FINAL
Preliminary Assessment Report
Army Aviation Support Facility #1, Topeka, Kansas

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

January 2020

Prepared for:

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Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
ARNG	Army National Guard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	conceptual site model
DLA	Defense Logistics Agency
KSARNG	Kansas Army National Guard
KSANG	Kansas Air National Guard
ft	feet
FTA	fire training area
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
SI	Site Inspection
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency

Executive Summary

The United States Army Corps of Engineers Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division, Cleanup Branch contracted AECOM Technical Services, Inc. to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. 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 released as part of firefighting activities, although other PFAS sources are possible.

AECOM completed a PA for PFAS at the Army Aviation Support Facility (AASF) #1 in Topeka, Kansas, to assess potential PFAS release areas and exposure pathways to receptors. The AASF #1 (also referred to as the "facility") is constructed on a parcel of land leased to the Kansas ARNG (KSARNG) from the Kansas Air National Guard for an indefinite term. The performance of this PA included the following tasks:

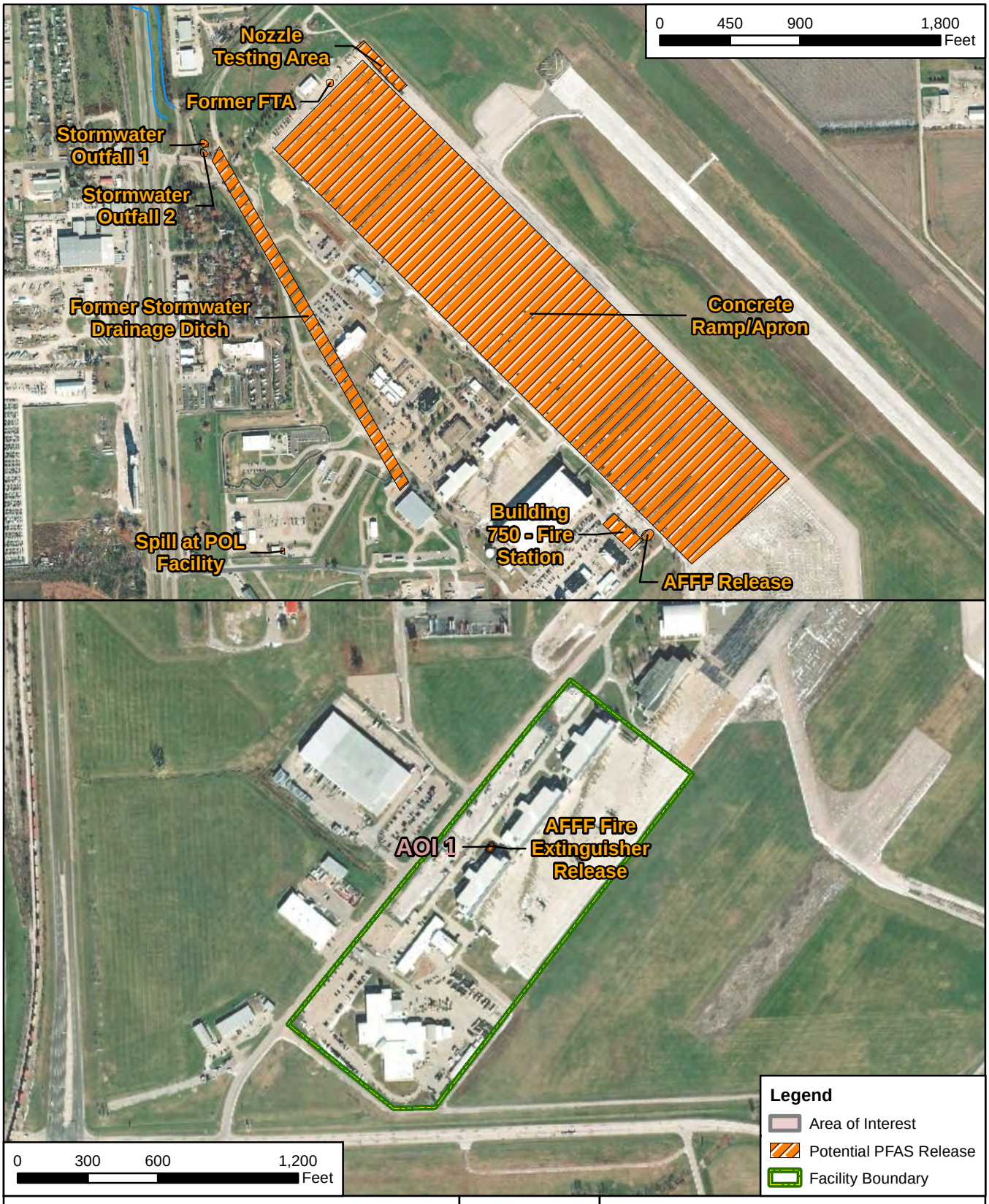
- Reviewed data resources to obtain information relevant to suspected PFAS releases
- Conducted a site visit 27 August 2019
- Interviewed current KSARNG personnel, KSARNG environmental managers, and operations staff
- Completed visual site inspections at known or suspected potential PFAS release locations and documented with photographs
- Developed a preliminary conceptual site model (CSM) to outline the potential release and pathway of PFAS for the area of interest (AOI) and the facility

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

Table ES-1: AOI at Topeka AASF #1

Area of Interest	Name	Used by	Potential Release Date
AOI 1	AFFF Fire Extinguisher Release	KSARNG	2014

Based on potential PFAS release at this AOI, there is potential for exposure to PFAS contamination in surface soil to site and construction workers; and subsurface soil to construction workers via ingestion and inhalation of dust. Because AASF #1 has been operated by the KSARNG since 1970, the uncertainty associated with potential PFAS use at the facility is relatively low. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS were detected in a public water system above the United States Environmental Protection Agency Lifetime Health Advisory level within 20 miles of the facility. The preliminary CSM for AASF #1 is shown on **Figure ES-2**.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Topkea AASF 1, KS			
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SCALE	1:10,800	CHK BY	SI	11/25/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	11/25/2019

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Summary of Findings

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Figure ES-1

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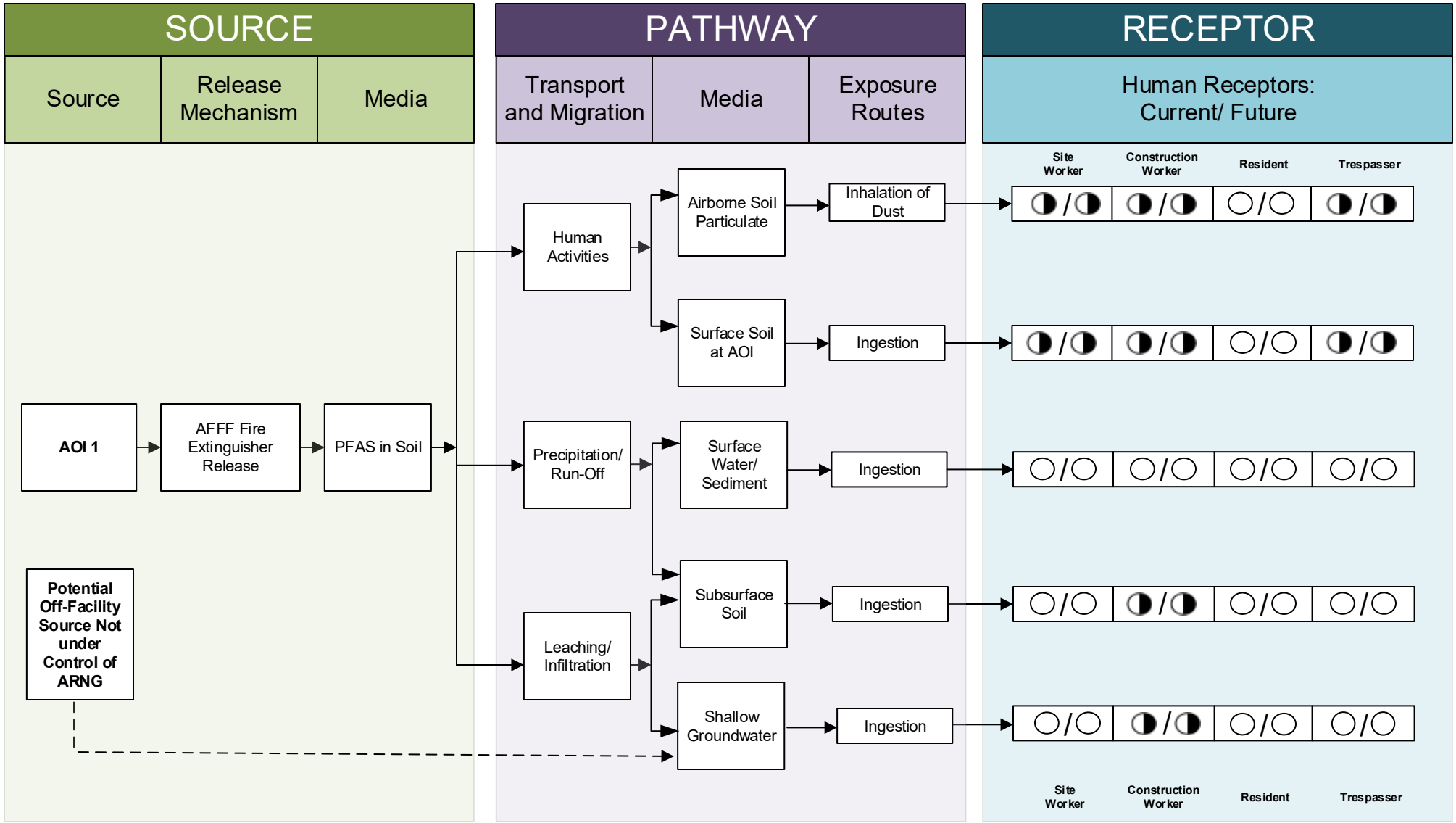


LEGEND

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

Notes:

1. Dermal contact exposure pathway is incomplete for PFAS.

Figure ES-2
Preliminary Conceptual Site Model
Topeka AASF #1

1. Introduction

1.1 Authority and Purpose

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division, Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide* 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 Health Advisories for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. In the absence of federal maximum contaminant levels, some states have adopted their own drinking water standards for PFAS. The State of Kansas does not currently have drinking water standards for PFAS. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS were detected in a public water system above the USEPA Lifetime Health Advisory level within 20 miles of the facility.

This report presents the findings of a PA for PFAS at the Army Aviation Support Facility (AASF) #1 in Topeka, Kansas, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300), and USACE requirements and guidance.

This PA documents the known fire training areas (FTAs) as well as other locations where PFAS may have been released into the environment at the AASF #1. 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 data resources to obtain information relevant to suspected PFAS releases
- Conducted a site visit on 27 August 2019
- Interviewed current Kansas ARNG (KSARNG) personnel, KSARNG environmental managers, and operations staff
- Completed visual site inspections at known or suspected potential PFAS release locations and documented with photographs

- Developed a preliminary conceptual site model (CSM) to outline the potential release and pathway of PFAS for the area of interest (AOI) and the facility

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 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 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 #1 (also referred to as the “facility”) is in Shawnee County, Kansas (**Figure 1-1**), approximately 7 miles south of the city center of Topeka, 24 miles west of Lawrence, and 100 miles east of Salina. The facility is accessible from Southwest Topeka Boulevard by Southeast Gary Ormsby Drive.

AASF #1 is on the Topeka Regional Airport, and is south of Forbes Field, which is under control of the Kansas Air National Guard (KSANG). AASF #1 occupies approximately 30 acres of land that have been licensed from the US Air Force since 1980 for an indefinite term. See **Appendix A** for real estate documents. The current AASF #1 facilities include hangars for the operation, maintenance, and repair of KSARNG rotary-winged aircraft.

1.5 Facility Environmental Setting

Shawnee County is situated along the Kansas River. The region is characterized by east-facing ridges and gently rolling plains. The topography consists of nearly level to gently sloping surfaces, and the elevation in the area ranges from 1,020 to 1,050 feet above mean sea level (Leidos, 2014).

1.5.1 Geology

AASF #1 is situated on the eastern edge of the Great Plains and is located within the southeastern part of Shawnee County. AASF #1 is underlain by glacial drift, which is composed of clays, sand, and silts, with a thickness ranging up to 40 feet. At AASF #1, the unconsolidated sediment layer is thin, ranging from 5 to 20 feet in thickness. The bedrock geology at AASF #1 is made up of two major geologic groups: The Pennsylvanian Wabaunsee and Shawnee Groups. Formations within both of these groups are largely non-marine sandy shales, with coal seams alternating with sandstones, marine shales, and limestone. There is no evidence in literature indicating significant regional fracturing, but locally, certain limestone units have been described as vertically jointed (Leidos, 2014).

There are several types of surface soils at AASF #1: Alluvial, Breaks-Alluvial Complex, Labette, Ladysmith, Pawnee, eroded Pawnee, and Sogn-Vinland Complex. Alluvial soils, which occur on floodplains, and often floodplains dissected by stream channels, are classified as loam to silty-clay loam. Breaks soils, classified as silty-clay loam, typically occur on uplands. The Breaks-Alluvial Complex is characterized by steep-sided floodplains with rocky outcrops. Labette soils at the surface layer are silty-clay loam; subsoil ranges from clay loam to clay or silty clay. Ladysmith soils occur mantled with loess and clay beds. The surface layer is a silty-clay loam underlain by a light silty clay. The surface layer of Pawnee soil is a clay loam underlain by additional clay loam, and then a clay horizon that usually includes glacial sand and pebbles. The Sogn-Vinland Complex is comprised of shallow (15 to 20 inches) soils on nearly level to steep slopes. Sogn soils, which are silty-clay loams, rest on limestone bedrock. Vinland soils, which are silty loams, rest on shale and clay beds (Leidos, 2014).

1.5.2 Hydrogeology

Groundwater occurs in two aquifers at AASF #1: an unconfined aquifer within the shallow, unconsolidated material, and a confined aquifer within the Nodaway Coal formation of the bedrock. The water table is relatively shallow, at 10 feet below ground surface (bgs), on average, but can occur anywhere from 2 to 24 feet bgs. Groundwater flow is limited at AASF #1 because of a lack of hydraulic connectivity, but it generally flows northwest.

The unconfined aquifer is found within the unconsolidated silty-clayey soil formed from glacial drift and weathered bedrock. Usually, the water-bearing portion of the unconsolidated aquifer is found within the weathered bedrock. Recharge occurs from precipitation in areas free of asphalt and concrete at the surface and from vertical discharge from the confined aquifer of the Nodaway Coal layer. The unconfined aquifer discharges to an unnamed tributary of the South Branch of Shunganunga Creek and, ultimately, to the Kansas River. The confined aquifer, held in the Nodaway Coal formation, is located in the upper 50 feet of bedrock. The Nodaway Coal formation runs at a slightly different angle than surrounding bedrock; its aquifer is, therefore, confined by impermeable surrounding bedrock, but discharges water upward to the unconfined aquifer (Leidos, 2014).

No potable water wells are located within the boundary of the AASF #1; however, there are approximately five domestic wells that exist within 2 miles of the facility, and approximately 8 additional domestic wells within 3 miles of the facility (**Figure 1-2**). These wells are side gradient of AASF #1 and are not likely to be impacted by potential PFAS releases. There are additional US Geological Survey wells in addition to geothermal wells that exist in the area surrounding AASF #1; however, these are not drinking water wells. Drinking water for AASF #1 is supplied by the City of Topeka, which obtains water from the Kansas River as its drinking water source (City of Topeka, 2018).

1.5.3 Hydrology

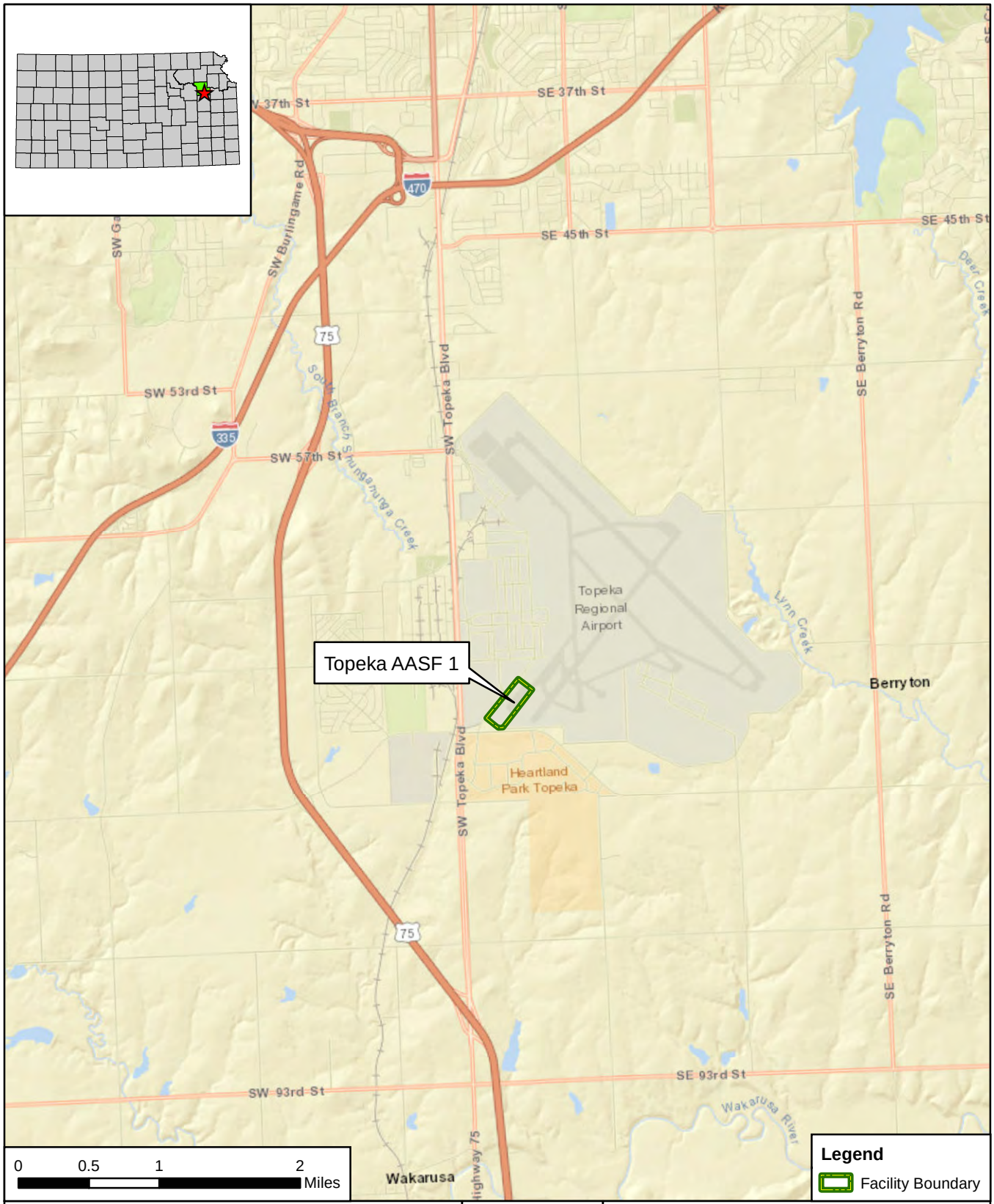
AASF #1 is located between two creeks, Lynn Creek and the south branch of Shunganunga Creek, where there is a drainage divide that runs along the main runway (**Figure 1-3**). Lynn Creek drains southeast to the Wakarusa River, while Shunganunga Creek drains into the Kansas River to the north. At AASF #1, surface runoff is primarily in the form of sheet flow, but discharges in to the Wakarusa River via direct discharge or through the storm sewer (Leidos, 2014).

1.5.4 Climate

The climate in Topeka is defined as humid continental and is characterized by highly variable seasonal temperatures governed by strong frontal air masses. The winter temperature low is 16.3 degrees Fahrenheit and, in summer, the temperature reaches 89.2 degrees Fahrenheit. The average annual precipitation is 35.2 inches and is more prevalent in the warmer months, when thunderstorms commonly produce tornadoes (World Climate, 2019).

1.5.5 Current and Future Land Use

AASF #1 is a controlled access facility with public roads and is adjacent to the Topeka Regional Airport. The facility consists of a split-level administrative office building and three hangars used for maintenance repair and storage with partial second floor office areas in two of the hangars. The Topeka Regional Airport is owned and operated by the Metropolitan Topeka Airport Authority and provides private, commercial, and military air service. Future infrastructure improvements, land acquisitions, and land use controls are not anticipated to change.



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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	11/25/2019

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Facility Location

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Figure 1-1

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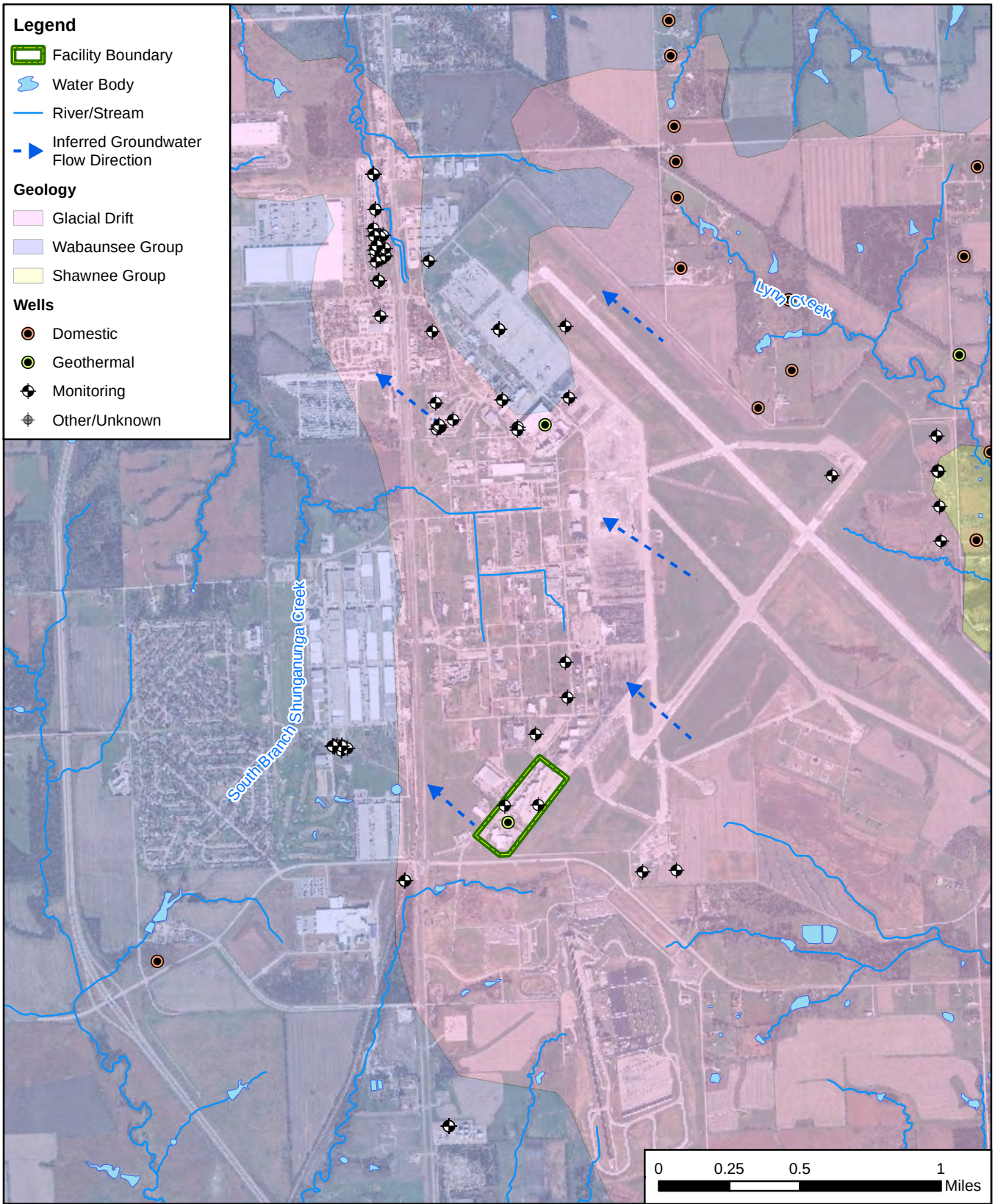

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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	11/25/2019

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Groundwater Features

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Figure 1-2

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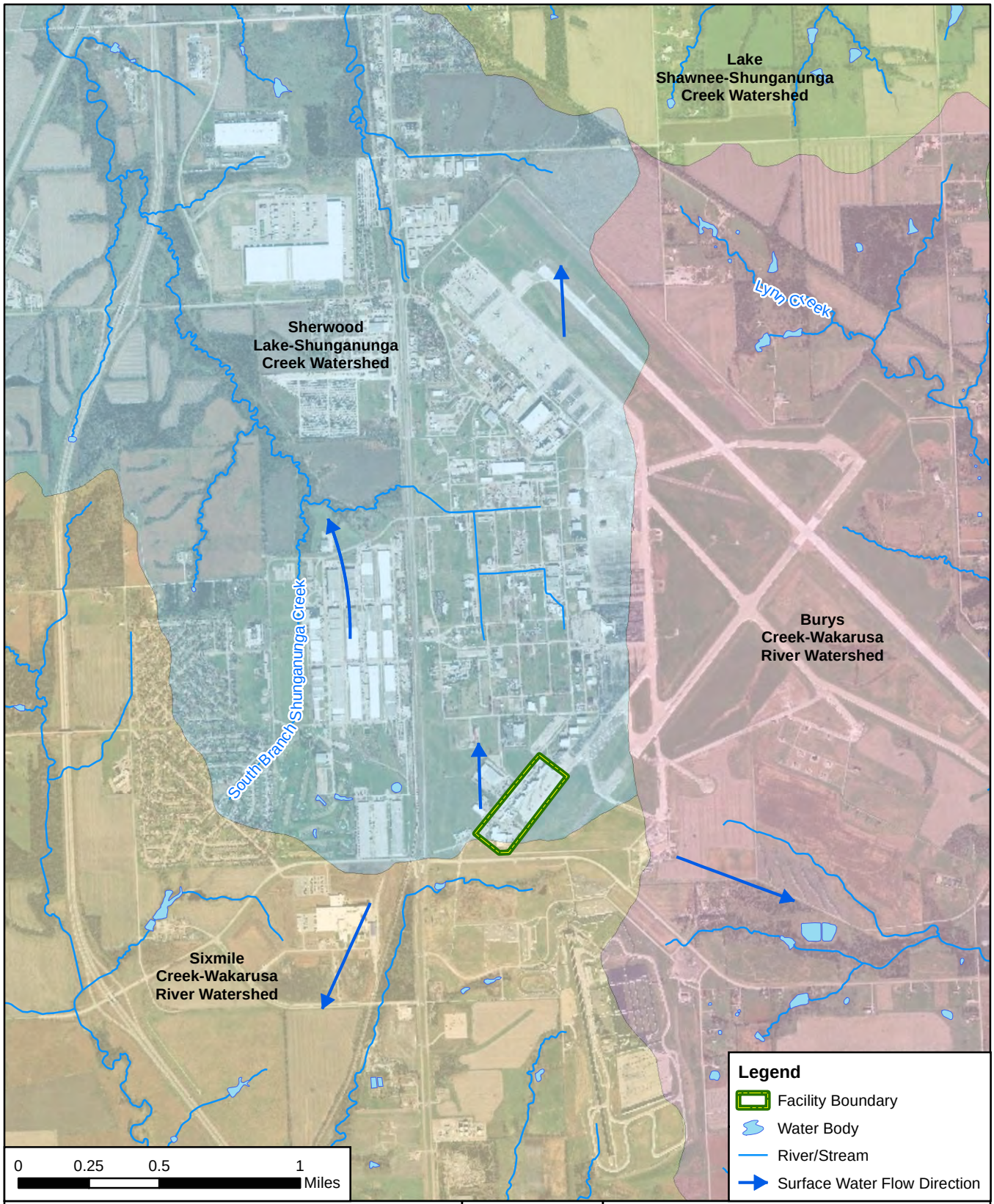

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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	11/25/2019

Surface Water Features

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Figure 1-3

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2. Fire Training Areas

No FTAs were identified at AASF #1 during the PA through interviews (**Appendix B**), historical document review, or the Environmental Data Resource Report.

3. Non-Fire Training Areas

One non-FTA where AFFF was stored and/or potentially released was identified during the PA. A description of the non-FTA is presented below and shown on **Figure 3-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**, respectively.

3.1 AFFF Fire Extinguishers Release

Since 1992, the AASF #1 facility housed six TriMax-30™ fire extinguishers that were placed on the ramp area. In 2008, the TriMax-30™ fire extinguishers were removed from the facility, and five Ansul Alcohol-Resistant AFFF fire extinguishers (Ansul AR-33-D) with a 15 percent (%) AFFF solution concentration were placed on the ramp area. In 2014, there was a one-time release of AFFF, when four Ansul AFFF fire extinguishers were emptied on gravel behind building 682 (**Figure 3-1**). The estimated total amount emptied onto the gravel area was 132 gallons of 15% AFFF solution. The geographic coordinates are 38°56'18.73"N; 95°40'50.50"W. One of the Ansul AFFF fire extinguishers was containerized in a 55-gallon drum during the time when the four Ansul AFFF fire extinguishers were emptied, and ultimately from the facility in August 2019 to be properly disposed of through the Defense Logistics Agency (DLA) contract. No bulk AFFF solution has been stored on the facility. The TriMax-30™ and Ansul fire extinguishers were tested annually by a contractor, and any release was containerized then removed by the contractor. Since 2014, the AASF #1 facility has housed six Purple K fire extinguishers that are placed on the ramp area.

There are two stormwater drains in the proximity of the release area. The closest stormwater drain is approximately 65 feet to the north, and the second is approximately 140 feet to the south. Both of the stormwater drains are elevated above the gravel release area; therefore, it is unlikely the release impacted the stormwater system. The two stormwater drains lead to two outfalls on the west boundary of the facility and ultimately discharge north to the South Branch Shunganunga Creek.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Topkea AASF 1, KS			
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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	11/25/2019

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Non-Fire Training Area

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Figure 3-1

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4. Emergency Response Areas

No emergency response areas were identified within the AASF #1 facility during the PA through interviews or document review. The KSANG at Forbes Field provides fire emergency services for AASF #1.

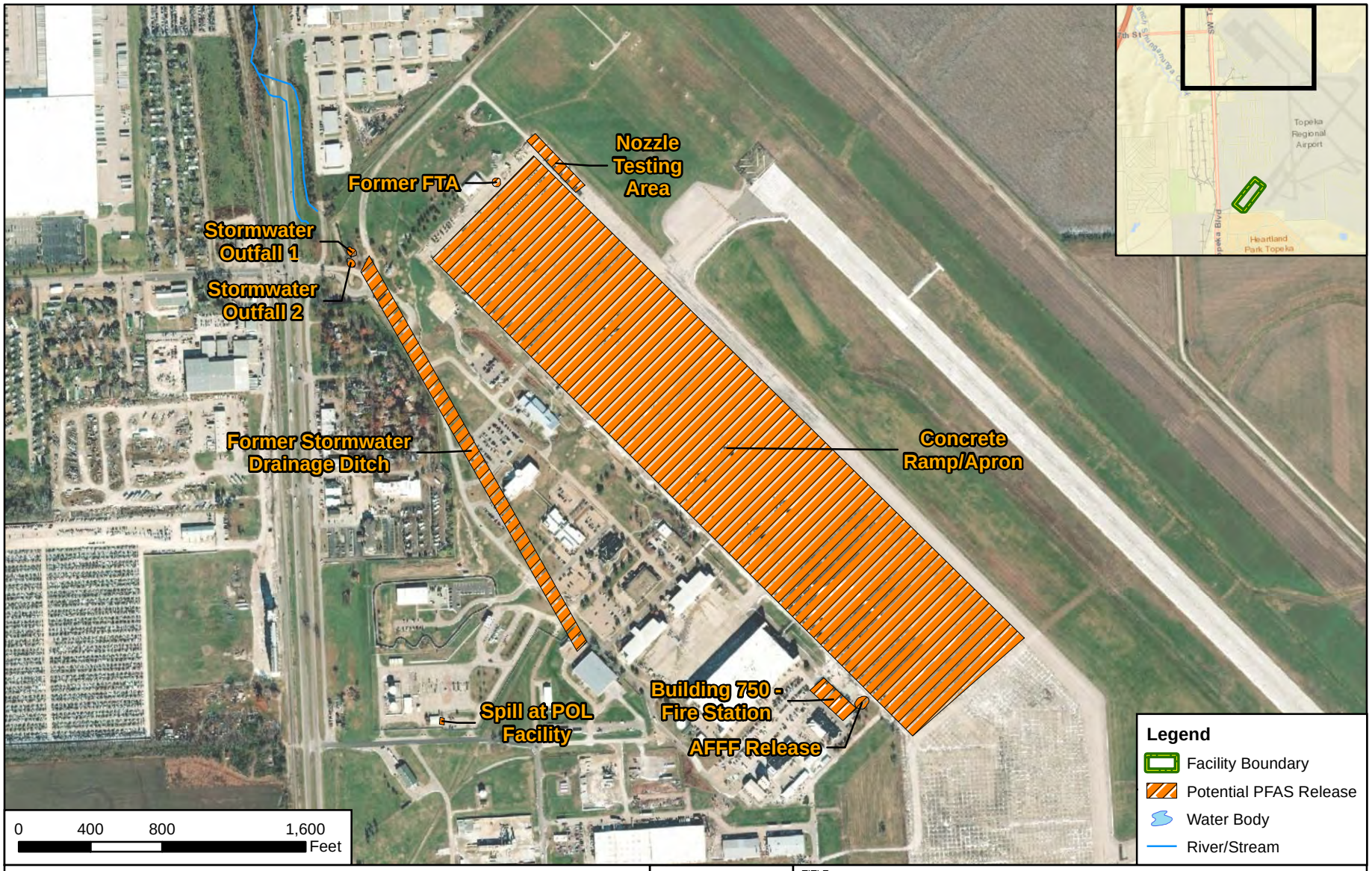
5. Adjacent Sources

Nine off-site potential PFAS source areas adjacent to AASF #1 were identified during the PA through interviews (**Appendix B**), online research, and the Environmental Data Resource Report (**Appendix A**). **Figure 5-1** presents the location of potential adjacent source areas.

5.1 Kansas Air National Guard

Based on the SI findings, several potential areas of potential use, storage, or release of AFFF have historically occurred at the KSANG, Forbes Field (Amec Foster Wheeler, 2017). These locations are described below.

- Former FTA: The pit was only used for approximately five fire training exercises and is equipped with a floor drain connected to an oil/water separator.
- Building 750 – Fire Station: AFFF was stored in many areas, including inside fire vehicles, tanks, and a trailer. The floor drains are connected to an oil/water separator which leads to the sanitary system, and ultimately to Stormwater Outfall 1.
- AFFF Release: This was a one-time accidental release of an unknown quantity of AFFF from a 500-gallon capacity fire response crash truck that drained to Outfall 1.
- Nozzle Testing Area: The northeastern portion of Old Ramp/Apron has been used for the disposal of AFFF and nozzle testing.
- Former Stormwater Drainage Ditch: Site of historical fuel spill which was covered with foam. The spilled fuel was recovered at Stormwater Outfall 2.
- Spill at Petroleum, Oils and Lubricants (POL) Facility: In 1981, foam was used to cover spilled Jet Propellant 4.
- Concrete Ramp/Apron: Historic spills and potential for AFFF release in this area.
- Stormwater Outfall 1: Stormwater runoff from the northern portion of Forbes Field.
- Stormwater Outfall 2: Stormwater runoff from the southern portion of Forbes Field.



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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	11/25/2019

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TITLE

Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, one AOI was identified at AASF #1: AOI 1 AFFF Fire Extinguisher Release. The AOI is shown on **Figure 6-1**. The following sections describe the CSM components and the specific preliminary CSM developed for the AOI 1. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

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 for Topeka AASF #1 include site workers, construction workers, trespassers and off-facility residents. The preliminary CSM for AOI 1 indicates which specific receptors could potentially be exposed to PFAS.

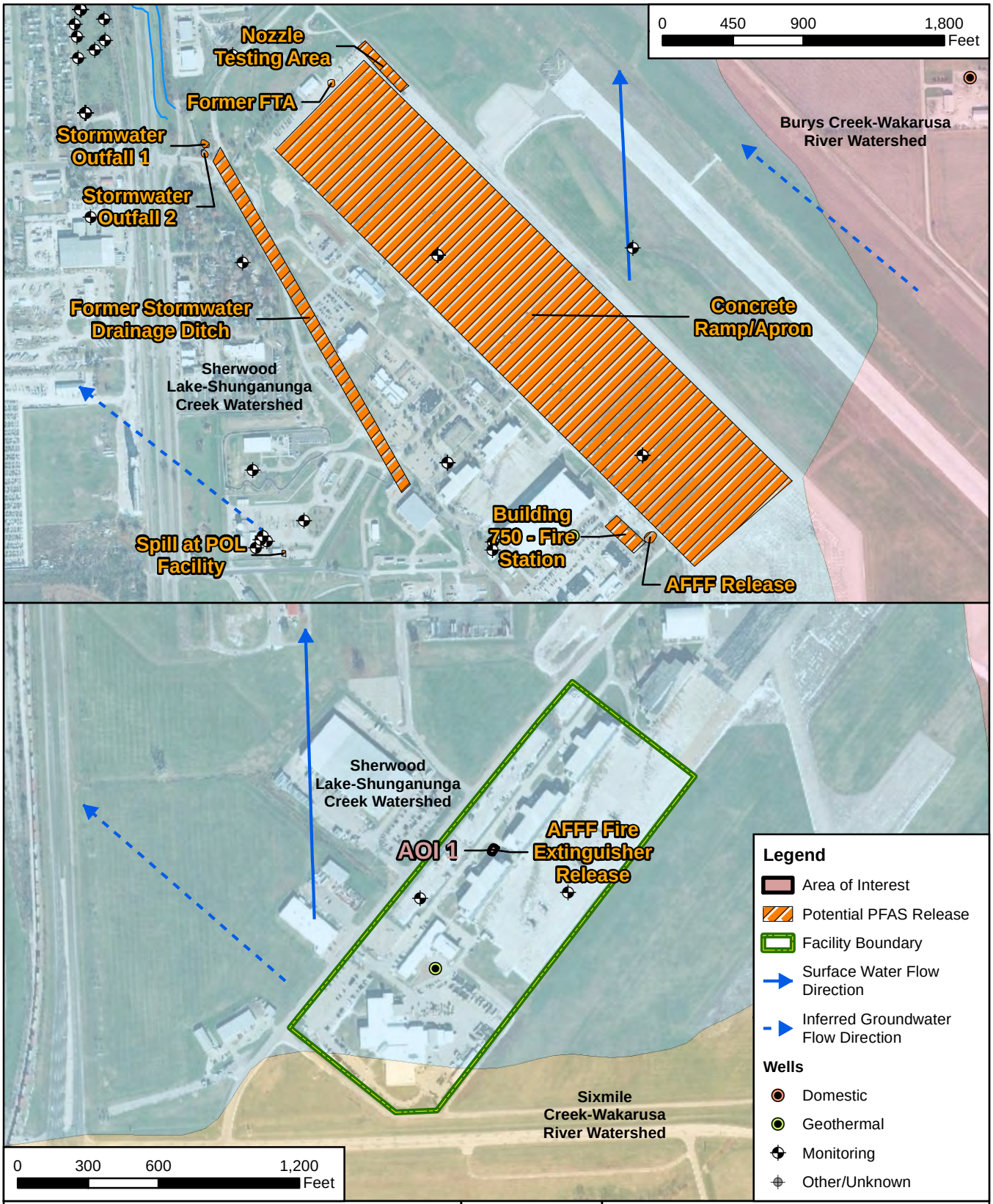
6.1 AOI 1 AFFF Fire Extinguisher Release

AOI 1 is the AFFF Fire Extinguisher Release area adjacent to building 682. PFAS releases to soil by the KSARNG occurred in 2014, when four Ansul AFFF fire extinguishers were fully emptied on gravel behind the building. The estimated total amount emptied was 132 gallons of 15% AFFF solution.

Ground-disturbing activities to surface soil at AOI 1 could result in site worker, construction worker, and trespasser exposure to potential PFAS contamination. Therefore, the exposure pathways for inhalation of soil particles and ingestion of soil are potentially complete for these receptors. Ground-disturbing activities to subsurface soil could result in construction worker exposure via inhalation of soil particles and ingestion of subsurface soil. Therefore, the inhalation and ingestion pathways for these receptors are considered potentially complete.

No surface water features flow through AOI 1; therefore, surface water and sediment exposure pathways are incomplete for the site worker, construction worker, and trespasser. There are two stormwater drains in the proximity of the release area. The closest stormwater drain is approximately 65 feet to the north, and the second is approximately 140 feet to the south. Both of the stormwater drains are elevated above the gravel release area; therefore, it is unlikely the release impacted the stormwater system.

AOI 1 is located side gradient of five domestic wells within 2 miles of the facility; these wells are not likely to be impacted by potential PFAS releases at AOI 1. The AASF #1 drinking water is supplied by the City of Topeka; therefore, the exposure pathway for groundwater via ingestion to the site worker, trespasser, and off-facility resident is incomplete. Because PFAS are water soluble and can migrate readily from soil to groundwater, the exposure pathway via ingestion for the construction worker is considered potentially complete. The preliminary CSM for AASF #1 is shown on **Figure 6-2**.



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Area of Interest

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Figure 6-1

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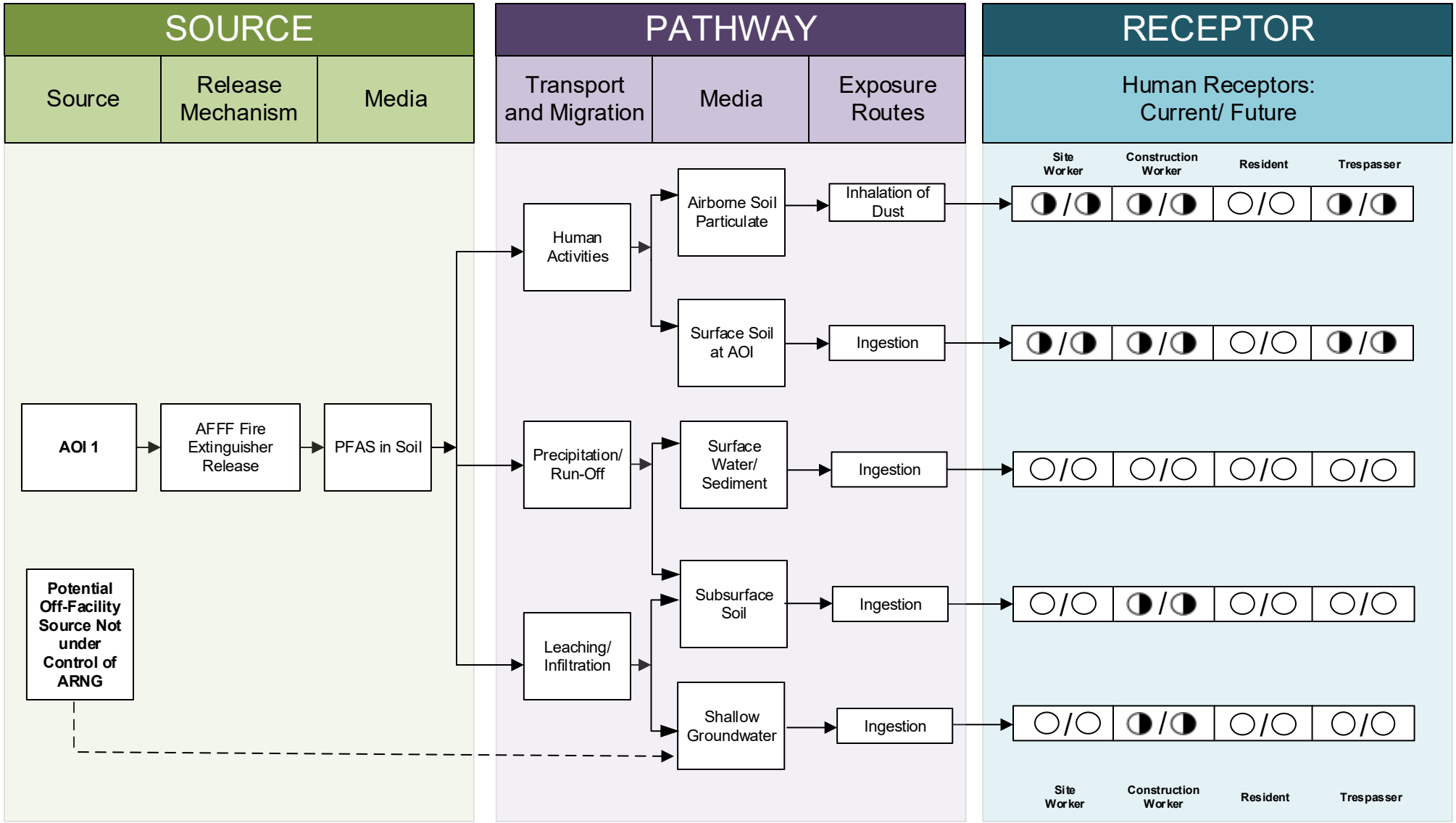


LEGEND

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

Notes:
1. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 AFFF Fire Extinguisher Release

7. Conclusions

This report presents a summary of available information gathered during the PA on the use and storage of AFFF and other PFAS-related activities at AASF #1. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

One AOI related to potential PFAS releases was identified (**Table 7-1**) at AASF #1 during the PA (**Figure 7-1**).

Table 7-1: AOIs at Topeka AASF #1

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	AFFF Fire Extinguisher Release	KSARNG	2014

Based on potential PFAS release at this AOI, there is potential for exposure to PFAS contamination in surface soil to site and construction workers; subsurface soil to construction workers via ingestion and inhalation of dust; and in groundwater to construction workers via ingestion.

The following areas, which were discussed in **Section 2** through **Section 5**, were determined to have no suspected release (**Table 7-2**).

Table 7-2: No Suspected Release Areas

No Suspected Release Area	Used by	Rationale for No Suspected Release Determination
AASF #1 Ramp Area	KSARNG	No AFFF fire extinguisher releases took place on the ramp areas from 1992 to current.

7.2 Uncertainties

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

The conclusions of this PA are predominantly based on the information provided during interviews with personnel who had direct knowledge of PFAS use at the facility. Sometimes the provided information was vague or conflicted with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (1992 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	Potential off-facility PFAS release areas exist adjacent to the AASF #1. Because these areas include property upgradient of the facility, it is unknown whether the off-facility sources affect AASF #1.
AASF #1	Direct interviewee knowledge is not available before 1985. Whether potential use, storage, or release of PFAS-containing materials occurred at this facility prior to 1985 is unknown.

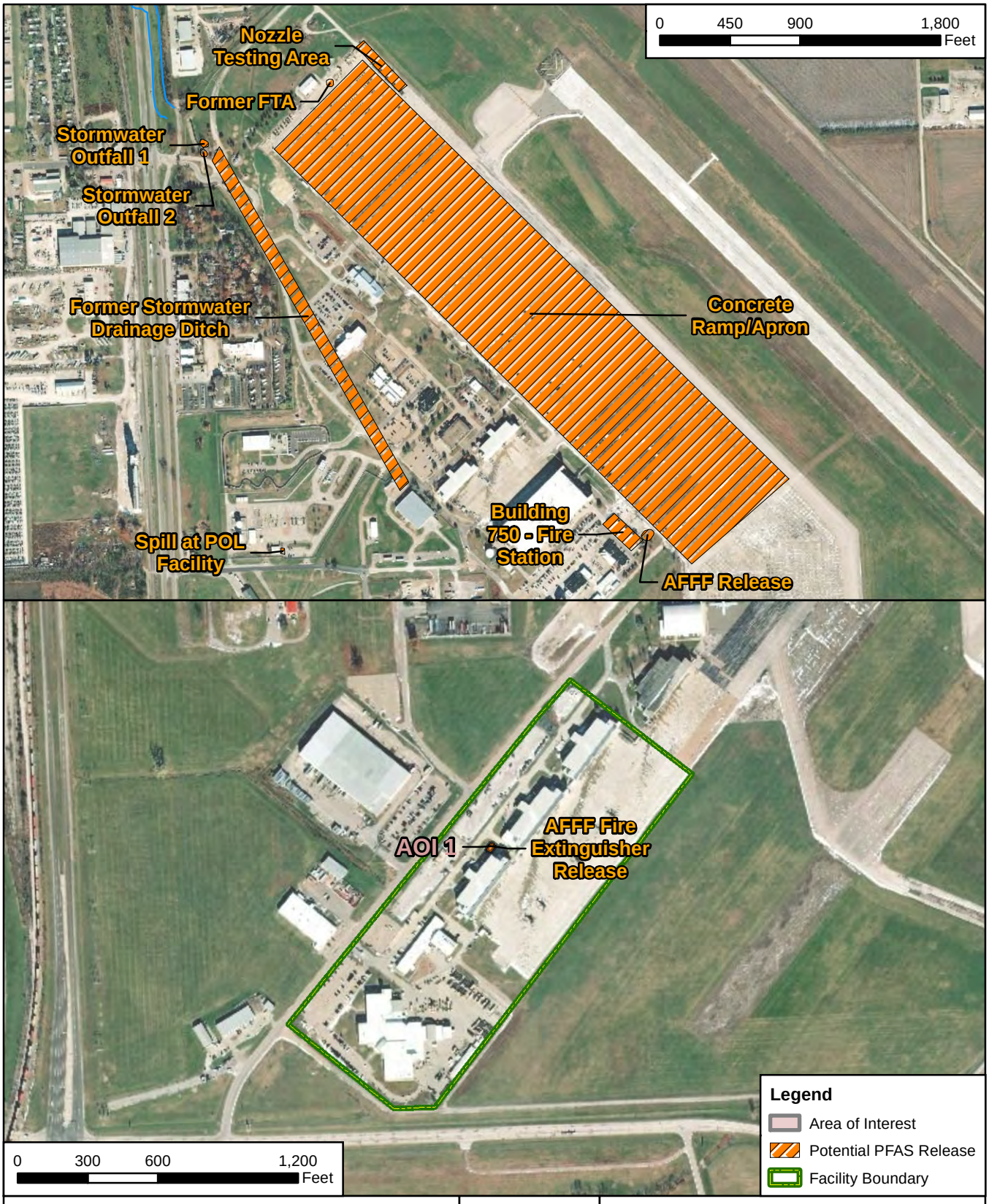
7.3 Potential Future Actions

Interviews and records (covering 1992 to present) indicate that ARNG activities may have resulted in potential PFAS releases at the AOI identified during the PA. Based on the CSM developed for the AOI, there is potential for receptors to be exposed to PFAS contamination in soil, subsurface soil, and groundwater. **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 evaluates the need for an SI at AASF #1 based on the presence of a PFAS release, possible receptors, and the migration potential of PFAS contamination to receptors.

Table 7-4: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1 AFFF Fire Extinguisher Release	45°25'22.39"N; 88°8'26.59"W	132-gallons of AFFF was released to the ground surface	Proceed to an SI for soil and groundwater



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Topkea AASF 1, KS			
REVISED	11/25/2019	GIS BY	MS	11/25/2019
SCALE	1:10,800	CHK BY	SI	11/25/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	11/25/2019

N

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 7-1

\\URSGermantown.us.ie.urs\Germantown\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\KS\Topeka_AASF1_Figures\Fig_7-1_Topeka_AASF1_Summary.mxd

8. References

Amec Foster Wheeler. 2017. *Final Work Plan FY 16 Phase 1 Regional Site inspections for Perfluorinated Compounds*. October.

City of Topeka Utilities. 2019. *2019 City of Topeka Water Quality Report*.

Leidos. 2019. *Preliminary Assessment/Site Investigation for Seven Areas of Concern at Kansas Air National Guard, Forbes Field, Topeka, Kansas.* January.

United States Environmental Protection Agency (USEPA). 1991. *Guidance for Performing Preliminary Assessments under CERCLA.* September.

World Climate, 2019. *Average Weather Data for Topeka Municipal Airport.* Accessed 1 October 2019.

Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for Topeka AASF #1.

Topeka AASF #1 Leases, Licenses, and Permits

- 1980 Lease Agreement

Topeka AASF #1 Documentation

- 1985 Groundwater Contamination Study – ANG Forbes Field
- 1989 Remedial Investigation Report – Forbes Field Air National Guard Topeka, Kansas
- 2008 Kansas Air National Guard Cultural Resources Survey at Forbes Field
- 2014 Preliminary Assessment/Site Investigation for Seven Areas of Concern at KSANG
- 2016 Perfluorinated Compounds Preliminary Assessment Site Visit Report for Forbes Field Air National Guard Base, Topeka Kansas
- 2017 Work Plan FY 16 Phase 1 Regional Site Inspections for Perfluorinated Compounds for Kansas Air National Guard at Forbes Field, Topeka, Kansas
- 2018 Kansas Department of Agriculture Monitoring Well Locations
- 2018 Stormwater Pollution Prevention Plan for Topeka AASF #1
- 2019 Turn-In of AFFF Signed Manifest
- Storm Sewer & Significant Materials Location for Topeka AASF #1

EDR Report

- 2019 Topeka AASF #1 EDR Report

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

Preliminary Assessment – Pre-Interview Form

1. Installation Name:	Topeka AASF #1
2. Primary Points of Contact:(Name/Title/Telephone Number/Email Address):	
ARNG:	[redacted]
USACE:	Unknown
Installation:	Bldg. Mgr.: [redacted] EC: [redacted] Facility Commander: [redacted]

3. Suggested Personnel to Interview (Name/Title/Number of Years at Installation/Retired):

[redacted] – still on staff ([redacted])

4. Is the ARNG property an enclave of a larger facility? What command or authority controls that facility? DoD or non-DoD? Does the facility have other DoD enclaves?

Yes – it is an enclave of a larger facility controlled by the Air National Guard (DoD).

5. Installation History (dates of operation, types of activity, active airfield, firefighting training):

Aug 1942 – Built as Topeka Army Air Field (TAAF) – Army Air Corps base

Nov 28, 1945 – Air Transport Command took over field

Oct 31, 1947 – Topeka Army Air Field (TAAF) – inactivated

Jul 1, 1948 to Oct 14, 1949 – TAAF reactivated as a Strategic Air Command (SAC) base; TAAF renamed as Forbes Air Force Base

Feb 1, 1951 – Forbes AFB reopened and reassigned to SAC (Korean War)

Feb 1954 – Base acquired 528 more acres of land and constructed a 12,000-foot runway

Oct 1958 – News came that Forbes AFB would support Atlas E missile sites in Kansas. (Only horizontal missile storage buildings were built at Forbes, the missile launch sites were in other KS towns.)

Jul 1, 1960 – Strategic Missile Squadron stood up and first missile arrived Jan 24, 1961.

Mar 25, 1965 – Strategic Missile Squadron was deactivated.

[Jan 1, 1970 – Kansas Army National Guard takes occupation on Forbes AFB as Topeka AASF #1, according to Real Property FISP.]

(Attach to the front of the Interview Form)

Preliminary Assessment – Pre-Interview Form

Apr 17, 1973 – DoD announced closure of Forbes AFB.

Oct 1, 1973 – Forbes redesignated an Air National Guard base (retained to today); Joint military-civilian use was authorized.

Jan 1974 – The city created the Metropolitan Topeka Airport Authority (MTAA) by charter ordinance, charging it with overseeing the transition of the bulk of the 3,100-acre federal enclave to civilian use.

Apr 1976 – Title was transferred to the city, less the Air Guard enclave on the northern third of the 6,000-foot north-south ramp, **a portion of the south ramp and four associated buildings reserved for the Kansas Army National Guard** and the former dental clinic. The last went to USD 501, Shawnee County received the golf course and buildings, USAF retained the 1,063-unit Cullen Village for later sale, the Army and Air Force Regional Exchange retained one supply depot building, the state received the former hospital complex. The remainder – 2,100 acres of runway, taxiway, 283 acres of buildings and facilities mostly east of US-75 – was deeded to the city of Topeka. The cantonment area was redesignated the Topeka Air Industrial Park.

Jan 1979 – The MTAA, formerly a city department, was made autonomous by state legislation.

KSARNG has a license from the Air Force to use the facility. (Issued Apr 9, 1980, for an indefinite term.)

6. Potential Sites to Investigate (hangars, airstrips, FTAs, TAs, paint shops and kitchen AFFF, plating areas):

Hangars, airstrips (flight line)

FTAs (Fire-Training Areas) – unknown; TAs (Training Areas) - unknown

No paint shop, kitchen AFFF or plating areas

7. Have we requested the following information from ARNG?

Lease Information	YES / **NO**	Comment: This property is not leased. KSARNG has a license from the Air Force.
Material Purchase Information	YES / **NO**	Comment: Purchase information for AFFF products (procurement & disposal); service reg. of extinguishers? – No information found by CW2 [redacted], USP&FO Federal Warehouse Supervisor
Permit/Transfer Documents	**YES** / NO	Comment: Permits and transfer of AFFF products? – Have former inventory of AFFF extinguishers at AASF 1 and AASF 2 (See below for disposal information)
Disposition Records for AFFF	**YES** / NO	Comment: Memo to NGB 12 Sep 2016 – four canisters drained on AASF 1. One more canister at AASF 1 and 8 canisters at AASF 2 marked "unserviceable" have been disposed of. KSARNG Hazardous Waste Manager will be providing disposal documentation.

(Attach to the front of the Interview Form)

Preliminary Assessment – Pre-Interview Form

8. Does the Installation have an Administrative Record or a Document Repository? If so, does the installation have the following types of documents? Circle all that apply.	
Historical Records Review	Some
Preliminary Assessment	Unknown
Site Inspections	Copy of Safety inspections – with Facility Safety Officers (Copy of IEPAS/EPAS Environmental Inspections are available upon request)
Remedial Investigation	Remedial Investigation Report – Oct 1989
Remedial Action Documentation	Unknown
Cultural Resources Management Plan	KSARNG 2010 ICRMP
~~**Natural Resources Management Plan**~~	KSARNG INRMP only applies to KSTC.
~~**Annual TAG Reports**~~	N/A
Firefighting Training Records (if documented)	Unknown
~~**As Built Drawings for Buildings with AFFF Systems**~~	Current buildings have no AFFF systems
~~**Fire Suppression in Dining Facilities**~~	No dining facility at AASF 1
Responded to an Aircraft Crash	No aircraft crashes in recent history
Responded to Forest Fires	No forest fires in recent history
Federal Facility Agreement	Unknown
State Permit	Have: AST Permit for AFRC NPDES Industrial Stormwater Permit KDHE Emergency Power Generator Construction Approval (AASF 1 and AFRC)
RCRA Permit	HW Verification Report and KDHE/EPA ID permit
NPDES Permit	Included in Topeka AASF #1 SWPPP
Environmental Baseline Study	Unknown
Groundwater Flow Information	Groundwater Contamination Study_Forbes Fl ANG_Sept 1985
Groundwater Studies	Groundwater Contamination Study_Forbes Fl ANG_Sept 1985
Groundwater Treatment Units	None
Groundwater Monitoring Well Location Map	Groundwater Contamination Study_Forbes Fl ANG_Sept 1985 – still open?
Surface Water Flow Information	Included in Topeka AASF #1 SWPPP.

(Attach to the front of the Interview Form)

Preliminary Assessment – Pre-Interview Form

Historical Aerials	For years: 1943, 1953, 1963, 1966, 1972, 1984, 1993 (and possibly others)

9. What GIS data do we have (e.g., HQANG GIS)? Do we need (e.g., State GIS)? Will aerial photographs be needed? (These files will be asked for during the interview)

NOTE: Nothing is mapped outside of the facility boundary lines.

Available GIS information:

- Aerial Photo Layers (historic if available) – Digital Globe and County Imagery yr2016
- Roads with labels (but no names)
- Buildings with labels
- Lease/ownership-related boundaries with labels
- AASF 1 runway and parking ramp
- Surface Waterways (lakes, creeks, streams, ponds, etc.)

(Attach to the front of the Interview Form)

PA Interview Questionnaire - Other

Facility:
Interviewer: [redacted]
Date/Time:

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

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

[redacted] has been at the Topeka AASF #1 since 1992.

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

[redacted] stated that there has been TriMax30 fire extinguishers on the ramp areas since he started in 1992. The only testing that took place with the TriMax30 fire extinguishers was done by a contractor annually, where they did hydrostatic testing which was all contained and removed by the contactors. The KSARNG never released the TriMax30 units and never had any bulk AFFF at the facility. In 2008 or 2009, the TriMax30 units were removed from the AASF, and replaced with five AFFF fire extinguishers. The maintenance on the AFFF units were conducted by a contactor where they containerized any liquid and took it off the facility. The fate of the TriMax30 units are unknown.

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: Topeka AASF #1
Interviewer: [redacted]
Date/Time: 08/27/2019, 1100

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

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

[redacted] has been at the Topeka AASF since 2014.

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

[redacted] stated that when fire training was conducted with the Forbes Field Air National Guard Fire Department, it was done with ABC fire extinguishers.

There was a one-time release of the AFFF fire extinguishers took place in approximately 2014, when four AFFF fire extinguishers were emptied on gravel behind building 682. The estimated total amount emptied was 132 gallons of AFFF solution. One of the AFFF fire extinguishers was containerized in a 55-gallon drum during the same time, and ultimately taken off the facility in August 2019 to be incinerated at Fort Riley in Kansas.

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: Topeka AASF #1 and Salina AASF #2
Interviewer: [redacted]
Date/Time: 8/27/19 1100 and 8/28/19 0900

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

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

[redacted] is currently the EPAS Compliance Manager for the Topeka AASF #1 and Salina AASF #2.

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

[redacted] provided clarity on the type of AFFF fire extinguisher that was at the Topeka AASF #1 and Salina AASF #2. Both AASFs had Alcohol Resistant AFFF foam Ansul fire extinguishers (Ansul CR-AR-33-D) with a 15% AFFF solution. After the contents were containerized, the actual fire extinguishers were shipped to the USP&FO/Quality Recycling Program (QRP) in Topeka for recycling as scrap metal.

[redacted] also provided photo documentation of the Ansul CR-AR-33-D fire extinguishers for Topeka AASF and Salina AASF.

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:Topeka AASF #1
Interviewer: [redacted]
Date/Time: 08/27/2019, 1100

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

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

[redacted] has been at the Topeka AASF #1 since 2013.

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

[redacted] stated that there is no fire suppression system in any of the hangars at the AASF. There has never been a firetruck stationed on the facility. The Topeka AASF is an enclave of the Forbes Field AFB, which provides their emergency services. Re-surfacing of the ramp area took place from 2013-2016, where up to 12 inches of surface was removed and taken off facility. [redacted] concurs with Mr [redacted] account of the fire extinguishers at the AASF.

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

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

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

Recorded by: [redacted]

ARNG Contact: [redacted]

Date and Time: 8/27/19 0900

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

Source/Release Information

Site Name / Area Name / Unique ID: Topeka AASF #1

Site / Area Acreage: approximately 30 acres

Historic Site Use (Brief Description): The AASF was built in August 1942 as Topeka Army Air Field. In 1970, the Kansas Army National Guard took occupation of Forbes Field AFB as Topeka AASF #1. In 1980, the Air Force issued a license for the KSARNG to use the facility for an indefinite term.

Current Site Use (Brief Description): The AASF supports the Kansas Army National Guard (KSARNG).

Physical barriers or access restrictions: Access to the area is restricted to KSARNG.

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):
Never actually dispensed.

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

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

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

3a. Indicate what businesses are located near the site
Forbes Field AFB, Topeka Regional Airport, FedEx facility

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

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

Visual Site Inspection Checklist

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:
N/A

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?
The floor drains lead to an oil/water separator then to the sanitary WWTP.

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:
Surface water flows to the north and south off the installation.

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:
There are unknown wells off-facility.

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

4a. If so, please note the location:
There are several about the installation but two at least 50ft away from AFFF release.

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

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

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

6a. If so, please note the source and location.
Yes, potentially Topeka Regional Airport and Forbes Field.

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

Visual Site Inspection Checklist

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):

There was ramp resurfacing in approximately 2013-2016.

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

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

vegetated except for ramp and parking 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:

The facility has controlled access

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:

Residents to the west

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

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

There is 1 school within 2 miles.

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

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

Visual Site Inspection Checklist

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
1	8/28/19, north side of building 682	Gravel area where AFFF fire extinguishers were emptied.
2	8/28/19, north side of building 682	Stormwater drain that is situated slightly above gravel area. Surface water flow from AOI 1 would not reach this stormwater drain.
3	8/28/19, north side of building 682	Gravel area is along fence line. This shows the slight sloping that occurs at AOI 1.
4	8/28/19, north side of building 682	Gravel area where AFFF fire extinguishers were emptied.

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Topeka Army Aviation Support Facility #1

Why has this location been identified as a site?
Facility is an aviation support site with aircraft hangars, high probability of release due to asset type and historical site usage.

Are there any other activities nearby that could also impact this location?
Yes, the potential adjacent sources include the ANG Forbes Field facility.

Training Events

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

If so, how often? *n/a.*

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

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

Surface Water:

Surface water flow direction? *To the north towards the South Branch Shunganunga Creek.*

Average rainfall? *33 inches*

Any flooding during rainy season? *unknown*

Direct or indirect pathway to ditches? *indirect*

Direct or indirect pathway to larger bodies of water? ind*irect to South Branch Shunganunga Creek.*

Does surface water pond any place on site? *Did not appear to be areas with ponded water.*

Any impoundment areas or retention ponds? *No*

Any NPDES location points near the site? *unknown*

How does surface water drain on and around the flight line? *Around the flight line, the surface water drains south.*

Groundwater:

Groundwater flow direction? *Next to the adjacent sources north of the facility, groundwater flows to the north towards the South Branch Shunganunga Creek. The southern part of the installation flows south to smaller creeks.*

Depth to groundwater? *In most areas, approximately 10 feet*

Uses (agricultural, drinking water, irrigation)? *Not used.*

Any groundwater treatment systems? *unknown*

Any groundwater monitoring well locations near the site? *Yes*

Preliminary Assessment – Conceptual Site Model Information

Is groundwater used for drinking water? *Drinking water is supplied by the City of Topeka, which sources drinking water from the Kansas River.*

Are there drinking water supply wells on installation? *No*

Do they serve off-post populations? *n/a*

Are there off-post drinking water wells downgradient? *No potable water wells are located within the boundary of the AASF; however, wells exist within one mile of the facility.*

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?
No firefighting equipment ever washed at the AASF.

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

3. Other?
Firefighting services for the AASF are provided by the City of Topeka, and the Metropolitan Topeka Airport Authority (MTAA) FD.

Identify Potential Receptors:

Site Worker *Yes*

Construction Worker *Yes*

Recreational User *Yes*

Residential *No*

Child *No*

Ecological *No*

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?
Residential area and one school are within two miles of the facility.

Documentation

Ask for Engineering drawings (if applicable). Has there been a reconstruction or changes to the drainage system? When did that occur? *No.*

Appendix C
Photographic Log

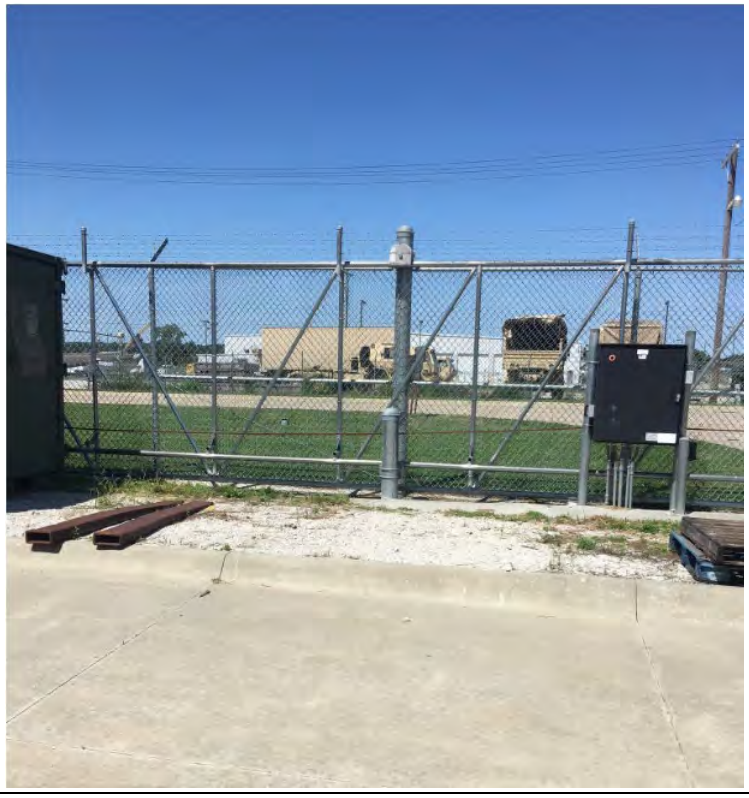
APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Topeka AASF #1	Kansas

Photograph No. 1

Description:

Gravel area where AFFF fire extinguishers were emptied.



Photograph No. 2

Description:

Stormwater drain that is situated slightly above gravel area. Surface water flow from AOI 1 would not reach this stormwater drain.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Topeka AASF #1	Kansas

Photograph No. 3

Description:

Gravel area is along fence line. This shows the slight sloping that occurs at AOI 1.

Photograph No. 4

Description:

Gravel area where AFFF fire extinguishers were emptied.