FINAL
Site Inspection Report
Army Aviation Support Facility #1
Jackson, Mississippi

Site Inspection for Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorohexanesulfonic acid (PFHxS), Perfluorononanoic acid (PFNA), Hexafluoropropylene oxide dimer acid (HFPO-DA), and Perfluorobutanesulfonic acid (PFBS) at ARNG Installations, Nationwide

September 2023

Prepared for:

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

UNCLASSIFIED

THIS PAGE INTENTIONALLY BLANK

RPG Certification

ARNG PFAS Report:	Site Inspection (SI) Report for Army Aviation Support Facility (AASF) #1
Activity:	Site Inspection for Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorohexanesulfonic acid (PFHxS), Perfluorononanoic acid (PFNA), Hexafluoropropylene oxide dimer acid (HFPO-DA), and Perfluorobutanesulfonic acid (PFBS)
Prepared for:	U.S. Army Corps of Engineers, Baltimore District
Prepared by:	AECOM Technical Services, Inc.
SI Location:	AASF #1, Jackson Mississippi
Date:	28 June 2023

This report, prepared by AECOM Technical Services, Inc. (AECOM), documents the referenced Site Investigation activities and findings associated with the April 2022 field investigation. I, Troy Brumfield, have reviewed this document in sufficient depth to accept responsibility for its contents related to the geologic discussion contained herein.

Troy Brumfield, RPG (Mississippi)
28 June 2023

THIS PAGE INTENTIONALLY BLANK

Table of Contents

Appendices

Figures

Tables

THIS PAGE INTENTIONALLY BLANK

Acronyms and Abbreviations

%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
µg/kg	micrograms per kilogram
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film-forming foam
ANGB	Air National Guard Base
AOI	Area of Interest
ARNG	Army National Guard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CoC	chain of custody
CSM	conceptual site model
DA	Department of the Army
DoD	Department of Defense
DOT	Department of Transportation
DPT	direct push technology
DQO	data quality objective
DUA	data usability assessment
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
GPRS	Ground Penetrating Radar Systems, LLC
HDPE	high-density polyethylene
HFPO-DA	hexafluoropropylene oxide dimer acid
IDW	investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LC/MS/MS	liquid chromatography with tandem mass spectrometry
MARIS	Mississippi Automated Resource Information System
MDEQ	Mississippi Department of Environmental Quality
MIL-SPEC	military specification
MSARNG	Mississippi Army National Guard
NELAP	National Environmental Laboratory Accreditation Program
ng/L	nanograms per liter
OSD	Office of the Secretary of Defense
OWS	oil/water separator
PA	Preliminary Assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

PID	photoionization detector
PQAPP	Programmatic UFP-QAPP
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality Systems Manual
SI	Site Inspection
SL	screening level
SOP	standard operating procedure
TOC	total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
US	United States
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Executive Summary

The Army National Guard (ARNG) G-9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum from the Office of the Secretary of Defense (OSD) dated 6 July 2022 (Assistant Secretary of Defense, 2022). The six compounds listed in the OSD memorandum include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), hexafluoropropylene oxide dimer acid (HFPO-DA)[1], and perfluorobutanesulfonic acid (PFBS). These compounds are collectively referred to as "relevant compounds" throughout the document, and the applicable screening levels (SLs) are provided in **Table ES-1**.

The PA identified one Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically (see **Table ES-2** for AOI locations). The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on SLs for relevant compounds. This SI was completed at the Army Aviation Support Facility (AASF) #1 in Jackson, Mississippi and determined further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is not warranted for AOI 1. AASF #1 will also be referred to as the "facility" throughout this document.

AASF #1 is a 30.40-acre tract of land within Hawkins Field Airport. The facility is located at 365 Shop Street, in the City of Jackson, Hinds County, and it is situated in the west central area of Mississippi. In March 1972, the Military Department, State of Mississippi began leasing AASF #1 from the City of Jackson, Mississippi. The facility provides aviation and maintenance support for aircraft and aviation personnel stationed in the City of Jackson. Prior to leasing, the field was used by the Air Force for training during World War II (AECOM Technical Services, Inc., 2020).

The PA identified one AOI for investigation during the SI phase. SI sampling results from the one AOI were compared to OSD SLs. **Table ES-2** summarizes the SI results for the AOI. Based on the results of this SI, no further evaluation under CERCLA is warranted for AOI 1 at this time.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Table ES-1: Screening Levels (Soil and Groundwater)

Analyte[b]	Residential (Soil) (µg/kg)[a] 0-2 feet bgs	Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a] 2-15 feet bgs	Tap Water (Groundwater) (ng/L)[a]
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
bgs = below ground surface; µg/kg = micrograms per kilogram; ng/L = nanograms per liter

a.) Assistant Secretary of Defense, 2022. Risk Based Screening Levels in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ) = 0.1. 6 July 2022.

b.) Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Table ES-2: Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area[a]	Groundwater – Source Area[a]	Future Action
1	Release Area A	 0.832 J µg/kg (PFOS)	 4.62 ng/L (PFBS)	No further action

Notes:
AOI = area of interest; ng/L = nanograms per liter; µg/kg = micrograms per kilogram

a.) The maximum relevant compound concentration is reported at the AOI.

Legend:

 = detected; exceedance of the screening levels

 = detected; no exceedance of the screening levels

 = not detected

1. Introduction

1.1 Project Authorization

The Army National Guard (ARNG) G-9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum from the Office of the Secretary of Defense (OSD) dated 6 July 2022 (Assistant Secretary of Defense, 2022). The six compounds listed in the OSD memorandum will be referred to as "relevant compounds" throughout this document and include perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA)[1], and perfluorobutanesulfonic acid (PFBS) at ARNG facilities nationwide. The ARNG performed this SI at Army Aviation Support Facility (AASF) #1 in Jackson, Mississippi. AASF #1 is also referred to as the "facility" throughout this document.

The SI project elements were performed in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; United States [US] Environmental Protection Agency [USEPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300; USEPA, 1994), and in compliance with US Department of the Army (DA) requirements and guidance for field investigations.

1.2 SI Purpose

A PA was performed at AASF #1 (AECOM Technical Services, Inc. [AECOM], 2020) that identified one Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically. The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on screening levels (SLs) for the relevant compounds.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

THIS PAGE INTENTIONALLY BLANK

2. Facility Background

2.1 Facility Location and Description

AASF #1 is a 30.40-acre tract of land within Hawkins Field Airport. The facility is located at 365 Shop Street in the City of Jackson in Hinds County, situated in the west central area of Mississippi (**Figure 2-1**). AASF #1 is bordered by two Hawkins Field Airport runways, one to the immediate north and one to the east, industrial properties to the immediate west and northwest, and Interstate 220, approximately 1.1 miles west. Residential properties are present along the outer lying areas of the facility, approximately 0.3 miles to the west and south.

AASF #1 was leased by the Military Department, State of Mississippi from the City of Jackson, Mississippi on 8 March 1972. The facility provides aviation and maintenance support for aircraft and aviation personnel stationed in the City of Jackson. Prior to leasing, the field was used by the Air Force for training during World War II.

2.2 Facility Environmental Setting

Hinds County is within the Mississippi Embayment subsection of the Gulf Coastal Plain. Two physiographic areas comprise the Mississippi Embayment: the lowlands of the Mississippi Alluvial Plain to the east, and the Coastal Plain Uplands in which AASF #1 is situated. The region is characterized as low-lying, with extensive tracts of marshy lands and rivers. The rich and deep soils, beset by high rugged hills, flat alluvial plains, narrow valleys, prairies, river lowlands, and pine woods, are all naturally well-suited for agriculture (Wallenfeldt, 2019). AASF #1 is relatively flat and predominately covered by grassed areas as well as impermeable surfaces that consist of asphalt, concrete, and tarmac. The topography at the facility is displayed on **Figure 2-2**. The ecology of the Coastal Plain Uplands in this section of Mississippi is characterized by the Jackson Prairie and South Pine Hills ecoregions.

2.2.1 Geology

Soils near AASF #1 are associated with the Loring-Siwell-Byram system, deposited in the Quaternary Period, and described as riverine terrace deposits composed of sand, gravel, and clay. The sand and gravel deposits of the Mississippi River alluvial plain form the most significant Quaternary groundwater reservoir (Cushing et al., 1964). Underlying the fill and alluvial soils are the impermeable clays of the Jackson Group, which outcrops as far as Louisiana, Arkansas, and Tennessee and produces a gently rolling topography (**Figure 2-3**). The Jackson Group, which was deposited in the late Eocene, consists of the Moodys Branch Formation and the overlying Yazoo Clay. In certain areas near Jackson, Mississippi, the Yazoo Clay can be found exposed at the surface as a highly weathered zone containing desiccation cracks, grass, roots, and other organic matter. Unweathered Yazoo clay is up to 480 feet thick, very stiff, blue-green to blue-gray, massive, calcareous, and contains fossils (Stover et al., 1988). The Yazoo Clay is divided, in ascending order, into the North Creek, Cocoa Sand, Pachuta Marl, and Shubota Members. The underlying Moodys Branch Formation is a highly fossiliferous, glauconitic, sandy marl that is approximately 20 to 30 feet thick. The Moodys Branch Formation unconformably overlies the Claiborne Group, which contains the region's main aquifer, the Sparta aquifer.

Direct push borings installed during the SI were completed at depths between 10 to 20 feet below ground surface (bgs). Silt and lean clay with varying quantities of sand were observed as the dominant lithology of the unconsolidated sediments below AASF #1. Sandy silts were generally observed in the top 5 to 10 feet bgs. Silt and clay were generally observed below 10 feet bgs. A layer of gravelly lean clay was observed in AOI01-01 from 16 to 17.5 feet bgs. A sample for grain size analysis was collected at one location, AOI01-02 (5 to 7 feet bgs). The sample was analyzed

via American Society for Testing and Materials (ASTM) Method D-422. The results indicate that the soil sample is primarily comprised of silt (61.98 percent [%]) and clay (19.96%) with minor amounts of sand (12.17%) and gravel (5.89%). These results and facility observations are consistent with the riverine terrace deposits of the Loring-Siwell-Byram system. Boring logs are presented in **Appendix E**, and grain size results are presented in **Appendix F**.

2.2.2 Hydrogeology

The Jackson Group is the upper confining unit of the Claiborne group, which consists of the Cockfield Formation (250 to 480 feet bgs) and the Sparta Sand Formation (630 to 920 feet bgs), which are the main aquifers for the region. The Sparta aquifer is large and supplies sections of Mississippi, Arkansas, Alabama, Louisiana, Tennessee, and small portions of Kentucky and Missouri (McKee & Hays, 2002). To the east of AASF #1, the Mississippi Alluvial Plain is sourced for groundwater; however, near the facility, the Quaternary terrace deposits are not used for water resources. Although groundwater sourced by public supply wells near AASF #1 is approximately 250 to 480 feet bgs, there is surficial groundwater located in the fill and alluvial deposits above the Yazoo Clay. Based on boring logs and field observations from the PFAS SI conducted at nearby Jackson Air National Guard Base (ANGB) (approximately 10 miles east of Jackson AASF #1), shallow, perched lenses of groundwater are present intermittently in silty sandy layers interbedded with silty clay to tight dry clays. Groundwater at Jackson ANGB was measured in the existing monitoring wells at depths between 12.72 to 32.06 feet bgs (Leidos, 2018). Shallow groundwater may discharge to nearby drainages or surface water bodies.

The Jackson AASF #1 drinking water supply is provided by the City of Jackson. The City of Jackson obtains its water supply from six public wells that draw from the Sparta aquifer (Mississippi Department of Environmental Quality [MDEQ], 2011). The J.H. Fewell Water Treatment Plant and O.B. Curtis Water Treatment Plant obtain their water from surface water intakes in the Pearl River and the Ross Barnett Reservoir, respectively (MDEQ, 2021). Both surface water sources are located upgradient of AASF #1. Domestic wastewater from the facility is discharged to the municipal sanitary sewer. Based on information obtained from the Mississippi Automated Resource Information System (MARIS) Mississippi Land and Water Database, the nearest potable water wells are located less than 1 mile downgradient of the facility and include a commercial well owned by the City of Jackson, and an unknown use well, owned by the Jackson Zoo. The total depths of these wells are greater than 600 feet bgs. Downgradient public supply well total depths are greater than 500 feet bgs (MARIS, 2009).

Depths to water measured in April 2022 during the SI ranged from 2.04 to 5.23 feet bgs. Groundwater elevation contours from the SI are presented on **Figure 2-4** and indicate the groundwater flow direction at AASF #1 is primarily to the southwest.

2.2.3 Hydrology

Hinds County is located within two major drainage basins: Pearl River and the Big Black River. The divide that separates these basins runs north-south through the eastern one-third of the county. AASF #1 is located entirely within the Town Creek-Pearl River Watershed, and lies on the western fork of Town Creek, which is a southward flowing tributary of the Pearl River. Additionally, Hanging Moss Creek, Lynch Creek, Carey Creek, and several smaller creeks drain the area in and around the City of Jackson and are tributaries of the Pearl River. South of Jackson, the Trahon, Big Rhodes, and Beaverdam creeks, and their tributaries flow eastward into Pearl River. Pearl River is used for both boating and fishing, and numerous boat ramps are located along the river (Mississippi Wildlife, Fisheries, & Parks, 2018).

The floor trench drains located within the Hangar lead to an oil/water separator (OWS), which eventually discharges to the City of Jackson Sanitary Sewer System. Floor trench drains present

along the western perimeter of the UH-60 Staging Area (AOI 1, ramp area) also discharge to the City of Jackson Sanitary Sewer System; however, storm water runoff can bypass these floor drains and discharge into the surrounding grassy areas via Outfall 001. The ramp areas are engineered to allow storm water to flow off the concrete and into the surrounding grass areas that ultimately drain to Town Creek (Mississippi ARNG [MSARNG], 2017). General surface flow within the Town Creek catchment is southeast. Surface water features are presented on **Figure 2-5**.

2.2.4 Climate

Mississippi is located in the humid subtropical climate region and is characterized by temperate winters and long, hot summers (Mississippi State University, 2022). Summer temperatures in Jackson reach an average maximum of 92 degrees Fahrenheit (°F), with July being the hottest month. The coldest month in Jackson is January, with average maximum temperature of 56 °F and an average minimum temperature of 35 °F. Jackson averages an annual 54.16 inches of precipitation. Higher precipitation is generally reported between the months of March and December. Snowfall in Mississippi is rare (World Climate, 2022).

2.2.5 Current and Future Land Use

According to the Jackson Township Zoning Map dated August 2016, the facility is located within a special use district, with a light industrial zone adjoining the facility to the west (City of Jackson, Mississippi, 2022). AASF #1 is in its original location, and it has never been relocated or retrofitted. The original water sprinkler system for fire suppression is still in place, and the buildings include offices and large storage areas. The flight facility is used for MSARNG training support and maintenance. National Guard Bureau classroom training takes place at a location across the street from AASF #1. Reasonably anticipated future land use is not expected to change from the current land use described above.

2.2.6 Sensitive Habitat and Threatened/ Endangered Species

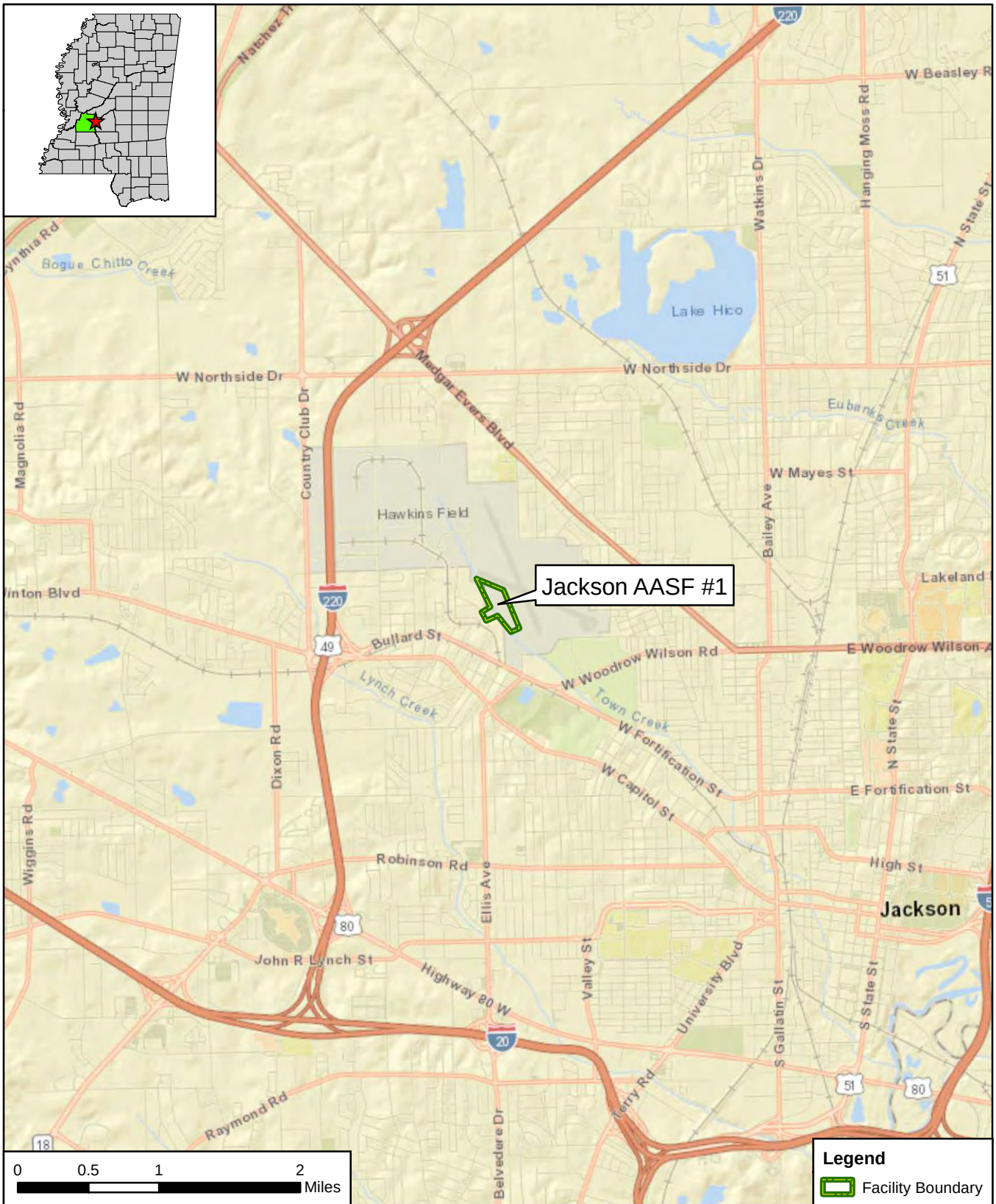
The following clams, fishes, insects, mammals, and reptiles are federally endangered, threatened, proposed, and/ or are listed as candidate species in Hinds County, Mississippi (US Fish and Wildlife Service [USFWS], 2022).

- **Clams:** Rabbitsfoot, *Quadrula cylindrica cylindrica* (threatened)
- **Fishes:** Gulf sturgeon, *Acipenser oxyrinchus desotoi* (threatened); Bayou darter, *Etheostoma rubrum* (threatened)
- **Insects:** Monarch butterfly, *Danaus plexippus* (candidate)
- **Mammals:** Northern Long-Eared Bat, *Myotis septentrionalis* (threatened); Tricolored bat, *Perimyotis subflavus* (proposed endangered)
- **Reptiles:** Ringed map turtle, *Graptemys oculifera* (threatened)

2.3 History of PFAS Use

One potential release was identified in the PA where AFFF may have been used, stored, disposed, or released historically at AASF #1 (AECOM, 2020). Tri-Max™ units that potentially contained AFFF were stored at the facility as early as 2008 to as late as 2017. These units were stored at the Flight Line and wash rack area. The potential release area was grouped into one AOI based on preliminary data and presumed groundwater flow directions. A description of the AOI is presented in **Section 3**.

THIS PAGE INTENTIONALLY BLANK



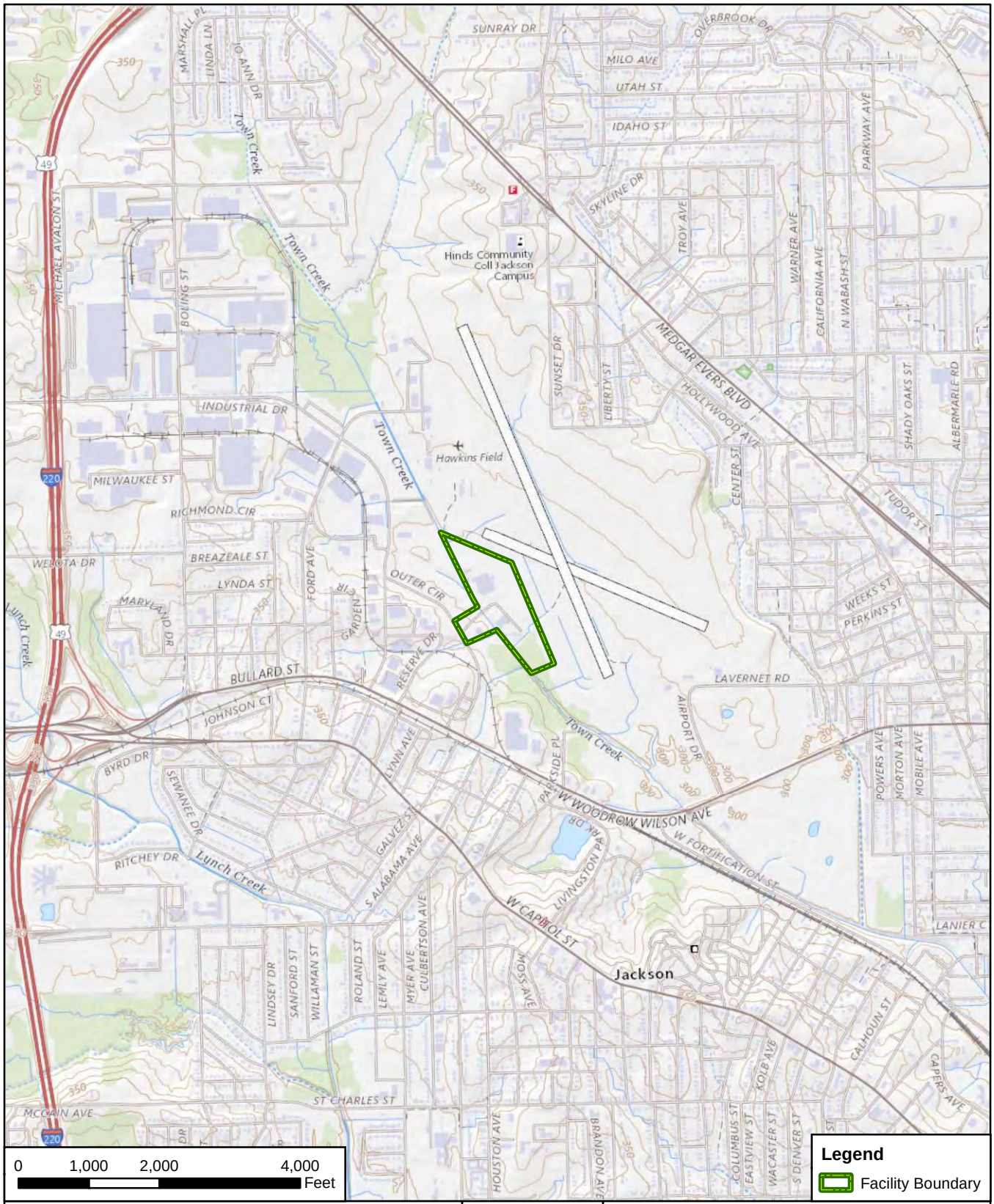
CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:63,360	CHK BY	JH	9/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	9/22/2022

N

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-1

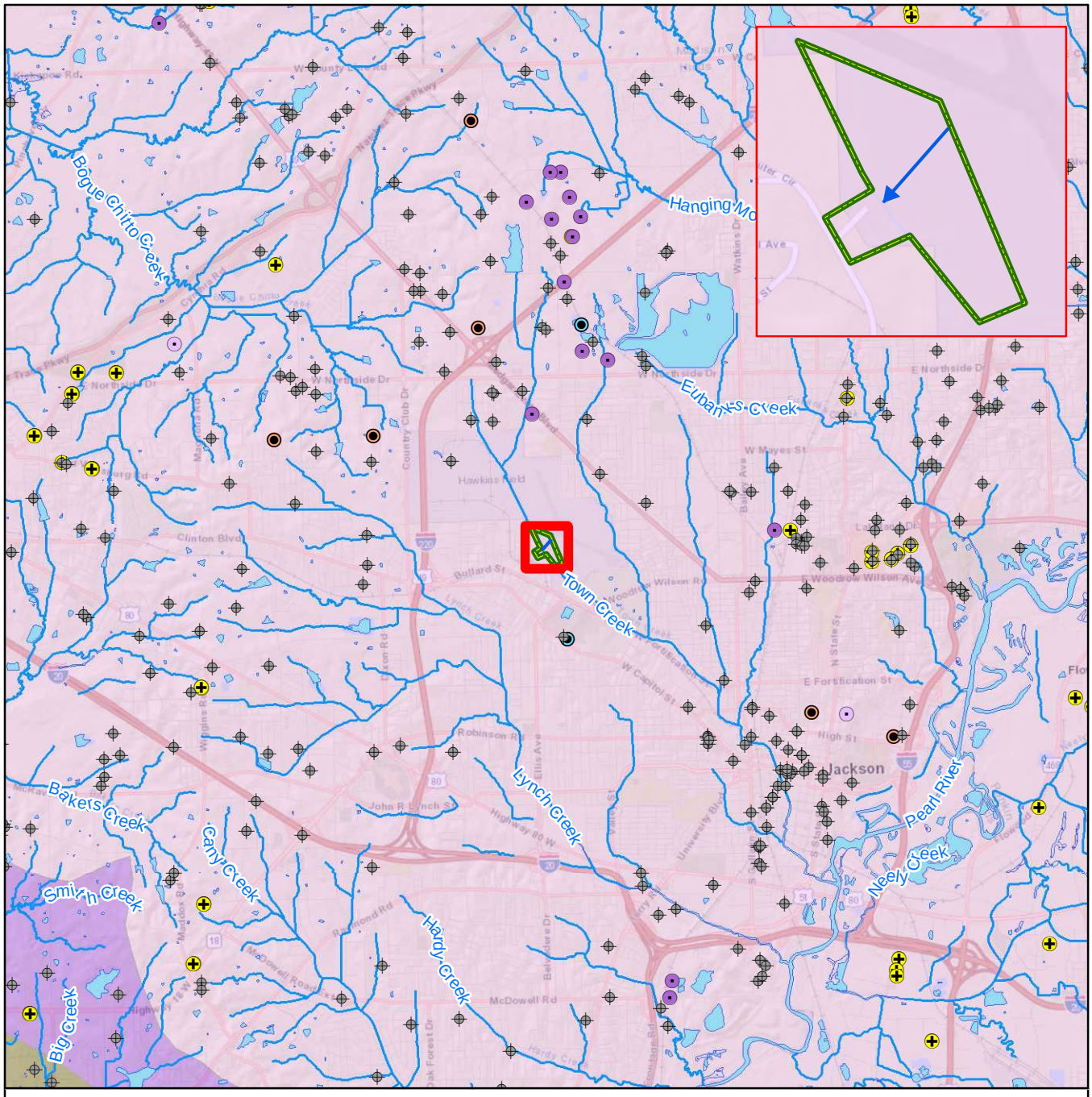


CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:24,000	CHK BY	JH	9/22/2022
Base Map: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program,		PM	CM	9/22/2022

Facility Topography

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-2

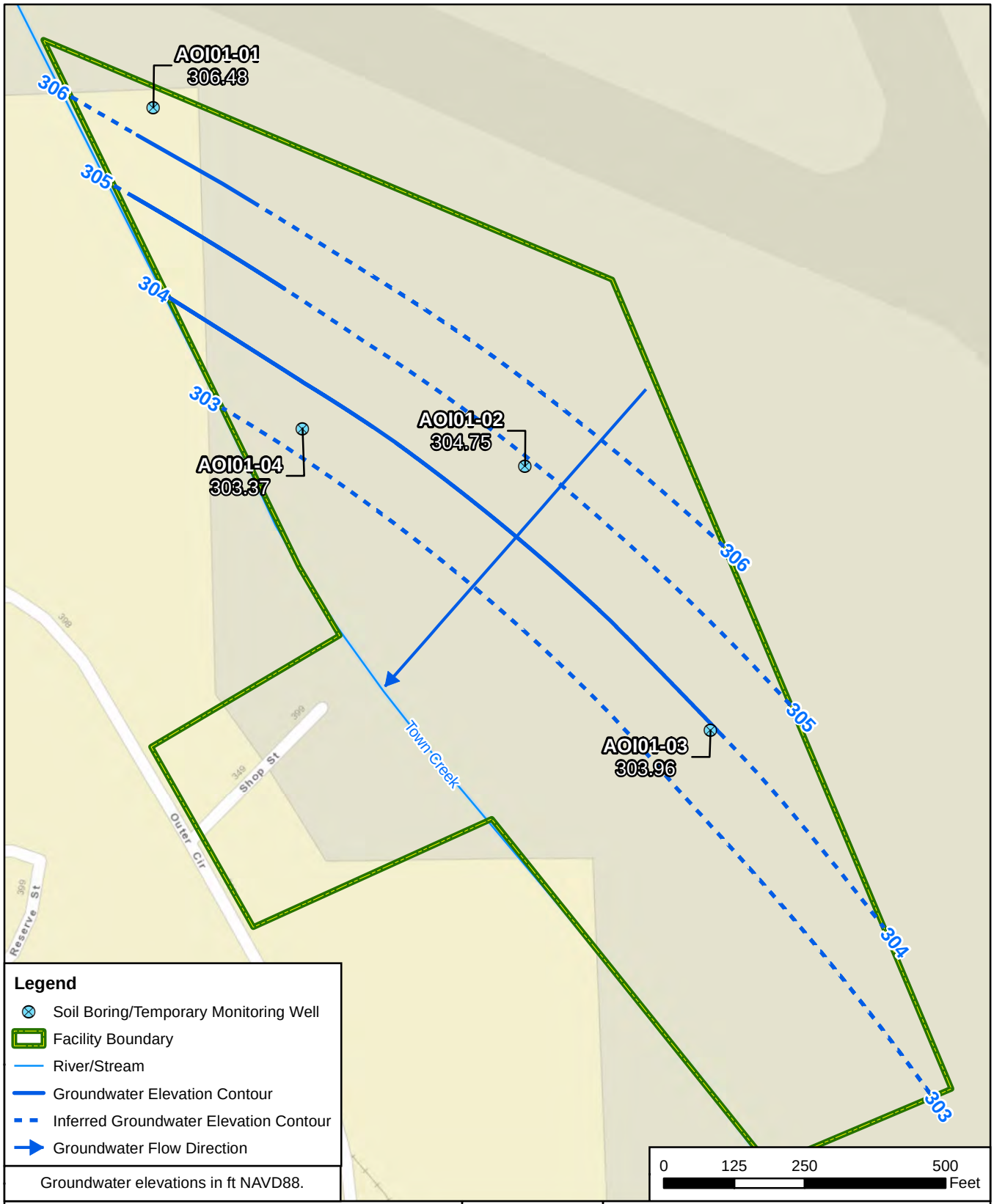


CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:95,040	CHK BY	JH	9/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	9/22/2022

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-3

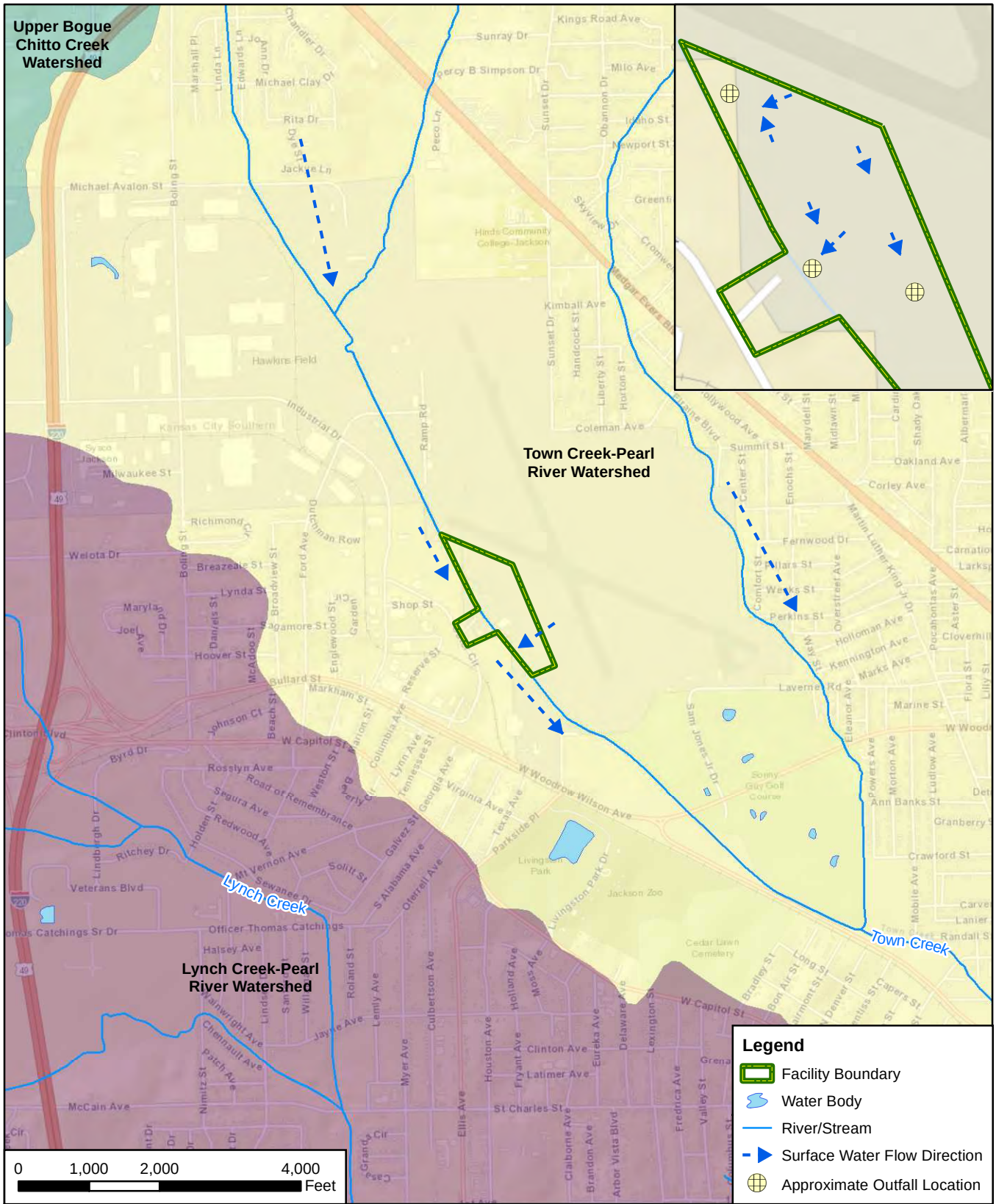


CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	10/25/2022	GIS BY	MS	10/25/2022
SCALE	1:3,000	CHK BY	JH	10/25/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	10/25/2022

Groundwater Elevations, April 2022

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-4



CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	11/29/2022	GIS BY	MS	11/29/2022
SCALE	1:24,000	CHK BY	JH	11/29/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	11/29/2022

Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-5

THIS PAGE INTENTIONALLY BLANK

3. Summary of Area of Interest

The PA evaluated areas where PFAS-containing materials may have been used, stored, disposed, or released historically. Based on the PA findings, one AOI was identified and is shown on **Figure 3-1** (AECOM, 2020).

3.1 AOI 1

Starting around 2008 or 2009, an unknown number of Tri-Max™ units were present at the facility's Flight Line (Release Area A) for approximately 6 to 8 years. Although the number of units were not known, AASF #1 is required to have at least one portable extinguisher for every two aircraft. No information was provided on the volume or type of foam used in the extinguishers. There are no reports of discharge, testing, or refilling of the units at AASF #1.

During the November 2020 SI Quality Assurance Project Plan (QAPP) scoping call, the wash rack, which flows to an OWS that discharges to the City of Jackson Sanitary Sewer, was identified and incorporated into AOI 1. Approximately 10 Tri-Max™ units were reportedly staged on the wash rack area between 2007 to 2012. The wash rack and OWS are located northwest of the hangar.

The units were serviced off-site by a private company. At the time of the PA, no information was available regarding the final disposition of the Tri-Max™ units. Common practice would be to send the units to Camp Shelby for disposal; however, it is unknown if such a transfer occurred, or if unit contents were drained/removed prior to shipment or disposal.

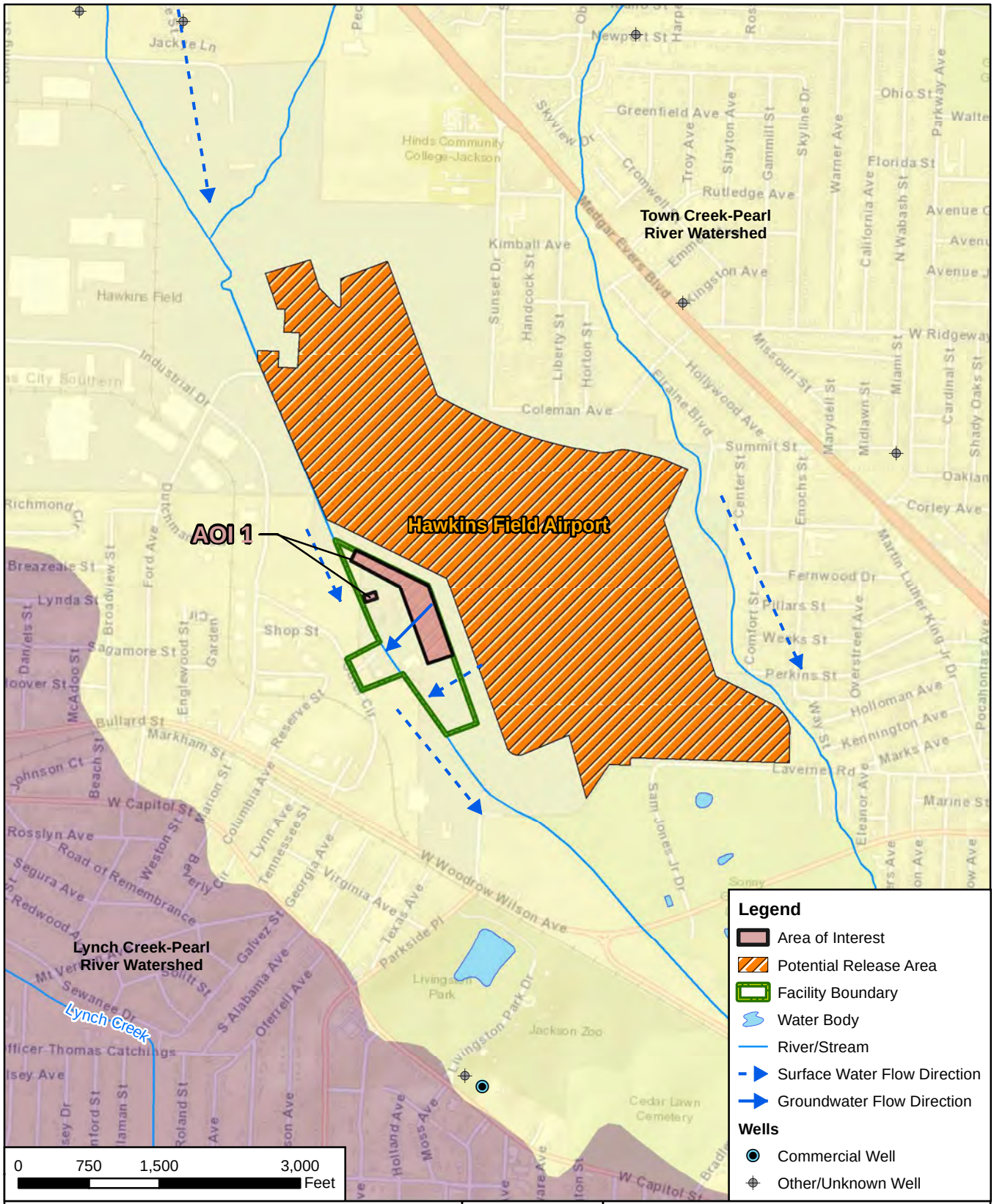
3.2 Adjacent Sources

One off-facility potential source was identified adjacent to AASF #1 during the PA and is not associated with ARNG activities. The adjacent potential source is shown on **Figure 3-1** and described in the following section for informational purposes only, and it will not be investigated as part of this SI.

3.2.1 Hawkins Field Airport

AASF #1 is located on the grounds of the Hawkins Field Airport. Personnel at the airport and nearby municipal fire departments were not interviewed during this PA. It is not known if AFFF is currently or historically used or stored at the airport. Because the presence of AFFF at the airport has not been confirmed, Hawkins Field Airport has been identified as a potential off-site source area.

THIS PAGE INTENTIONALLY BLANK



CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	2/9/2023	GIS BY	MS	2/9/2023
SCALE	1:18,000	CHK BY	JH	2/9/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	2/9/2023

Area of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 3-1

THIS PAGE INTENTIONALLY BLANK

4. Project Data Quality Objectives

As identified during the Data Quality Objective (DQO) process and outlined in the SI QAPP Addendum (AECOM, 2022a), the objective of the SI is to identify whether there has been a release to the environment at the AOI identified in the PA. For each AOI, ARNG determines if further investigation is warranted, a removal action is required to address immediate threats, or whether no further action is warranted. This SI evaluated groundwater and soil for presence or absence of relevant compounds at each of the sampled AOI.

4.1 Problem Statement

ARNG will recommend an AOI for Remedial Investigation (RI) if related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based SLs. The SLs are presented in **Section 6.1** of this report.

4.2 Information Inputs

Primary information inputs included:

- The PA for AASF #1 (AECOM, 2020);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific Uniform Federal Policy (UFP)-QAPP Addendum (AECOM, 2022a); and
- Field data collected during the SI, including groundwater elevation and water quality parameters measured at the time of sampling.

4.3 Study Boundaries

The scope of the SI was bounded by the property limits of the facility (**Figure 2-2**). Off-facility sampling was not included in the scope of this SI. If future off-facility sampling is required, the proper stakeholders will be notified, and necessary rights of entry will be obtained by ARNG with property owner(s). The SI scope was bounded vertically by the observed depths of the surficial groundwater table. Temporal boundaries were limited to the non-summer months to avoid high temperatures and hurricane season.

4.4 Analytical Approach

Samples were analyzed by Pace Analytical Gulf Coast, accredited under the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP; Accreditation Number 74960) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 01955). Data were compared to applicable SLs within this document and decision rules as defined in the SI QAPP Addendum (AECOM, 2022a).

4.5 Data Usability Assessment

The Data Usability Assessment (DUA), which is provided in **Appendix A**, is an evaluation at the conclusion of data collection activities that uses the results of both data verification and validation in the context of the overall project decisions or objectives. Using both quantitative and qualitative methods, the assessment determines whether project execution and the resulting data have met installation-specific DQOs. Both sampling and analytical activities are considered to assess whether the collected data are of the right type, quality, and quantity to support the decision-making (DoD, 2019a; DoD, 2019b; USEPA, 2017).

Based on the DUA, the environmental data collected during the SI were found to be acceptable and usable for this SI evaluation with the qualifications documented in the DUA and its associated data validation reports. These data are of sufficient quality to meet the objectives and requirements of the SI QAPP Addendum (AECOM, 2022a).

5. Site Inspection Activities

This section describes the environmental investigation and sampling activities that occurred as part of the SI. The SI sampling approach was based on the findings of the PA and implemented in accordance with the following approved documents:

- *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP)* dated March 2018 (AECOM, 2018a);
- *Final Programmatic Accident Prevention Plan* dated July 2018 (AECOM, 2018b);
- *Final Preliminary Assessment Report, Jackson Army Aviation Support Facility #1, Jackson, Mississippi* dated August 2020 (AECOM, 2020);
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Jackson Army Aviation Support Facility #1, Jackson, Mississippi* dated March 2022 (AECOM, 2022a); and
- *Final Site Safety and Health Plan, Jackson Army Aviation Support Facility #1, Jackson, Mississippi* dated April 2022 (AECOM, 2022b).

The SI field activities were conducted from 22 to 27 April 2022 and consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2022a), except as previously noted in **Section 5.8**.

The following samples were collected during the SI and analyzed by liquid chromatography with tandem mass spectrometry (LC/MS/MS) compliant with Quality Systems Manual (QSM) 5.3 Table B-15 to fulfill the project DQOs:

- Sixteen (16) soil samples from nine borings;
- Four grab groundwater samples from four temporary wells; and
- Thirteen (13) quality assurance (QA)/quality control (QC) samples.

Figure 5-1 provides the sample locations for all media across the facility. **Table 5-1** presents the list of samples collected for each media. Field documentation is provided in **Appendix B**. A Log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix B1**. Sampling forms are provided in **Appendix B2**, a Field Change Request form is provided in **Appendix B3**, and land survey data are provided in **Appendix B4**. Additionally, a photographic log of field activities is provided in **Appendix C**.

5.1 Pre-Investigation Activities

In preparation for the SI field activities, project team members participated in Technical Project Planning (TPP) meetings, performed utility clearance, and sampled decontamination source water. Details for each of these activities are presented below.

5.1.1 Technical Project Planning

The US Army Corps of Engineers (USACE) TPP Process, Engineer Manual (EM) 200-1-2 (USACE, 2016) defines four phases to project planning: 1.) defining the project phase; 2.) determining data needs; 3.) developing data collection strategies; and 4.) finalizing the data collection plan. The process encourages stakeholder involvement in the SI, beginning with

defining overall project objectives, including DQOs, and formulating a sampling approach to address the AOI identified in the PA.

A combined TPP Meeting 1 and 2 was held on 10 March 2022, prior to SI field activities. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2. The stakeholders for this SI include the ARNG, MDEQ, MSARNG, and USACE. Stakeholders were provided the opportunity to make comments on the technical sampling approach and methods at the combined TPP Meeting 1 and 2. The outcome of the combined TPP Meeting 1 and 2 was memorialized in the SI QAPP Addendum (AECOM, 2022a).

A TPP Meeting 3 will be held after the field event (date to be determined) to discuss the results of the SI. Meeting minutes for TPP 3 will be included in **Appendix D** of this report. Future TPP meetings will provide an opportunity to discuss the results and findings, and future actions, where warranted.

5.1.2 Utility Clearance

AECOM submitted a locate ticket with the Mississippi 811 utility clearance provider to notify them of intrusive work prior to field activities. Additionally, AECOM contracted Ground Penetrating Radar Systems, LLC (GPRS), a private utility location service, to perform utility clearance. GPRS performed utility clearance of the proposed boring locations on 22 April 2022 with input from the AECOM field team and AASF #1 facility staff. General locating services and ground-penetrating radar were used to complete the clearance. Additionally, the first 5 feet of each boring were pre-cleared using a hand auger to verify utility clearance in shallow subsurface where utilities would typically be encountered.

5.1.3 Source Water and Sampling Equipment Acceptability

Two potable water sources at AASF #1 were sampled on 22 February 2022 to assess usability for decontamination of drilling equipment. JAC-DECON-01 was collected from the wash rack spigot and JAC-DECON-02 was collected from the western side of the hangar. Results of the sample collected at the wash rack spigot confirmed this source to be acceptable for use in this investigation; therefore, it was used throughout the field activities. Specifically, the samples were analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15. The results of the decontamination water sample associated with the wash rack spigot source used during the SI are provided in **Appendix F**. A discussion of the results is presented in the DUA (**Appendix A**).

Materials that were used within the sampling zone were confirmed as acceptable for use in the sampling environment. The checklist of acceptable materials for use in the sampling environment was provided in the Standard Operating Procedures (SOPs) appendix to the SI QAPP Addendum (AECOM, 2022a). Prior to the start of field work each day, a Sampling Checklist was completed as an additional layer of control. The checklist served as a daily reminder to each field team member regarding the allowable materials within the sampling environment.

5.2 Soil Borings and Soil Sampling

Borings were installed in grass areas where applicable, to avoid disturbing concrete or asphalt surfaces. Soil samples were collected via direct push technology (DPT), in accordance with the SI QAPP Addendum (AECOM, 2022a). A GeoProbe® 7730DT macrocore sampling system was used to collect continuous soil cores to the target depth. A hand auger was used to collect soil from the top five feet of the boring, in accordance with AECOM utility clearance procedures. The soil boring locations are shown on **Figure 5-1**, and depths are provided **Table 5-1**.

In general, soil borings advanced using DPT were sampled in three discrete intervals within the vadose zone for chemical analysis: one surface soil sample (0 to 2 feet bgs), one subsurface soil sample approximately 2 feet above the groundwater table, and one subsurface soil sample at the mid-point between the surface and the groundwater table. At AOI01-03, shallow groundwater was encountered and only two discrete soil samples were collected: one surface soil sample (0 to 2 feet bgs) and one subsurface soil sample approximately 2 feet above the groundwater table. This field change is further discussed in **Section 5.8**. Additionally, five surface soil samples (0 to 2 feet bgs) were collected using a hand auger.

The soil cores were continuously logged for lithological descriptions by an AECOM field geologist using the Unified Soil Classification System (USCS). A photoionization detector (PID) was used to screen the breathing zone during boring activities as part of personal safety requirements. Observations and measurements were recorded on sampling forms (**Appendix B2**) and in a non-treated field logbook (i.e., composition notebook). Depth interval, recovery thickness, PID concentrations, moisture, relative density, color (using a Munsell soil color chart), and texture (using the USCS) were recorded. The boring logs are provided in **Appendix E**.

Direct push borings installed during the SI were completed at depths between 10 to 20 feet bgs. Silt and lean clay with varying quantities of sand were observed as the dominant lithology of the unconsolidated sediments below AASF #1. Sandy silts were generally observed at the top 5 to 10 feet bgs. Silt and clay were generally observed below 10 feet bgs. A layer of gravelly lean clay was observed in AOI01-01 from 16 to 17.5 feet bgs.

Each soil sample was collected into laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard chain of custody (CoC) procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15, total organic carbon (TOC) (USEPA Method 9060A), pH (USEPA Method 9045D), and grain size (ASTM Method D-422) in accordance with the SI QAPP Addendum (AECOM, 2022a).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike (MS)/MS duplicates (MSDs) were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. In instances when non-dedicated sampling equipment was used, such as a hand auger for the shallow soil samples, equipment rinsate blanks were collected at a rate of 5% and analyzed for the same parameters as the soil samples. A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6 degrees Celsius (°C) during shipment.

DPT borings were converted to temporary wells, which were subsequently abandoned in accordance with the SI QAPP Addendum (AECOM, 2022a) using bentonite chips at completion of sampling activities.

5.3 Temporary Well Installation and Groundwater Grab Sampling

Temporary wells were installed using a GeoProbe® 7730DT macrocore sampling system. Once the borehole was advanced to the desired depth, a temporary well was constructed of a 5-foot section of 1-inch Schedule 40 poly-vinyl chloride (PVC) screen with sufficient casing to reach ground surface. New PVC pipe and screen were used to avoid cross contamination between locations. The screen intervals for the temporary wells are provided in **Table 5-2**.

Groundwater samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well screen intervals. After the recharge period, groundwater samples were collected using a bladder pump with PFAS-free HDPE tubing. The temporary wells were purged at a rate determined in the field to reduce turbidity and draw

down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen, and oxidation-reduction potential) were measured using a water quality meter and recorded on the field sampling form (**Appendix B2**) before each grab sample was collected. Additionally, a subsample of each groundwater sample was collected in a separate container, and a shaker test was completed to identify if there were any foaming. No foaming was noted in any of the groundwater samples.

Each sample was collected into laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard CoC procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15 in accordance with the SI QAPP Addendum (AECOM, 2022a).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. MS/MSDs were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. One field reagent blank was collected in accordance with the PQAPP (AECOM, 2018a). A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6 °C during shipment.

Following well surveying (described below in **Section 5.5**), temporary wells were abandoned in accordance with the SI QAPP Addendum (AECOM, 2022a) by removing the PVC and backfilling the hole with bentonite chips.

5.4 Synoptic Water Level Measurements

A synoptic groundwater gauging event was performed on 26 April 2022. Groundwater elevation measurements were collected from the four new temporary monitoring wells. Water level measurements were taken from the northern side of the well casing. A groundwater flow contour map is provided in **Figure 2-4**. Groundwater elevation data are provided in **Table 5-2**.

5.5 Surveying

The northern side of each well casing was surveyed by Mississippi-licensed land surveyors following guidelines provided in the SOPs provided in the SI QAPP Addendum (AECOM, 2022a). Survey data from the newly installed wells on the facility were collected on 27 April 2022 in the applicable Universal Transverse Mercator zone projection with Mississippi State Plane-West North American Datum 1983 (NAD83, horizontal) and North American Vertical Datum 1988 (NAVD88, vertical). The surveyed well data are provided in **Appendix B4**.

5.6 Investigation-Derived Waste

As of the date of this report, the disposal of investigation-derived waste (IDW) is not regulated federally. IDW generated during the SI is considered non-hazardous waste and was managed in accordance with the SI QAPP Addendum (AECOM, 2022a) and with the Army Guidance for Addressing Releases of PFAS, Q18 (DA, 2018).

Soil IDW (i.e., soil cuttings) generated during the SI activities were containerized in labeled, 55-gallon Department of Transportation (DOT)-approved steel drums and left onsite, northwest of the hangar. The soil IDW was not sampled and assumes the characteristics of the associated soil samples collected from that source location. Containerized soil IDW will be managed and disposed of by ARNG (either by offsite disposal or onsite disposal with treatment, as appropriate) under a separate contract. ARNG will further manage soil IDW in accordance with the Army Guidance for Addressing Releases of PFAS, Q18 (DA, 2018). ARNG will coordinate transportation and disposal of the soil IDW.

Liquid IDW generated during SI activities (i.e., purge water, development water, and decontamination fluids) were containerized in labeled, 55-gallon DOT-approved steel drums, and left onsite, next to the soil IDW drums. The liquid IDW was not sampled and assumes the characteristics of the associated groundwater samples collected from that source location. Containerized liquid IDW will be managed and disposed of by ARNG (either by offsite disposal or onsite disposal with treatment, as appropriate) under a separate contract. ARNG will further manage liquid IDW in accordance with the Army Guidance for Addressing Releases of PFAS, Q18 (DA, 2018). ARNG will coordinate transportation and disposal of the liquid IDW.

Other solids such as spent personal protective equipment, plastic sheeting, tubing, rope, unused monitoring well construction materials, and other environmental media generated during the field activities were disposed of at a licensed solid waste landfill.

5.7 Laboratory Analytical Methods

Samples were analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15 at Pace Analytical Gulf Coast in Baton Rouge, Louisiana, a DoD ELAP and NELAP certified laboratory. Soil samples were also analyzed for TOC using USEPA Method 9060A and pH by USEPA Method 9045D.

5.8 Deviations from the SI QAPP Addendum

One deviation from the SI QAPP Addendum was identified during review of the field documentation. The deviation is noted below and is documented in Field Change Request Forms (**Appendix B3**).

- According to the SI QAPP Addendum, three soil samples were planned to be collected from each direct push soil boring. All three samples were supposed to target the soil above the water table in the vadose zone. However, due to shallow groundwater encountered at AOI01-03, only two samples could be collected in the vadose zone.

THIS PAGE INTENTIONALLY BLANK

Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Jackson AASF #1, Jackson, Mississippi

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
Soil Samples							
AOI01-01-SB-00-02	4/26/2022 9:05	0 - 2	x				
AOI01-01-SB-04-06	4/26/2022 9:15	4 - 6	x				
AOI01-01-SB-04-06-D	4/26/2022 9:15	4 - 6	x				Duplicate
AOI01-01-SB-08-10	4/26/2022 9:30	8 - 10	x				
AOI01-02-SB-00-02	4/26/2022 12:30	0 - 2	x	x	x		
AOI01-02-SB-00-02-D	4/26/2022 12:30	0 - 2		x	x		Duplicate
AOI01-02-SB-00-02-MS	4/26/2022 12:30	0 - 2		x	x		MS
AOI01-02-SB-00-02-MSD	4/26/2022 12:30	0 - 2		x	x		MSD
AOI01-02-SB-05-07	4/26/2022 12:45	5 - 7				x	
AOI01-02-SB-08-10	4/26/2022 12:40	8 - 10	x				
AOI01-02-SB-10-12	4/26/2022 12:45	10 - 12	x				
AOI01-03-SB-00-02	4/26/2022 10:30	0 - 2	x				
AOI01-03-SB-03-05	4/26/2022 10:45	3 - 5	x				
AOI01-03-SB-03-05-MS	4/26/2022 10:45	3 - 5	x				MS
AOI01-03-SB-03-05-MSD	4/26/2022 10:45	3 - 5	x				MSD
AOI01-04-SB-00-02	4/26/2022 8:00	0 - 2	x				
AOI01-04-SB-04-06	4/26/2022 8:30	4 - 6	x				
AOI01-04-SB-04-06-D	4/26/2022 8:30	4 - 6	x				Duplicate
AOI01-04-SB-08-10	4/26/2022 8:45	8 - 10	x				
AOI01-05-SB-00-02	4/26/2022 9:55	0 - 2	x				
AOI01-06-SB-00-02	4/26/2022 10:15	0 - 2	x				
AOI01-07-SB-00-02	4/26/2022 10:35	0 - 2	x				
AOI01-08-SB-00-02	4/26/2022 9:15	0 - 2	x				
AOI01-09-SB-00-02	4/26/2022 8:35	0 - 2	x				

Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Jackson AASF #1, Jackson, Mississippi

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
Groundwater Samples							
AOI01-01-GW	4/26/2022 14:50	NA	x				
AOI01-01-GW-D	4/26/2022 14:50	NA	x				Duplicate
AOI01-01-GW-MS	4/26/2022 14:50	NA	x				MS
AOI01-01-GW-MSD	4/26/2022 14:50	NA	x				MSD
AOI01-02-GW	4/26/2022 16:05	NA	x				
AOI01-03-GW	4/26/2022 15:33	NA	x				
AOI01-04-GW	4/26/2022 13:40	NA	x				
Quality Control Samples							
JAC-FRB-01	4/27/2022 9:00	NA	x				FRB
JAC-ERB-01	4/26/2022 8:30	NA	x				Off drill rig shoe
JAC-ERB-02	4/26/2022 8:55	NA	x				Off AECOM hand auger
JAC-ERB-03	4/27/2022 9:30	NA	x				Off driller's hand auger
JAC-DECON-01	2/22/2022 8:00	NA	x				From wash rack spigot
JAC-DECON-02	2/22/2022 8:05	NA	x				From hangar spigot

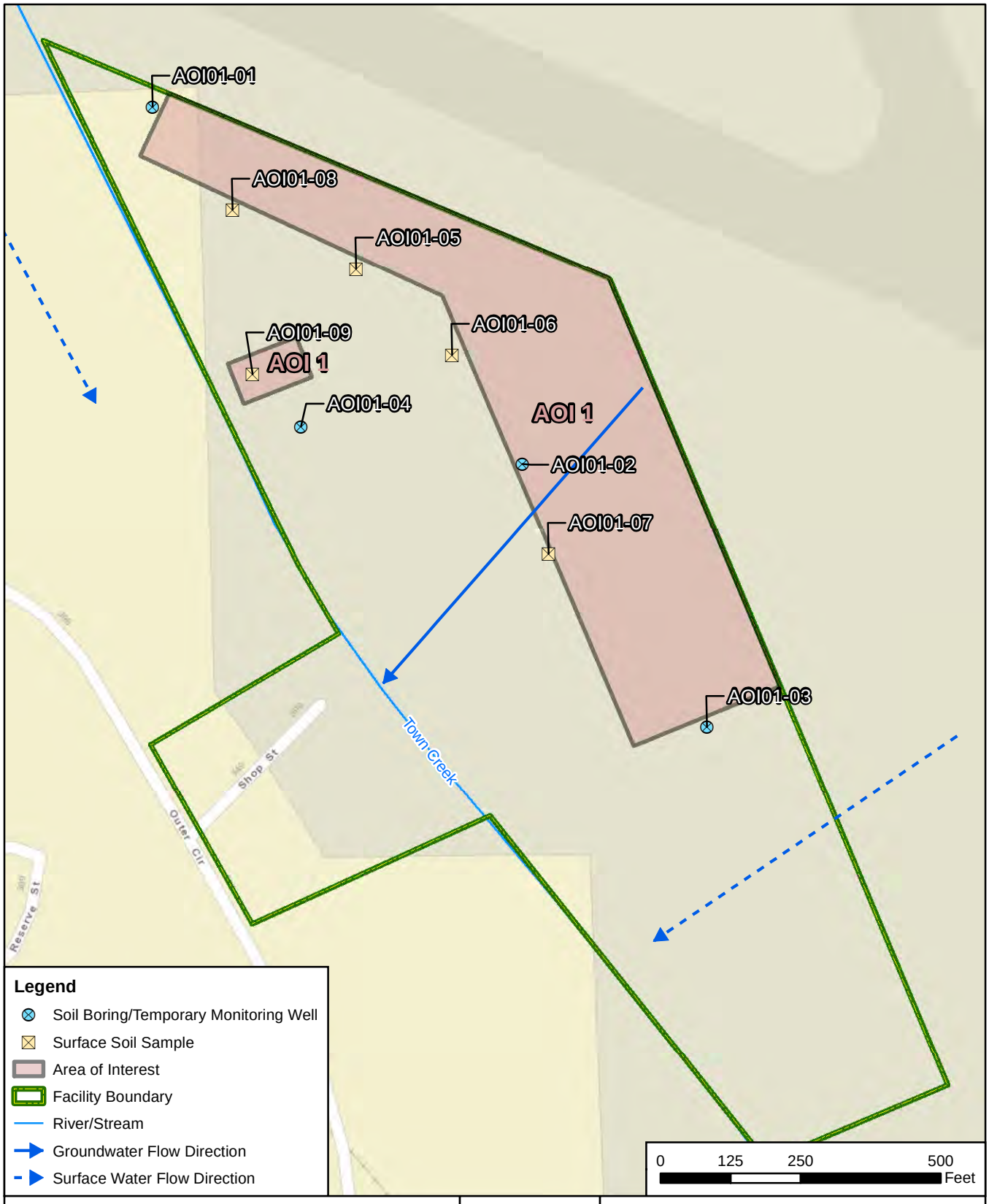
Notes:
ASTM = American Society for Testing and Materials
bgs = below ground surface
ERB = equipment rinsate blank
FRB = field reagent blank
LC/MS/MS = Liquid Chromatography Mass Spectrometry
MS/MSD = matrix spike/ matrix spike duplicate
QSM = Quality Systems Manual
TOC = total organic carbon
USEPA = United States Environmental Protection Agency

Table 5-2
Soil Boring Depths, Temporary Well Screen Intervals, and Groundwater Elevations
Site Inspection Report, Jackson AASF #1, Jackson, Mississippi

Area of Interest	Boring Location	Soil Boring Depth (feet bgs)	Temporary Well Screen Interval (feet bgs)	Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet NAVD88)
1	AOI01-01	20	15 - 20	310.06	309.40	3.58	2.92	306.48
	AOI01-02	20	15 - 20	307.70	307.30	2.95	2.55	304.75
	AOI01-03	10	5 - 10	306.46	306.00	2.50	2.04	303.96
	AOI01-04	15	10 - 15	309.05	308.60	5.68	5.23	303.37

Notes:
bgs = below ground surface
btoc = below top of casing
NAVD88 = North American Vertical Datum 1988

THIS PAGE INTENTIONALLY BLANK



CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:3,000	CHK BY	JH	9/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	9/22/2022

N

Site Inspection Sample Locations

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

THIS PAGE INTENTIONALLY BLANK

6. Site Inspection Results

This section presents the analytical results of the SI. The SLs used in this evaluation are presented in **Section 6.1**. A discussion of the results for AOI 1 is provided in **Section 6.3**. **Table 6-2** through **Table 6-4** present results in soil or groundwater for the relevant compounds. Tables that contain all results are provided in **Appendix F**, and the laboratory reports are provided in **Appendix G**.

6.1 Screening Levels

The DoD has adopted a policy to retain facilities in the CERCLA process based on risk-based SLs for soil and groundwater, as described in a memorandum from the OSD dated 6 July 2022 (Assistant Secretary of Defense, 2022). The ARNG program under which this SI was performed follows this DoD policy. Should the maximum site concentration for sampled media exceed the SLs established in the OSD memorandum, the AOI will proceed to the next phase under CERCLA. The SLs established in the OSD memorandum apply to the five compounds presented on **Table 6-1** below.

Table 6-1: Screening Levels (Soil and Groundwater)

Analyte[b]	Residential (Soil) (µg/kg)[a] 0-2 feet bgs	Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a] 2-15 feet bgs	Tap Water (Groundwater) (ng/L)[a]
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
bgs = below ground surface; µg/kg = micrograms per kilogram; ng/L = nanograms per liter

a.) Assistant Secretary of Defense, 2022. Risk Based Screening Levels in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ) = 0.1. 6 July 2022.

b.) Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

The data in the subsequent sections are compared to the SLs presented in **Table 6-1**. The SLs for groundwater are based on direct ingestion. The SLs for soil are based on incidental ingestion and are applied to the depth intervals reasonably anticipated to be encountered by the receptors identified at the facility: the residential scenario is applied to surface soil results (0 to 2 feet bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil results (2 to 15 feet bgs). The SLs are not applied to deep subsurface soil results (>15 feet bgs) because 15 feet is the anticipated limit of construction activities.

6.2 Soil Physicochemical Analyses

To provide basic soil parameter information, soil samples were analyzed for TOC, pH, and grain size, which are important for evaluating transport through the soil medium. **Appendix F** contains the results of the TOC, pH, and grain size sampling.

The data collected in this investigation will be used in subsequent investigations, where appropriate, to assess fate and transport. According to the Interstate Technology Regulatory Council (ITRC), several important partitioning mechanisms include hydrophobic and lipophobic effects, electrostatic interactions, and interfacial behaviors. At relevant environmental pH values, certain PFAS are present as organic anions and are therefore relatively mobile in groundwater (Xiao et al., 2015), but tend to associate with the organic carbon fraction that may be present in soil or sediment (Higgins and Luthy, 2006; Guelfo and Higgins, 2013). When sufficient organic carbon is present, organic carbon normalized distribution coefficients (K_{oc} values) can help in evaluating transport potential, though other geochemical factors (for example, pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC, 2018).

6.3 AOI 1

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1. The soil and groundwater results are summarized on **Table 6-2** through **Table 6-4**. Soil and groundwater results are presented on **Figure 6-1** through **Figure 6-7**.

6.3.1 AOI 1 Soil Analytical Results

Surface soil was sampled from 0 to 2 feet bgs from boring locations AOI01-01 through AOI01-09. Soil was also sampled from shallow subsurface soil (between 3 to 12 feet bgs) from boring locations AOI01-01 through AOI01-04. Deep subsurface soil was not sampled. **Figure 6-1** through **Figure 6-5** present the ranges of detections in soil. **Table 6-2** through **Table 6-3** summarize the soil results.

PFOA, PFOS, PFBS, PFHxS, and PFNA were detected in surface soil at concentrations more than one order of magnitude below the SLs. The maximum detected concentration was PFOS at 0.832 J micrograms per kilogram (µg/kg) at AOI01-09. The relevant compounds were not detected in surface soil at AOI01-01, AOI01-02, AOI01-03, AOI01-05, and AOI01-08. PFOA, PFOS, PFBS, PFHxS, and PFNA were not detected in any of the subsurface soil samples.

6.3.2 AOI 1 Groundwater Analytical Results

Groundwater was sampled from temporary monitoring wells AOI01-01 through AOI01-04. **Figure 6-6** and **Figure 6-7** present the ranges of detections in groundwater. **Table 6-4** summarizes the groundwater results.

PFOS, PFBS, and PFHxS were detected in groundwater at concentrations below the SLs. PFBS was detected in all four temporary wells, with a maximum detected concentration of 4.62 nanograms per liter (ng/L) at AOI01-03. PFOS and PFHxS were only detected in one monitoring well each, with concentrations of 0.873 J ng/L and 2.43 J ng/L, respectively. PFOA and PFNA were not detected in groundwater.

6.3.3 AOI 1 Conclusions

Based on the results of the SI, PFOA, PFOS, PFBS, PFHxS, and PFNA were detected in soil below their SLs. PFOS, PFBS, and PFHxS were detected in groundwater at concentrations below their respective SLs. Therefore, further evaluation at AOI 1 is not warranted.

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, AASF Jackson

Area of Interest		AOI01																	
Sample ID		AOI01-01-SB-00-02		AOI01-02-SB-00-02		AOI01-03-SB-00-02		AOI01-04-SB-00-02		AOI01-05-SB-00-02		AOI01-06-SB-00-02		AOI01-07-SB-00-02		AOI01-08-SB-00-02		AOI01-09-SB-00-02	
Sample Date		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022	
Depth		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																			
PFBS	1900	ND	U	ND	U	ND	U	0.035	J	ND	U	0.049	J	ND	U	ND	U	ND	U
PFHxS	130	ND	U	ND	U	ND	U	0.051	J	ND	U	0.108	J	ND	U	ND	U	0.288	J
PFNA	19	ND	U	ND	U	ND	U	0.050	J	ND	U	ND	U	ND	U	ND	U	0.058	J
PFOA	19	ND	U	ND	U	ND	U	0.325	J	ND	U	ND	U	ND	U	ND	U	0.334	J
PFOS	13	ND	U	ND	U	ND	U	0.398	J	ND	U	0.101	J	0.137	J	ND	U	0.832	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1, May 2022. Soil screening levels based on residential scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted DL

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.054-0.064 µg/kg
PFHxS: 0.108-0.128 µg/kg
PFNA: 0.054-0.064 µg/kg
PFOA: 0.215-0.256 µg/kg
PFOS: 0.215-0.256 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, AASF Jackson

Area of Interest		AOI01																	
Sample ID		AOI01-01-SB-04-06		AOI01-01-SB-04-06-D		AOI01-01-SB-08-10		AOI01-02-SB-08-10		AOI01-02-SB-10-12		AOI01-03-SB-03-05		AOI01-04-SB-04-06		AOI01-04-SB-04-06-D		AOI01-04-SB-08-10	
Sample Date		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022	
Depth		4-6 ft		4-6 ft		8-10 ft		8-10 ft		10-12 ft		3-5 ft		4-6 ft		4-6 ft		8-10 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																			
PFBS	25000	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	1600	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFNA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	160	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1, May 2022. Soil screening levels based on industrial/commercial composite worker scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

U = The analyte was not detected at a level greater than or equal to the adjusted DL

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.055-0.059 µg/kg
PFHxS: 0.111-0.118 µg/kg
PFNA: 0.055-0.059 µg/kg
PFOA: 0.221-0.235 µg/kg
PFOS: 0.221-0.235 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-4
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater
Site Inspection Report, AASF Jackson

Area of Interest		AOI01									
Sample ID		AOI01-01-GW		AOI01-02-GW		AOI01-03-GW		AOI01-04-GW		AOI01-04-GW-D	
Sample Date		04/26/2022		04/26/2022		04/26/2022		04/26/2022		04/26/2022	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)											
PFBS	601	4.04		3.04	J	4.62		3.93	J	3.91	J
PFHxS	39	2.43	J	ND	U	ND	U	ND	U	ND	U
PFNA	6	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	6	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	4	ND	U	0.873	J	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1, May 2022 Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

Interpreted Qualifiers

J = Estimated concentration

U = The analyte was not detected at a level greater than or equal to the adjusted DL

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 1.98-2.03 ng/L
PFHxS: 2.98-3.05 ng/L
PFNA: 1.98-2.03 ng/L
PFOA: 1.98-2.03 ng/L
PFOS: 1.98-2.03 ng/L

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
GW	groundwater
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter

THIS PAGE INTENTIONALLY BLANK

CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:4,080	CHK BY	JH	9/22/2022
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	CM	9/22/2022

Legend

Facility Boundary

River/Stream

0 170 340 680 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

N

PFOA Detections in Soil

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-1

CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:4,080	CHK BY	JH	9/22/2022
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	CM	9/22/2022

Legend

Facility Boundary

River/Stream

0 170 340 680 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

N

PFOS Detections in Soil

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 6-2

CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:4,080	CHK BY	JH	9/22/2022
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	CM	9/22/2022

Legend

Facility Boundary

River/Stream

0 170 340 680 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

N

PFBS Detections in Soil

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 6-3

CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:4,080	CHK BY	JH	9/22/2022
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	CM	9/22/2022

Legend

Facility Boundary

River/Stream

0 170 340 680 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

N

PFHxS Detections in Soil

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 6-4

CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:4,080	CHK BY	JH	9/22/2022
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	CM	9/22/2022

Legend

Facility Boundary

River/Stream

0 170 340 680 Feet

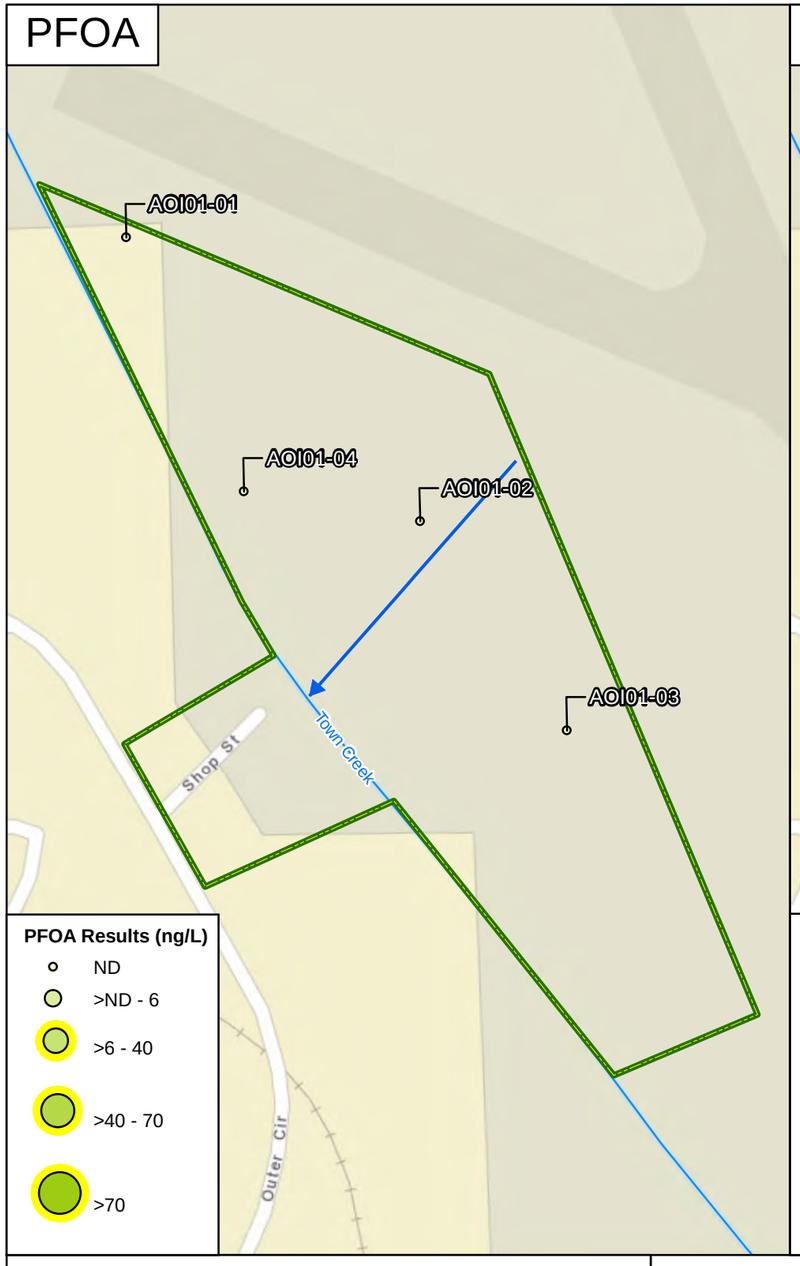
Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

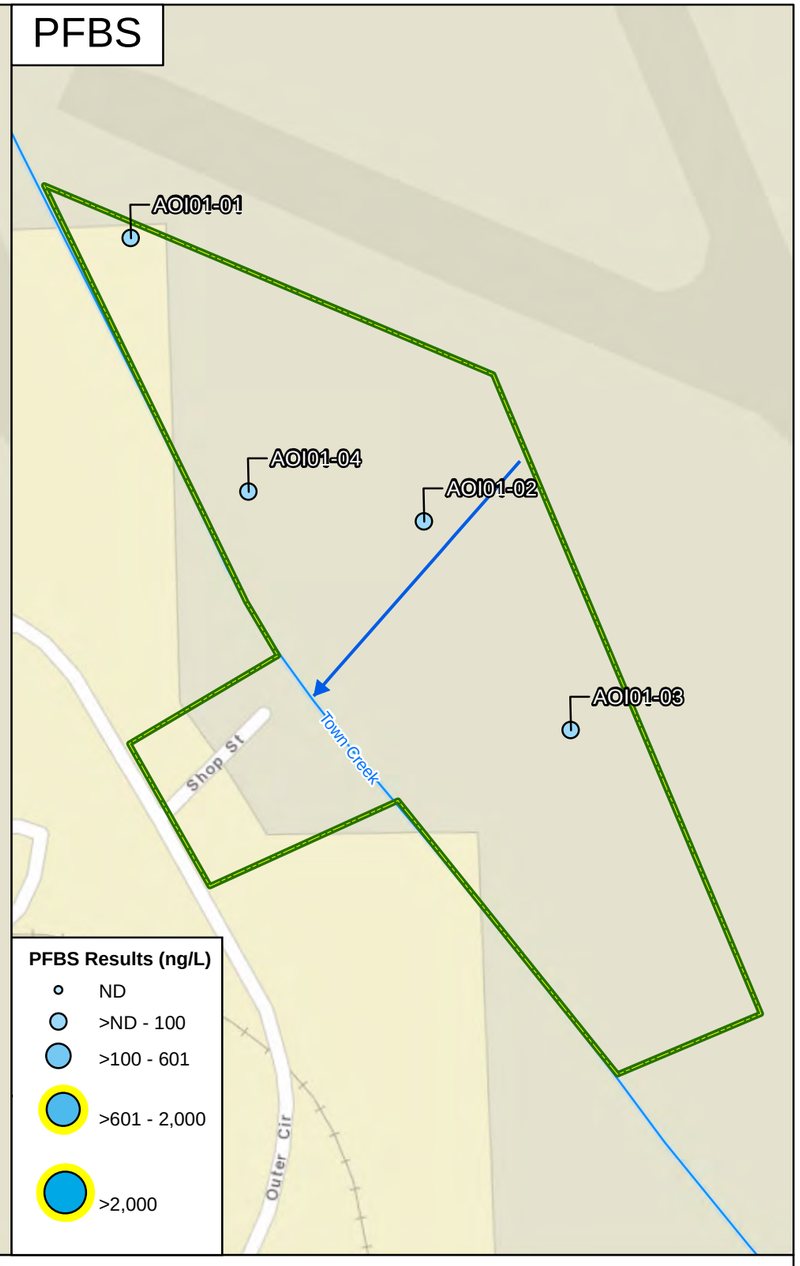
N

PFNA Detections in Soil

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 6-5





CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	10/6/2022	GIS BY	MS	10/6/2022
SCALE	1:4,080	CHK BY	JH	10/6/2022
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	CM	10/6/2022

Legend

- Facility Boundary
- River/Stream
- Groundwater Flow Direction

0 170 340 680 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

N

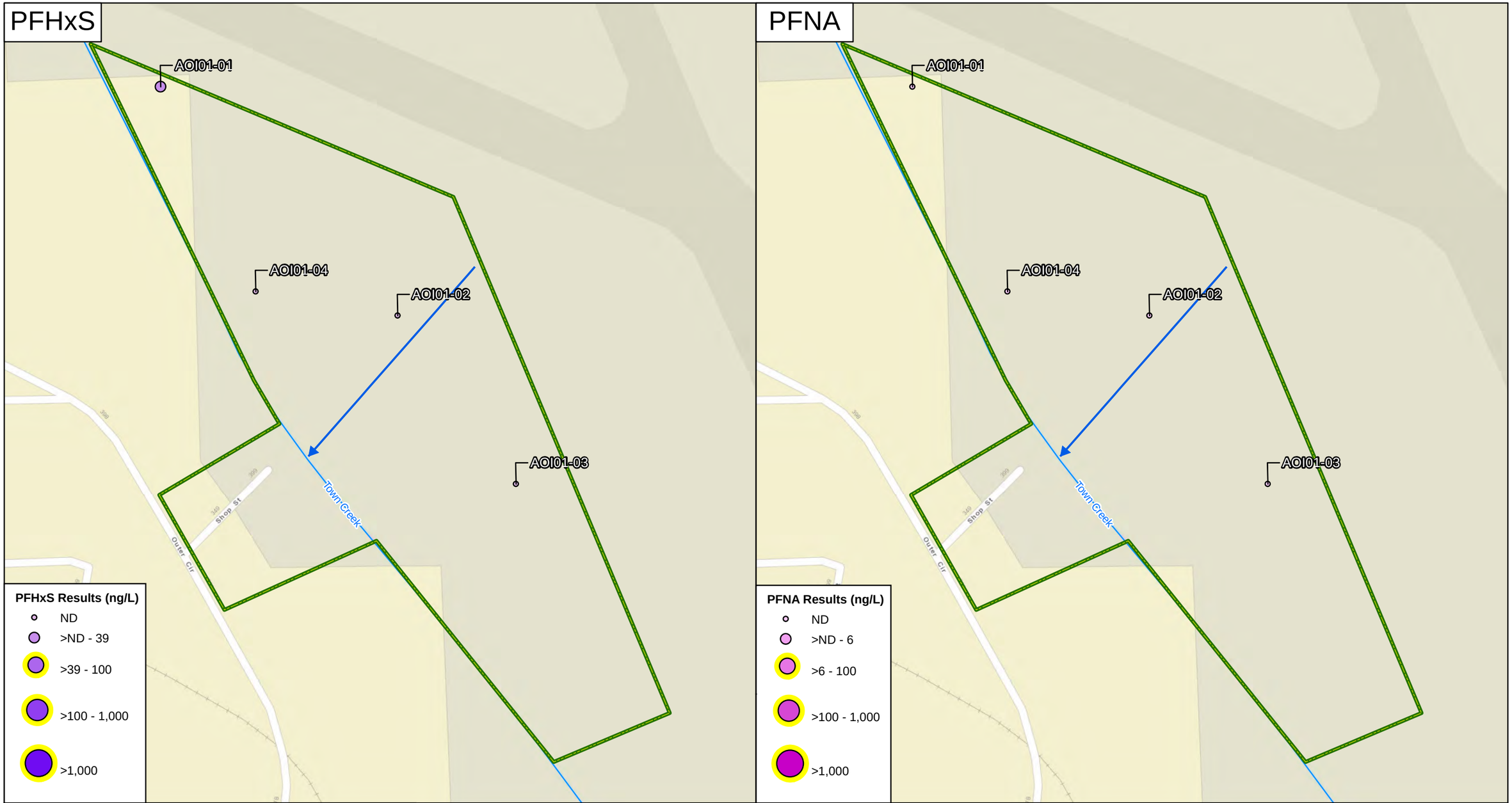
PFOA, PFOS, and PFBS Detections in Groundwater

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-6

PFHxS

PFNA



PFHxS Results (ng/L)

- ND
- >ND - 39
- >39 - 100
- >100 - 1,000
- >1,000

PFNA Results (ng/L)

- ND
- >ND - 6
- >6 - 100
- >100 - 1,000
- >1,000

CLIENT	ARNG			
PROJECT	Site Inspection at Jackson AASF #1, MS			
REVISED	9/22/2022	GIS BY	MS	9/22/2022
SCALE	1:3,240	CHK BY	JH	9/22/2022
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	CM	9/22/2022

Legend

- Facility Boundary
- River/Stream
- Groundwater Flow Direction

0 135 270 540 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

N

PFHxS and PFNA Detections in Groundwater

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-7

THIS PAGE INTENTIONALLY BLANK

7. Exposure Pathways

The CSM for AOI 1, revised based on the SI findings, is presented on **Figure 7-1**. Please note that while the CSM discussion assists in determining if a receptor may be impacted, the decision to move from SI to RI or interim action is determined based upon exceedances of the SLs for the relevant compounds and whether the release is more than likely attributable to the DoD. A CSM presents the current understanding of the site conditions with respect to known and suspected sources, potential transport mechanisms and migration pathways, and potentially exposed human receptors. A human exposure pathway is considered potentially complete when the following conditions are present:

1. Contaminant source;
2. Environmental fate and transport;
3. Exposure point;
4. Exposure route; and
5. Potentially exposed populations.

If any of these elements are missing, the pathway is incomplete. The CSM figures use an empty circle symbol to represent an incomplete exposure pathway. Areas with an incomplete pathway generally warrant no further action. However, the pathway is considered potentially complete if the relevant compounds are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of relevant compounds above the SLs. Areas with an identified potentially complete pathway that have detections of the relevant compounds above the SLs may warrant further investigation. Although the CSMs indicate whether potentially complete exposure pathways may exist, the recommendation for future study in an RI or no action at this time is based on the comparison of the SI analytical results for the relevant compounds to the SLs.

In general, the potential routes of exposure to the relevant compounds are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of toxicological study. The receptors evaluated are consistent with those listed in USEPA guidance for risk screening (USEPA, 2001). Receptors at the facility include site workers (e.g., facility staff and visiting soldiers), construction workers, trespassers (though unlikely due to restricted access), residents outside the facility boundary, and recreational users outside of the facility boundary. No construction was observed during SI field activities.

7.1 Soil Exposure Pathway

The SI results in soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at AOI 1 based on the aforementioned criteria.

7.1.1 AOI 1

An unknown number of Tri-Max™ units were staged at the flight line for 6 to 8 years, starting around 2008 or 2009. Additionally, approximately 10 Tri-Max™ units were reportedly staged on the wash rack area between 2007 to 2012.

PFOA, PFOS, PFBS, PFHxS, and PFNA were detected in surface soil at AOI 1. Site workers, future construction workers, and trespassers could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathways for these receptors are potentially complete. The exposure pathways for offsite residents via incidental ingestion of surface soil are considered incomplete. PFOA, PFOS, PFBS, PFHxS, and PFNA were not detected in subsurface soil at AOI 1; therefore, all exposure pathways are considered incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.2 Groundwater Exposure Pathway

The SI results in groundwater were used to determine whether a potentially complete pathway exists between the source and potential receptors based on the aforementioned criteria.

7.2.1 AOI 1

PFOS, PFBS, and PFHxS were detected below their SLs in groundwater samples collected at AOI 1. Downgradient domestic and public supply wells have depths greater than 500 feet bgs and are screened below the Yazoo Clay aquitard. Therefore, the pathway for exposure to off-facility residents via ingestion of groundwater is considered incomplete. Depths to water measured at AOI 1 in July 2021 during the SI ranged from 2.04 to 5.23 feet bgs. Therefore, the incidental ingestion exposure pathway for future construction workers is considered potentially complete. Additionally, during wet periods, the water level may rise to depths shallower than 2 feet bgs. Therefore, the incidental ingestion pathway for future site worker receptors is considered potentially complete. The ingestion pathways for trespassers and recreational users are considered incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.

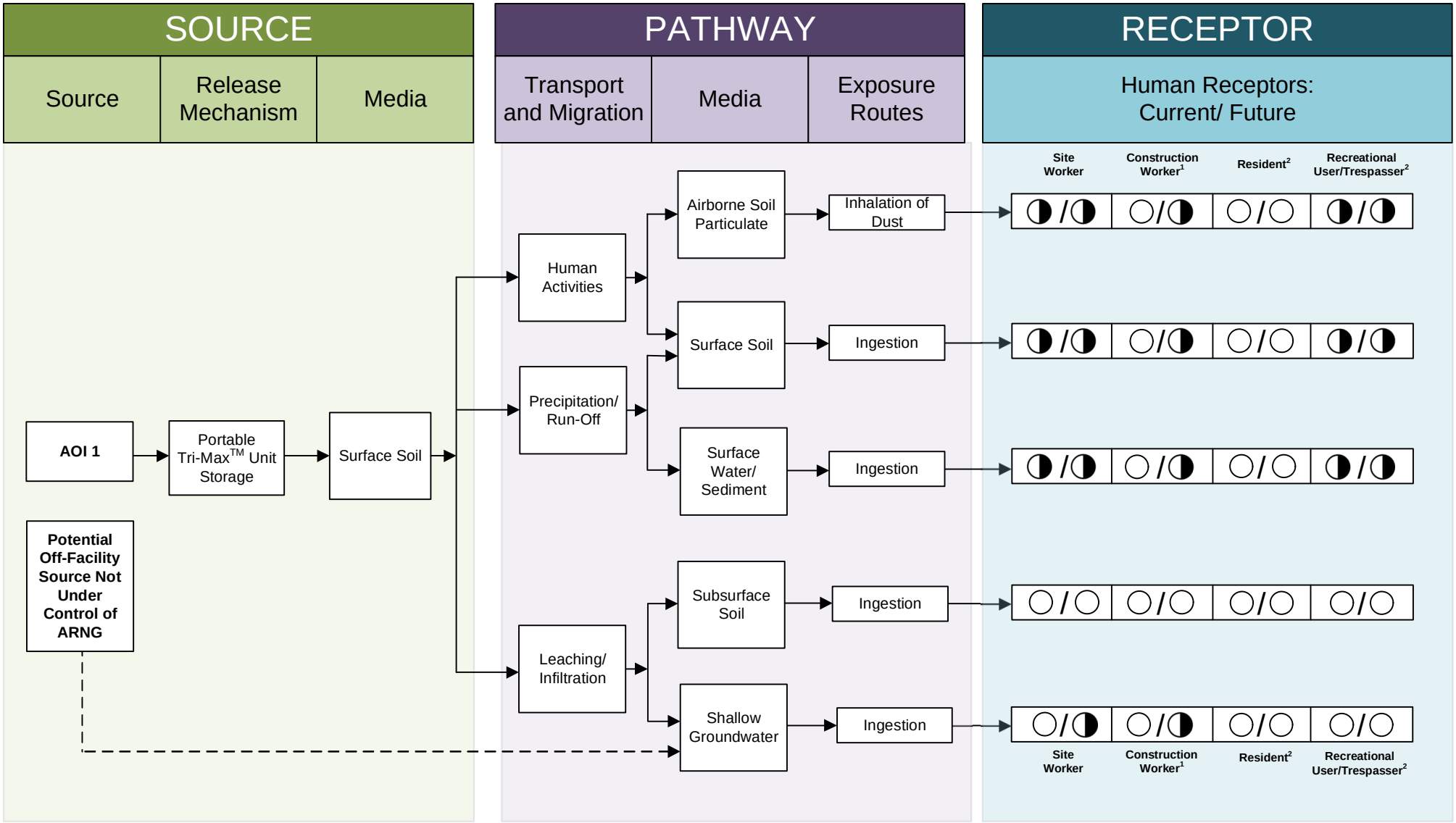
7.3 Surface Water and Sediment Exposure Pathway

The SI results in soil and groundwater, in combination with knowledge of the fate and transport properties of PFAS, were used to determine whether a potentially complete pathway exists between the source and potential receptors.

7.3.1 AOI 1

PFAS are water soluble and can migrate readily from soil to surface water via leaching and run-off. PFOA, PFOS, PFBS, PFHxS, and PFNA were detected in soil and PFOS, PFBS, and PFHxS were detected in groundwater. Consequently, it is possible that those compounds may have migrated from soil and groundwater to Town Creek, located along the facility's western boundary, or other drainage ditches at the facility. Compounds in surface water bodies at or near the facility could be transported to Pearl River.

Surface water bodies used for public drinking water are located upgradient of the facility; therefore the ingestion pathway for residents is considered incomplete. Because Town Creek is located within the boundary of the facility, there is potential for site workers and future construction workers to come into contact with the identified compounds. Therefore, the incidental ingestion pathway for these receptors to surface water and sediment is considered potentially complete. Due to the recreational use of Pearl River, the surface water and sediment ingestion exposure pathway for off-facility recreational users is also considered potentially complete. The exposure pathway for residents to surface water via ingestion is considered incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.



LEGEND

- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

NOTES

1. No construction activities were observed during SI field activities.
2. The resident and recreational users refer to off-site receptors.

Figure 7-1
Conceptual Site Model, AOI 1
AASF #1, Jackson, Mississippi

THIS PAGE INTENTIONALLY BLANK

8. Summary and Outcome

This section summarizes SI activities and findings. The most significant findings are summarized in this section and are reproduced directly or abstracted from information contained in this report. The outcome provides general and comparative interpretations of the findings relative to the SLs.

8.1 SI Activities

The SI field activities were conducted from 22 to 27 April 2022 and consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2022a), except as previously noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI QAPP Addendum (AECOM, 2022a), samples were collected and analyzed for a subset of 18 compounds by LC/MS/MS compliant with QSM 5.3 Table B-15 as follows.

- Sixteen (16) soil samples from 9 borings;
- Four grab groundwater samples from four temporary wells; and
- Thirteen (13) QA/QC samples.

An SI is conducted when the PA determines an AOI exists based on probable use, storage, and/or disposal of PFAS-containing materials. The SI includes multi-media sampling at AOI to determine whether or not a release has occurred. The SI may conclude further investigation is warranted, a removal action is required to address immediate threats, or no further action is required. Additionally, the CSM was refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOI, which are described in **Section 7**.

8.2 Outcome

Based on the results of this SI, further evaluation under CERCLA is not warranted for AOI 1 at AASF #1 at this time (see **Table 8-1**). Based on the CSMs developed and revised in light of the SI findings, there is no potential for exposure to drinking water receptors from AOI 1 from sources on the facility resulting from historical DoD activities. Sample analytical concentrations collected during the SI were compared to the project SLs in soil and groundwater, as described in **Table 6-1**. A summary of the results of the SI data relative to the SLs is as follows:

- At AOI 1:
    - PFOA, PFOS, PFBS, PFHxS, and PFNA were detected in surface soil at concentrations at least one order of magnitude below the SLs. These compounds were not detected in subsurface soil.
    - PFOS, PFBS, and PFHxS were detected in groundwater at concentrations below the SLs. The maximum detected concentration was PFBS at 4.62 ng/L at AOI01-03. PFOA and PFNA were not detected in groundwater.
    - Based on the results of the SI, no further evaluation of AOI 1 is warranted.

Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA

is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Table 8-1 summarizes the SI results for soil and groundwater used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI.

Table 8-1: Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area[a]	Groundwater – Source Area[a]	Future Action
1	Release Area A	◐ 0.832 J µg/kg (PFOS)	◐ 4.62 ng/L (PFBS)	No further action

Notes:
AOI = area of interest; ng/L = nanograms per liter; µg/kg = micrograms per kilogram
a.) The maximum relevant compound concentration is reported at the AOI.

Legend:
● = detected; exceedance of the screening levels
◐ = detected; no exceedance of the screening levels
○ = not detected

9. References

AECOM. 2018a. *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan, Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide Contract No. W912DR-12-D-0014/ W912DR17F0192*. 9 March.

AECOM. 2018b. *Final Programmatic Accident Prevention Plan, Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide Contract No. W912DR-12-D-0014/W912DR17F0192.* July.

AECOM. 2020. *Final Preliminary Assessment Report, Jackson Army Aviation Support Facility #1, Jackson, MS*. August.

AECOM. 2022a. *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Jackson Army Aviation Support Facility #1, Jackson, Mississippi, Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide.* March.

AECOM. 2022b. *Final Site Safety and Health Plan, Jackson Army Aviation Support Facility #1, Jackson, Mississippi, Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide*. April.

Assistant Secretary of Defense. 2022. *Investigation Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program*. United States Department of Defense. 6 July.

City of Jackson, Mississippi. 2022. *Zoning Map.* Accessed 31 October 2022 at https://cmpdd.maps.arcgis.com/apps/webappviewer/index.html?id=1c2ee1fa1b064ac1b6a18c6b08a040b6.

Cushing, E.M., Boswell, E.H., Hosman, R.L. 1964. *General Geology of the Mississippi Embayment*, *Water Resources of the Mississippi Embayment.* Geological Survey Professional Paper 448-B, United States Geological Survey (USGS), Department of Interior (DOI).

DA. 2018. *Army Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances.* 4 September.

DoD. 2019a. *Department of Defense (DoD), Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3*.

DoD. 2019b. *General Data Validation Guidelines. Environmental Data Quality Workgroup*. 4 November.

Guelfo, J.L. and Higgins, C.P. 2013. *Subsurface Transport Potential of Perfluoroalkyl Acids at Aqueous Film-Forming Foam (AFFF)-Impacted Sites.* Environmental Science and Technology 47(9): 4164-71.

Higgins, C.P., and Luthy, R.G. 2006. *Sorption of Perfluorinated Surfactants on Sediments*. Environmental Science and Technology 40 (23): 7251-7256.

ITRC. 2018. *Environmental Fate and Transport for Per- and Polyfluoroalkyl Substances*. March.

Leidos. 2018. *Final Site Inspection Report for Perfluorooctane Sulfonate and Perfluorooctanoic Acid at Jackson International Airport and the C-17 Assault Strip, Mississippi*. November.

McKee, P.W., and Hays, P.D. 2002. *The Sparta Aquifer: A Sustainable Water Resource?* Fact Sheet FS-111-02, USGS, DOI.

MDEQ. 2011. *2010 Annual Drinking Water Report.* City of Jackson Maddox Road Well System. Public Water Supply Identification Number MS0250012. June 17.

MDEQ. 2021. *2021 Annual Drinking Water Report.* City of Jackson. Public Water Supply Identification Number MS0250008 & 0250012. May.

Mississippi Automated Resource Information System (MARIS). 2009. MS *USGS Wells 2009.* Accessed 28 October 2022 at https://www.maris.state.ms.us/HTML/DATA/data_Hydrology/USGSWells.html#gsc.tab=0.

Mississippi State University. 2022. *Office of the Mississippi State Climatologist. Mississippi Climate.* Accessed 25 October 2022 at https://www.geosciences.msstate.edu/state-climatologist/climate/.

Mississippi Wildlife, Fisheries, & Parks. 2018. *Pearl River 2018, Middle Reach, REEL FACTS.* https://www.mdwfp.com/media/254843/pearl-river-middle-reach-reel-facts-2018-final.pdf.

MSARNG. 2017. *Jackson AASF Storm Water Pollution Prevention Plan (SWPPP), Volumes I & II*.

Stover, Curtis W., Williams, Ross D., and Peel, Charles O. M. 1988. Y*azoo Clay: Engineering Aspects and Environmental Geology of an Expansive Clay*. Circular 1, Mississippi Department of Natural Resources Bureau of Geology. 1988.

USACE. 2016. *Technical Project Planning Process*, EM-200-1-2. 26 February.

USEPA. 1980. *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*.

USEPA. 1994. *National Oil and Hazardous Substances Pollution Contingency Plan (Final Rule)*. 40 CFR Part 300; 59 Federal Register 47384. September.

USEPA. 2001. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)*. December.

USEPA. 2017. *National Functional Guidelines for Organic Superfund Data Review*. OLEM 9355.0-136, EPA-540-R-2017-002. Office of Superfund Remediation and Technology Innovation. January.

USFWS. 2022. *Species by County Report, County: Hinds County, Mississippi.* Environmental Conservation Online System. Accessed 28 October 2022 at https://ecos.fws.gov/ecp/report/species-listings-by-current-range-county?fips=28049.

Wallenfeldt, J., Burrus, J.N., and Sansing, D.G. *Magnolia State*. Encyclopedia Britannica, Inc., 5 February 2019, www.britannica.com/place/Mississippi-state.

World Climate. 2022. *Average Weather Data for Meridian, Mississippi.* Accessed 28 October 2022 at http://worldclimate.com/climate/us/mississippi/jackson.

Xiao, F., Simcik, M. F., Halbach, T. R., and Gulliver, J. S. 2015, *Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoate (PFOA) in Soils and Groundwater of a U.S. Metropolitan Area: Migration and Implications for Human Exposure.* Water Research 72: 64-74.