Interest	AOI Location	Rationale	Potential Future Action
AOI 1 Northern Drainage Ditch	39°34'45.88"N; 85°48'41.55"W	Approximately 50 gallons of AFFF discharged into drainage ditch circa 2003.	Proceed to an SI, focus on soil and groundwater
AOI 2 AASF Flight Line	39°34'42.36"N; 85°48'38.30"W	TRI-MAX units stored on flight line for at least 12 years and potentially kept outside during winter. Units may have leaked onto the ramp surface during this time.	Proceed to an SI, focus on soil, groundwater, sediment



CLIENT		ARNG				Summary of Findings		
NOTES		Preliminary Assessment for PFAS at Shelbyville AASF, IN				 12420 Milestone Center Drive Germantown, MD 20876	Figure 7-1	
REVISED	5/29/2020	GIS BY	MS	5/29/2020				
SCALE	1:11,760	CHK BY	LC	5/29/2020				
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	5/29/2020				

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Appendix A

Data Resources

Data resources will be provided separately on CD. Data resources for Shelbyville AASF include:

Previous Investigations Completed

- 2018 The EDR Radius Map[™] Report with GeoCheck[®]; Aerial Photo Decade Package; & Certified Sanborn Map Report; Target Property Shelbyville AASF, 3556 North Michigan Road, Shelbyville, IN 46176.
- 2017 Final Spill Prevention, Control, and Countermeasures Plan (SPCC) for the INARNG AASF at Shelbyville, Indiana

Leasing Documents

- 1993 Deed Record for 17.6 Acre Acquisition
- 1973 Deed Record for 7.5 Acre Acquisition
- 1970 Deed Record for 2.5 Acre Acquisition
- 1970 Deed Record for 17.76 Acre Acquisition

EPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) Data

- UCMR3 data for PFOS and PFOA for local area

Appendix B

Preliminary Assessment Documentation

Appendix B.1

Interview Records

PA Interview Questionnaire - Environmental Manager

Facility: Shelbyville AA5F
 Interviewer: _____
 Date/Time: _____

Interviewee: [REDACTED] Title: <u>Environmental Specialist</u> 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 _____
1. Roles or activities with the Facility/years working at the Facility. <u>Several Years @ AA5F as environmental specialist</u>	
2. Where can I find previous facility ownership information? <u>N/A</u>	
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. <div style="display: flex;"> <div style="flex: 1;"> 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 </div> <div style="flex: 1; margin-left: 20px;"> <u>Used for weed control.</u> </div> </div>	
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? <u>No.</u>	

PA Interview Questionnaire - Environmental Manager

Facility: Shelbyville ASJF
Interviewer: _____
Date/Time: _____

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?

No.

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

Bought using FPC (Fed. purchase card), ~\$1500 (~25 buckets) purchased every 5 years, from 2002-2015

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)?

Chemguard 3% alcohol-resistant

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?

In small cabinet, 5-Gal buckets

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?

2, both active.

PA Interview Questionnaire - Environmental Manager

Facility: Shelbyville ARF
Interviewer: _____
Date/Time: _____

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?

N/A

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?

Recalls 1 emergency response from off-post EMS. No formal rec.

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

No.

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?

No.

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.

PA Interview Questionnaire - Environmental Manager

Facility: Shelbyville MS
Interviewer: _____
Date/Time: _____

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.

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?

No.

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)?

No.

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

AFFF was discharged into a drainage ditch as weed control measure.

PA Interview Questionnaire - Environmental Manager

Facility: Shelbyville NASC
Interviewer: _____
Date/Time: _____

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?

No.

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

N/A

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?

No.

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.?

No.

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?

Only once, it was discharged into drainage ditch

PA Interview Questionnaire - Environmental Manager

Facility: Shelbyville NARA
Interviewer: _____
Date/Time: _____

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

N/A

PA Interview Questionnaire - Other

Facility: Camp Atterbury & Shelbyville AASF

Interviewer: [REDACTED]

Date/Time: 08/28/18 1000

Interviewee: <u>SFC [REDACTED]</u> Title: <u>SSA/RBP Supervisor</u> Phone Number: <u>[REDACTED]</u> 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:	
Role: Supervisor at Camp Atterbury for past 3 years (2015-present). Spent 12 years before that at Shelbyville AASF (2003-2015) and was responsible for the fuel point there. Knowledge of multiple Trimax carts with AFFF stored at Camp Atterbury.	
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 built), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?	
AFFF has never been used at Camp Atterbury to her knowledge in the past 3 years. Never heard of it being used at Camp Atterbury during her 12-year tenure at Shelbyville either. Six (6) Trimax-30 carts were reportedly sent to Camp Atterbury in 2004 from Shelbyville. However, there are currently only four Trimax -30 carts stored in a “tent” – temporary storage building in the northern portion of the facility. It is unknown whether only four were sent to Atterbury in 2004 or if there were two additional carts at Camp Atterbury at some point in time. These carts were sent to Camp Atterbury from the Shelbyville AASF in 2004 because the AFFF in them had expired, and Shelbyville had more Trimax carts than they needed. They are presumed to be full. These carts were never discharged at Camp Atterbury, but did undergo hydrostatic testing at Shelbyville AASF in 2003 (details below). Upon visual inspection of the carts at Atterbury, it does not appear that the Trimax-30 carts have been moved, cleaned around/under, or otherwise handled during their time in storage. No sign of any leaks present under or around the carts. SFC [REDACTED] has no other knowledge of AFFF at Camp Atterbury.	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
The following information is specific to the Shelbyville AASF, and does not pertain directly to the Camp Atterbury Preliminary Assessment:	
Hydrostatic testing was conducted with the Trimax-30 carts in early 2000s (possibly 2003) at the Shelbyville AASF. Approximately 50 gallons of 3% AFFF was	
Fuel Spill Washing and Fueling Stations	
Chrome Plating or Waterproofing	

PA Interview Questionnaire - Other

Facility: Camp Atterbury & Shelbyville AASF

Interviewer: [REDACTED]

Date/Time: 08/28/18 1000

discharged into the drainage ditch (identified on site map) during hydrostatic testing, which served a secondary purpose as a weed control measure. This was only performed once during the tenure of SFC [REDACTED]. Additionally, the air line on a Trimax-30 cart malfunctioned in 2010, but no AFFF was released in that incident.

The Trimax carts were filled by SFC [REDACTED], she confirms that there were no leaks or spills during these transfers.

During her tenure at Shelbyville there was one emergency response in 2003/2004, no AFFF was used. ABC extinguisher was used on the prop plane which was sparking on the runway. Not aware of any other crashes/emergency responses

No suppression system in the hangar at Shelbyville. There was a vehicle mounted system there from 2003 to around 2015. The system was mounted on a skid which attached to a Ford F350 truck. It was a dual system with both AFFF and purple K. The AFFF was never used to her knowledge, never leaked, and no nozzle testing was performed.

SFC [REDACTED] purchased all AFFF at Shelbyville, using an FPC card. Approximately 25 5-gallon buckets were ordered every 5 years. Unused, expired buckets were hauled away by the vendor.

Appendix B.2

Visual Site Inspection Checklists

Visual Site Inspection Checklist

Names(s) of people performing VSI:

Recorded by:

ARNG Contact:

Date and Time:

Method of visit (walking, driving, adjacent):

Source/Release Information

Site Name / Area Name / Unique ID:

Site / Area Acreage:

Historic Site Use (Brief Description):

Current Site Use (Brief Description):

Physical barriers or access restrictions:

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):

2003, ~50 Gal discharged into drainage ditch

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

Supermarket distribution center, Industrial Manufacturer

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

☒ Y / ☐ N

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

US Army

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:

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

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?

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation?

Y / N

1a. If so, note observation and location:

drainage ditches flow to an outfall @ the western edge of facility.

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

Y / N

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

drainage ditches

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

Y / N

3a. If so, please note the location:

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.

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

Y / N

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

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):

2. Is the site/area vegetated?

Y / ☒ N

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

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:

Gate w/ access code

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:

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

Y / ☒ N

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

5. Are any wetlands located near the site?

☒ Y / N

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

There is a industrial drainage pond ~500-yards west.

Appendix B.3

Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Shelbyville AASF

Why has this location been identified as a site?

Historical purchasing & storage on site.

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

No.

Training Events

Have any training events with AFFF occurred at this site?

N/A

If so, how often?

How much material was used? Is it documented?

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

Surface Water:

Surface water flow direction?

To closest drainage ditch

Average rainfall?

40 inches

Any flooding during rainy season?

yes, documented in nearby city of Shelbyville, '65, '71, '73

Direct or indirect pathway to ditches?

yes, drainage ditches

Direct or indirect pathway to larger bodies of water?

yes, outfall leads to 2 miles of Big Blue River

Does surface water pond any place on site?

not really; drains to ditches

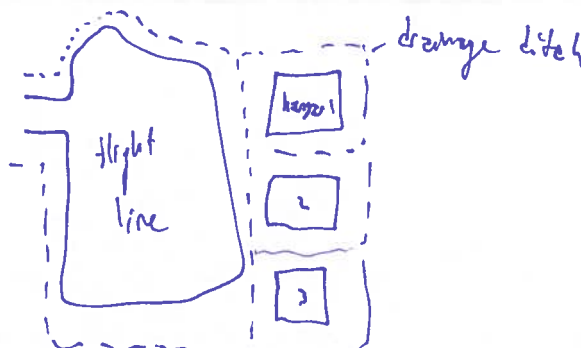
Any impoundment areas or retention ponds?

Any NPDES location points near the site?

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

into drainage ditches, outlined

in site spec.



Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction?

SW

Depth to groundwater?

low, ~3 ft.

Uses (agricultural, drinking water, irrigation)?

Any groundwater treatment systems?

No.

Any groundwater monitoring well locations near the site?

Is groundwater used for drinking water?

yes

Are there drinking water supply wells on installation?

~~No.~~

Yes

Do they serve off-post populations?

No.

Are there off-post drinking water wells downgradient

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present?

yes.

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

No.

Do we understand the fate of sludge waste?

No.

Is surface water from potential contaminated sites treated?

Equipment Rinse Water

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

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?

Flight line extinguishers are taken to facility to be tested & recharged.

3. Other?

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker

✓

Construction Worker

✓

Recreational User

✓

Residential

3 offsite

Child

Ecological

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

Ag.

Documentation

Ask for Engineering drawings (if applicable).

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

Appendix C

Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Shelbyville AASF	Shelbyville, Indiana
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Photograph No. 1

Description:

Area of interest (AOI) 1:
Drainage Ditch on north side
of facility. Approximately 50
gallons of AFFF solution was
sprayed here to reduce weed
growth and simultaneously
perform hydrostatic testing on
firefighting equipment. The
Fuel Point FTA is located just
off-frame to the left.

Date Taken:

30 August 2018



Photograph No. 2

Description:

Fuel Point FTA. No recorded
use or training with AFFF has
occurred here. AOI 1
(Drainage Ditch) can be seen
in the background. The fuel
point is just off-frame to the
left.

Date Taken:

30 August 2018



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Shelbyville AASF	Shelbyville, Indiana
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Photograph No. 3

Description:

Bravo Row FTA. No historical training or releases of AFFF have been documented here. The drainage ditch (AOI 1) is located just off-frame to the left.

Date Taken:

30 August 2018



Photograph No. 4

Description:

AFFF storage area housing 20 5-gallon buckets of 3% alcohol-resistant AFFF and 1 5-gallon bucket of Tri-Max AFFF. 4 Buckets of Purple K firefighting powder are also visible. Located on the NE face of the main building.

Date Taken:

30 August 2018



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Shelbyville AASF	Shelbyville, Indiana
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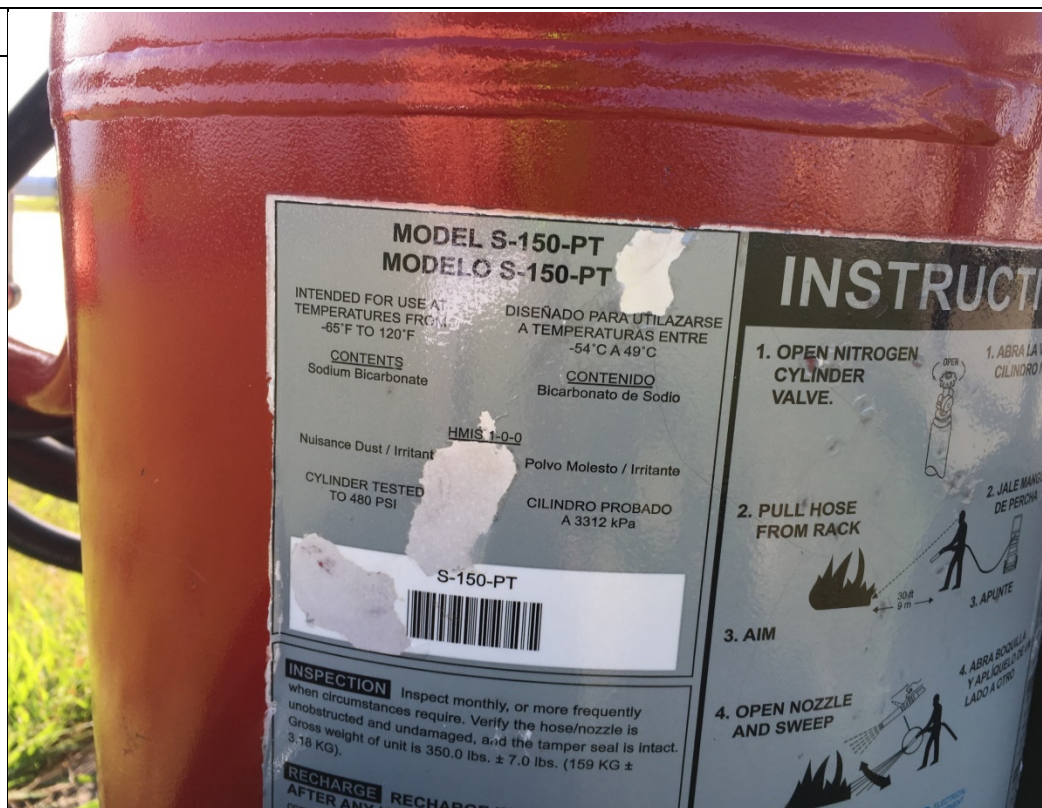
Photograph No. 5

Description:

One of several recently inspected and painted crash-cart extinguishers located on the helicopter staging area. The label indicates that Sodium Bicarbonate (NaHCO_3) is the content.

Date Taken:

30 August 2018



Photograph No. 6

Description:

Fuel Point. Trucks here are equipped with Purple K and Sodium Bicarbonate extinguishers. AOI I and the Fuel Point FTA are located just off-frame to the right.

Date Taken:

30 August 2018



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Shelbyville AASF	Shelbyville, Indiana
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Photograph No. 7

Description:

Purple K extinguisher mounted on truck parked at the fuel point.

Date Taken:

30 August 2018



Photograph No. 8

Description:

Sodium Bicarbonate extinguisher mounted on truck parked at the fuel point.

Date Taken:

30 August 2018



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Shelbyville AASF	Shelbyville, Indiana
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Photograph No. 9

Description:

Location in the front of the facility of two fuel spills in the late 1990's. No fires or fire-response occurred. Fuel was remedied with sorbent and disposed of properly.

Date Taken:

30 August 2018



Photograph No. 10

Description:

A single bromotrifluoromethane (halon 1301) fire extinguisher. This was the only extinguisher of its kind found, located on a tool cart inside the hanger bay. Does not contain AFFF (i.e. PFAS), but is a fluorinated compound and therefore may be a source of cross-contamination.

Date Taken:

30 August 2018

