FINAL
Site Inspection Report
Robinson Maneuver Training Center
North Little Rock, Arkansas

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

May 2023

Prepared for:

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

UNCLASSIFIED

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
%	Percent
µg/kg	Microgram(s) per kilogram
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFB	Air Force Base
AFFF	Aqueous film-forming foam
amsl	Above mean sea level
AOI	Area of Interest
ARARNG	Arkansas Army National Guard
ARFF	Aircraft rescue and firefighting
ARNG	Army National Guard
bgs	Below ground surface
btoc	Below top of casing
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRFD	Camp Robinson Fire Department
CSM	Conceptual site model
DoD	Department of Defense
DQO	Data Quality Objectives
EA	EA Engineering, Science, and Technology, Inc., PBC
EB	Equipment blank
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
FB	Field blank
FD	Field duplicate
FedEx	Federal Express
ft	Foot (feet)
gal	Gallon(s)
Genesis	Genesis Environmental Consulting, Inc.
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
LOQ	Limit of quantification

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

MIL-SPEC	Military specification
MS	Matrix spike
MSD	Matrix spike duplicate
NA	Not applicable
ng/L	Nanogram(s) per liter
No.	Number
OSD	Office of the Assistant Secretary of Defense
PA	Preliminary Assessment
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexane sulfonate
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PID	Photoionization detector
PVC	Polyvinyl chloride
QAPP	Quality Assurance Project Plan
QSM	Quality Systems Manual
RI	Remedial investigation
RMTA	Robinson Maneuver and Training Area
RMTC	Robinson Maneuver Training Center
SI	Site inspection
SL	Screening level
TOC	Total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VSI	Visual site inspection
WWII	World War II

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EXECUTIVE SUMMARY

The Army National Guard (ARNG) G-9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based 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) (Assistant Secretary of Defense) dated 6 July 2022. The six compounds listed in the OSD memorandum include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA)[1]. These compounds are collectively referred to as "relevant compounds" throughout the document and the applicable Screening Levels (SLs) are provided below in **Table ES-1**.

The PA identified two Areas of Interest (AOIs) where PFAS-containing materials may have been stored, disposed, or released historically. Four additional AOIs were added as a result of the scoping process (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 AOIs identified in the PA and to determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on a comparison of SI results to screening levels (SLs) for the relevant compounds. This SI was completed at the Robinson Maneuver Training Center (RMTC) in North Little Rock, Arkansas, and determined further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted for AOI 1, AOI 3, AOI 4, AOI 5, and AOI 6. RMTC will be referred to as the "Facility" throughout this document.

The Facility, operated by the Arkansas Army National Guard (ARARNG), encompasses approximately 31,900 acres in Pulaski and Faulkner counties within North Little Rock, Arkansas. First established in 1917 as Camp Pike, and later renamed to Camp Joseph T. Robinson, the Facility was used for basic training through World War II. After World War II, the Facility was declared surplus and deeded to the Arkansas State Military Department for its use as an ARNG facility. The Facility was eventually renamed RMTC and is utilized by the ARARNG for professional military education and infantry training. The Facility is located in the northeast edge of the Ouachita Mountain physiographic province and lies on the southeast corner of the Fourche Mountains. The Arkansas River is located immediately southwest of the Facility.

The PA identified two potential PFAS release areas at the Facility: the Echo Pad and All American Landing/Drop Zone (AECOM Technical Services, Inc. 2020). As a result of the SI scoping process, four additional storage areas/potential release areas were identified, including: Building 28001, Building 28002, the Wash Bay, and Building 70200/70201. The potential release areas were categorized into six separate AOIs. SI sampling results from the six AOIs were

[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.

compared to OSD SLs. **Table ES-2** summarizes the SI results for each AOI. Based on the results of this SI, further evaluation under CERCLA is warranted in a remedial investigation (RI) for AOI 1, AOI 3, AOI 4, AOI 5, and AOI 6.

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

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

Notes:
1. Assistant Secretary of Defense. July 2022. Risk Based Screening Levels Calculated for Groundwater and Soil using U.S. Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
2. 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.

µg/kg = Microgram(s) per kilogram
ng/L = Nanogram(s) per liter

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

AOI	Potential Release Area	Soil Source Area	Groundwater Source Area	Groundwater Facility Boundary	Future Action
1	Echo Pad	●	●	NA	Proceed to RI
2	All American Landing/Drop Zone	◐	◐	NA	No further action
3	Building 28001	◐	●	NA	Proceed to RI
4	Building 28002	◐	●	NA	Proceed to RI
5	Wash Pad	●	●	NA	Proceed to RI
6	Building 70200/70201	●	●	NA	Proceed to RI

Legend:
● = Detected; exceedance of SLs
◐ = Detected; no exceedance of SLs
○ = Not detected
NA = Not applicable
RI = Remedial investigation

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) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on 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 components listed in the OSD memorandum will be referred to as "relevant compounds" throughout this document and include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide-dimer acid (HFPO-DA)[2] at ARNG facilities nationwide. The ARNG performed this SI at the Robinson Maneuver Training Center (RMTC) in North Little Rock, Arkansas. RMTC will be referred to as the "Facility" throughout this report.

The SI project elements were performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (U.S. 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 Army requirements and guidance for field investigations.

1.2 SITE INSPECTION PURPOSE

A PA was performed at RMTC (AECOM Technical Services, Inc. [AECOM] 2020) that identified two Areas of Interest (AOIs) where PFAS-containing materials were used, stored, and/or disposed, or areas where known or suspected releases to the environment occurred. During scoping, four additional AOIs were added. The objective of the SI is to identify whether there has been a release to the environment from the AOIs 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.

[2] 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.

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2. FACILITY BACKGROUND

2.1 FACILITY LOCATION AND DESCRIPTION

RMTC occupies approximately 31,900 acres in Pulaski and Faulkner counties within North Little Rock, Arkansas. The Facility is approximately 2 miles north and east of the Arkansas River, 2.5 miles north and east of Little Rock, and 4 miles west of Little Rock Air Force Base (AFB). **Figure 2-1** illustrates the location of the current RMTC (AECOM 2020).

The Facility was first established in 1917 as Camp Pike and consisted of 6,000 acres, which was expanded to 48,188 acres during World War II (WWII) and renamed Camp Joseph T. Robinson. Camp Joseph T. Robinson was a basic training facility through WWII and was used to house German prisoners of war. The Facility was declared surplus after WWII and deeded to the Arkansas State Military Department for use as a National Guard facility. After the WWII expansion, approximately 16,300 acres were turned over to various public and private organizations (AECOM 2020). Currently, the Facility is used by the Arkansas ARNG (ARARNG) for professional military education and infantry training (Robinson Maneuver and Training Area [RMTA] 2001).

2.2 FACILITY ENVIRONMENTAL SETTING

RMTC is in the northeast edge of the Ouachita Mountain physiographic province and lies on the southeast corner of the Fourche Mountains. The topography is characterized as hilly, with steep east-west hog-back ridges, which were developed on the limbs of anticlines and synclines formed during the Ouachita orogeny (RMTA 2001). These ridges also enclose numerous valleys and watersheds. Locally, elevations range from 255 to 590 feet (ft) above mean sea level (amsl). The Arkansas River is located immediately southwest of the Facility (AECOM 2020).

2.2.1 Soil

The soils at RMTC are generally very low to moderately low permeability and are heavily influenced by the surrounding geology; they are composed of clays, silty clays, and some sand (RMTA 2001). Carnasaw soil complexes are abundant and include Carnasaw gravelly loam, Carnasaw-Pirum Littlefir silt loam, Olmstead silt loam, Pirum fine sandy loam, Psyam silt loam, and Purdham gravelly loam (Genesis Environmental Consulting Inc. [Genesis] 2005). The heavy clays and silt encourage runoff and prevent the development of a significant surface aquifer. The Carnasaw, Littlefir, Pirum, and Purdham soils are dominant on hills and ridges, whereas the Cato, Psyam, Olmstead, and Maumelle soils are found in valleys and depressions (AECOM 2020). Soils encountered during the SI activities consisted of interbedded sands, silty clays, and clays of varying plasticity from the Carnasaw soil complexes (RMTA 2001).

2.2.2 Geology

RMTC is located within the Ouachita Mountain physiographic province. The Ouachita mountains, which rise to 2,130 ft amsl, extend from the northwestern edge of the Mississippi Embayment, approximately 125 miles west, to the Gulf Coastal Plain in western Arkansas and Oklahoma. The Ouachita Mountain province near RMTC is characterized by Paleozoic bedrock

formations displayed and folded into east-west trending broad synclines and narrow anticlines. (McFarland 2004). Steep ridges were formed from folding and differential weathering of more resistant sandstones and less resistant shales. To the east and southeast of the Facility is the fall line between the Ouachita Mountain province and the Mississippi Alluvial Plain province, which consists of thick Quaternary alluvial layers. The local surface geological formations exposed at RMTC are described below (AECOM 2020):

- Quaternary alluvial deposits: The youngest layer at RMTC comprises Quaternary alluvium deposits of gravels, sands, silts, and clays. These deposits are the result of erosion and reworking of deposits by streams. There are also lenticular and discontinuous Quaternary terrace deposits consisting of unconsolidated gravels, sand, silts, and clays. These layers vary in thickness across the area (Genesis 2005).

- Atoka Group: Underlying the Quaternary deposits is the Atoka Formation, which is up to 25,000 ft thick and has the largest areal extent of any Paleozoic formation in Arkansas (McFarland 2004). The Atoka Group is a marine sequence of silty sandstones and black shales (McFarland 2004). The Atoka Group is subdivided into upper, middle, and lower formations based on the distinct shale and sandstone units. The Atoka Group gradually decreases in thickness to the south and conformably overlies the Johns Valley Shale, which does not outcrop at RMTC. The Atoka Group unconformably overlies the Jackfork Sandstone Group on the Facility (Genesis 2005).

- Jackfork Sandstone Group: The Jackfork Sandstone Group varies in thickness from 3,500 to 6,000 ft. It is a Pennsylvanian-age formation with fine to coarse sandstones, as well as brown silty sandstones and gray-black shales (McFarland 2004). The Jackfork Sandstone Group has been deformed during mountain building processes similar to other formations in the area. The Jackfork Sandstone is known to host lead- and zinc-bearing quartz veins (Arkansas Geological Survey 2011).

During the SI, unconsolidated silts, sands, and clays and their diagenetic analogs were observed as the dominant lithology below RMTC. The borings were completed at depths between 4.5 and 20 ft below ground surface (bgs). Layers of poorly graded and clayey sand with fat and lean clay lenses of varying thickness and fill material including asphalt and rock were encountered during drilling. Samples for grain size analyses were collected at four locations, AOI01-01, AOI02-04, AOI03-02, and AOI05-02, and analyzed via American Society for Testing and Materials (ASTM) Method D-422. The results indicate that the soil samples are comprised primarily of silt (48.7 [percent] % to 65.6%) and clay (23% to 34%).

2.2.3 Hydrogeology

Groundwater on RMTC occurs primarily in fractures, joints, and other openings in the shale and sandstone units. Based on drilling logs from monitoring wells installed at the Facility, shallow bedrock can occur from as little as 8 inches to 48 ft bgs (Genesis 2005). The overburden above bedrock generally consists of clay or silty clay, which impedes the development of a significant surface aquifer. The fractures and secondary openings of the sandstone and shale units can yield

water; however, wells are generally less than 300 ft deep and produce less than 10 gallons (gal) per minute (Genesis 2005).

The water table generally mimics surface topography (**Figure 2-2**), and the generalized flow direction in the northern half of the Facility is to the southwest and in the southern half to the northeast, although some local variations exist across the Facility and surrounding the AOIs (Genesis 2005). This generally correlates with the direction of groundwater flow (**Figure 2-3**). The Facility and the majority of Central Arkansas receive potable water from Central Arkansas Water via surface water intakes at Lake Maumelle (URS Group, Inc. and Arcadis 2013). Groundwater is not used for any purposes at RMTC but may be present at shallow occurrences (less than 6 ft bgs). Multiple facility monitoring wells surround two operational range areas that are depicted in the PA (AECOM 2020).

Depths to groundwater encountered during the SI (October 2021) were recorded to be between 0.2 to 18.8 ft bgs. Groundwater flow direction, based on observed groundwater elevations during the SI activities, varied by location. It should be noted that during sample collection groundwater elevations could be off slightly due to settlement and placement of the stadia rod during surveying. Final depth to water measurements at all locations used for potentiometric maps and tables were collected after surveying had been completed, so these elevations were not affected and are therefore correct.

Groundwater flow direction at the Robinson Army Airfield (AOIs 1, 3, 4, and 5) follows facility topography and generally flows east along a centrally located groundwater divide (**Figure 2-4**). Soil encountered during drilling was generally comprised of layers of tight silt and clay lenses and poorly graded sands, which limits groundwater flow.

Groundwater generally flows to the southeast at AOI 2 (**Figure 2-5**). Soil encountered during drilling was comprised of tight clays and silts. Well recharge during drilling was very slow.

Groundwater generally flows to the east/southeast at AOI 6 (**Figure 2-6**); however, based on the linear distribution of the groundwater elevation data collected at AOI 6, groundwater flow direction may not be entirely accurate at this location. Shallow groundwater likely follows topography, which decreases in elevation to the south. According to base personnel, in order to elevate building 70200/70201 (Camp Robinson Fire Department [CRFD] Building), fill was placed prior to construction. Soil encountered during drilling was comprised of low permeable silts, clays, and clayey and silty sands.

Groundwater is used as a potable water source east of the fall line, which delineates the contact between local bedrock and the thick alluvial deposits of the Mississippi Alluvial Plain province. These alluvial sequences are very thick and yield significant amounts of high-quality groundwater. Several municipalities outside of a 4-mile radius and east of RMTC use these for potable water. However, these wells are drilled into the Sparta aquifer, which is a very deep (600 to 1,000 ft bgs) confined aquifer not hydraulically connected to geologic formations underlying the Facility (URS Group, Inc. and Arcadis, 2013).

2.2.4 Hydrology

There are several streams, both perennial and intermittent, that drain surface water at RMTC (**Figure 2-7**). Because of the anticline-syncline structures, surface drainage is circuitous at RMTC. In the northern half of the Facility, Clifton Mountain acts as a barrier and directs surface water flow into Jim Creek and Mile Creek (and an unnamed smaller tributary), which merge and drain into the wetlands surrounding the 1.5-square-mile Grassy Lake (also known as Clear Lake) (RMTA 2001). These streams may flow intermittently during drier periods (AECOM 2020).

South of Clifton Mountain, Leopard Creek drains the eastern half of the Facility, and an unnamed stream drains west to Tupelo Gum Pond and a wetland area. White Oak Bayou flows westward and eventually drains into the Arkansas River after passing through several low wetland areas and Devoe Lake. The cantonment area is drained by several small unnamed streams and drainage ditches into Engineers Lake. This lake is drained by Five Mile Creek, which then flows easterly toward Trammel Lake (RMTA 2001).

Drainage swales and Outfalls 001 through 005 surround the outer perimeter of the Robinson Army Airfield, leading to neighboring tributary creeks of the Arkansas River. Swales surrounding the Echo Pad (AOI 1) are connected to Outfalls 004 and 005. Swales and stormwater collector pipes surrounding Building 28001 (AOI 3) discharge primarily to Outfall 001 (draining the paved areas surrounding the building) and to a lesser extent Outfall 002 (draining northwest of the building). Building 28002 (AOI 4) and the Wash Bay (AOI 5) are also connected to Outfall 001. Outfalls 001, 002, and 004 drain to Newton Creek and White Oak Bayou before intersecting with the Arkansas River, located 14 miles away. Outfall 005 drains to Spring Creek, Miles Creek, Kellogg Creek, and Bayou Meto before intersecting with the Arkansas River.

Surface runoff near the All American Landing/Drop Zone (AOI 2) drains southeasterly, eventually discharging to the Arkansas River. Surface runoff at the Fire Station (AOI 6) drains by sheet flow into nearby swales, diverting the water south to an unnamed ephemeral stream and eventually discharging to Shilcotts Bayou and the Arkansas River at Greathouse Bend.

Runoff is relatively rapid and excessive when there is heavy rainfall because of shallow bedrock and relatively impermeable clay soils. Shallow groundwater levels are influenced by surface water leakage; however, when compared to the volume of surface water runoff, the shallow clays restrict the infiltration of water. Locally, the streams and creeks exiting RMTC are small, muddy, and slow flowing. Several streams exiting RMTC, observed during a 2013 Operational Range Phase I site visit (URS Group, Inc. and Arcadis 2013), were slow flowing, likely due to the dry weather, and could conceivably stop flowing during drought and near-drought conditions. Off-facility wetland geographic information system data were unavailable from the U.S. Fish and Wildlife Service; however, wetlands data were available from the Arkansas State Transportation Department. There are wetlands in and around RMTC in localized areas near surface water (such as Five Mile Creek) and to the east where Kellogg, Miles, and Spring Creeks discharge on the Arkansas River floodplain. Several sewage disposal ponds are located in the wetlands approximately 4 miles southeast of the Facility. Kellogg and Woodruff creeks pass near sewage disposal areas before eventually entering the Arkansas River. Surface water features, including

streams and their flow direction, lakes, watersheds, ponds, and wetlands, are shown in **Figure 2-7** (AECOM 2020).

2.2.5 Climate

The climate of the RMTC area is characterized by hot summers and moderately cool winters. The average high temperature for the summer is 91 degrees Fahrenheit, and the average winter low temperature is 35 degrees Fahrenheit. The area receives an average of 50 inches of precipitation throughout the year. Generally, the heaviest rains are in the spring, and the driest months are from July to September, during which minor droughts occasionally occur. Severe thunderstorms and tornadoes can occur during the late spring and early summer months. RMTC receives an average of 4.4 inches of snowfall per year (National Weather Service 2019).

2.2.6 Current and Future Land Use

The Facility is used by the ARARNG for professional military education and infantry training on its three primary range areas. There are 26 areas used for non-live-fire maneuver training. The maneuver and training ranges are north of the cantonment area and cover most of the Facility. The Robinson Army Airfield is the military airfield within RMTC, where AOIs 1, 3, 4, and 5 were identified. The airfield is located west of the cantonment area and south of the mountain biking trail system (Little Rock Convention and Visitors Bureau 2022), and it contains an Army Aviation Support Facility (AASF). RMTC is also used for Arkansas National Guard administrative, logistical, and maintenance directorates. Reasonably anticipated future land use is not anticipated to change from the current land use (AECOM 2020). The Facility is enclosed within fencing and access is restricted, however recreational users can access mountain biking trails and hunting areas.

2.2.7 Sensitive Habitat and Threatened/Endangered Species

Wildlife surveys have been conducted at RMTC; one was completed from 19 April – 30 July 1999 (George Miksch Sutton Avian Research Center 2022). The Facility has significant areas of habitat; however, none are considered critical habitats.

The following species are listed as federally endangered, threatened, proposed, and/or candidate species in Pulaski and Faulkner counties, Arkansas (U.S. Fish and Wildlife Service 2022), although these species have not been observed at RMTC:

- Birds: Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*) – Federally Threatened; Piping Plover (*Charadrius melodus*) – Federally Threatened; and Red Knot (*Calidris canutus rufa*) – Federally threatened

- Clams: Arkansas Fatmucket (*Lampsilis powellii*) – Federally Threatened; Pink Mucket (pearlymussel, *Lampsilis abrupta*) – Federally Endangered; Rabbitsfoot (*Quadrula cylindrica cylindrica*) – Federally Threatened; and Winged Mapleleaf (*Quadrula fragosa*) – Federally Endangered

- Insects: Monarch Butterfly (*Danaus plexippus*) – Federal Candidate

- Mammal: Indiana Bat (*Myotis sodalist*) – Federally Endangered; and Northern Long-eared Bat (*Myotis septentrionalis*) – Federally Threatened.

2.3 HISTORY OF PFAS USE

Two potential PFAS release areas were identified at RMTC during the PA at locations where aqueous film-forming foam (AFFF) may have been used or released historically (AECOM 2020). Four additional potential release areas/storage areas were identified and added during the scoping of the SI. Interviews and records obtained during the PA indicate that fire training activities were conducted, from as early as 2006 until 2018, with AFFF at the Echo Pad located in the Robinson Army Airfield. Additionally, three separate facilities located within the Robinson Army Airfield (Building 28001, Building 28002, and the Wash Bay) have historically stored AFFF within their fire suppression systems and two have had known releases of their contents. In addition to these areas, firetrucks capable of holding AFFF have also been staged within the RMTC at two additional locations, the All American Landing/Drop Zone and Buildings 70200/70201 (Fire Station). Due to the corrosive nature of AFFF and the potential for leaks, these locations are also considered potential release areas.

A description of each AOI is presented in **Section 3**.

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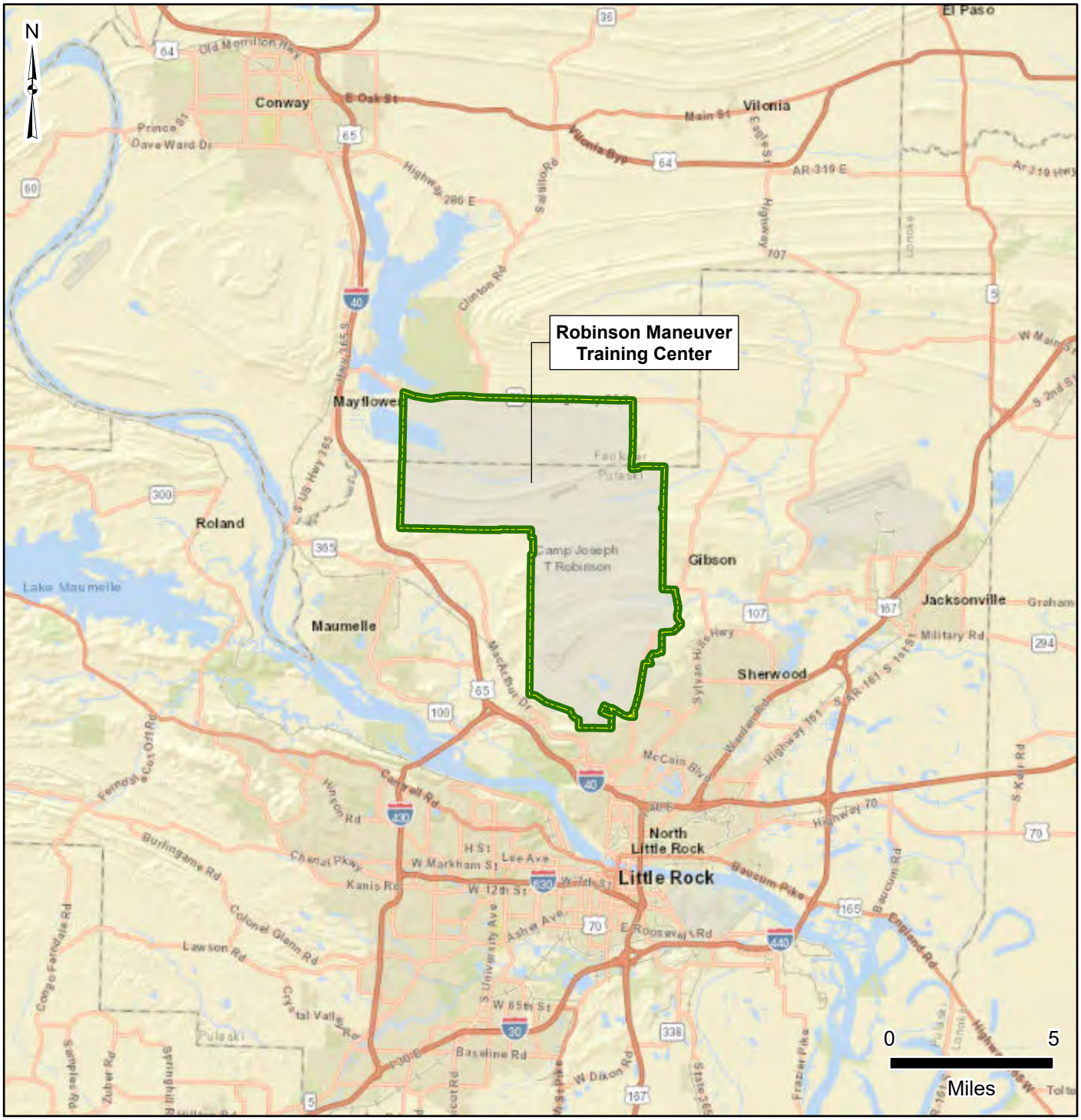
Figure 2-1
Facility Location



Facility Data

Facility Boundary

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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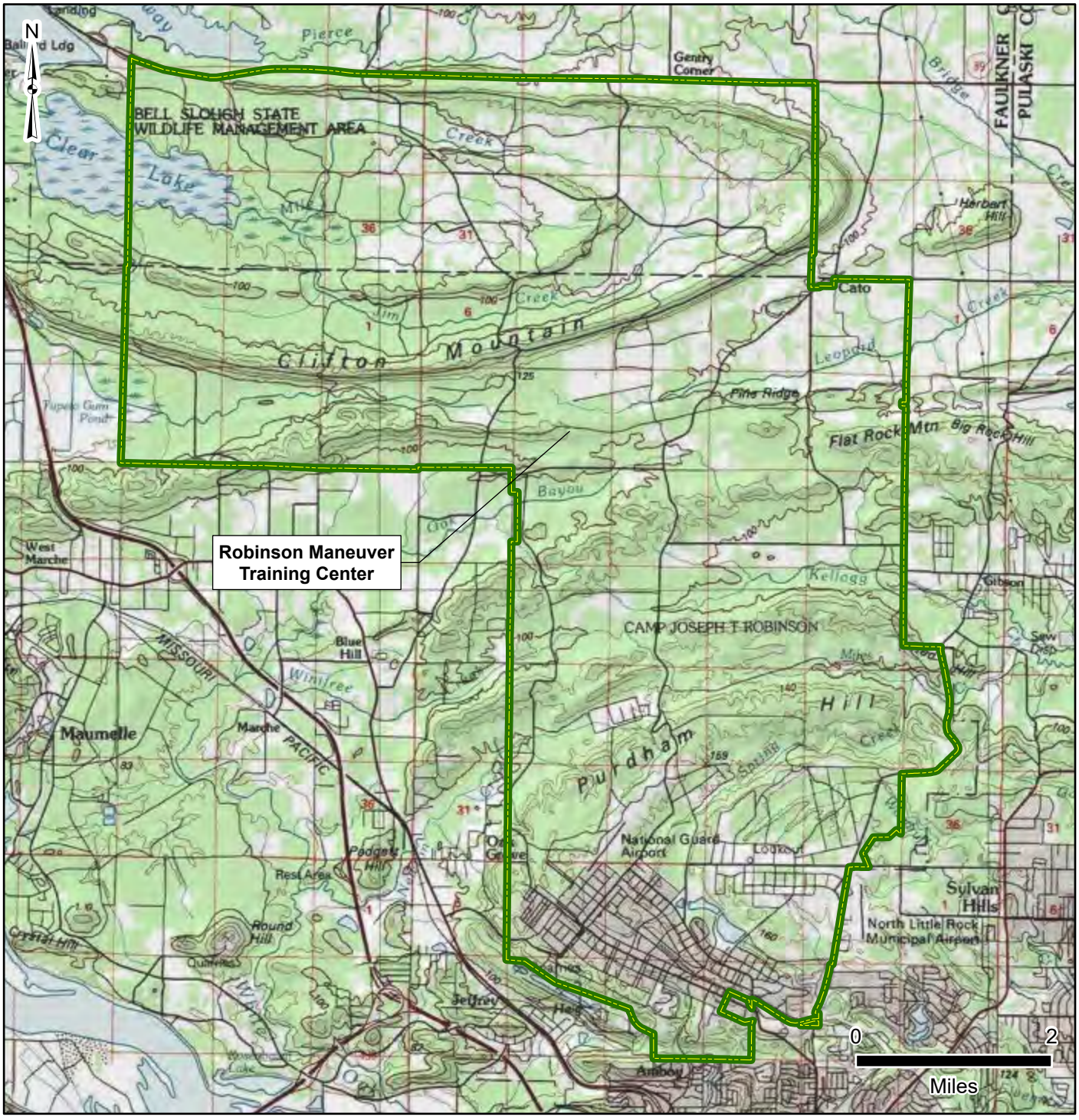
Robinson Maneuver Training Center, Arkansas

Figure 2-2
Facility Topography



Facility Data

Facility Boundary

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
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Projection:.....WGS 84 UTM 15N

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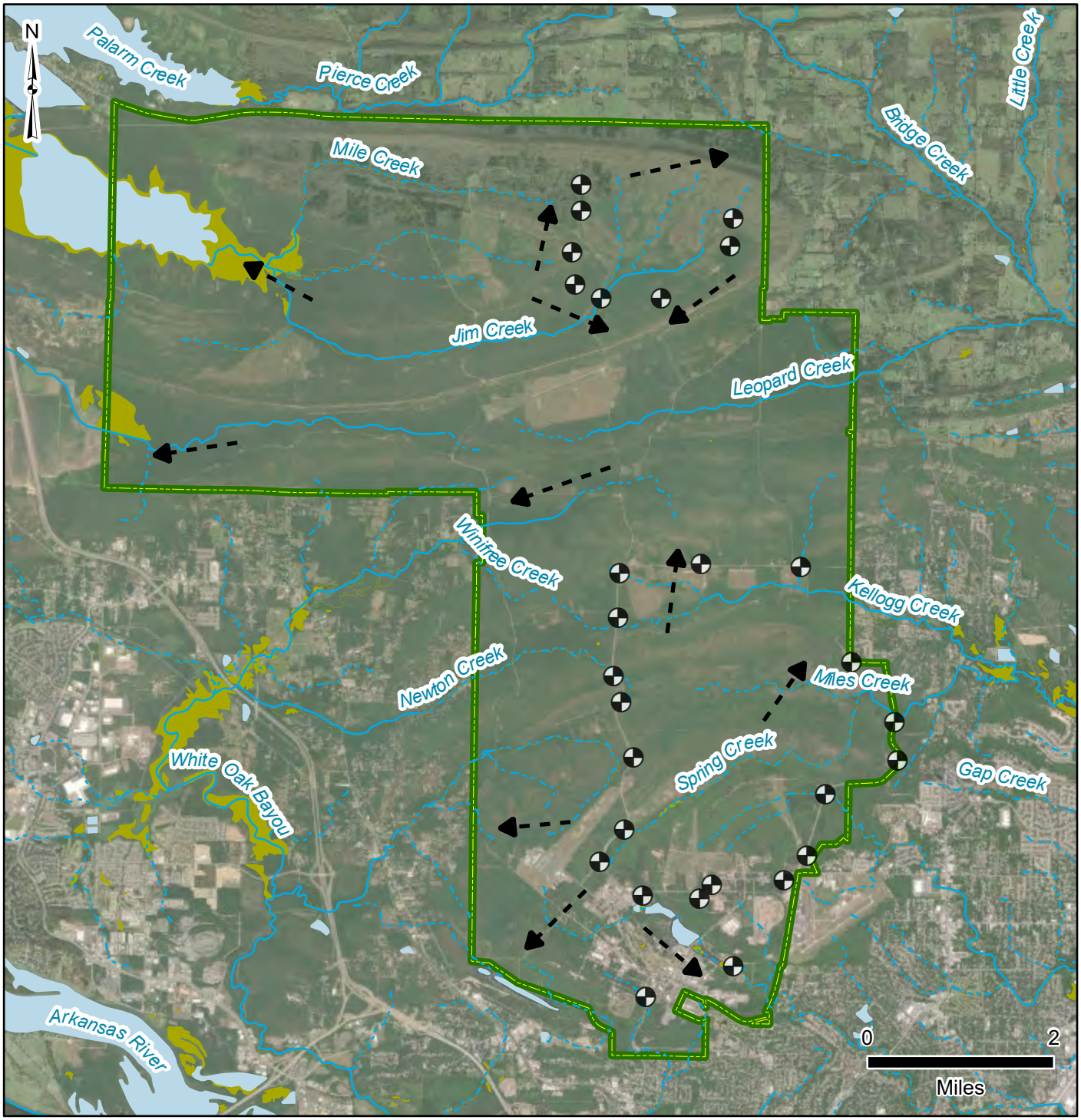
Figure 2-3
Groundwater Features



Facility Data
- Facility Boundary

Well Type
- Monitoring Well

Hydrology/Hydrogeology
- Inferred Groundwater Flow Direction
- Perennial Creek/Stream
- Intermittent Creek/Stream
- Wetlands

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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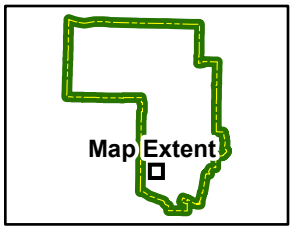
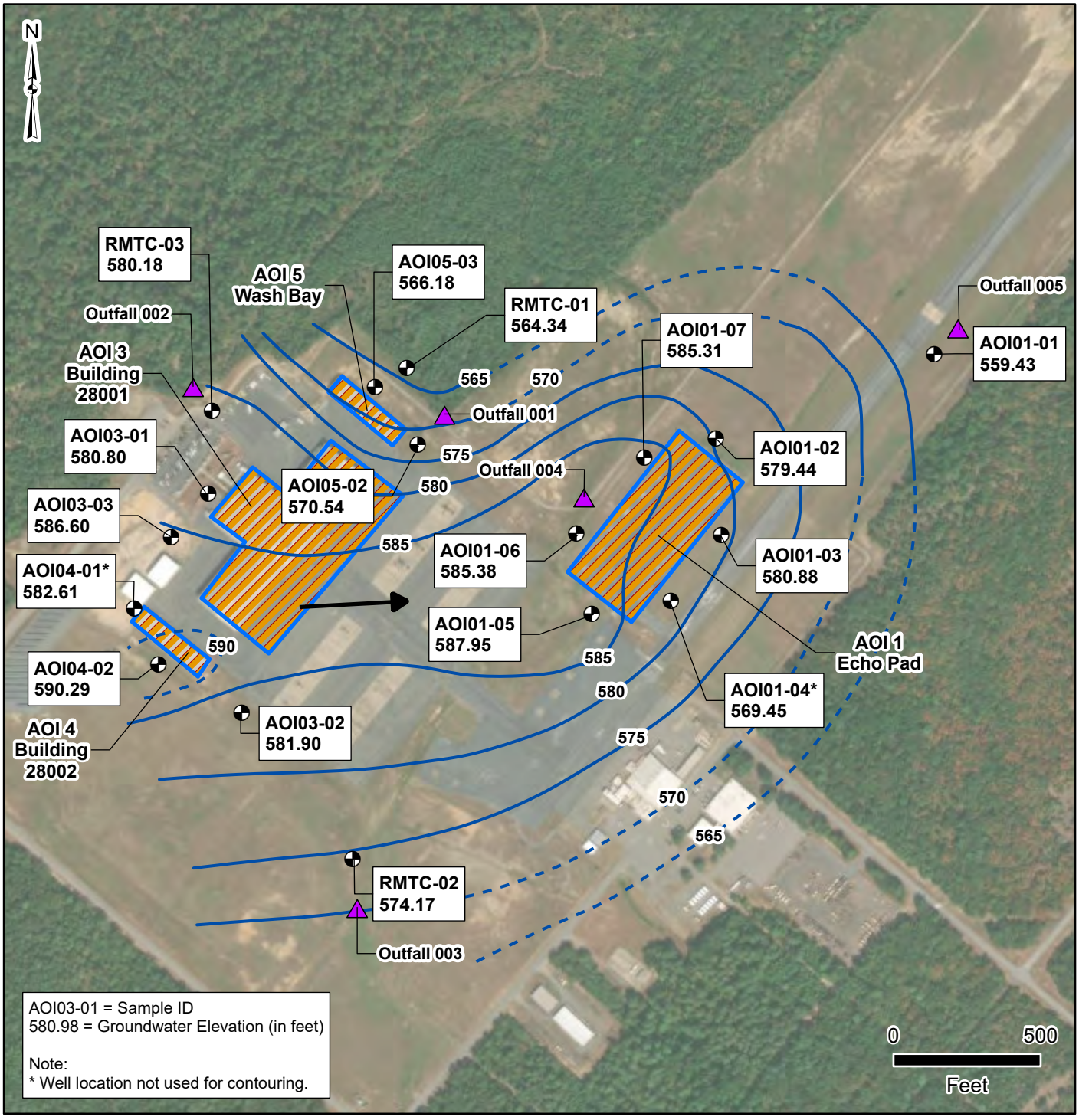
Figure 2-4
AOI 1, AOI 3, AOI 4 and AOI 5
Groundwater Elevations





Facility Data

- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology

- Well Location
- Groundwater Flow Direction
- Groundwater Elevation Contour (5 foot interval)
- Dashed where inferred

Data Sources:
ESRI 2022
AECOM 2019

Date:.....May 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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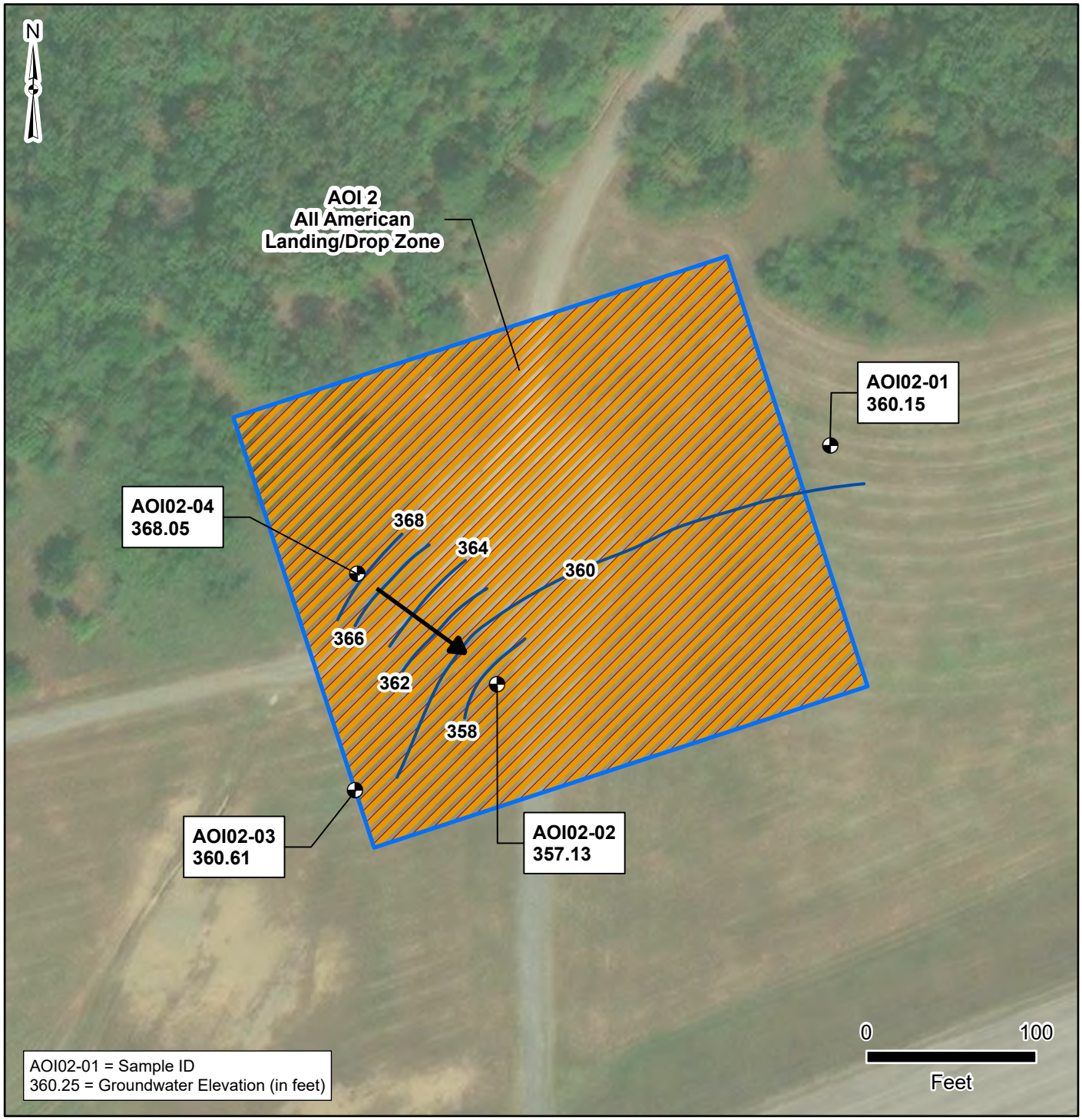
Figure 2-5
AOI 2
Groundwater Elevations



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Well Location
- Groundwater Flow Direction
- Groundwater Elevation Contour (2 foot interval)

Data Sources:
ESRI 2022
AECOM 2019

Date:.....May 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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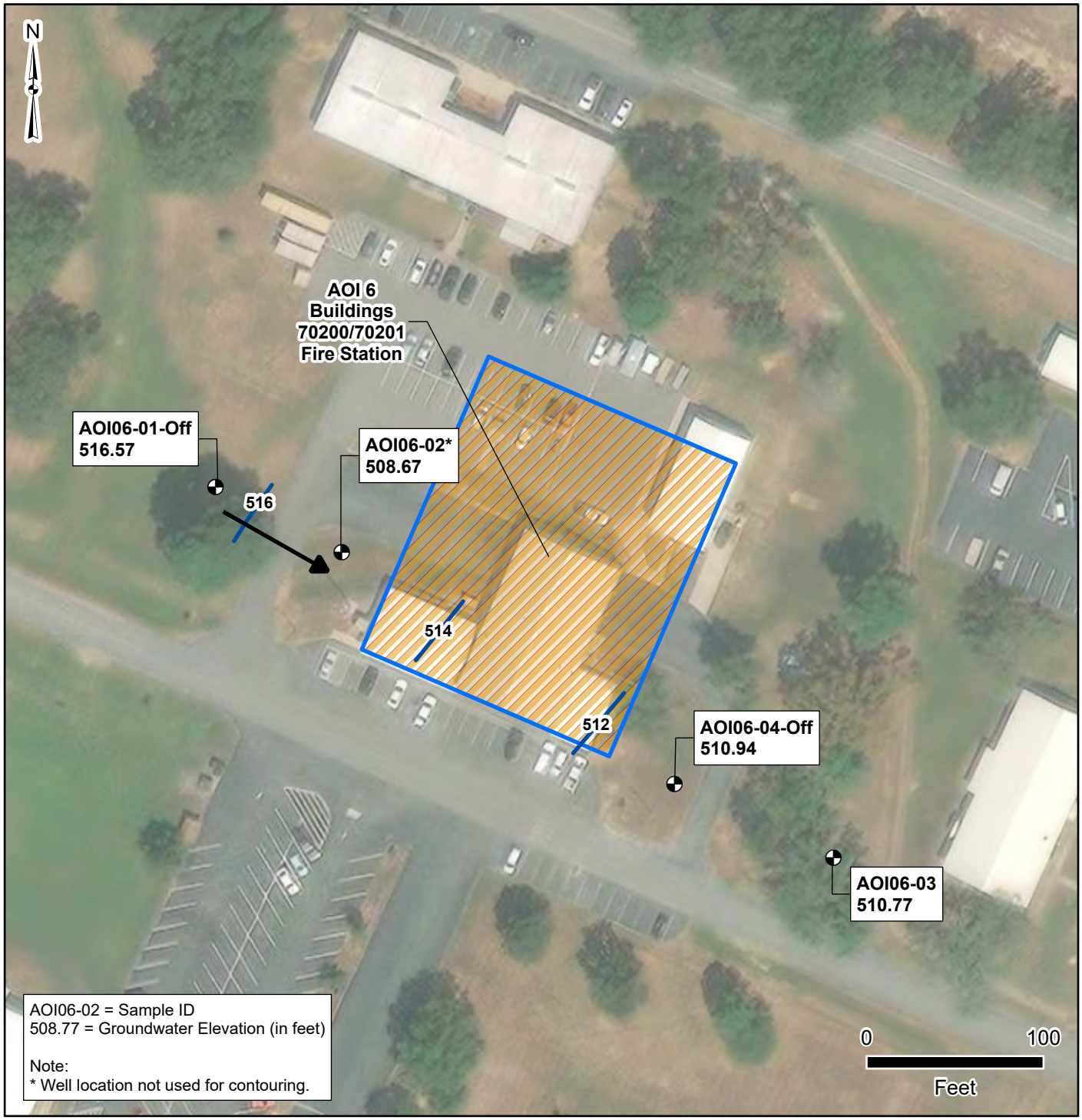
Figure 2-6
AOI 6
Groundwater Elevations



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Well Location
- Groundwater Flow Direction
- Groundwater Elevation Contour (2 foot interval)

Data Sources:
ESRI 2022
AECOM 2019

Date:.....May 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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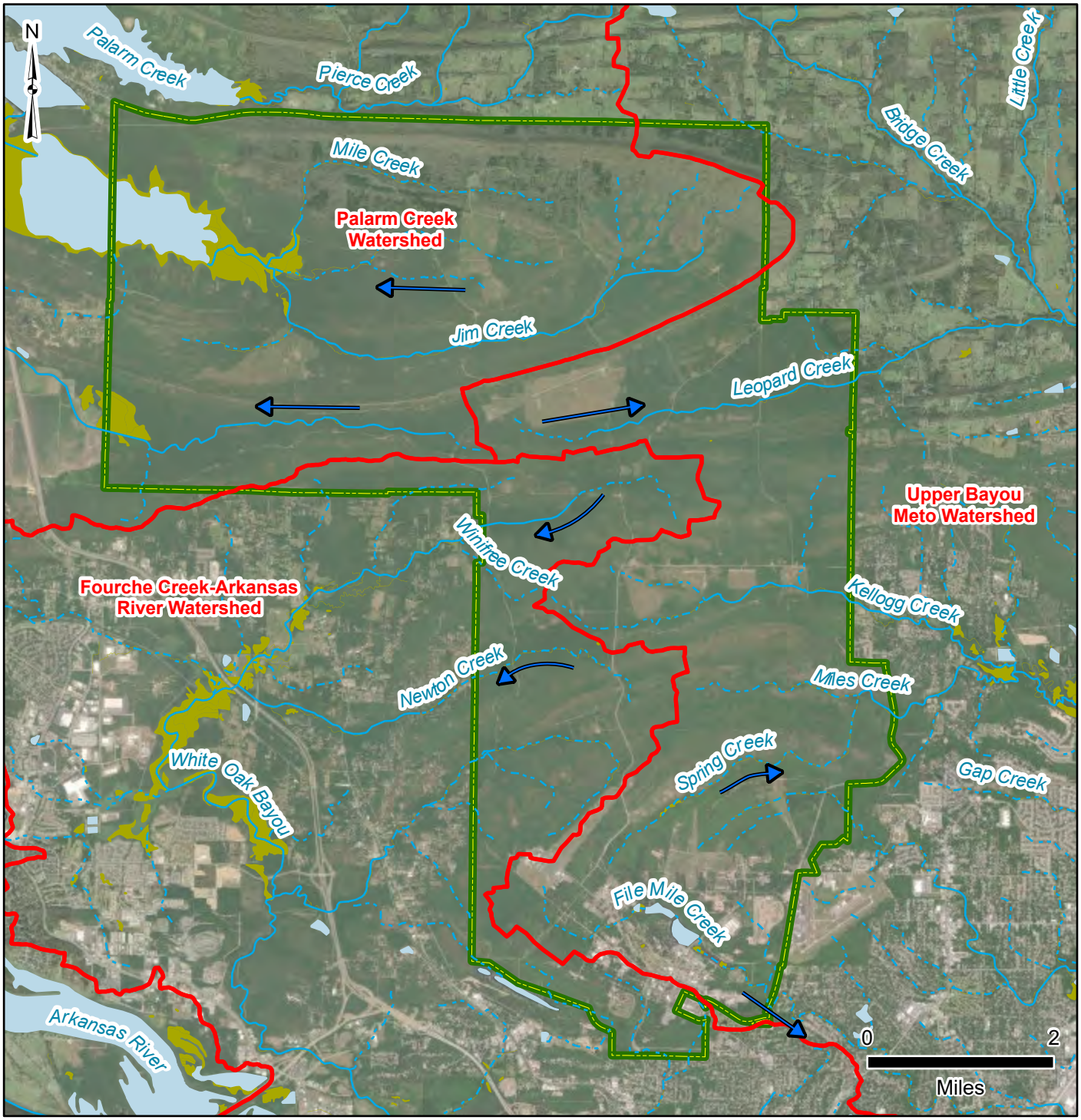
Figure 2-7
Surface Water Features



Facility Data
- Facility Boundary

Hydrology
- Surface Water Flow Direction
- Perennial Creek/Stream
- Intermittent Creek/Stream
- Waterbody
- Wetlands
- Watershed Boundary

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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3. SUMMARY OF AREAS OF INTEREST

The PA evaluated areas where PFAS-containing materials may have been used, stored, disposed, or released historically. AFFF storage areas, and areas of compliance demonstrations. Six AOIs were identified at the Facility: AOI 1 – Echo Pad, AOI 2 – All American Landing/Drop Zone, AOI 3 – Building 28001, AOI 4 – Building 28002, AOI 5 – Wash Pad, and AOI 6 – Building 70200/70201. Two of the AOIs were designated as AOIs in the PA and four more AOIs were added based on either a recorded PFAS release or storage. The potential AOIs are shown on **Figure 3-1**.

3.1 AOI 1 – ECHO PAD

AOI 1 consists of the Echo Pad, an approximately 4-acre aircraft, asphalt ramp/pad located at the Robinson Army Airfield. The pad was historically used for aircraft parking and fire training activities but is currently unused. The AASF Fire Chief reported that 3% AFFF of varying brands was used during the fire training activities. Activities at the Echo Pad involved extinguishing live burns, pump and roll exercises, and nozzle testing on mock vehicles at an approximately annual frequency. The most recent event using AFFF was a nozzle testing exercise that occurred in November 2018. Prior to that event, fire training did not occur in the past 5 years, and the last large-scale fire training event occurred approximately 13 years ago, when the AASF Fire Chief started his tenure at the Facility. It is unknown when fire training activities began and what might have occurred prior to the tenure of the current AASF Fire Chief (AECOM 2020).

During a large-scale fire training event, personnel would spray the entire pad with AFFF. An estimated 45 gal of AFFF would be discharged from an old firetruck with a 60-gal foam tank capacity. Typically, smaller-scale fire training events involved discharging AFFF in short bursts from the nozzle. All AFFF discharged on the Echo Pad was typically hosed down afterwards with water, and the runoff would drain radially from the pad (AECOM 2020).

During the visual site inspection (VSI) of the Echo Pad, conducted as part of the PA, multiple cracks were observed throughout the pavement. A mock vehicle and Conex box were also observed stationed at the northern corner of the Echo Pad, where it was indicated that personnel would practice target spraying of the firehose. Drainage swales surround most of the Echo Pad and connect to Outfalls 004 and 005, which drain to the north and to the southeast, respectively, to tributary creeks of the Arkansas River (AECOM 2020). The outfall locations are shown on **Figure 2-4**.

3.2 AOI 2 – ALL AMERICAN LANDING/DROP ZONE

AOI 2 consists of the All American Landing/Drop Zone, an approximately 471-acre property leased to the Department of the Air Force since 1996. The property contains two adjacent runways and is used by the Little Rock AFB for touch-and-go landing exercises. One Little Rock AFB firetruck with a 210-gal AFFF capacity and one water tender are typically stationed in a gravel parking area along the northern runway during touch-and-go exercises. Both the Camp Robinson Fire Department (CRFD) Fire Chief and Little Rock AFB Fire Chief stated that no activities or emergency responses involving AFFF discharge by either the Little Rock AFB or

CRFD have occurred within the area. The Little Rock AFB Fire Chief additionally stated he has not observed any AFFF leakage from the firetruck during his tenure of 32 years. However, according to the 2015 PFAS PA report for Little Rock AFB, the Little Rock AFB firetrucks have been known to occasionally leak AFFF due to the corrosive nature of the material (AECOM 2020).

3.3 AOI 3 – BUILDING 28001

AOI 3 consists of Building 28001, the current AASF operational building located at the Robinson Army Airfield. The building serves as a hangar and fire station and is equipped with an AFFF fire suppression system. The fire suppression system is connected to a 1,400-gal tank that currently contains Ansulite 3% AFFF Mil Spec C6 foam (AECOM 2020).

According to the AASF Fire Chief, two aircraft rescue and firefighting (ARFF) vehicles contain 3% AFFF of varying brands and remain parked at the AASF fire station. Vehicles ARFF-1 and ARFF-2 have foam capacity tanks of 100 gal and 30 gal, respectively. These vehicles were reportedly filled with AFFF in front of the fire station. Minimal spills occasionally occurred in the process of refilling the ARFF vehicles; however, the AASF Fire Chief stated that spill pads were always placed underneath the vehicles when being serviced. The spill pads were double-bagged and then disposed of into a dumpster (AECOM 2020).

Annual testing on the fire suppression system is performed by a contractor and involves equipment checks of pressure gauges. No false trips have occurred since the building construction and installment of the system in 2006. The AFFF tank was serviced most recently in January 2019, when the contractor changed out the original contents of the tank from Chemguard 6% AFFF C-601MS foam to Ansulite 3% AFFF Mil Spec C6 foam (AECOM 2020).

During the PA VSI, rust staining with white residue was observed on the concrete floor of the fire suppression system tank room, leading into a floor drain. RMTC personnel stated that the staining was most likely from water leaks, but an AFFF leak was possible. The floor drain is connected to the Facility wastewater treatment plant. All fire extinguishers observed within the building and in the immediate vicinity of the building were dry chemical fire extinguishers (non-AFFF) (AECOM 2020).

During a teleconference conducted on 19 February 2021 for the scoping of the SI, ARARNG personnel indicated that, in 2018, the AFFF tank was discovered to be only 15–20% full due to a leak in the tank bladder system. This leak allowed AFFF to enter the pressurized water source for the fire hydrants. As a result, when a nearby fire hydrant was opened in 2018, AFFF foam (Chemguard 6% AFFF) was released into the environment. A company was then contracted to drain the AFFF tanks, dispose of the foam (off-site), repair the leak, and retrofit the tanks with the Ansulite 3% AFFF Mil Spec C6 foam the tank is currently equipped with. A release located near the fire hydrant (located west of Building 28001) would discharge to Outfall 002 via stormwater collector pipes. ARARNG staff verified that the hydrant water supply is isolated from potable water lines via backflow preventors.

3.4 AOI 4 – BUILDING 28002

AOI 4 consists of Building 28002, an aircraft hangar located at the Robinson Army Airfield. The building has a fire suppression system connected to one 1,100-gal tank containing 3% AFFF of the brand Ansulite (AECOM 2020).

Annual testing on the fire suppression system is performed by a contractor and involves equipment checks of pressure gauges. No false trips have occurred since the building construction and installation of the system in 2006. The AFFF tanks were serviced most recently in January 2019, when the contractor changed out the contents of the tank from Chemguard 6% AFFF C-601MS foam to Ansulite 3% AFFF Mil Spec C6 foam (AECOM 2020).

During the PA VSI, the fire suppression system tank room was found to have an active drip leak of AFFF from an overhead pipe. The AFFF was pooled in the area surrounding the AFFF tank. However, the spillage remained contained within the room as there were no floor drains or cracks in the concrete floor. Repair services were requested by RMTC and the day following the site visit, a contractor used a suction truck to remove all the waste AFFF and capped the leaking pipe (AECOM 2020).

3.5 AOI 5 – WASH BAY

AOI 5 consists of the Wash Bay, located at the Robinson Army Airfield. The building contains a wash rack and is reportedly the Site where all the AFFF 5-gal buckets were historically and are currently stored for the entire Facility. An AFFF tote weighing 2,150 pounds was also received from Little Rock AFB and stored temporarily in the Wash Bay. The tote was turned in unused shortly afterwards in August 2017 to the Defense Reutilization and Marketing Office (AECOM 2020).

The AASF Fire Chief estimated that approximately 210 gal of 3% AFFF have been acquired over time and stored either in 5-gal buckets or in ARFF vehicles. Miscellaneous 3% AFFF brands in small quantities were often turned into the Defense Reutilization and Marketing Office unused to avoid mixing different brands of AFFF together. The AFFF buckets were not known to have leaked or spilled in the Wash Bay and were only used to refill the ARFF vehicles at Building 28001 (AECOM 2020).

During the VSI, eight 5-gal buckets of Class A foam were observed in storage at the Wash Bay building. There was no evidence of AFFF storage despite reports of current storage (AECOM 2020).

During the teleconference conducted for the scoping of this SI on 19 February 2021, ARARNG personnel indicated that the building containing the Wash Bay also contains a fire suppression system connected to one 1,100-gal AFFF tank. The foam in this tank was replaced with Ansulite 3% AFFF Mil Spec C6 foam in 2019 (at the same time as the other associated AASF tanks).

On 24 January 2022, ARNG reported that a release of AFFF was discovered at AOI 5, which had resulted from a compressor malfunction with the 1,100-gal AFFF tank. The quantity of AFFF released is unknown. The release filled the tank room and leaked into the adjoining

warehouse/hangar, where the spill was released into the environment via the overflow pipe. The release extended to the northwest and northeast of AOI 5, reaching northeast and downhill across the adjacent dirt road. The area affected was roughly from SI sample location AOI05-01 down to approximately 50 yards from SI sample location RMTC-01. The release was the result of a compressor malfunction with the tank, as such the quantity of AFFF released is unknown since the contents remaining in the tank cannot be verified. A clean-up occurred 25 through 26 January 2022, where approximately 200 cubic yards of contaminated soil were removed and placed into ten 20-yard environmental dumpsters (**Appendix A)**. The soil has been accepted for disposal at a Subtitle C landfill.

3.6 AOI 6 – BUILDING 70200/70201

AOI 6 consists of Building 70200/70201, the Fire Station. The CRFD occupies two buildings (Buildings 70200 and 70201) within the cantonment area. Various fire response vehicles are housed within the two buildings. According to the CRFD Fire Chief, whose tenure extends 13 years, AFFF has never been stored within Buildings 70200 and 70201, and only Class A foam of the brand Chemguard was observed during the VSI. The CRFD Fire Chief stated that only Fire Engine 500, stationed at Building 70200, may contain AFFF within its 5-gal capacity foam tank, and it has not been known to leak AFFF. Neither fire training activities nor nozzle testing have occurred with any fire response vehicles stationed in Buildings 70200 and 70201 (AECOM 2020).

3.7 ADJACENT SOURCES

Two potential off-facility sources of PFAS are adjacent to the Facility and are not under the control of the ARARNG. A description of each off-facility source is presented below and shown on **Figure 3-1**.

3.7.1 Little Rock Air Force Base

Little Rock AFB is located approximately 4 miles east of RMTC and occupies 6,128 acres in Pulaski County. Operations related to the use and/or storage of AFFF have historically occurred at various locations in Little Rock AFB. A 2015 PFAS PA report for Little Rock AFB recommended 13 locations for additional PFAS investigation based on the findings of the PA (AECOM 2020).

The Little Rock AFB SI was conducted in 2019 (Amec Foster Wheeler Programs, Inc. 2019) and recommended 12 locations to undergo RIs due to exceedances of PFOS and PFOA (separately or combined) in groundwater or surface water. Due to the distance, groundwater flow patterns, and the variable topography characterized by steep ridges and river valleys, it is unlikely that groundwater at RMTC is impacted by the storage or use of AFFF at Little Rock AFB.

3.7.2 North Little Rock Municipal Airport

The North Little Rock Municipal Airport is located immediately east of the RMTC cantonment area. North Little Rock Municipal Airport personnel were not interviewed during the PA because the focus of the assessment was to evaluate potential PFAS-related activities and sources at

ARARNG properties. Therefore, it is not known if AFFF is used or stored at the airport currently or historically. However, because AFFF is commonly used at airports, the North Little Rock Municipal Airport has been identified as a potential off-site PFAS source area (AECOM 2020). North Little Rock Municipal Airport is considered cross-gradient of RMTC.

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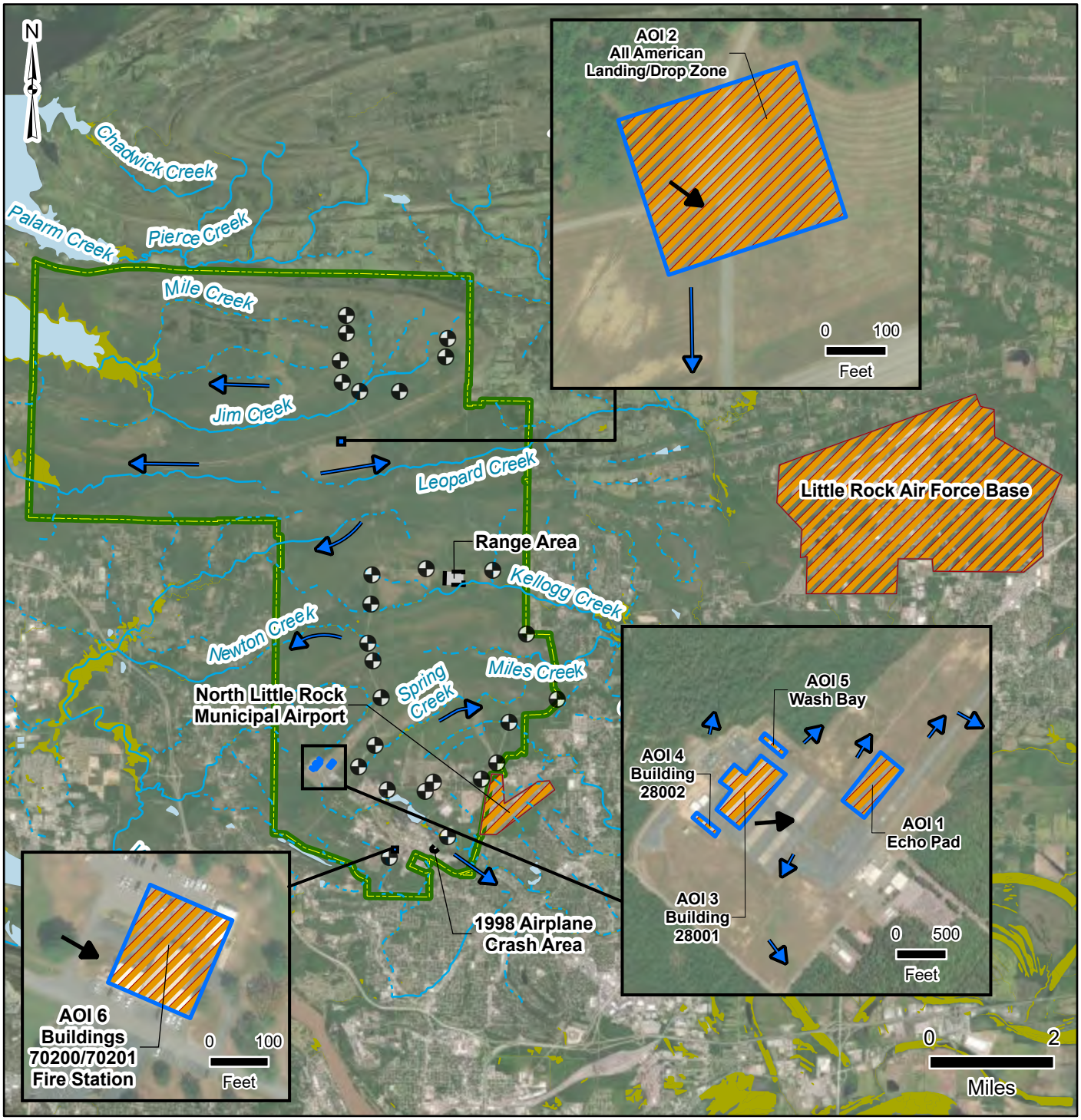
Figure 3-1
Areas of Interest



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release
- No Suspected Release

Well Type
- Monitoring Well

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction
- Perennial Creek/Stream
- Intermittent Creek/Stream
- Waterbody
- Wetlands

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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4. PROJECT DATA QUALITY OBJECTIVES

As identified during the data quality objective (DQO) process and outlined in the SI Uniform Federal Policy- (UFP) Quality Assurance Project Plan (QAPP) Addendum (EA Engineering, Science, and Technology, Inc., PBC [EA] 2021a), the objective of the SI is to identify whether there has been a release to the environment at the AOIs 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 AOIs.

4.1 PROBLEM STATEMENT

ARNG will recommend AOIs for remedial investigation (RI) if site-related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based screening levels. The SLs are presented in **Section 6.1** of this report.

4.2 INFORMATION INPUTS

Primary information inputs for the SI include the following:

- The PA Report for RMTC (AECOM 2020)
- Analytical data collected during other environmental sampling efforts at RMTC
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific UFP-QAPP Addendum (EA 2021a)
- Field data collected including groundwater elevation and water quality parameters measured at the time of sampling.

4.3 STUDY BOUNDARIES

The scope of the SI was bounded horizontally by the property limits of the Facility (**Figures 2-1 and 2-2**). The scope of this SI was bounded vertically by the occurrence of the shallow groundwater, approximately 10 ft bgs. 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). Temporal boundaries were limited to the earliest available time field resources were available to complete the study.

4.4 ANALYTICAL APPROACH

Samples were analyzed by Eurofins Lancaster Laboratories Environmental, LLC, accredited under the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP); Accreditation No. 1.01). PFAS data underwent 100% Stage 2B validation in accordance with the DoD General Data Validation Guidelines (2019) and DoD Data Validation Guidelines

Module 3: Data Validation Procedure of Per- and Polyfluoroalkyl Substances Analysis by Quality Systems Manual (QSM) Table B-15 (2020).

Data were compared to applicable SLs and decision rules as defined in the UFP-QAPP Addendum (EA 2021a).

4.5 DATA USABILITY ASSESSMENT

The Data Usability Assessment (DUA), which is provided in **Appendix B**, 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, 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 UFP-QAPP Addendum (EA2021a).

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 was implemented in accordance with the following approved documents:

- *Final Preliminary Assessment Report, Robinson Maneuver Training Center, North Little Rock, Arkansas*, dated March 2020 (AECOM 2020)
- *Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan, Site Inspections for Per- and Polyfluoroalkyl Substances Impacted Sites, ARNG Installations, Nationwide*, dated December 2020 (EA 2020a)
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Robinson Maneuver Training Center, North little Rock, Arkansas*, dated October 2021 (EA 2021a)
- *Final Programmatic Accident Prevention Plan, Revision 1*, dated November 2020 (EA 2020b)
- *Final Accident Prevention Plan / Site Safety and Health Plan Addendum, Robinson Maneuver Training Center, North Little Rock, Arkansas*, dated August 2021 (EA 2021b).

The SI field activities were conducted from 18 to 29 October 2021 and consisted of utility clearance, sonic boring soil sample collection, temporary monitoring well installation, grab groundwater sample collection, water level measurement, and survey. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA 2021a), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for a subset of 24 compounds via liquid chromatography with tandem mass spectrometry (LC/MS/MS) compliant with QSM Version 5.3 Table B-15 to fulfill the project DQOs:

- Sixty-seven (67) soil samples from 28 locations (soil borings locations)
- Twenty-five (25) grab groundwater samples from 26 temporary well locations (one location was dry)
- Seven (7) field blanks (FBs)
- Fifteen (15) equipment rinsate samples
- Nine (9) field duplicate (FD) samples.

Figures 5-1 through **5-3** provide 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 C**. A log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix C1**. Completed sample forms, survey data, and a field change request form are included as **Appendices C2** through **C4**, respectively. Additionally, a photographic log of field activities is provided in **Appendix D**.

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 of these activities are presented below.

5.1.1 Technical Project Planning

The U.S. Army Corps of Engineers (USACE) TPP Process, Engineer Manual (EM) 200-1-2 (Department of Army 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 AOIs identified in the PA.

A combined TPP Meeting 1 and 2 was held on 26 August 2021, prior to SI field activities. Meeting minutes are provided in **Appendix E**. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2.

The stakeholders for this SI include ARARNG, ARNG, USACE, and Arkansas Division of Environmental Quality representatives familiar with the Facility, the regulations, and the community. 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 UFP-QAPP Addendum (EA 2021a). Future TPP meetings will provide an opportunity to discuss results and findings, and future actions, where warranted.

5.1.2 Utility Clearance

On 30 September 2021, a dig permit request was made to RMTC. Proposed drilling locations were provided in a coordinate table and on maps. The proposed work areas were delineated with white pin flags. Utility locations within the proposed work areas were marked by utility providers and RMTC personnel.

On 18 October 2021, RMTC personnel met with members of the EA field team to identify marked utility locations where some uncertainty existed and to ensure that markings were still in place. On the east side of the Fire Station at AOI 2, some locations were adjusted based on RMTC personnel recommendations in order to avoid a high voltage power line that was installed by directional drilling at a depth greater than 5 ft. Based on the utility locate results, and refusal during drilling, some of the proposed sample locations were moved. When samples were moved, RMTC personnel were notified, and they supported clearance for sample relocation activities. Additionally, during the SI the first 5 ft of each boring were pre-cleared by EA's drilling

subcontractor, using a hand auger, to verify utility clearance in shallow subsurface where utilities were expected to be encountered.

5.1.3 Source Water and PFAS Sampling Equipment Acceptability

Samples collected from the potable water sources used for drilling equipment decontamination were analyzed and it was confirmed that PFAS concentrations were below the limit of quantitation (LOQ) and deemed acceptable prior to the start of field activities. Samples collected from the potable water sources at the Fire Station (FH-02) and Building 28002 (EP-01) on 16 September 2021, prior to mobilization, were analyzed for PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15. The sample data met acceptance criteria presented in the UFP-QAPP Addendum for the water source to be used for decontamination of drilling equipment (EA 2021a). A discussion of the results is presented in **Appendix B**. The analytical results are presented in **Appendix F**.

Materials that were used within the sampling zone were confirmed as acceptable for use in the PFAS sampling environment. The checklist of acceptable materials for use in the PFAS sampling environment was provided in the Standard Operating Procedures, Appendix B, to the Programmatic UFP-QAPP (EA 2020a).

5.2 SOIL BORINGS AND SOIL SAMPLING

All soil sample locations are shown on **Figures 5-1** through **5-3**, and boring sample depths are provided in **Table 5-1.** The boring locations were selected based on information provided in the PA (AECOM 2020) and as agreed upon by stakeholders during the TPP and review of the UFP-QAPP Addendum (EA 2021a). Non-dedicated sampling equipment (e.g., hand auger) was decontaminated between sampling locations.

Soil borings were drilled with a Geoprobe® 8150LS sonic drilling rig. A dual-tube sampling system was used to collect continuous soil cores to target depths. A hand auger was used to collect soil from the top 0 to 5 ft of the boring in compliance with utility clearance procedures. Due to refusal at some locations hand auguring stopped before the 5-ft mark.

Given the expected shallow groundwater depth, two discrete soil samples were planned to be collected for chemical analysis from each soil boring: one sample from the surface interval (0 to 2 ft bgs) and one subsurface soil sample from approximately 1 ft above the groundwater table in accordance with the UFP-QAPP Addendum (EA 2021a). Only one soil sample was collected from one location, AOI06-01, due to shallow rock being encountered at less than 6 ft bgs. Additionally, three soil samples were collected from 12 locations where groundwater was encountered deeper than expected. At locations where three samples were collected one surface soil and two subsurface soil samples were collected. Subsurface soil samples were collected at the mid-point between the surface and the groundwater table (not to exceed 15 ft bgs) and approximately 1 ft above the groundwater table.

Groundwater was encountered at depths ranging from 0.2 to 18.8 ft bgs during drilling. Total boring completion depths, to accommodate temporary well installation, ranged from 4.5 to 20.0 ft bgs. One surface soil sample (0 to 2 ft bgs) was collected at each boring location.

After submittal of the Final UFP-QAPP Addendum, during utility clearance and sampling, some locations were moved due to utilities
or refusals. Changes were detailed in a Field Change Request Form that was executed on 22 October 2021 (**Appendix C4**). The changes are discussed in **Section 5.8** as deviations from the UFP-QAPP Addendum.

During the drilling, the soil cores were continuously logged for lithological descriptions by a field geologist using the Unified Soil Classification System. A photoionization detector (PID) was used to screen the breathing zone during boring activities as a part of personal safety requirements and to screen the continuous cores. Observations and measurements were recorded on sampling forms (**Appendix C2**) and in a non-treated field logbook. Depth interval, recovery thickness, PID concentrations, moisture, relative density, Munsell color, and Unified Soil Classification System texture were recorded. The boring logs are provided in **Appendix G**.

Each sample was placed into a laboratory-supplied PFAS-free HDPE bottle and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard chain-of-custody procedures to the laboratory and analyzed for PFAS (LC/MS/MS compliant with QSM Version 5.3 Table B-15), total organic compound (TOC) (USEPA Method 9060A) and pH (USEPA Method 9045D) in accordance with the UFP-QAPP Addendum (EA 2021a).

FD samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike (MS)/matrix spike 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 blanks (EBs) were collected at a rate of one per day per medium and analyzed for the same parameters as the samples. A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6 degrees Celsius (°C) during shipment.

Borings were converted to temporary wells, which were subsequently abandoned after sampling, water level measuring, and surveying in accordance with the UFP-QAPP Addendum (EA 2021a). After removal of the casings, boreholes were abandoned using bentonite chips. Borings were installed in grass areas to avoid disturbing concrete and asphalt surfaces.

5.3 TEMPORARY WELL INSTALLATION AND GROUNDWATER GRAB SAMPLING

Temporary wells were bored using a GeoProbe® 8150LS sonic drill rig. Once the borehole was advanced to the desired depth, a temporary well was constructed with 5- and/or 10-ft sections of 1-inch Schedule 40 polyvinyl chloride (PVC) screen and casing. New PVC pipe and screen were used at each location to avoid cross-contamination between locations. The screened intervals for the temporary wells are provided in **Table 5-2**.

Groundwater samples were collected using a peristaltic pump with PFAS-free HDPE tubing. Samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well intervals. Each sample was collected in laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. 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 C2**) before each grab sample was collected in a separate container. Samples were packaged on ice and transported via FedEx under standard chain-of-custody procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM Version 5.3 Table B-15 in accordance with the UFP-QAPP Addendum (EA 2021a). 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. With the exception of sample RMTC-03, no foaming was noted in any of the groundwater samples.

FD 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. Seven FBs were collected in accordance with the UFP-QAPP Addendum (EA 2021a). A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6°C during shipment.

The temporary wells were surveyed by a licensed surveyor prior to collecting final water levels. When each well top of casing was surveyed, the weight of the stadia rod pushed the well casing down an estimated 1-3 hundredths of a foot. This resulted in measurements collected during sampling being off slightly relative to the final measured water level elevations in some wells.

Following well surveying (described in **Section 5.5**), temporary wells were abandoned in accordance with the SI UFP-QAPP Addendum (EA 2021a) by removing the PVC and backfilling the hole with bentonite chips. Upon completion of well abandonment, the ground surface at each location was patched to match existing surrounding conditions.

5.4 SYNOPTIC WATER LEVEL MEASUREMENTS

Groundwater levels were used to monitor facility-wide groundwater elevations and assess groundwater flow. Synoptic water level elevation measurements were collected from the newly installed temporary monitoring wells, taken from the survey mark on the northern side of the well casing on 29 October 2021. Groundwater flow contour maps are provided in **Figures 2-4, 2-5 and 2-6**. Groundwater elevation data are provided in **Table 5-3**.

5.5 SURVEYING

The northern side of each new temporary well casing was surveyed prior to abandonment. Horizontal positions of temporary wells at AOIs 2 and 6 were surveyed with a Sokkia Set 30R total station (transit) and all other locations were surveyed using a Trimble GNSS R10-2 global positioning system receiver. All vertical elevations were found with a Leica DNA03 Level. Positions were collected in the applicable Universal Transverse Mercator zone projection with World Geodetic System 1984 datum (horizontal) and North American Vertical Datum 1988

(vertical). Surveying data for AOIs 2 and 6 were collected on 21 October 2021 and surveying data for AOIs 1, 3, 4, and 5 were collected on 28 October 2021. Due to the weight of the stadia rod, it was noted that some well casings had settled after sample collection but before final water level elevations were measured. There was no effect on final groundwater elevation data, but elevations recorded during groundwater sampling may not be of survey accuracy. Surveying data are provided in **Appendix C3**.

5.6 INVESTIGATION-DERIVED WASTE

As of the date of this report, the disposal of PFAS 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 UFP-QAPP Addendum (EA 2021a).

Soil IDW (i.e., soil cuttings) and liquid IDW (i.e., purge water, development water, and decontamination fluids) generated during the SI activities were drummed (16 total) and staged in an approved area.

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

5.7 LABORATORY ANALYTICAL METHODS

Samples were analyzed for relevant compounds by LC/MS/MS compliant with QSM Version 5.3 Table B-15 at Eurofins Lancaster Laboratories Environmental, LLC, in Lancaster, Pennsylvania, a DoD ELAP-certified laboratory.

Soil samples were also analyzed for TOC using USEPA Method 9060A and pH by USEPA Method 9045D.

Due to the turbidity many of the samples were centrifuged and decanted prior to analysis.

5.8 DEVIATIONS FROM SITE INVESTIGATION UFP-QAPP ADDENDUM

Deviations from the UFP-QAPP Addendum occurred based on conditions encountered during the field investigation activities. These deviations were discussed between EA, ARNG, and USACE. Deviations from the UFP-QAPP Addendum are noted below:

- Sample locations AOI06-01, AOI06-03, AOI06-04, AOI01-05, AOI05-02, AOI05-03, and AOI03-03 required relocation due to the presence of subsurface utilities. All sample locations were moved to a safe distance from known and marked subsurface utilities, downgradient from their original locations (with the exception of AOI06-01, which was moved further upgradient from its original location). A Field Change Request Form (**Appendix C4**) was submitted for sample locations AOI06-01 and AOI06-03.

- In addition to the relocations prior to drilling, locations AOI06-01 and AOI06-04 were offset at the time of drilling due to penetrating a confining layer into dry sand at location AOI06-01 and in order to avoid penetrating a confining layer at location AOI06-04. As a result, a second boring was installed downgradient of the previous sample location: AOI06-01-Off and AOI06-04-Off. A surface soil sample was collected from AOI06-01, and the subsequent sample (2–3 ft bgs) was taken in the new location AOI06-01-Off. A surface soil sample and subsurface soil sample (10 –11 ft bgs) were taken from AOI06-04 and two additional subsurface samples (7–8 and 17–18 ft bgs) were collected from AOI-06-04-Off. Temporary wells were installed at these new locations.

- Borings from 20 locations (AOI01-01, AOI01-04, AOI01-07, AOI02-01, AOI02-02, AOI02-03, AOI02-04, AOI03-01, AOI03-02, AOI04-01, AOI04-02, AOI05-01, AOI05-02, AOI05-03, AOI06-02, AOI06-03, AOI06-04, AOI06-04-Off, RMTC-01, and RMTC-02) were advanced deeper than 10 ft bgs, as written in the UFP-QAPP Addendum (EA 2021a) due to the depth groundwater was encountered. Maximum boring depth reached 20 ft bgs. Three discrete soil samples were collected from each of these locations following ARNG PFAS SI protocols implemented at other PFAS sites, which is a deviation from the UFP-QAPP which identified two sampling intervals from each location.

- No groundwater sample was taken from AOI05-01 due to the lack of shallow groundwater at the well location.

- Purging volume/length requirements outlined in the UFP-QAPP Addendum (EA 2021a) were not met at well locations AOI03-01, RMTC-01, AOI02-01, AOI02-02, and AOI02-03 due to the wells purging dry. Samples at these locations were taken after the wells sufficiently recharged.

- The temporary well riser did not meet or exceed the ground surface at locations AOI01-01, AOI01-02, AOI01-05, AOI01-07, AOI02-01, AOI03-01, AOI03-02, AOI03 03, AOI04-01, AOI04-02, AOI06-02, AOI06-03, RMTC-01, RMTC-02, and RMTC-03 due to settling that occurred after each well was installed, but prior to measuring final groundwater levels. Temporary well riser was cut to be roughly level with the surface at each location during installation to reduce hazards to aircraft. In accordance with the UFP-QAPP, temporary wells within boreholes were not fully immobilized. During surveying, when the stadia rod was placed on each riser, field staff noticed that the weight displaced some of the temporary well risers slightly. The maximum vertical separation between the ground surface and top of casing was 0.28 ft, measured in AOI04-01. Final water levels used for potentiometric surface maps were measured after surveying was complete in order to ensure accurate water level measurements.

- In order to increase the likelihood of being able to collect water samples a 10-ft screen was used at some locations. Ten (10) ft of screen was installed at locations AOI01-01, AOI01-04, AOI01-07, AOI02-02, AOI02-03, AOI02-04, AOI03-02, RMTC-01, and RMTC-02. Due to the low yielding aquifer, determining the water level during drilling was difficult.

- The UFP-QAPP Addendum (EA 2021a) outlined that one pH/TOC sample would be collected from each AOI; however, the chain-of-custody submitted at the time of sampling did not clearly specify pH/TOC for all six samples. Only one sample, from AOI 6, was initially analyzed for pH/TOC. This inconsistency was noted after receipt of the initial data package and was resolved by having the laboratory run the pH/TOC analysis on the remaining soil sample material from AOIs 1, 2, 3, and 5.[3] This analysis occurred after the pH/TOC prep/analysis holding time outlined in the UFP-QAPP Addendum were exceeded; however, the data as reported is still considered usable and does not affect the conclusions of the SI.

Table 5-1. Samples by Medium
RMTC, North Little Rock, Arkansas
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Comments
Soil Samples						
AOI01-01-SB-0-2	10/27/2021	0-2	X			
AOI01-01-SB-0-2-DUP	10/27/2021	0-2	X			FD
AOI01-01-SB-5-6	10/27/2021	5-6	X			
AOI01-01-SB-7-8	10/27/2021	7-8				Grain Size
AOI01-01-SB-10-11	10/27/2021	10-11	X			
AOI01-02-SB-0-2	10/27/2021	0-2	X			
AOI01-02-SB-3-4	10/27/2021	3-4	X	X	X	
AOI01-03-SB-0-2	10/28/2021	0-2	X			
AOI01-03-SB-2-3	10/28/2021	2-3	X			
AOI01-03-SB-2-3-DUP	10/28/2021	2-3	X			FD
AOI01-04-SB-0-2	10/28/2021	0-2	X			
AOI01-04-SB-3-4	10/28/2021	3-4	X			
AOI01-04-SB-8-9	10/28/2021	8-9	X			
AOI01-05-SB-0-2	10/28/2021	0-2	X			
AOI01-05-SB-2-3	10/28/2021	2-3	X			
AOI01-06-SB-0-2	10/28/2021	0-2	X			
AOI01-06-SB-0-2-DUP	10/28/2021	0-2	X			FD
AOI01-06-SB-2-3	10/28/2021	2-3	X			
AOI01-07-SB-0-2	10/27/2021	0-2	X			

[3] For four of the five AOIs, adequate material was available. At AOI 4, there was not enough material to run pH or TOC analysis. AOIs 3, 4, and 5 are all essentially different buildings in the same area/geology; therefore, soil pH and TOC samples collected at AOIs 3 and 5 are assumed to be representative of conditions at AOI 4.

Table 5-1. Samples by Medium
RMTC, North Little Rock, Arkansas
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Comments
AOI01-07-SB-4.5-5.5	10/27/2021	4.5-5.5	X			
AOI01-07-SB-9-10	10/27/2021	9-10	X			
AOI02-01-SB-0-2	10/19/2021	0-2	X			
AOI02-01-SB-6-7	10/19/2021	6-7	X			
AOI02-02-SB-0-2	10/18/2021	0-2	X			
AOI02-02-SB-8-9	10/19/2021	8-9	X			
AOI02-02-SB-13-14	10/19/2021	13-14	X			
AOI02-03-SB-0-2	10/19/2021	0-2	X			
AOI02-03-SB-3-4	10/19/2021	3-4	X			
AOI02-03-SB-5-6	10/21/2021	5-6	X			
AOI02-03-SB-10-11	10/19/2021	10-11	X			
AOI02-04-SB-0-2	10/18/2021	0-2	X	X	X	
AOI02-04-SB-6-7	10/18/2021	6-7	X			
AOI02-04-SB-6-7-DUP	10/18/2021	6-7	X			FD
AOI02-04-SB-10-12	10/18/2021	10-12				Grain Size
AOI03-01-SB-02	10/21/2021	0-2	X			
AOI03-01-SB-8-9	10/21/2021	8-9	X			
AOI03-02-SB-0-2	10/21/2021	0-2	X			
AOI03-02-SB-5-6	10/21/2021	5-6				Grain Size
AOI03-03-SB-0-2	10/21/2021	0-2	X			
AOI03-03-SB-2-3	10/21/2021	2-3	X	X	X	
AOI04-01-SB-0-2	10/21/2021	0-2	X			
AOI04-01-SB-7-8	10/21/2021	7-8	X			
AOI04-01-SB-15-16	10/21/2021	15-16	X			
AOI04-02-SB-0-2	10/21/2021	0-2	X			
AOI04-02-SB-7-8	10/21/2021	7-8	X			
AOI05-01-SB-0-2	10/22/2021	0-2	X			
AOI05-01-SB-13	10/22/2021	12.5-13.5	X			
AOI05-02-SB-0-2	10/26/2021	0-2	X	X	X	
AOI05-02-SB-6-7	10/26/2021	6-7	X			
AOI05-02-SB-7-8	10/26/2021	7-8				Grain Size
AOI05-02-SB-11-12	10/26/2021	11-12	X			
AOI05-02-SB-18-18.5	10/28/2021	18-18.5	X			

Table 5-1. Samples by Medium
RMTC, North Little Rock, Arkansas
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Comments
AOI05-03-SB-0-2	10/26/2021	0-2	X			
AOI05-03-SB-0-2-DUP	10/26/2021	0-2	X			FD
AOI05-03-SB-7-8	10/26/2021	7-8	X			
AOI05-03-SB-15-16	10/26/2021	15-16	X			
AOI06-01-SB-0-2	10/20/2021	0-2	X			
AOI06-01-OFF-SB-2-3	10/20/2021	2-3	X			
AOI06-01-OFF-SB-2-3-DUP	10/20/2021	2-3	X			FD
AOI06-02-SB-0-2	10/20/2021	0-2	X			
AOI06-02-SB-7-8	10/20/2021	7-8	X			
AOI06-02-SB-16-17	10/20/2021	16-17	X			
AOI06-03-SB-0-2	10/20/2021	0-2	X			
AOI06-03-SB-7.5-8.5	10/20/2021	7.5-8.5	X			
AOI06-03-SB-17.5-18.5	10/20/2021	17.5-18.5	X			
AOI06-04-SB-0-2	10/20/2021	0-2	X	X	X	
AOI06-04-SB-10-11	10/20/2021	10-11	X			
AOI06-04-OFF-SB-7-8	10/20/2021	7-8	X			
AOI06-04-OFF-SB-17-18	10/20/2021	17-18	X			
RMTC-01-OFF-SB-0-2	10/25/2021	0-2	X			
RMTC-01-OFF-SB-6-7	10/26/2021	6-7	X			
RMTC-01-OFF-SB-12-13	10/26/2021	12-13	X			
RMTC-02-SB-0-2	10/27/2021	0-2	X			
RMTC-02-SB-4-5	10/27/2021	4-5	X			
RMTC-02-SB-9-10	10/27/2021	9-10	X			
RMTC-03-SB-0-2	10/22/2021	0-2	X			
RMTC-03-SB-4-5	10/22/2021	4-5	X			
Groundwater Samples						
AOI01-01-GW	10/28/2021	-	X			
AOI01-01-GW-DUP	10/28/2021	-	X			FD
AOI01-02-GW	10/28/2021	-	X			
AOI01-03-GW	10/28/2021	-	X			
AOI01-04-GW	10/29/2021	-	X			
AOI01-05-GW	10/28/2021	-	X			
AOI01-06-GW	10/28/2021	-	X			

Table 5-1. Samples by Medium
RMTC, North Little Rock, Arkansas
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Comments
AOI01-07-GW	10/28/2021	-	X			
AOI02-01-GW	10/26/2021	-	X			
AOI02-02-GW	10/26/2021	-	X			
AOI02-03-GW	10/29/2021	-	X			
AOI02-04-GW	10/19/2021	-	X			
AOI03-01-GW	10/25/2021	-	X			
AOI03-02-GW	10/25/2021	-	X			
AOI03-02-GW-DUP	10/25/2021	-	X			FD
AOI03-03-GW	10/25/2021	-	X			
AOI04-01-GW	10/25/2021	-	X			
AOI04-02-GW	1025/2021	-	X			
AOI05-02-GW	10/29/2021	-	X			
AOI05-03-GW	10/27/2021	-	X			
AOI06-01-GW	10/22/2021	-	X			
AOI06-02-GW	10/22/2021	-	X			
AOI06-03-GW	10/21/2021	-	X			
AOI06-03-GW-DUP	10/21/2021	-	X			FD
AOI06-04-GW	10/22/2021	-	X			
RMTC-01-GW	10/27/2021	-	X			
RMTC-02-GW	10/27/2021	-	X			
RMTC-03-GW	10/26/2021	-	X			
Blank Samples						
FB-01-102121	10/21/2021	-	X			FB
FB-2-102221	10/22/2021	-	X			FB
FB-3-GW-102521	10/25/2021	-	X			FB
FB-4-GW-102621	10/26/2021	-	X			FB
FB-5-GW-102721	10/27/2021	-	X			FB
FB-6-GW-102821	10/28/2021	-	X			FB
FB-7-GW102921	10/29/2021	-	X			FB
EB-1-GW-101821	10/19/2021	-	X			EB
EB-1-Soil-101821	10/19/2021	-	X			EB
EB-2-GW-101921	10/20/2021	-	X			EB
EB-2-Soil-101921	10/20/2021	-	X			EB

Table 5-1. Samples by Medium
RMTC, North Little Rock, Arkansas
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Comments
EB-3-GW-10202021	10/20/2021	-	X			EB
EB-3-Soil-10202021	10/20/2021	-	X			EB
EB-04-GW-102121	10/21/2021	-	X			EB
EB-4-Soil-102121	10/21/2021	-	X			EB
EB-5-GW-102221	10/22/2021	-	X			EB
EB-5-Soil-102221	10/22/2021	-	X			EB
EB-6-GW-102521	10/25/2021	-	X			EB
EB-6-Soil-102721	10/27/2021	-	X			EB
EB-7-GW-102621	10/26/2021	-	X			EB
EB-8-GW-102721	10/27/2021	-	X			EB
EB-9-GW-102921	10/29/2021	-	X			EB
Source Water Samples						
EP-01	9/16/2021	-	X			
FH-02	9/16/2021	-	X			

Table 5-2. Soil Boring Depths and Temporary Well Screen Intervals
RMTC, North Little Rock, Arkansas
Site Inspection Report

Areas of Interest	Boring ID	Soil Boring Depth (ft bgs)	Temporary Well Screen Interval (ft bgs)
1	AOI01-01	20.0	10-20
	AOI01-02	7.0	2-7
	AOI01-03	9.0	4-9
	AOI01-04	20.0	10-20
	AOI01-05	7.5	2.5-7.5
	AOI01-06	10.0	5-10
	AOI01-07	14.5	4.5-14.5
2	AOI02-01	13.0	7-12
	AOI02-02	19.0	9-19
	AOI02-03	12.0	2-12
	AOI02-04	15.0	5-15
3	AOI03-01	11.25	6.25-11.25
	AOI03-02	15.0	5-15
	AOI03-03	6.5	1.5-6.5
4	AOI04-01	18.0	13-18
	AOI04-02	13.0	8-13
5	AOI05-01	20.0	15-20
	AOI05-02	20.0	15-20
	AOI05-03	20.0	15-20
6	AOI06-01*	7.0	NA
	AOI06-01-Off	4.5	1-4.5
	AOI06-02	20.0	15-20
	AOI06-03	19.0	14-19
	AOI06-04*	11.5	NA
	AOI06-04-Off	20.0	15-20
Robinson Army Airfield	RMTC-01	18.5	8.5-18.5
	RMTC-02	14.0	4-14
	RMTC-03	10.0	5-10

Notes:
*Hit refusal prior to groundwater, boring was offset.
NA = Not applicable

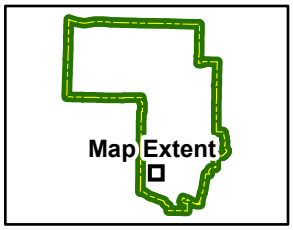
Table 5-3. Groundwater Elevation
RMTC, North Little Rock, Arkansas
Site Inspection Report

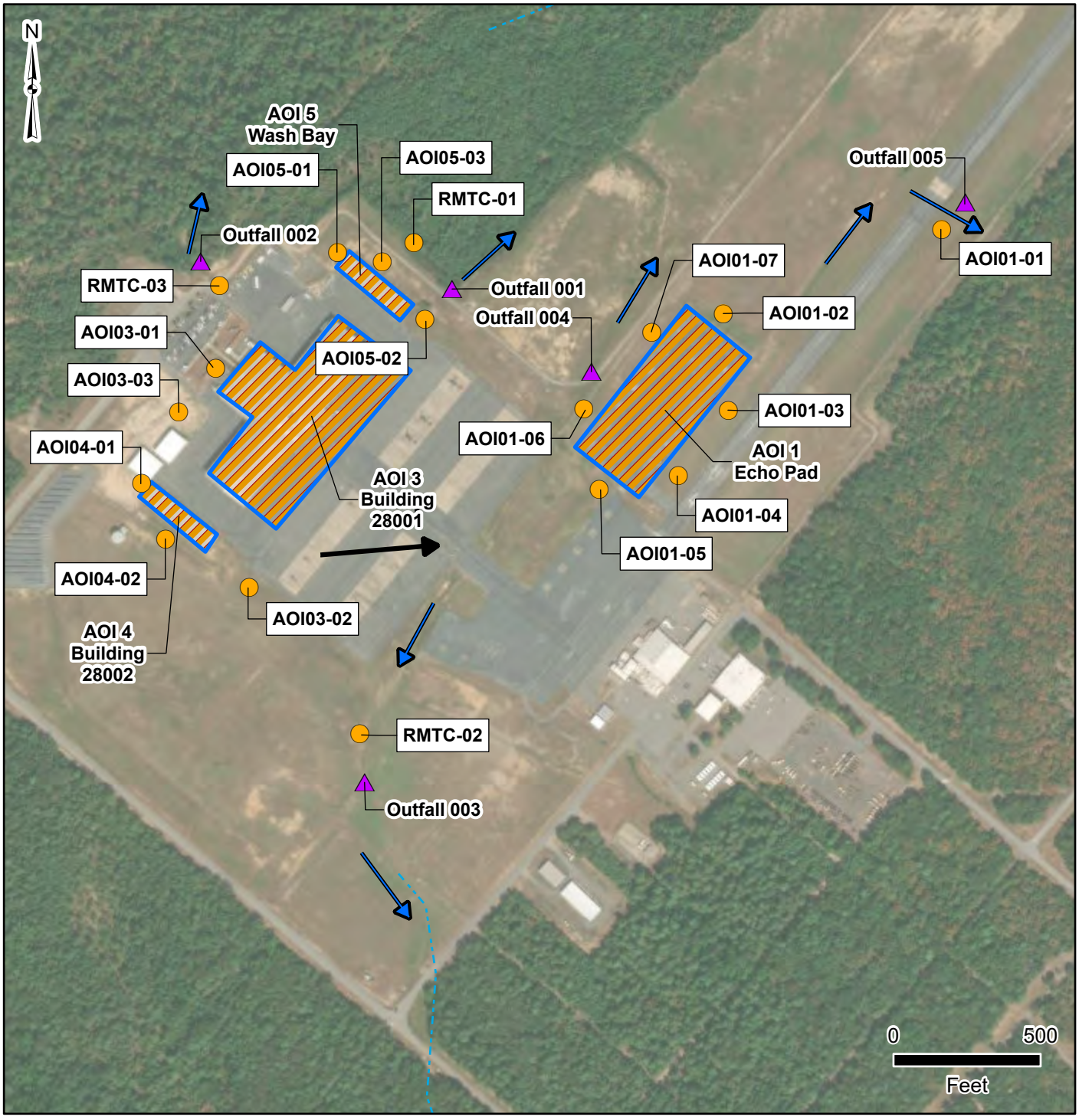
Monitoring Well ID	Top of Casing Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
AOI01-01	570.71	570.87	11.28	559.43
AOI01-02	580.85	581.12	1.41	579.44
AOI01-03	581.90	581.79	1.02	580.88
AOI01-04	586.56	586.28	17.11	569.45
AOI01-05	588.15	588.16	0.20	587.95
AOI01-06	586.18	586.05	0.80	585.38
AOI01-07	585.71	585.72	0.40	585.31
AOI02-01	371.15	371.25	11.00	360.15
AOI02-02	371.72	371.62	14.59	357.13
AOI02-03	371.80	371.65	11.19	360.61
AOI02-04	374.09	373.96	6.04	368.05
AOI03-01	589.67	589.85	8.87	580.80
AOI03-02	589.82	590.23	7.92	581.90
AOI03-03	587.88	587.97	1.28	586.60
AOI04-01	588.88	589.16	6.27	582.61
AOI04-02	591.78	591.84	1.49	590.29
AOI05-01	588.68	588.55	DRY	NA
AOI05-02	589.34	589.23	18.80	570.54
AOI05-03	583.80	583.74	17.62	566.18
AOI06-01-Off	518.54	518.48	1.97	516.57
AOI06-02	522.16	522.26	13.49	508.67
AOI06-03	514.01	514.03	3.24	510.77
AOI06-04-Off	516.73	516.54	5.79	510.94
RMTC-01	576.06	576.31	11.72	564.34
RMTC-02	580.44	580.64	6.27	574.17
RMTC-03	584.74	584.80	4.56	580.18

Notes:
btoc = Below top of casing
NA = Not applicable

Army National Guard Site Inspections
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 5-1
AOI 1, AOI 3, AOI 4 and AOI 5
Site Inspection Sample Locations





Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Sample Locations
- Sonic Boring

Hydrology/Hydrogeology
- Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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Army National Guard Site Inspections
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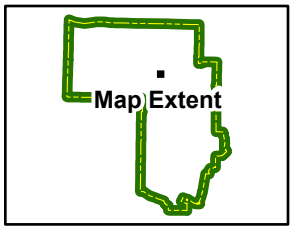
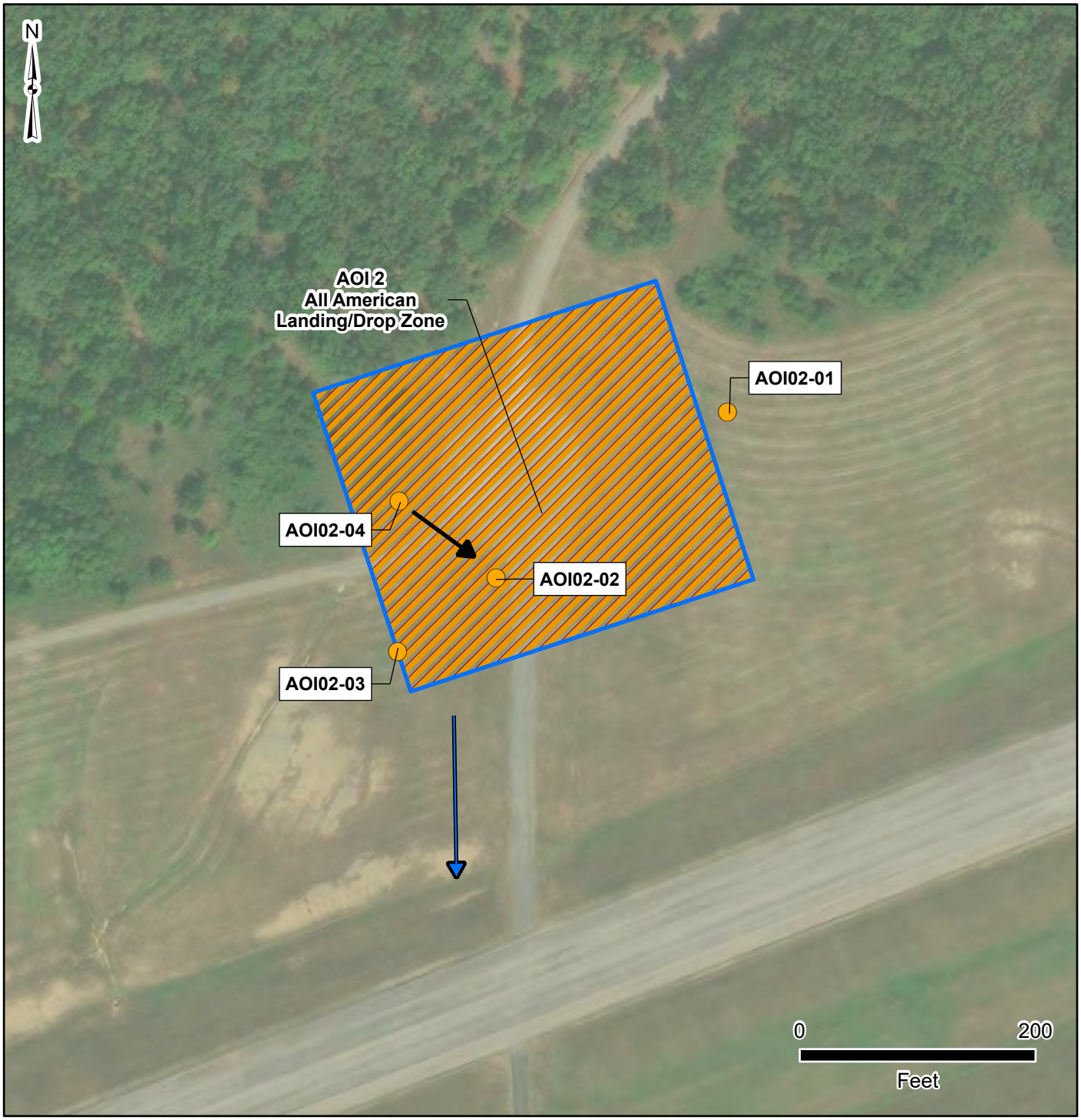
Figure 5-2
AOI 2
Site Inspection Sample Locations





Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Sample Locations
- Sonic Boring

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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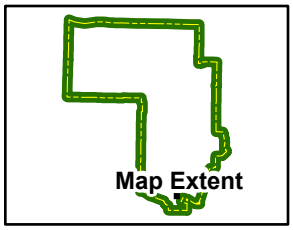
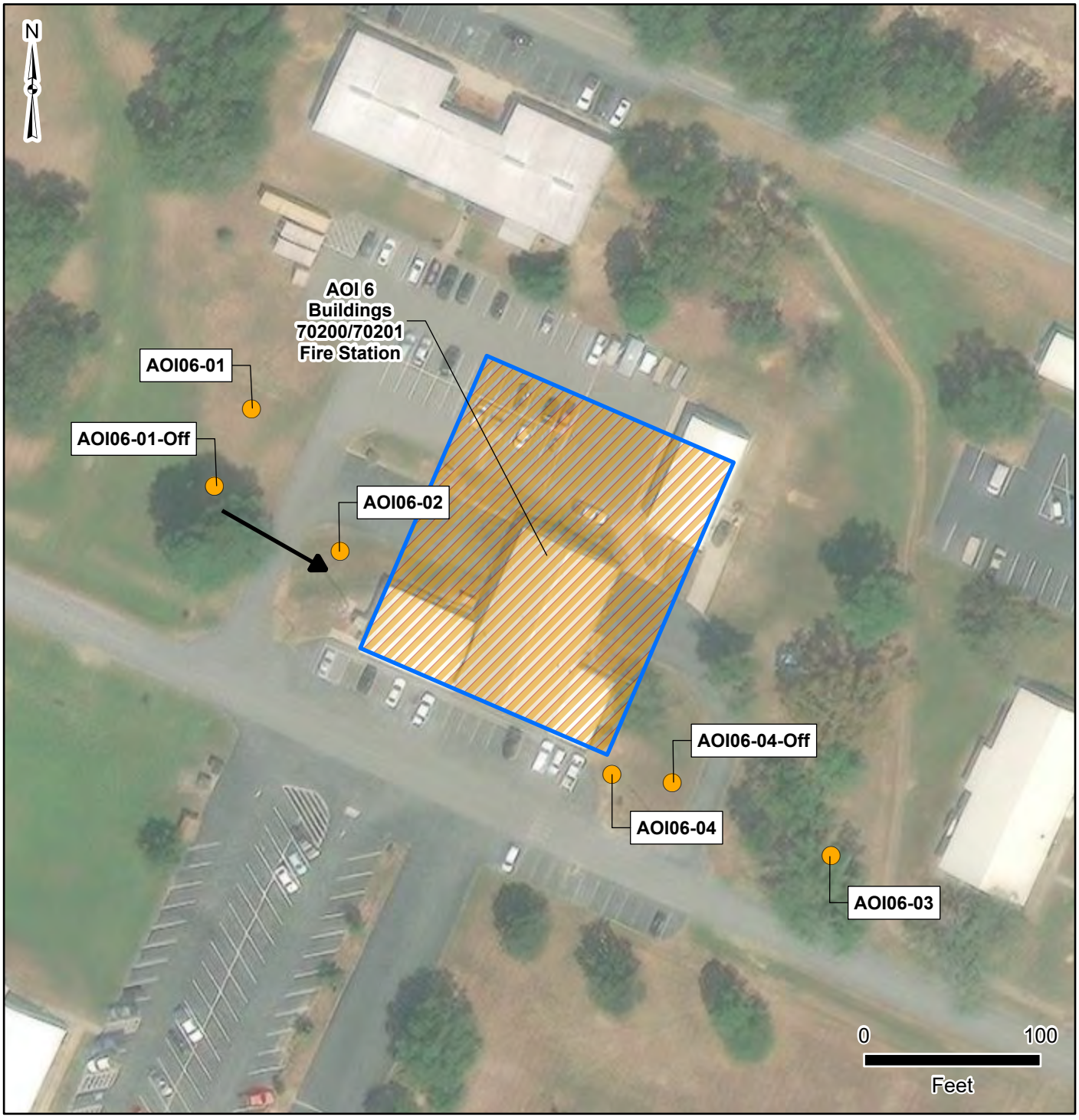
Army National Guard Site Inspections
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 5-3
AOI 6
Site Inspection Sample Locations





Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Sample Locations
- Sonic Boring

Hydrogeology
- Groundwater Flow Direction

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
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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 the AOIs is provided in **Sections 6.3** through **6.8**. **Tables 6-2** through **6-5** present results for 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 H**.

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 AOI 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**.

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

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

Notes:
1. Assistant Secretary of Defense. 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient=0.1. 6 July 2022.
2. 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.

µg/kg = Microgram(s) per kilogram
ng/L = Nanogram(s) per liter

The data in the subsequent sections are compared against 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 ft bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil results (2 to 15 ft bgs). The SLs are not applied to deep subsurface soil results (greater than 15 ft bgs) because 15 ft 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 grain size, TOC and pH sampling.

The data collected in this investigation will be used in subsequent investigations, where appropriate, to assess fate and transport of PFAS contaminants. According to the Interstate Technology Regulatory Council (ITRC), several important PFAS 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 (i.e., pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC 2018).

Soil pH was measured as 5.6 in samples collected from AOIs 1, 2, 5, and 6. Soil pH was measured as 7.7 in a sample collected from AOI 3. TOC ranged from a low of 730 H milligrams per kilogram (mg/kg) in the sample collected from AOI 1 to a high of 14,000 mg/kg in the sample collected from AOI 6.

Grain sizes were analyzed from samples collected from AOI01-01, AOI02-04, AOI03-02, and AOI05-02 and compared with United Soil Classification grain size ranges. The combined silt and clay content ranged from 43.5% to 78.6% in samples AOI01-01 and AOI05-02, respectively. The content of sand grain size ranged from 19.8% to 42.6% in samples AOI05-02 and AOI02-04, respectively. Gravel sized grain size ranged from 0% to 25.6% in samples collected from AOI03-02 and AOI01-01, respectively.

6.3 AOI 1

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1 - Echo Pad. The soil and groundwater results are summarized on **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7**.

6.3.1 AOI 1 – Soil Analytical Results

Figure 6-1 through **6-5** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.

Soil was sampled in 7 boring locations in AOI 1. Soil was sampled from three intervals at locations AOI01-01, AOI01-04, and AOI01-07 and from two intervals at locations AOI01-02, AOI01-03, AOI01-05, and AOI01-06.

Soil was sampled from surface soil (0 to 2 ft bgs) from AOI01-01 through AOI01-07. There were no detections of PFOA, PFOS, PFHxS, PFNA, or PFBS at boring location AOI01-01. PFOA was detected below the SL in AOI01-02 through AOI01-07 and ranged from 0.22 J µg/kg to 6.2 µg/kg at boring locations AOI01-05 and AOI01-02, respectively. PFOS was detected above the SL in samples collected from boring locations AOI01-02 and AOI01-07 at concentrations of 44 µg/kg and 190 µg/kg, respectively. PFHxS was detected below the SL in samples collected from boring locations AOI01-02 through AOI01-07 at concentrations ranging from 0.25 J µg/kg to 12 µg/kg at boring locations AOI01-04 and AOI01-07, respectively. PFHxS was only detected in the duplicate sample for AOI01-06 and not the primary surface soil sample from location AOI01-06. PFNA was detected in excess of the SL at a concentration of 20 µg/kg from soil boring location AOI01-02. PFNA was detected at concentrations below the SL in samples collected from boring locations AOI01-03, AOI01-04, AOI01-06, and AOI01-07. PFNA was not detected at locations AOI01-01 or AOI01-05. PFBS was detected at boring location AOI01-07, with a concentration of 1.1 J µg/kg, which is below the SL. PFBS was not detected in samples collected at the remaining surface soil locations.

Shallow subsurface soils were collected from soil boring locations AOI01-01 through AOI01-07 at depths ranging from 2 to 6 ft bgs. PFOA was detected below the SL in samples collected from four soil boring locations ranging from 0.24 J µg/kg at AOI01-06 to 3.1 µg/kg at location AOI01-02. PFOS was detected at concentrations below the SL in samples collected from 5 of 7 soil boring locations, ranging from 0.49 J µg/kg at soil boring location AOI01-03 to 7.1 µg/kg at soil boring location AOI01-02. PFHxS was detected below the SL in samples collected from three locations and ranged from 0.22 J to 1.4 µg/kg at AOI01-04 and AOI01-02, respectively. PFNA was only detected in the sample collected from AOI01-02 at a concentration of 2.5 µg/kg, but the concentration was below the SL. PFBS was not detected in samples collected from any of the soil boring locations.

PFOS, PFOA, PFNA, and PFBS were not detected in samples collected from deep subsurface soils, ranging from 8 to 18.5 ft bgs. PFHxS was detected below the SL at 0.84 µg/kg in the sample collected from AOI01-07. PFHxS was not detected in the other deep subsurface samples.

6.3.2 AOI 1 – Groundwater Analytical Results

Figures 6-6 and **6-7** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from 7 temporary wells at AOI 1 during the SI activities. A duplicate sample was also collected from one of the wells for a total of eight groundwater samples. PFOS, PFOA, PFHxS, PFNA, and PFBS were detected in groundwater samples collected from all of the locations in AOI 1. PFOS concentrations in all samples collected from AOI 1 exceeded the SL and ranged from a low of 14 ng/L in the sample collected from AOI01-04 to a high of 3,000 J+ ng/L in the sample collected from AOI01-02. PFOA concentrations from 7 samples collected from AOI 1 exceeded the SL and ranged from 6.4 ng/L to 540 ng/L in samples collected from AOI01-01 and AOI01-02, respectively. PFOA concentrations in the AOI01-01 primary sample (5.2 ng/L) did not exceed the SL; however, the duplicate sample collected from this location exceeded the SL with a value of 6.4 ng/L. PFHxS was detected in all

samples collected from AOI 1 and PFHxS exceeded the SL in samples collected from six locations AOI01-02 through AOI01-07. Concentrations exceeding the SL ranged from a low of 55 ng/L in AOI01-05 to a maximum concentration of 1,000 ng/L in AOI01-07. PFNA was detected in all groundwater samples collected from AOI 1 and exceeded the SL in samples collected from five locations AOI01-02 through AOI01-04, AOI01-06, and AOI01-07. Concentrations exceeding the SL ranged from a low of 11 ng/L in AOI01-04 to a maximum of 770 J+ ng/L in AOI01-02. PFBS concentrations did not exceed the SL in any samples collected from AOI 1. PFBS concentrations ranged from 3.3 ng/L in a sample collected from temporary well AOI01-01 to 190 ng/L in the sample collected from temporary well AOI01-07.

6.3.3 AOI 1 – Conclusions

Based on the results of the SI, PFOS and PFNA were detected in soil at concentration above their respective SLs. PFOA, PFOS, PFNA, and PFHxS were detected in groundwater at concentrations above their respective SLs. Based on the exceedances of the SLs in soils and groundwater, further evaluation at AOI 1 is warranted.

6.4 AOI 2

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 2 - All American Landing/Drop Zone. The detected compounds are summarized in **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-8** through **6-14**.

6.4.1 AOI 2 – Soil Analytical Results

Figures 6-8 through **6-12** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.

Soil was sampled in four boring locations at AOI 2. Soil was sampled from three intervals at locations AOI02-02 and AOI02-03 and from two intervals at locations AOI02-01 and AOI02-04.

PFOS and PFHxS were detected in surface soil at concentrations below their respective SLs. PFHxS was detected in three surface soil samples at concentrations ranging from 0.26 J µg/kg to 0.38 J µg/kg in samples collected from AOI02-04 and AOI02-03, respectively. PFOS was detected in one sample collected from AOI02-03 at a concentration of 0.32 J ug/kg. PFNA, PFOA, and PFBS were not detected in surface soil from AOI02.

PFOA, PFHxS, PFNA, and PFBS were not detected in any of the shallow subsurface soil (3 to 9 ft bgs) samples collected from AOI 2. PFOS was detected in the sample collected from AOI02-02 at a concentration below the SL, 0.26 J µg/kg.

Deep subsurface soil samples (10 to 14 ft bgs) were collected from boring locations AOI02-02 and AOI02-03. PFOA, PFOS, PFHxS, PFNA, and PFBS were not detected in deep subsurface soils collected at AOI 2.

6.4.2 AOI 2 – Groundwater Analytical Results

Figures 6-13 and **6-14** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from four temporary wells associated with AOI 2 during the SI. PFOA, PFOS, PFHxS, PFNA, or PFBS when detected, did not exceed their respective SLs. PFOA was detected at low levels in groundwater collected from temporary well locations AOI02-03 and AOI02-04 with concentrations of 0.63 J ng/L and 0.74 J ng/L, respectively. PFOS detections in groundwater ranged from 0.48 J ng/L (AOI02-02) to 1.8 J ng/L (AOI02-01). PFHxS detections in groundwater ranged from 0.76 J ng/L (AOI02-01) to 2.8 ng/L (AOI02-04). PFNA was not detected in any of the groundwater samples collected from AOI 2. PFBS was only detected in groundwater collected from temporary well location AOI02-04, with a concentration of 1.1 J ng/L.

6.4.3 AOI 2 – Conclusions

Based on the results of the SI, PFOS and PFHxS were detected in soil and PFOA, PFOS, PFHxS, and PFBS were detected in groundwater at concentrations below their respective SLs. Therefore, further evaluation at AOI 2 is not warranted.

6.5 AOI 3

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 3 - Building 28001. The detected compounds are summarized in **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7**.

6.5.1 AOI 3 – Soil Analytical Results

Figures 6-1 and **6-5** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.

Soil was sampled in three boring locations at AOI 3. Soil was sampled from two intervals (shallow and intermediate) at all three boring locations.

PFOA, PFOS, and PFNA were detected in the surface interval at boring location AOI03-01, with concentrations of 0.5 J µg/kg, 0.21 J µg/kg, and 0.48 J µg/kg, respectively and below their respective SLs. PFOA, PFOS, and PFNA were not detected in any other soil samples collected from AOI 3. PFHxS and PFBS were not detected in any of the soil samples collected from AOI 3.

6.5.2 AOI 3 – Groundwater Analytical Results

Figures 6-6 and **6-7** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from three temporary well locations associated with AOI 3 during the SI activities. PFHxS, PFNA, and PFBS were not detected in groundwater at concentrations exceeding their respective SLs. PFOA was detected in two temporary well locations. PFOA was detected in AOI03-01 at a concentration of 3.4 ng/L below the SL of 6 ng/L and at AOI03-03 with a concentration of 8.4 ng/L which exceeds the SL. PFOS was detected in all three temporary well locations, with detections ranging from 0.78 J ng/L (AOI03-01) below the SL of 4 ng/L up to 5.3 ng/L (AOI03-03) which exceeds the SL. PFHxS was detected in samples collected from temporary wells AOI03-01 and AOI03-02 at concentrations of 2.8 ng/L and 5.5 ng/L, respectively. PFNA was detected in samples collected from temporary wells AOI03-01 and AOI03-03 at concentrations of 0.57 J ng/L and 5.7 ng/L, respectively. PFBS was detected in three temporary well locations, with detections ranging from 0.5 J ng/L (AOI03-03) to 16 ng/L (AOI03-01).

6.5.3 AOI 3 – Conclusions

Based on the results of the SI, PFOA, PFOS, and PFNA were detected in soil at concentrations below their respective SLs. PFOA and PFOS were detected in groundwater at concentrations above their respective SLs. Based on the exceedances of the SLs in groundwater, further evaluation of AOI 3 is warranted.

6.6 AOI 4

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 4 - Building 28002. The detected compounds are summarized in **Tables 6-2 through 6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7**.

6.6.1 AOI 4 – Soil Analytical Results

Figures 6-1 through **6-5** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.

Soil was sampled in two boring locations at AOI 4. Soil was sampled from three intervals at boring location AOI04-01 and two intervals (shallow and intermediate) at boring location AOI04-02.

PFOA was detected in soil within the surface interval (0–2 ft) at boring location AOI04-01, with a concentration of 0.48 J µg/kg. PFOS was detected in soil within the surface interval at both boring locations AOI04-01 and AOI04-02, with a maximum concentration of 1.3 µg/kg, which is below the SL (19 µg/kg). PFOS was also detected in intermediate (shallow subsurface) soil at boring location AOI04-02, at a concentration of 0.47 J µg/kg, which is below the SL (13 µg/kg). There were no detections of PFOA in soils taken from the intermediate or deep interval at either boring location. Additionally, PFHxS, PFNA, and PFBS were not detected in any soil sample associated with AOI 4.

6.6.2 AOI 4 – Groundwater Analytical Results

Figures 6-6 and **6-7** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from two temporary wells associated with AOI 4 during the SI activities. PFOA was detected in groundwater from temporary well location AOI04-01 with a concentration of 41 ng/L, exceeding the SL of 6 ng/L. PFOA was also detected below the SL in groundwater from temporary well location AOI04-02 with a concentration of 3 ng/L. PFOS was detected in excess of the SL at both wells with a maximum detection of 36 ng/L at temporary well location AOI04-02. PFNA was detected below the SL and ranged from 4.5 ng/L to 0.88 J ng/L in samples collected from temporary wells AOI04-01 and AOI04-02, respectively. PFHxS was detected at the SL (39 ng/L) in the sample collected from temporary well AOI04-01. PFHxS was detected below the SL in the groundwater sample collected from AOI04-02 at a concentration of 13 ng/L. PFBS was also detected in both wells below the SL with a maximum concentration of 9 ng/L at temporary well location AOI04-01.

6.6.3 AOI 4 – Conclusions

Based on the results of the SI, PFOA and PFOS were detected in soil below their respective SL. PFOA, PFOS, PFHxS, PFNA and PFBS were detected in groundwater. PFOA exceeded its SL in one of the two temporary well locations and PFOS exceeded the SL in both temporary well locations. Based on the exceedances of the SLs in groundwater, further evaluation at AOI 4 is warranted.

6.7 AOI 5

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 5 - Wash Bay. The detected compounds are summarized in **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7**.

6.7.1 AOI 5 – Soil Analytical Results

Figures 6-1 through **6-5** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.

Soil was sampled in three boring locations at AOI 5. Soil was sampled from four intervals at location AOI05-02, three intervals at location AOI05-03 and two intervals at location AOI05-01.

PFOA was detected in surface soil (0–2 ft) in all three boring locations, with a maximum concentration of 2.4 µg/kg in boring location AOI05-02, which is below the SL (19 µg/kg). PFOS was detected in surface soil in two boring locations AOI05-01 (below the SL) and AOI05-02. PFOS with a reported concentration of 23 µg/kg in surface soil at AOI05-02 exceeded the SL (13 µg/kg). PFHxS was detected below the SL in one sample collected from AOI05-02 at a concentration of 6.7 µg/kg. PFNA was detected below the SL (19 µg/kg) in one sample collected from boring AOI05-02 (0.4 J µg/kg). PFBS was not detected in any surface soil samples.

Shallow subsurface soil samples (6 to 13 ft bgs) were collected from three locations in AOI 5 (one location AOI05-02 had two shallow subsurface samples). PFOA, PFOS, PFHxS, PFNA, and PFBS were not detected in samples collected from borings AOI05-01 and AOI05-03. PFOA, PFHxS, and PFBS were all detected below the SLs in the soil collected from the shallow subsurface intervals (6–7 ft bgs) of boring location AOI05-02 with concentrations of 0.29 J µg/kg, 5.5 µg/kg, and 0.7 J µg/kg, respectively. PFOA, PFOS, PFHxS, and PFBS were also detected below SLs in the soil collected from the shallow subsurface sample (11–12 ft bgs) of boring location AOI05-02 with concentrations of 0.31 J µg/kg, 0.29 J µg/kg, 2.9 µg/kg and 0.55 J µg/kg, respectively.

There were no detections of PFOA, PFOS, PFHxS, PFNA, and PFBS in soil collected from the capillary zone/groundwater interface (deep subsurface interval) at AOI 5.

6.7.2 AOI 5 – Groundwater Analytical Results

Figures 6-6 and **6-7** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from two temporary well locations associated with AOI 5 during the SI activities. Temporary well location AOI05-01 did not produce water and was not sampled. PFOA (12 ng/L), PFOS (23 ng/L), and PFHxS (110 ng/L) were detected in groundwater at concentrations exceeding their associated SLs at temporary well AOI05-02. PFNA (0.55 ng/L) and PFBS (130 ng/L) were detected below the SLs in the sample collected from temporary well AOI05-02. PFOA (1.2 J ng/L), PFHxS (0.69 J ng/L), and PFBS (0.99 J ng/L) were detected below their respective SLs in temporary well location AOI05-03.

6.7.3 AOI 5 – Conclusions

Based on the results of the SI, PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in soil. PFOS was detected in soil above the SL in one location. PFNA and PFBS were detected in groundwater below their respective SLs and PFOA, PFOS, and PFHxS were detected in groundwater at concentrations exceeding their associated SLs. RMTC personnel reported a release of AFFF water mixture at AOI 5 after SI sampling had been completed (January 2022); this resulted in the removal of approximately 200 tons of soil from the northern portion of the building at AOI 5. Based on the exceedances of the SLs in soils and groundwater and the recent reported release, further evaluation at AOI 5 is warranted.

6.8 AOI 6

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 6 - Building 70200/70201, or the Fire Station. The detected compounds are summarized in **Table 6-2** through **Table 6-5**. Soil and groundwater results are presented on **Figures 6-15** through **6-21**.

6.8.1 AOI 6 – Soil Analytical Results

Figures 6-15 through **6-19** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.
Soil was sampled in six boring locations[4] at AOI 6. Soil was sampled from three intervals at boring locations AOI06-02 and AOI06-03, two intervals at locations AOI06-04 and AOI06-04-Off, and one interval at locations AOI06-01 and AOI06-01-Off.

PFOA, PFOS, PFHxS, and PFNA were detected in the shallow interval (0 to 2 ft bgs). PFOA concentrations were detected below the SL in samples collected from borings AOI06-01 (0.29 J µg/kg), AOI06-03 (0.48 µg/kg), and AOI06-04 (0.84 µg/kg). PFOS was detected above the SL (13 µg/kg) in soil boring AOI06-04 (410 µg/kg) and below the SL in AOI06-01 (0.25 µg/kg) through AOI06-03 (11 µg/kg). PFHxS was detected at concentrations below the SL (ranging from 0.73 to 4.2 µg/kg) in three of the four samples collected from borings at AOI 6. PFNA was detected at a concentration (0.29 J µg/kg) below the SL from one boring AOI06-04.

Shallow subsurface samples were collected from six boring locations at depths ranging from 2 to 11 ft bgs. PFOA, PFNA, and PFBS were not detected in any of the shallow subsurface soil samples collected in AOI 6. PFOS was detected below the SL (160 µg/kg) in samples from five of the six boring locations and ranged from 0.24 J µg/kg at AOI06-01 offset to 1.1 µg/kg at AOI06-04. PFHxS was detected below the SL (1,600 µg/kg) in two of the six samples collected from soil borings at AOI 6 at AOI06-03 (1.6 µg/kg) and AOI06-04-off (0.45 J µg/kg).

PFOA, PFOS, PFHxS, PFNA, and PFBS were not detected in deep (16–18.5 ft bgs) subsurface samples collected from AOI 6.

6.8.2 AOI 6 – Groundwater Analytical Results

Figures 6-20 and **6-21** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from four temporary wells associated with AOI 6 during the SI activities. PFOA, PFOS, and PFHxS were detected in excess of their SLs in groundwater samples collected at AOI 6. PFOA, PFOS, PFHxS, PFNA, and PFBS were all detected in at least one sample at AOI 6. PFOA concentrations ranged from 0.88 J ng/L from the sample collected from temporary well AOI06-02 to 14 ng/L in the sample collected from temporary well AOI06-03. PFOA concentrations from samples in the remaining temporary wells were all below the SL (6 ng/L). PFOS concentrations from samples collected from temporary wells at AOI 6 were in excess of the SL (4 ng/L) in three of the four temporary wells. PFOS concentrations ranged from 1.6 J ng/L to 120 ng/L in samples collected from temporary wells AOI06-02 and AOI06-3, respectively. PFHxS was detected in samples collected from all four temporary wells at AOI06. The PFHxS concentration from the sample collected from temporary well AOI06-03 (310 ng/L) exceeded the SL (39 ng/L). PFNA was detected below the SL (6 ng/L) in one sample

[4] Two borings, AOI06-01 and AOI06-04, were offset due to potentially penetrating a confining layer. Samples were collected from the original locations as well as the offset locations.

collected at AOI 6, from temporary well AOI06-01 (0.72 J ng/L). PFBS was detected below the SL (601 ng/L) in samples collected from all four temporary wells in AOI 6 ranging from 1.7 ng/L from temporary well AOI06-02 to 48 ng/L from temporary well AOI06-01.

6.8.3 AOI 6 – Conclusions

Based on the results of the SI, PFOA, PFOS, PFHxS, and PFNA were detected in soil. PFOS was detected in shallow surface soil above the SL in one location. PFNA and PFBS were detected in groundwater below their respective SLs. PFOA, PFOS, and PFHxS were detected in groundwater at concentrations exceeding their associated SLs. Based on the exceedances of the SLs in soils and groundwater, further evaluation at AOI 6 is warranted.

6.9 ADDITIONAL FACILITY SAMPLING LOCATIONS – DRAINAGE PATHWAYS

This section presents the analytical results for soil and groundwater in comparison to SLs for 3 additional borings/temporary wells located within the surface water drainage pathways located within the Robinson Army Airfield, leading from AOIs 1, 3, 4, and 5. The detected compounds are summarized in **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7**.

6.9.1 Additional Facility Sampling Locations – Drainage Pathways – Soil Analytical Results

Figures 6-1 through **6-5** present the ranges of detections in soil. **Tables 6-2** through **6-4** summarize the detected compounds in soil.

Soil was sampled in three boring locations associated with drainage pathways leading from the AOIs within the Robinson Army Airfield. Soil was sampled from three intervals at boring locations RMTC-01 and RMTC-02 and two intervals at location RMTC-03.

PFOA was detected below the SL in the soil samples taken from the shallow interval (0 to 2 ft) of all three boring locations, ranging from 0.23 J µg/kg (RMTC-02) to 5.9 µg/kg (RMTC-03). PFOS was detected below the SL in soil collected from the shallow interval of boring location RMTC-01 with a concentration of 11 µg/kg. PFHxS was detected below the SL in two of the three boring locations in the shallow zone, RMTC-01 and RMTC-03 at concentrations of 1 µg/kg and 0.72 µg/kg, respectively. PFNA was detected below the SL in the shallow interval at one boring location, RMTC-01, at a concentration of 1.2 µg/kg.

PFOA, PFOS, PFHxS, and PFNA were detected at concentrations below their respective SLs in one of three shallow subsurface samples (depths ranging from 4 to 7 ft bgs) from soil boring RMTC-03.

PFOA, PFOS, PFHxS, PFNA, and PFBS were not detected in either of the two deep subsurface soil samples, depths ranging from 9 to 13 ft bgs.

PFBS was not detected in any soil sample associated with the drainage pathways exiting the Robinson Army Airfield.

6.9.2 Additional Facility Sampling Locations – Drainage Pathways – Groundwater Analytical Results

Figure 6-6 and **Figure 6-7** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from three temporary wells associated with the drainage pathways exiting the Robinson Army Airfield. PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in all three groundwater samples associated with drainage pathways exiting the Robinson Army Airfield. PFOA was detected in groundwater samples collected from all three temporary wells, one of which exceeded the SL of 6 ng/L. Concentrations ranged from 3.7 ng/L to 190 ng/L at temporary well locations RMTC-02 and RMTC-03, respectively. PFOS was detected at concentrations in excess of the SL (4 ng/L) at all three temporary wells and ranged from 4.2 ng/L to 1,000 ng/L at temporary well locations RMTC-01 and RMTC-03, respectively. PFHxS was detected in groundwater from all three temporary wells, one of which exceeded the SL of 39 ng/L. Concentrations ranged from 12 ng/L to 230 ng/L at temporary well locations RMTC-01 and RMTC-03, respectively. PFNA was detected in groundwater from all three temporary wells, one of which exceeded the SL of 6 ng/L. Concentrations ranged from 0.5 J ng/L to 31 ng/L at temporary well locations RMTC-01 and RMTC-03, respectively. PFBS was detected below the SL in all three groundwater samples with concentrations ranging from 2.8 ng/L to 54 ng/L at temporary well locations RMTC-02 and RMTC-03, respectively.

6.9.3 Additional Facility Sampling Locations – Drainage Pathways – Conclusions

Based on the results of the SI, PFOA, PFOS, PFHxS, and PFNA were detected in soil below their respective SLs. PFBS was detected in groundwater below the SL and PFOA, PFOS, PFHxS, PFNA were detected in one or more groundwater samples at concentrations exceeding their associated SLs. These results also indicate that relevant compounds from AOIs 1, 3, 4, and 5 are migrating away from source areas at concentrations exceeding respective SLs. Based on the exceedances of the SLs in groundwater further evaluation of the Drainage Pathways is warranted.

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

		Location ID	AOI01-01		AOI01-01		AOI01-02		AOI01-03		AOI01-04		AOI01-05		AOI01-06	
		Sample Name	AOI01-01-SB-0-2		AOI01-01-SB-0-2-DUP		AOI01-02-SB-0-2		AOI01-03-SB-0-2		AOI01-04-SB-0-2		AOI01-05-SB-0-2		AOI01-06-SB-0-2	
		Parent Sample ID			AOI01-01-SB-0-2											
		Sample Date	10/27/2021		10/27/2021		10/27/2021		10/28/2021		10/28/2021		10/28/2021		10/28/2021	
		Depth (ft bgs)	0-2		0-2		0-2		0-2		0-2		0-2		0-2	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	130	µg/kg	ND	U	ND	U	4.5		0.32	J	0.25	J	0.76		ND	U
Perfluorononanoic acid (PFNA)	19	µg/kg	ND	U	ND	U	20		0.28	J	1.7		ND	U	0.25	J
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	ND	U	ND	U	44		0.60	J	5.3		0.80		0.86	J
Perfluorooctanoic acid (PFOA)	19	µg/kg	ND	U	ND	U	6.2		0.46	J	2.3		0.22	J	0.39	J

Notes:
(1) The Screening Levels for soil are based on a residential scenario for incidental ingestion of contaminated soil.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection.
Associated numerical value is approximate.
ft bgs = feet below ground surface
µg/kg = Microgram(s) per kilogram
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI01-06		AOI01-07		AOI02-01		AOI02-02		AOI02-03		AOI02-04		AOI03-01	
		Sample Name	AOI01-06-SB-0-2-DUP		AOI01-07-SB-0-2		AOI02-01-SB-0-2		AOI02-02-SB-0-2		AOI02-03-SB-0-2		AOI02-04-SB-0-2		AOI03-01-SB-0-2	
		Parent Sample ID	AOI01-06-SB-0-2													
		Sample Date	10/28/2021		10/27/2021		10/19/2021		10/18/2021		10/19/2021		10/18/2021		10/21/2021	
		Depth (ft bgs)	0-2		0-2		0-2		0-2		0-2		0-2		0-2	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	ND	U	1.1	J	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	130	µg/kg	0.36	J	12		ND	U	0.32	J	0.38	J	0.26	J	ND	U
Perfluorononanoic acid (PFNA)	19	µg/kg	0.41	J	9.3		ND	U	ND	UJ	ND	U	ND	U	0.48	J
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	2.2	J	190		ND	U	ND	U	0.32	J	ND	U	0.21	J
Perfluorooctanoic acid (PFOA)	19	µg/kg	0.61		3.9		ND	U	ND	UJ	ND	U	ND	U	0.50	J

Notes:
(1) The Screening Levels for soil are based on a residential scenario for incidental ingestion of contaminated soil.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection.
Associated numerical value is approximate.
ft bgs = feet below ground surface
µg/kg = Microgram(s) per kilogram
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI03-02		AOI03-03		AOI04-01		AOI04-02		AOI05-01		AOI05-02		AOI05-03	
		Sample Name	AOI03-02-SB-0-2		AOI03-03-SB-0-2		AOI04-01-SB-0-2		AOI04-02-SB-0-2		AOI05-01-SB-0-2		AOI05-02-SB-0-2		AOI05-03-SB-0-2	
		Parent Sample ID														
		Sample Date	10/21/2021		10/21/2021		10/21/2021		10/21/2021		10/22/2021		10/26/2021		10/26/2021	
		Depth (ft bgs)	0-2		0-2		0-2		0-2		0-2		0-2		0-2	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	130	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	6.7		ND	U
Perfluorononanoic acid (PFNA)	19	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	0.40	J	ND	U
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	ND	U	ND	U	1.3		1.0		0.34	J	23		ND	U
Perfluorooctanoic acid (PFOA)	19	µg/kg	ND	U	ND	U	0.48	J	ND	U	0.50	J	2.4		ND	U

Notes:
(1) The Screening Levels for soil are based on a residential scenario for incidental ingestion of contaminated soil.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection.
Associated numerical value is approximate.
ft bgs= feet below ground surface
µg/kg = Microgram(s) per kilogram
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI05-03		AOI06-01		AOI06-02		AOI06-03		AOI06-04		RMTC-01		RMTC-02		RMTC-03	
		Sample Name	AOI05-03-SB-0-2-DUP		AOI06-01-SB-0-2		AOI06-02-SB-0-2		AOI06-03-SB-0-2		AOI06-04-SB-0-2		RMTC-01-Off-SB-0-2		RMTC-02-SB-0-2		RMTC-03-SB-0-2	
		Parent Sample ID	AOI05-03-SB-0-2															
		Sample Date	10/26/2021		10/20/2021		10/20/2021		10/20/2021		10/20/2021		10/25/2021		10/27/2021		10/22/2021	
		Depth (ft bgs)	0-2		0-2		0-2		0-2		0-2		0-2		0-2		0-2	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																		
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	130	µg/kg	ND	U	ND	U	0.75		0.73		4.2		1.0		ND	U	0.72	
Perfluorononanoic acid (PFNA)	19	µg/kg	ND	UJ	ND	UJ	ND	U	ND	U	0.29	J	1.2		ND	UJ	ND	U
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	ND	U	0.25	J	0.41	J	11		410		11		ND	U	ND	U
Perfluorooctanoic acid (PFOA)	19	µg/kg	0.27	J+	0.29	J	ND	U	0.48	J	0.84		2.0		0.23	J	5.9	

Notes:
(1) The Screening Levels for soil are based on a residential scenario for incidental ingestion of contaminated soil.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection.
Associated numerical value is approximate.
ft bgs = feet below ground surface
µg/kg = Microgram(s) per kilogram
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI01-01		AOI01-02		AOI01-03		AOI01-03		AOI01-04		AOI01-05		AOI01-06	
		Sample Name	AOI01-01-SB-5-6		AOI01-02-SB-3-4		AOI01-03-SB-2-3		AOI01-03-SB-2-3-DUP		AOI01-04-SB-3-4		AOI01-05-SB-2-3		AOI01-06-SB-2-3	
		Parent Sample ID							AOI01-03-SB-2-3-10282021							
		Sample Date	10/27/2021		10/27/2021		10/28/2021		10/28/2021		10/28/2021		10/28/2021		10/28/2021	
		Depth (ft bgs)	5-6		3-4		2-3		2-3		3-4		2-3		2-3	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																
Perfluorobutanesulfonic acid (PFBS)	25000	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1600	ug/kg	ND	U	1.4		ND	U	ND	U	0.22	J	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	ug/kg	ND	U	2.5		ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	ug/kg	ND	U	7.1		ND	U	0.49	J	ND	U	1.2		0.51	J
Perfluorooctanoic acid (PFOA)	250	ug/kg	ND	U	3.1		ND	U	0.26	J	ND	U	ND	U	0.24	J

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/ commercial worker scenario.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
ug/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI01-07		AOI02-01		AOI02-02		AOI02-03		AOI02-04		AOI02-04	
		Sample Name	AOI01-07-SB-4.5-5.5		AOI02-01-SB-6-7		AOI02-02-SB-8-9		AOI02-03-SB-3-4		AOI02-04-SB-6-7		AOI02-04-SB-6-7-DUP	
		Parent Sample ID											AOI02-04-SB-6-7-10182021	
		Sample Date	10/27/2021		10/19/2021		10/19/2021		10/19/2021		10/18/2021		10/18/2021	
		Depth (ft bgs)	4.5-5.5		6-7		8-9		3-4		6-7		6-7	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)														
Perfluorobutanesulfonic acid (PFBS)	25000	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1600	ug/kg	0.65		ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	ug/kg	4.2		ND	U	0.26	J	ND	U	ND	U	ND	U
Perfluorooctanoic acid (PFOA)	250	ug/kg	0.35	J	ND	U	ND	U	ND	U	ND	U	ND	U

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/ commercial worker scenario.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
ug/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

Location ID			AOI03-01		AOI03-02		AOI03-03		AOI04-01		AOI04-02		AOI05-01		AOI05-02	
Sample Name			AOI03-01-SB-8-9		AOI03-02-SB-5-6		AOI03-03-SB-2-3		AOI04-01-SB-7-8		AOI04-02-SB-7-8		AOI05-01-SB-12-13		AOI05-02-SB-11-12	
Parent Sample ID																
Sample Date			10/21/2021		10/21/2021		10/21/2021		10/21/2021		10/21/2021		10/22/2021		10/26/2021	
Depth (ft bgs)			8-9		5-6		2-3		7-8		7-8		12-13		11-12	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																
Perfluorobutanesulfonic acid (PFBS)	25000	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	0.55	J
Perfluorohexanesulfonic acid (PFHxS)	1600	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	2.9	
Perfluorononanoic acid (PFNA)	250	ug/kg	ND	U	ND	UJ	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	ug/kg	ND	U	ND	U	ND	U	ND	U	0.47	J	ND	U	0.29	J
Perfluorooctanoic acid (PFOA)	250	ug/kg	ND	U	ND	UJ	ND	U	ND	U	ND	U	ND	U	0.31	J

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/ commercial worker scenario.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
ug/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI05-02		AOI05-03		AOI06-01		AOI06-01		AOI06-02	
		Sample Name	AOI05-02-SB-6-7		AOI05-03-SB-7-8		AOI06-01-OFF-SB-2-3		AOI06-01-OFF-SB-2-3-DUP		AOI06-02-SB-7-8	
		Parent Sample ID							AOI06-01-OFF-SB-2-3			
		Sample Date	10/26/2021		10/26/2021		10/20/2021		10/20/2021		10/20/2021	
		Depth (ft bgs)	6-7		7-8		2-3		2-3		7-8	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)												
Perfluorobutanesulfonic acid (PFBS)	25000	ug/kg	0.70	J	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1600	ug/kg	5.5		ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	ug/kg	ND	U	ND	U	ND	UJ	ND	UJ	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	ug/kg	ND	U	ND	U	0.28	J	0.24	J	ND	U
Perfluorooctanoic acid (PFOA)	250	ug/kg	0.29	J	ND	U	ND	UJ	ND	UJ	ND	U

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/ commercial worker scenario.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
ug/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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

		Location ID	AOI06-03		AOI06-04		AOI06-04		RMTC-01		RMTC-02		RMTC-03	
		Sample Name	AOI06-03-SB-7.5-8.5		AOI06-04-OFF-SB-7-8		AOI06-04-SB-10-11		RMTC-01-Off-SB-6-7		RMTC-02-SB-4-5		RMTC-03-SB-4-5	
		Parent Sample ID												
		Sample Date	10/20/2021		10/20/2021		10/20/2021		10/26/2021		10/27/2021		10/22/2021	
		Depth (ft bgs)	7.8-8.5		7-8		10-11		6-7		4-5		4-5	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)														
Perfluorobutanesulfonic acid (PFBS)	25000	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1600	ug/kg	1.6		0.45	J	ND	U	ND	U	ND	U	0.41	J
Perfluorononanoic acid (PFNA)	250	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	0.34	J
Perfluorooctanesulfonic acid (PFOS)	160	ug/kg	0.44	J	0.94		1.1		ND	U	ND	U	18	
Perfluorooctanoic acid (PFOA)	250	ug/kg	ND	U	ND	U	ND	U	ND	U	ND	U	0.76	

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/ commercial worker scenario.
(2) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
ug/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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Table 6-4. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil, Site Inspection Report, RMTC

Location ID			AOI01-01		AOI01-04		AOI01-07		AOI02-02		AOI02-03		AOI04-01		AOI05-02		AOI05-03	
Sample Name			AOI01-01-SB-10-11		AOI01-04-SB-8-9		AOI01-07-SB-9-10		AOI02-02-SB-13-14		AOI02-03-SB-10-11		AOI04-01-SB-15-16		AOI05-02-SB-18-18.5		AOI05-03-SB-15-16	
Parent Sample ID																		
Sample Date			10/27/2021		10/28/2021		10/27/2021		10/19/2021		10/19/2021		10/21/2021		10/28/2021		10/26/2021	
Depth (ft bgs)			10-11		8-9		9-10		13-14		10-11		15-16		18-18.5		15-16	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)																		
Perfluorobutanesulfonic acid (PFBS)	25,000	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1,600	µg/kg	ND	U	ND	U	0.84		ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	UJ
Perfluorooctanesulfonic acid (PFOS)	160	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanoic acid (PFOA)	250	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	UJ

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/commercial worker scenario.
(2) Assistant Secretary of Defense. 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
µg/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

Table 6-4. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil, Site Inspection Report, RMTC

Location ID			AOI06-02		AOI06-03		AOI06-04		RMTC-01		RMTC-02	
Sample Name			AOI06-02-SB-16-17		AOI06-03-SB-17.5-18.5		AOI06-04-OFF-SB-17-18		RMTC-01-Off-SB-12-13		RMTC-02-SB-9-10	
Parent Sample ID												
Sample Date			10/20/2021		10/20/2021		10/20/2021		10/26/2021		10/27/2021	
Depth (ft bgs)			16-17		17.5-18.5		17-18		12-13		9-10	
Analyte	**Screening Level[1, 2]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)												
Perfluorobutanesulfonic acid (PFBS)	25,000	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1,600	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanoic acid (PFOA)	250	µg/kg	ND	U	ND	U	ND	U	ND	U	ND	U

Notes:
(1) The Screening Levels for soil are based on incidental ingestion of soil in a industrial/commercial worker scenario.
(2) Assistant Secretary of Defense. 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ft bgs = feet below ground surface
µg/kg = Microgram(s) per kilogram
LOD = Limit of Detection
LOQ = Limit of Quantitation
Qual = QualifierND
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

Table 6-5. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater, Site Inspection Report, RMTC

		Location ID	AOI01-01		AOI01-01		AOI01-02		AOI01-03		AOI01-04		AOI01-05		AOI01-06		AOI01-07	
		Sample Name	AOI01-01-GW		AOI01-01-GW-DUP		AOI01-02-GW		AOI01-03-GW		AOI01-04-GW		AOI01-05-GW		AOI01-06-GW		AOI01-07-GW	
		Parent Sample ID			AOI01-01-GW													
		Sample Date	10/28/2021		10/28/2021		10/28/2021		10/28/2021		10/29/2021		10/28/2021		10/28/2021		10/28/2021	
Analyte	**Screening Level[1]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (ng/L)																		
Perfluorobutanesulfonic acid (PFBS)	601	ng/L	3.3		3.5		79		16		19		4.5		120		190	
Perfluorohexanesulfonic acid (PFHxS)	39	ng/L	17		19		790		130		200		55		560		1000	
Perfluorononanoic acid (PFNA)	6	ng/L	0.98	J	0.99	J	770	J+	68		11		4.5	J+	160		250	
Perfluorooctanesulfonic acid (PFOS)	4	ng/L	27		29		3000	J+	130		14		91	J+	290		2900	
Perfluorooctanoic acid (PFOA)	6	ng/L	5.2		6.4		540		220		87		15		440	J+	190	

Notes:
(1) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.

Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
J- = Estimated concentration, biased low
J+ = Estimated concentration, biased high
UJ = The analyte was not detected and was reported as less than the LOD.
U = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
ng/L = Nanogram(s) per liter
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

Table 6-5. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater, Site Inspection Report, RMTC

		Location ID	AOI02-01		AOI02-02		AOI02-03		AOI02-04		AOI03-01		AOI03-02		AOI03-02		AOI03-03	
		Sample Name	AOI02-01-GW		AOI02-02-GW		AOI02-03-GW		AOI02-04-GW		AOI03-01-GW		AOI03-02-GW		AOI03-02-GW-DUP		AOI03-03-GW	
		Parent Sample ID													AOI03-02-GW			
		Sample Date	10/26/2021		10/26/2021		10/29/2021		10/19/2021		10/25/2021		10/25/2021		10/25/2021		10/25/2021	
Analyte	**Screening Level[1]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (ng/L)																		
Perfluorobutanesulfonic acid (PFBS)	601	ng/L	ND	U	ND	U	ND	U	1.1	J	16		1.5	J-	1.5	J-	0.5	J
Perfluorohexanesulfonic acid (PFHxS)	39	ng/L	0.76	J	ND	U	2.2	J+	2.8		2.8		5.3	J-	5.5		ND	U
Perfluorononanoic acid (PFNA)	6	ng/L	ND	U	ND	U	ND	U	ND	U	0.57	J	ND	U	ND	U	5.7	
Perfluorooctanesulfonic acid (PFOS)	4	ng/L	1.8	J	0.48	J	0.93	J	ND	U	0.78	J	1.6	J	1.7		5.3	
Perfluorooctanoic acid (PFOA)	6	ng/L	ND	U	ND	U	0.63	J	0.74	J	3.4		ND	U	ND	U	8.4	

Notes:
(1) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.

Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
J- = Estimated concentration, biased low
J+ = Estimated concentration, biased high
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
ng/L = Nanogram(s) per liter
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

Table 6-5. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater, Site Inspection Report, RMTC

		Location ID	AOI04-01		AOI04-02		AOI05-02		AOI05-03		AOI06-01-off		AOI06-02		AOI06-03		AOI06-03	
		Sample Name	AOI04-01-GW		AOI04-02-GW		AOI05-02-GW		AOI05-03-GW		AOI06-01-GW		AOI06-02-GW		AOI06-03-GW		AOI06-03-GW-DUP	
		Parent Sample ID															AOI06-03-GW	
		Sample Date	10/25/2021		10/25/2021		10/29/2021		10/27/2021		10/22/2021		10/22/2021		10/21/2021		10/21/2021	
Analyte	**Screening Level[1]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (ng/L)																		
Perfluorobutanesulfonic acid (PFBS)	601	ng/L	9.0		0.98	J	130		0.99	J	48		1.7		41	J-	40	J-
Perfluorohexanesulfonic acid (PFHxS)	39	ng/L	39		13		110		0.69	J	28		7.6		300		310	
Perfluorononanoic acid (PFNA)	6	ng/L	4.5		0.88	J	0.66	J	ND	U	0.72	J	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	4	ng/L	32		36		23		ND	U	19		1.6	J	120		110	
Perfluorooctanoic acid (PFOA)	6	ng/L	41		3.0		12		1.2	J	2.3		0.88	J	14		14	

Notes:
(1) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.

Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
J- = Estimated concentration, biased low
J+ = Estimated concentration, biased high
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
ng/L = Nanogram(s) per liter
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

Table 6-5. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater, Site Inspection Report, RMTC

		Location ID	AOI06-04-off		RMTC-01		RMTC-02		RMTC-03	
		Sample Name	AOI06-04-GW		RMTC-01-GW		RMTC-02-GW		RMTC-03-GW	
		Parent Sample ID								
		Sample Date	10/22/2021		10/27/2021		10/27/2021		10/26/2021	
Analyte	**Screening Level[1]**	**Unit**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (ng/L)										
Perfluorobutanesulfonic acid (PFBS)	601	ng/L	8.3		4.6		2.8		54	
Perfluorohexanesulfonic acid (PFHxS)	39	ng/L	19		12		14		230	
Perfluorononanoic acid (PFNA)	6	ng/L	ND	U	0.50	J	0.59	J	31	
Perfluorooctanesulfonic acid (PFOS)	4	ng/L	72		4.2		44		1000	
Perfluorooctanoic acid (PFOA)	6	ng/L	1.9		4.0		3.7		190	

Notes:
(1) Assistant Secretary of Defense. July 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.

Values exceeding the Screening Level are shaded gray.
J = Estimated concentration
J- = Estimated concentration, biased low
J+ = Estimated concentration, biased high
UJ = The analyte was not detected and was reported less than or equal to the adjusted Limit of Detection. Associated numerical value is approximate.
U = The analyte was not detected at a level greater than or equal to the adjusted Limit of Detection (LOD).
ng/L = Nanogram(s) per liter
Qual = Qualifier
ND = Analyte not detected above the LOD (LOD values are presented in Appendix F).

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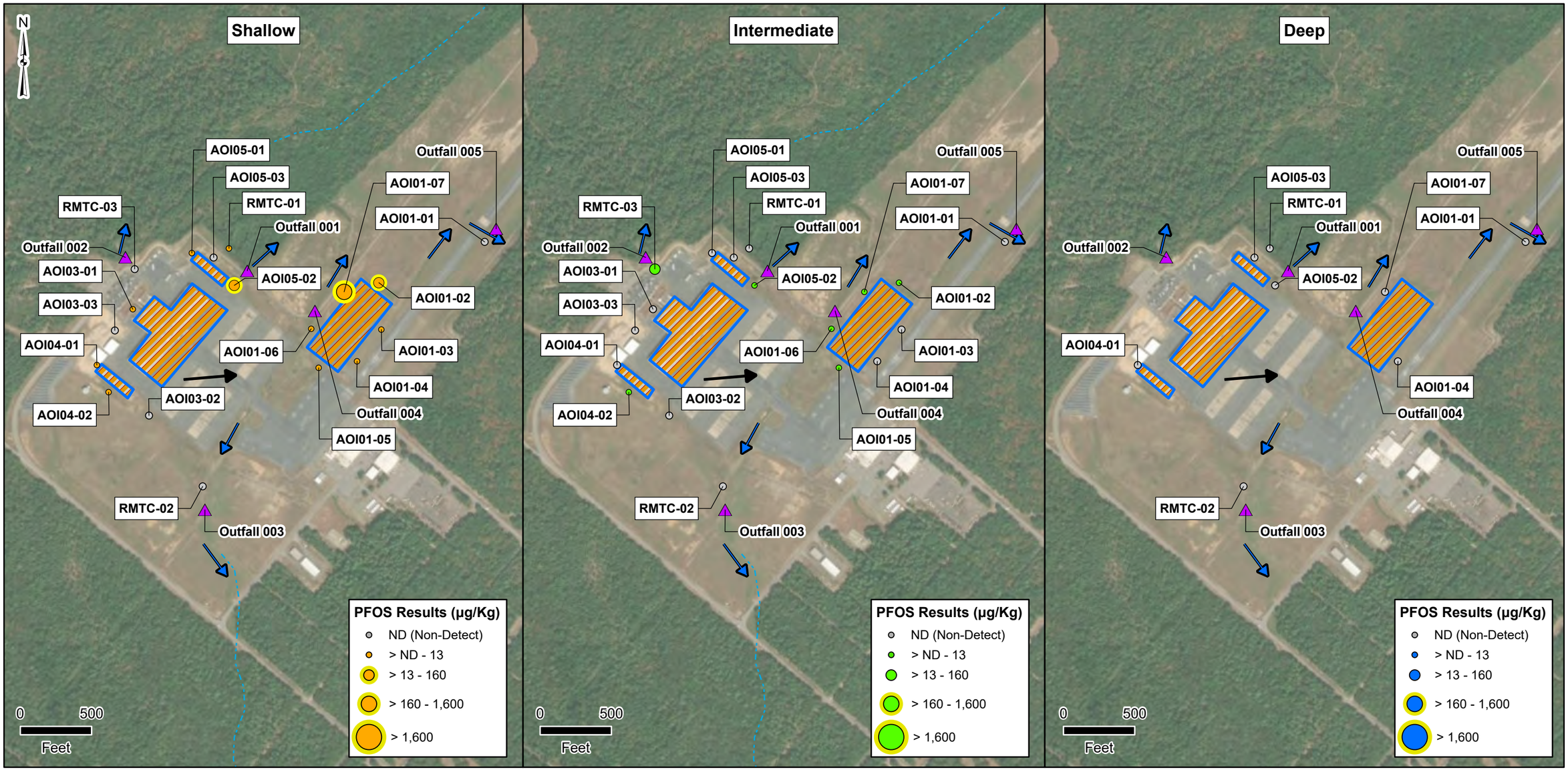
Figure 6-1
AOI 1, AOI 3, AOI 4 and AOI 5
PFOS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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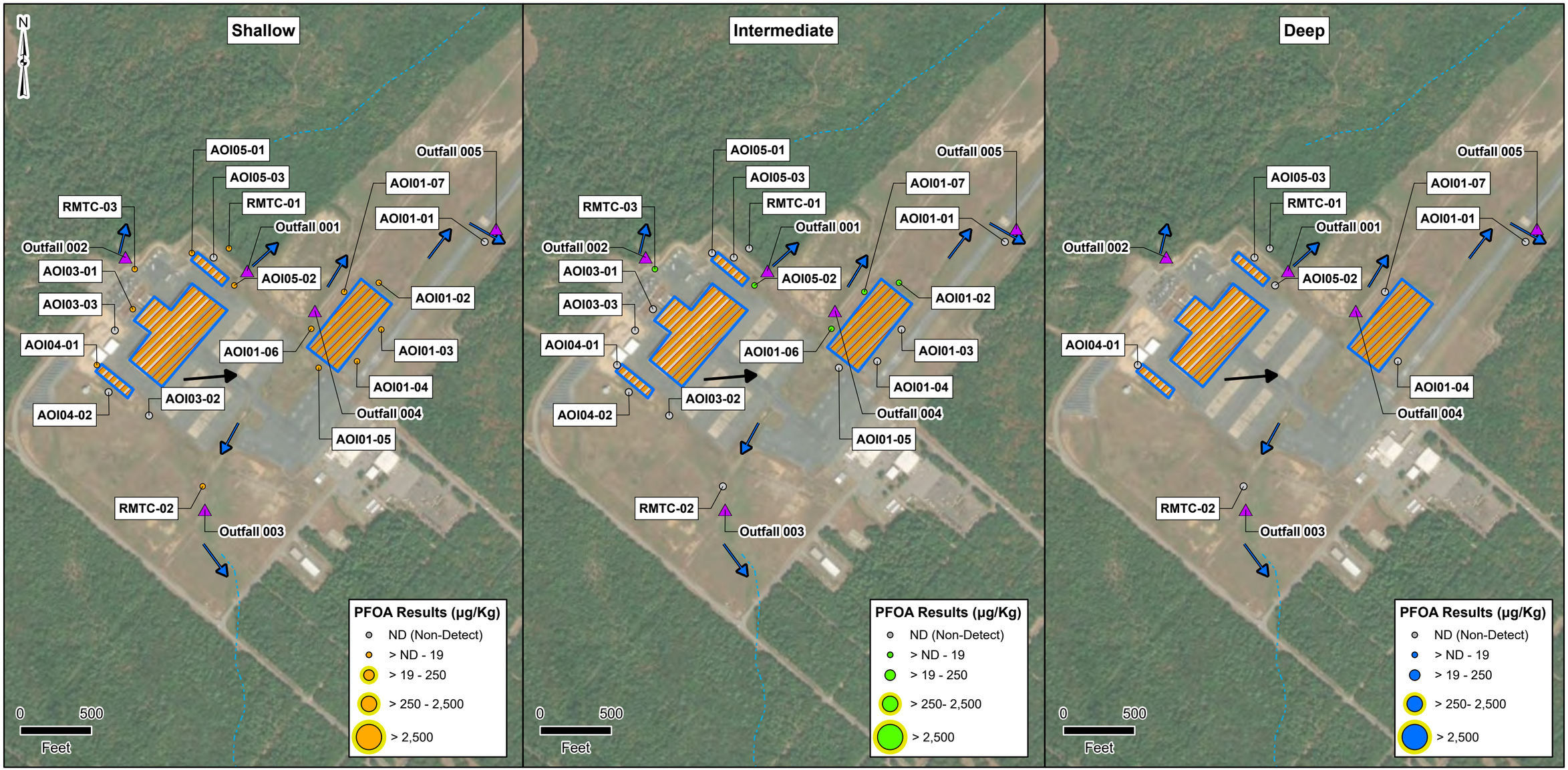
Figure 6-2
AOI 1, AOI 3, AOI 4 and AOI 5
PFOA Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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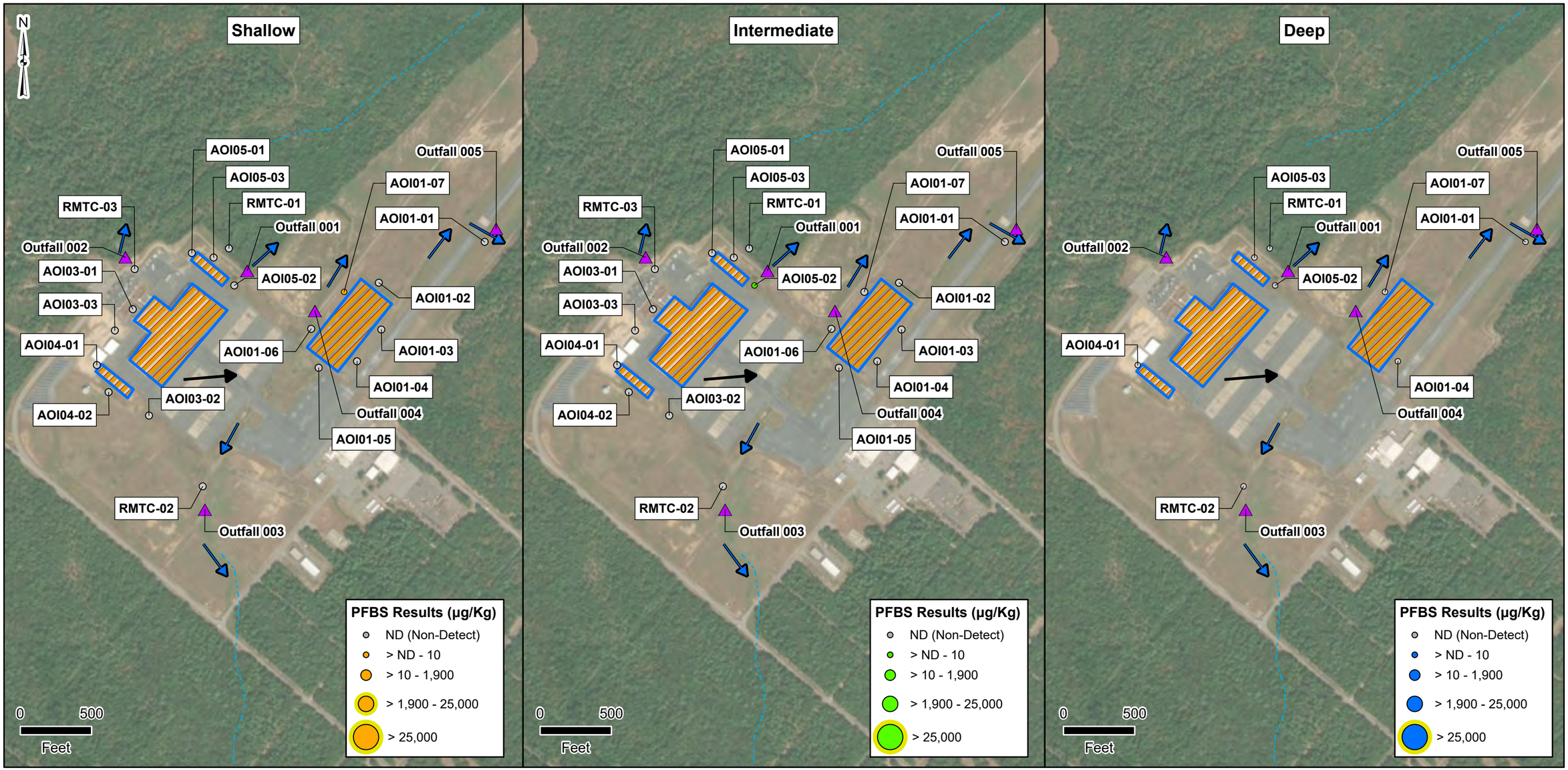
Figure 6-3
AOI 1, AOI 3, AOI 4 and AOI 5
PFBS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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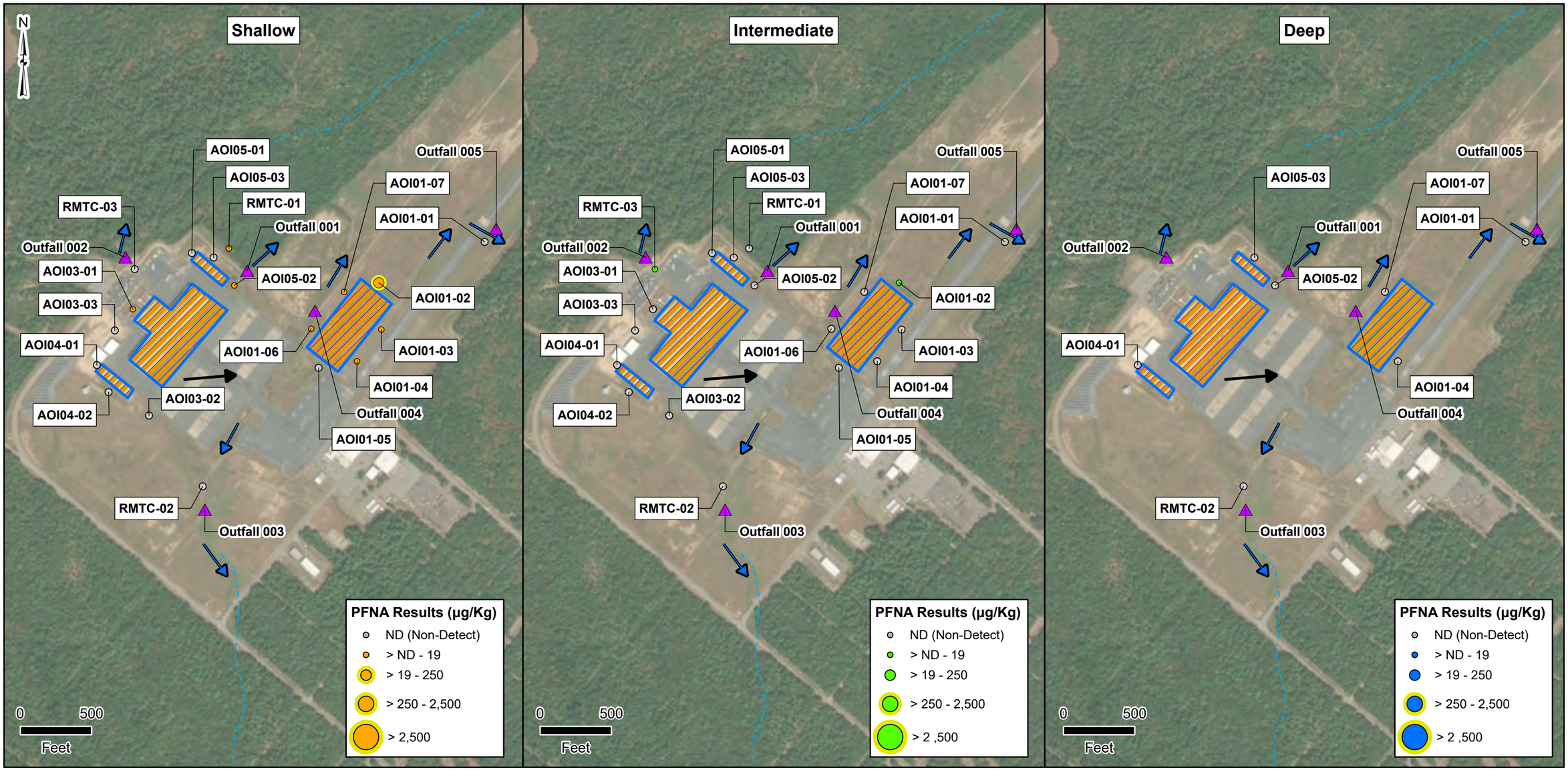
Figure 6-4
AOI 1, AOI 3, AOI 4 and AOI 5
PFNA Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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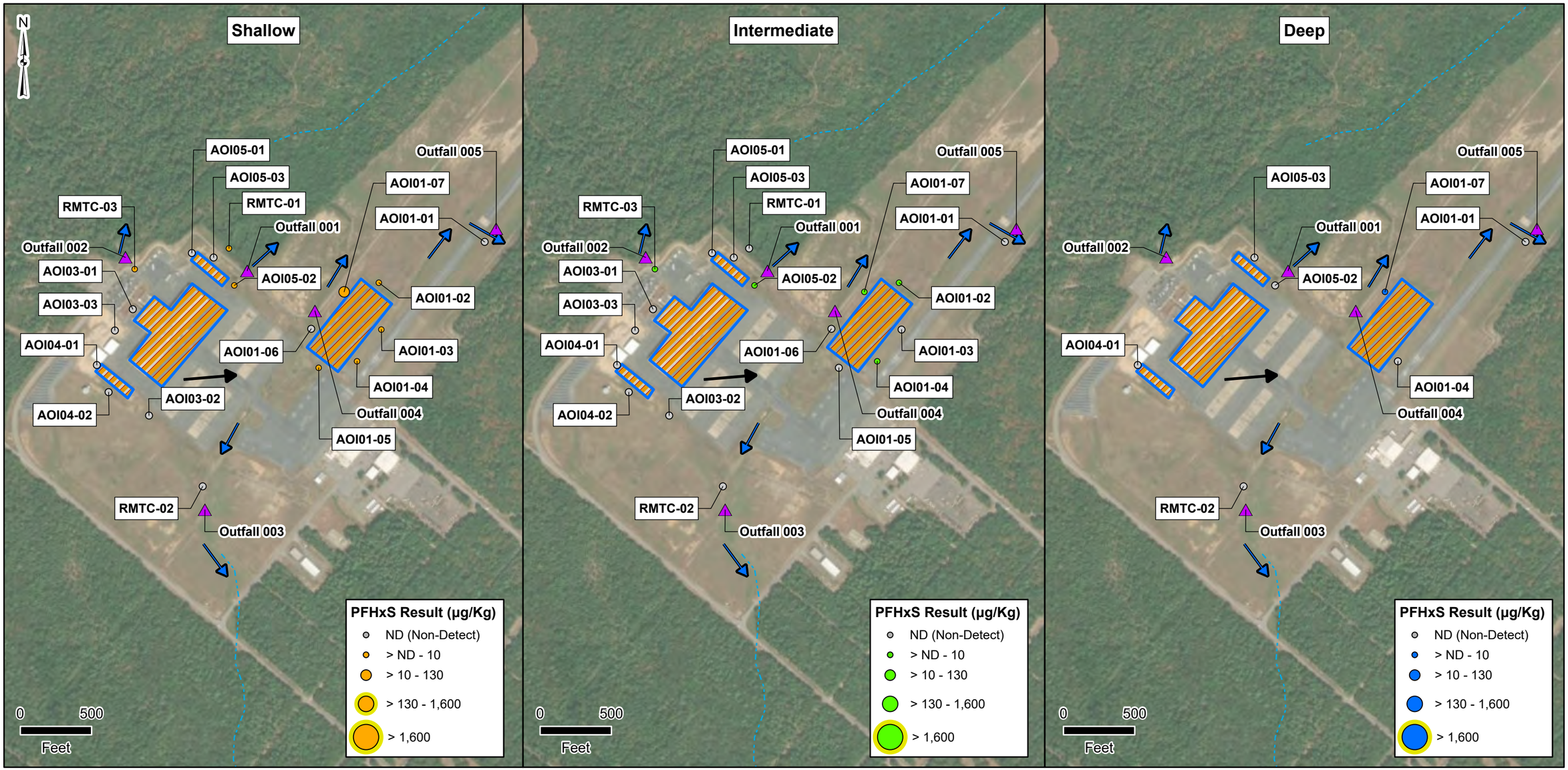
Figure 6-5
AOI 1, AOI 3, AOI 4 and AOI 5
PFHxS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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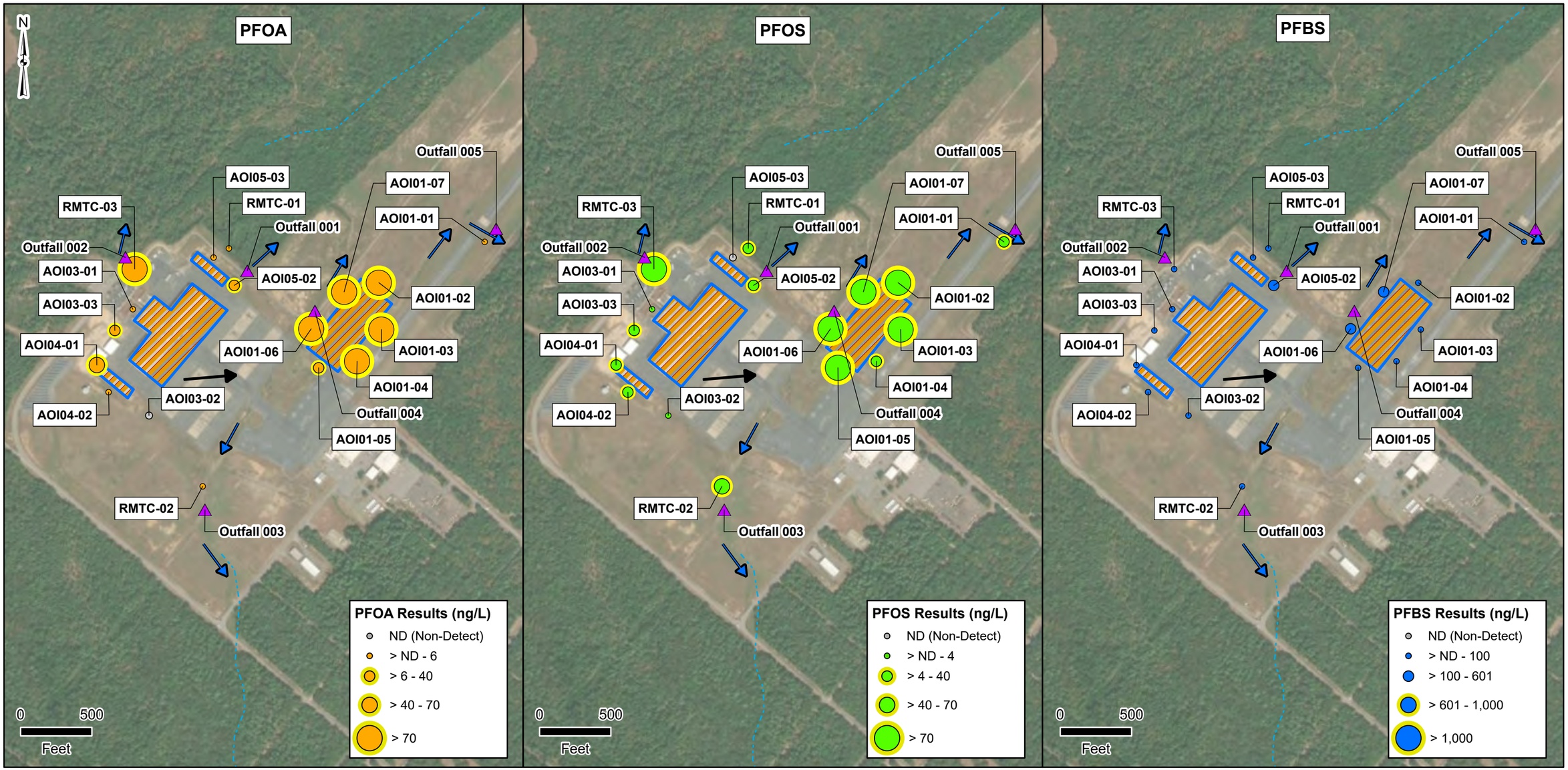
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 6-6
AOI 1, AOI 3, AOI 4 and AOI 5
PFOA, PFOS and PFBS Detections in Groundwater



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

Notes:
PFOA = Perfluorooctanesulfonic acid
PFOS = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
Exceedances of the OSD SL are depicted with a yellow halo.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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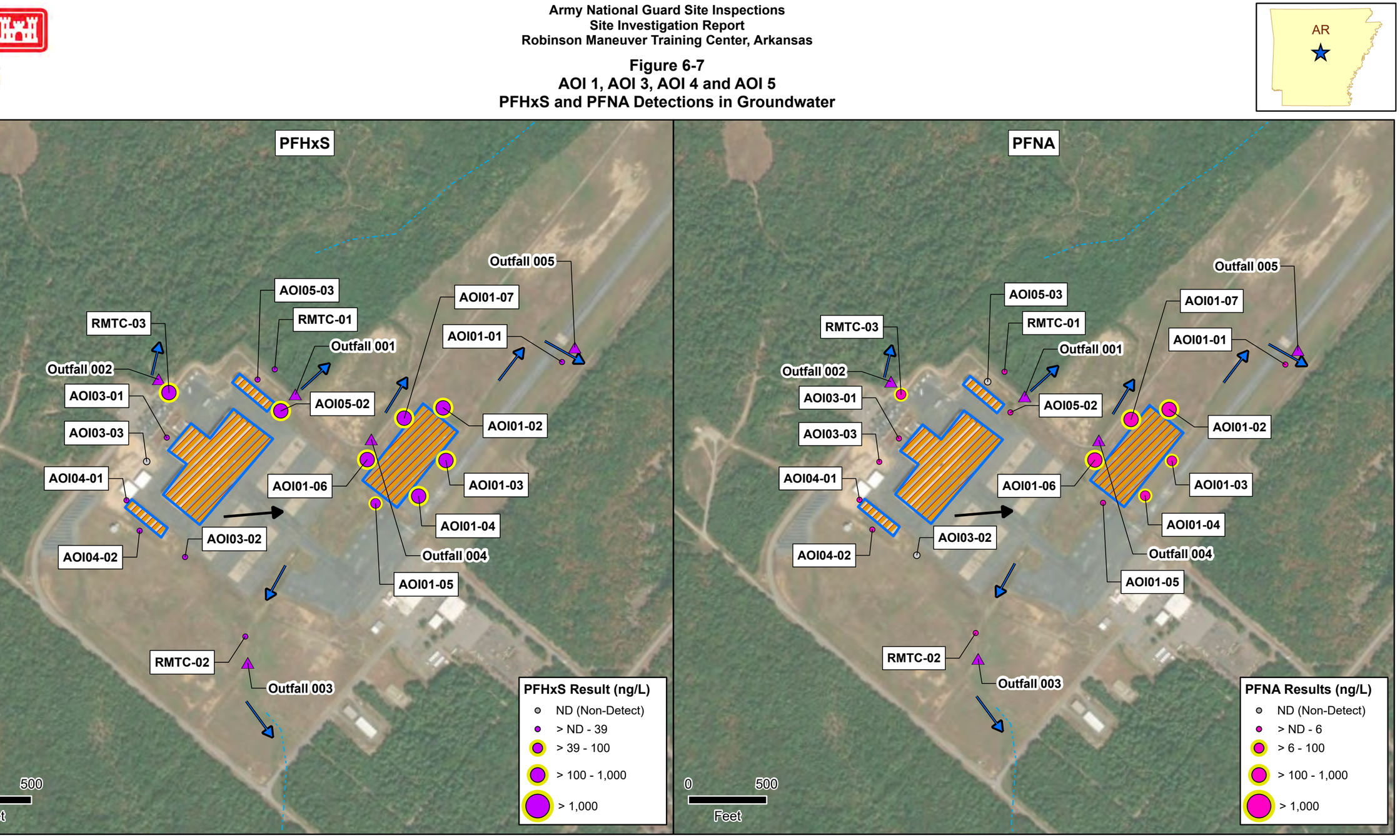
Army National Guard Site Inspections
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 6-7
AOI 1, AOI 3, AOI 4 and AOI 5
PFHxS and PFNA Detections in Groundwater



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Outfall
- Surface Water Flow Direction
- Groundwater Flow Direction
- Intermittent Creek/Stream

Notes:
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
Exceedances of the OSD SL are depicted with a yellow halo.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

Path: C:\Users\kwheatley\Desktop\PFAS\RMTC\PROJECTS\RMTC_SI.aprx

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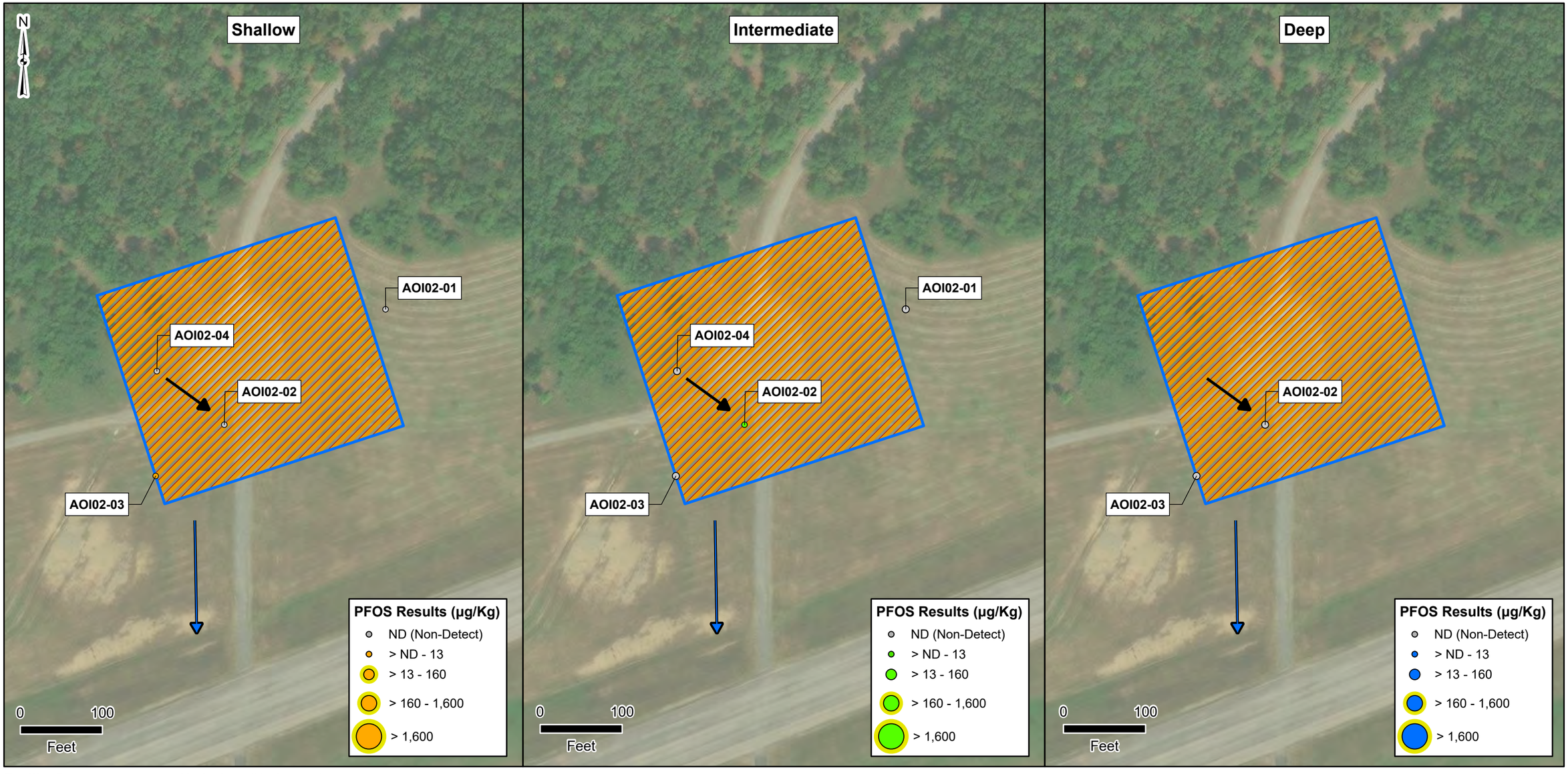
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 6-8
AOI 2
PFOS Detections in Soil



Facility Data

- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology

- Surface Water Flow Direction
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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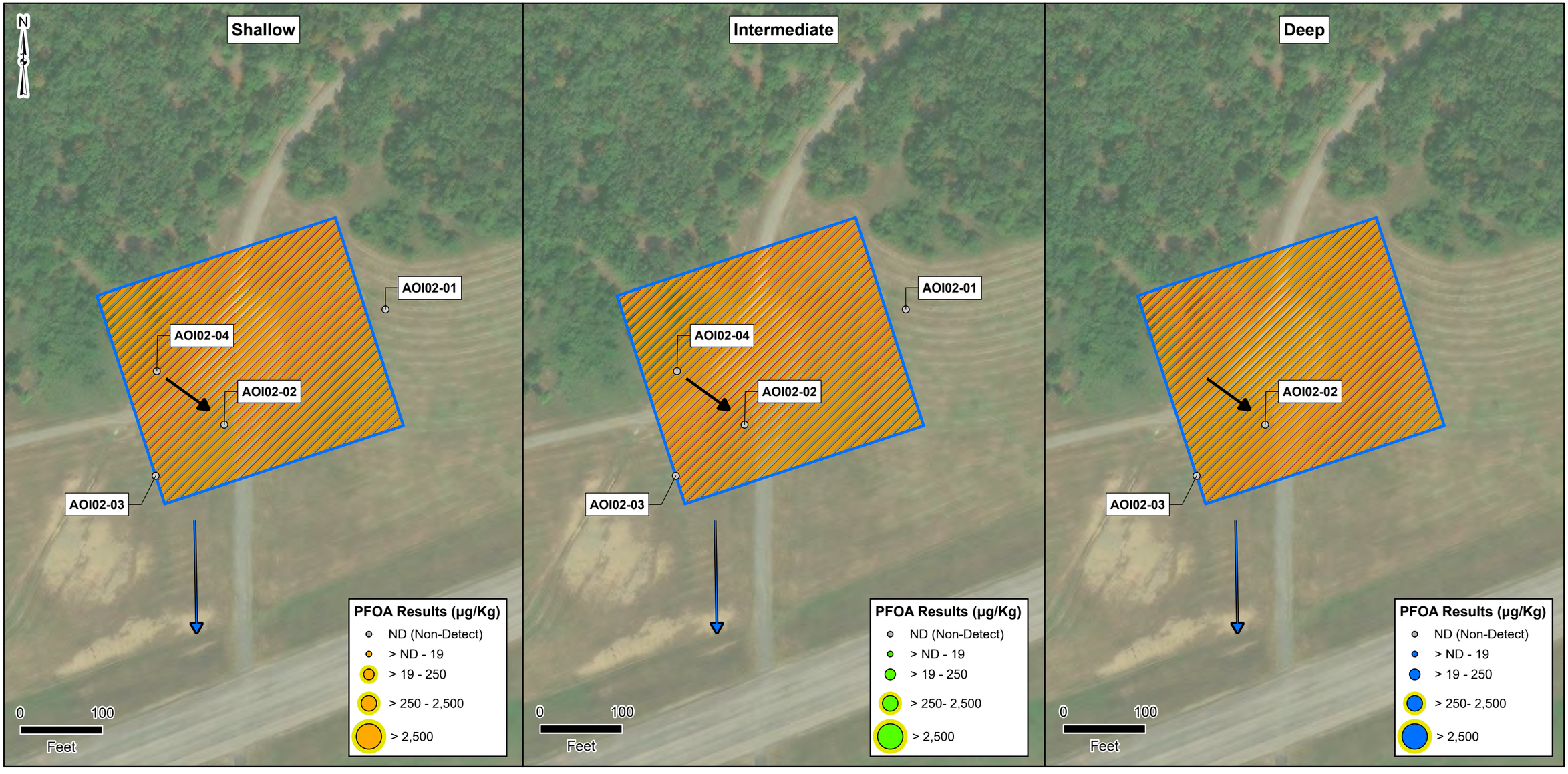
Figure 6-9
AOI 2
PFOA Detections in Soil



Facility Data

- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology

- Surface Water Flow Direction
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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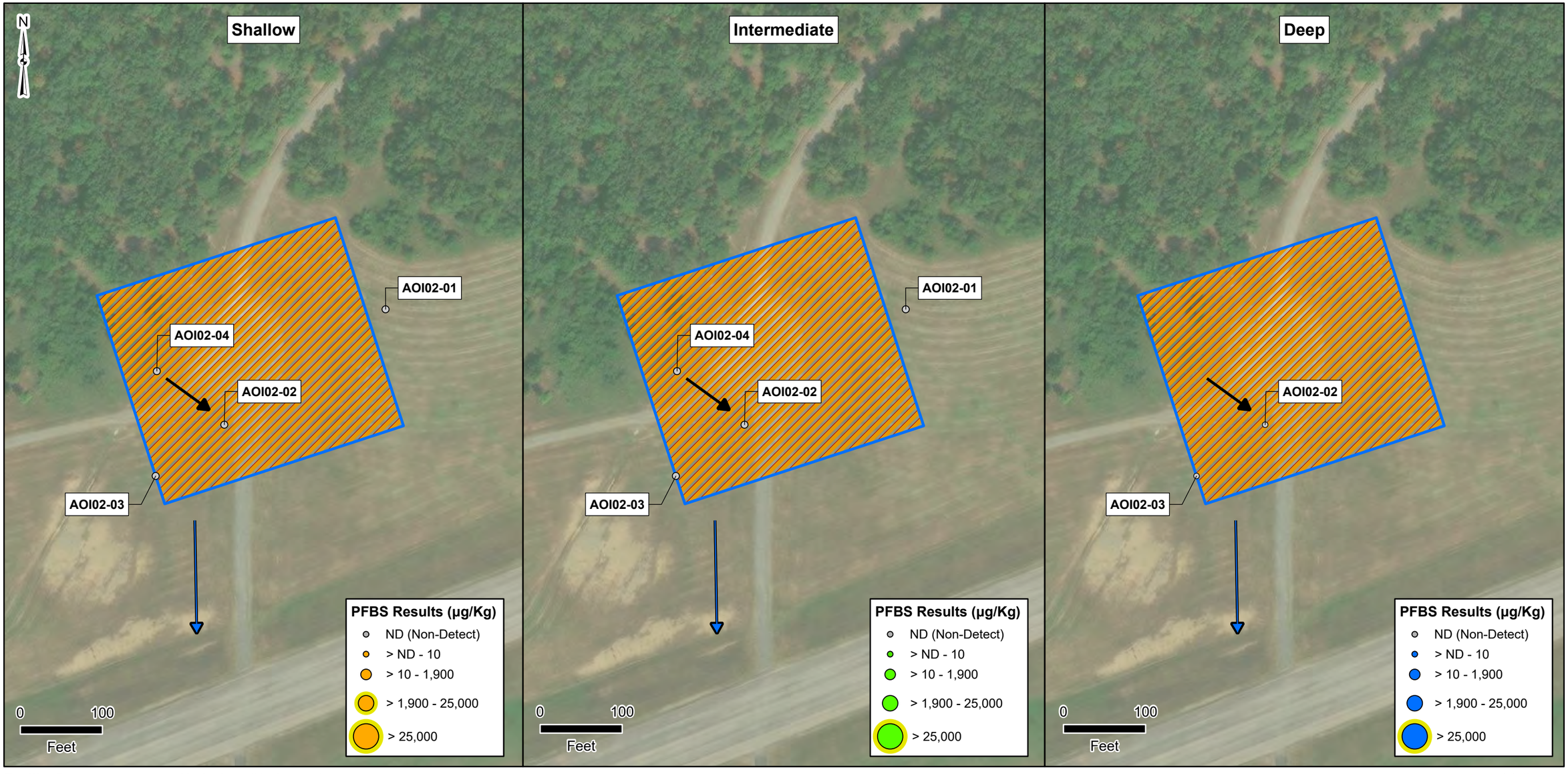
Figure 6-10
AOI 2
PFBS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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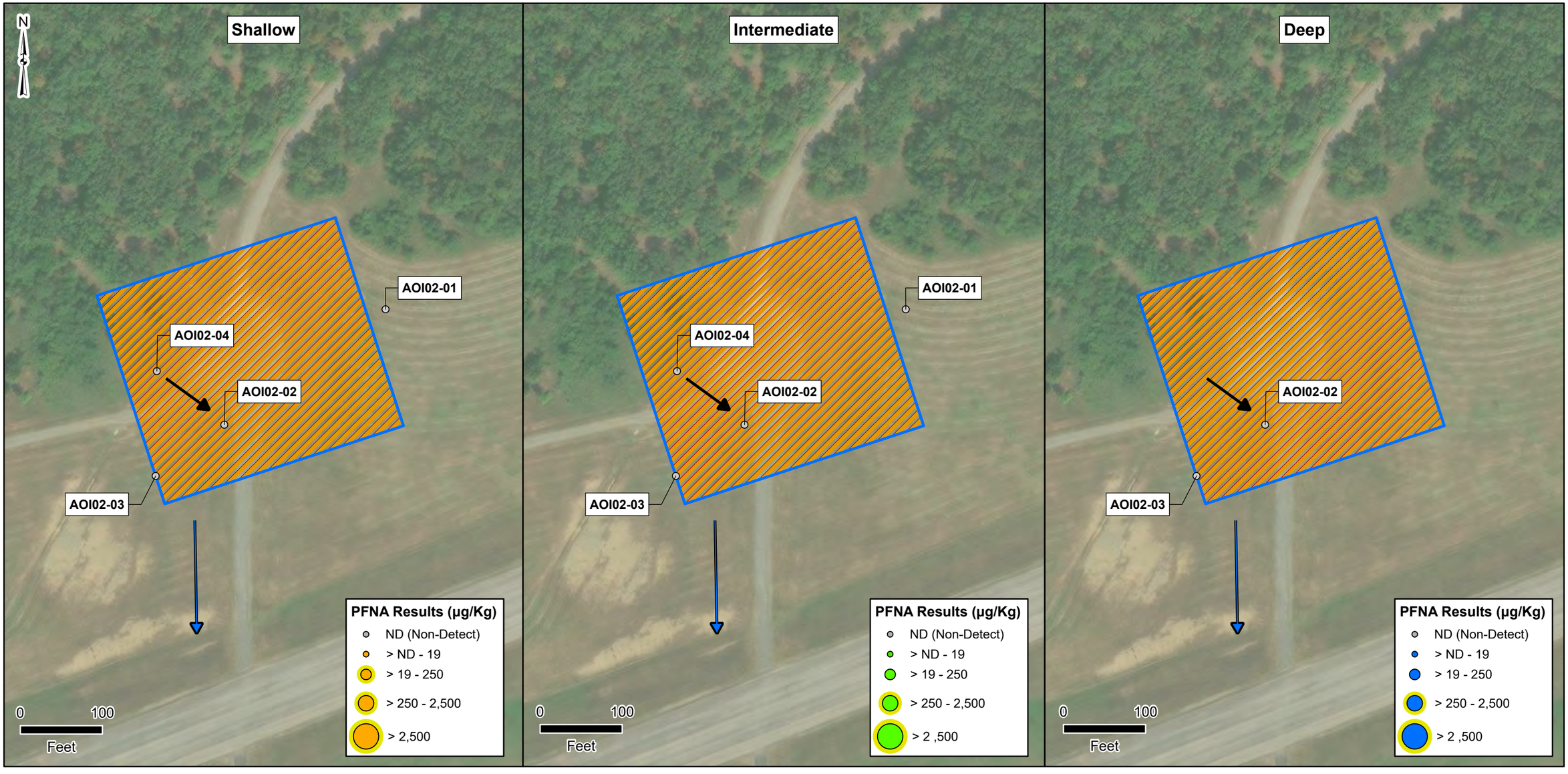
Figure 6-11
AOI 2
PFNA Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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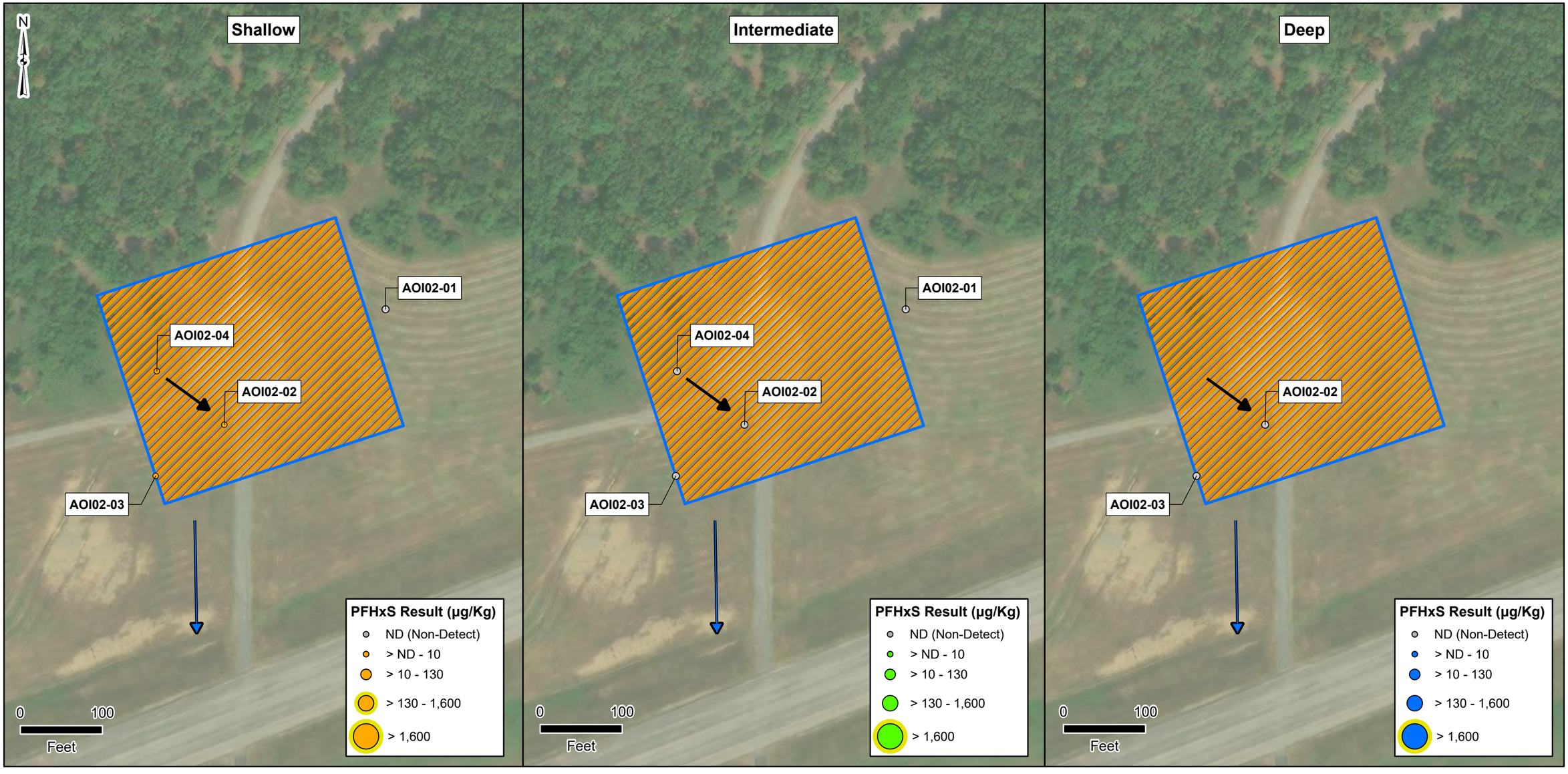
Figure 6-12
AOI 2
PFHxS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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Army National Guard Site Inspections
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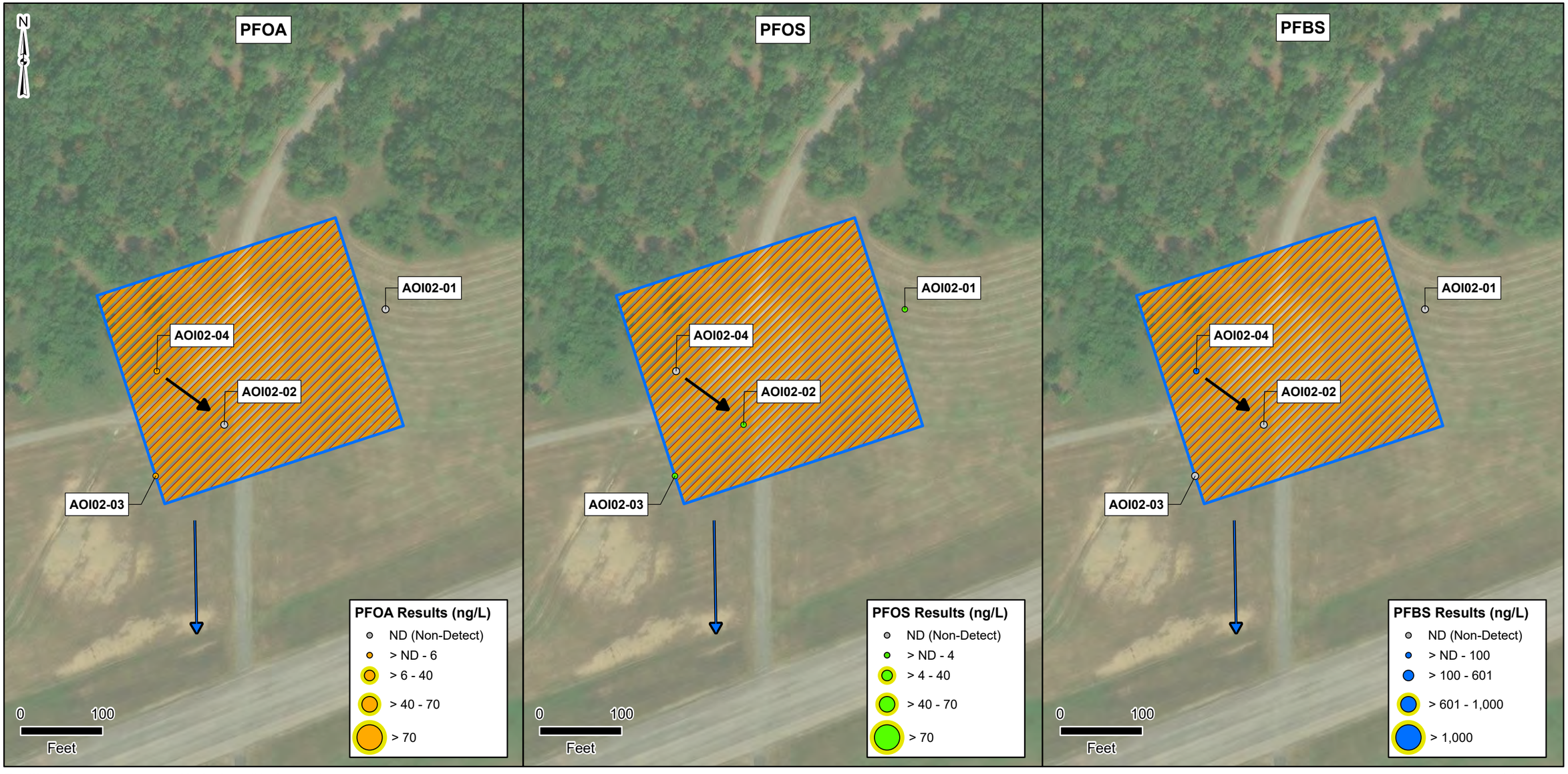
Figure 6-13
AOI 2
PFOA, PFOS and PFBS Detections in Groundwater



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction

Notes:
PFOA = Perfluorooctanesulfonic acid
PFOS = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
Exceedances of the OSD SL are depicted with a yellow halo.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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Army National Guard Site Inspections
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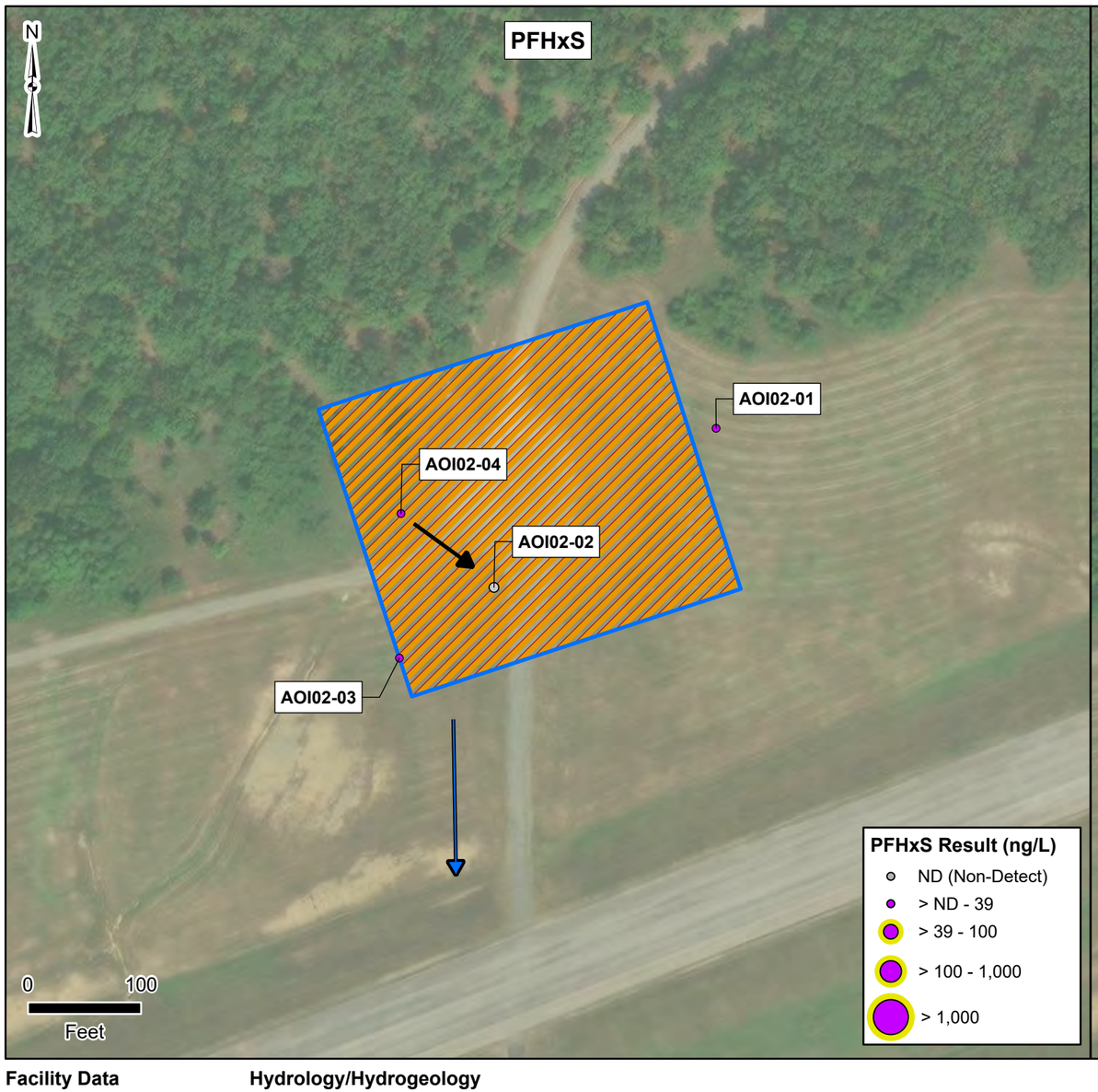
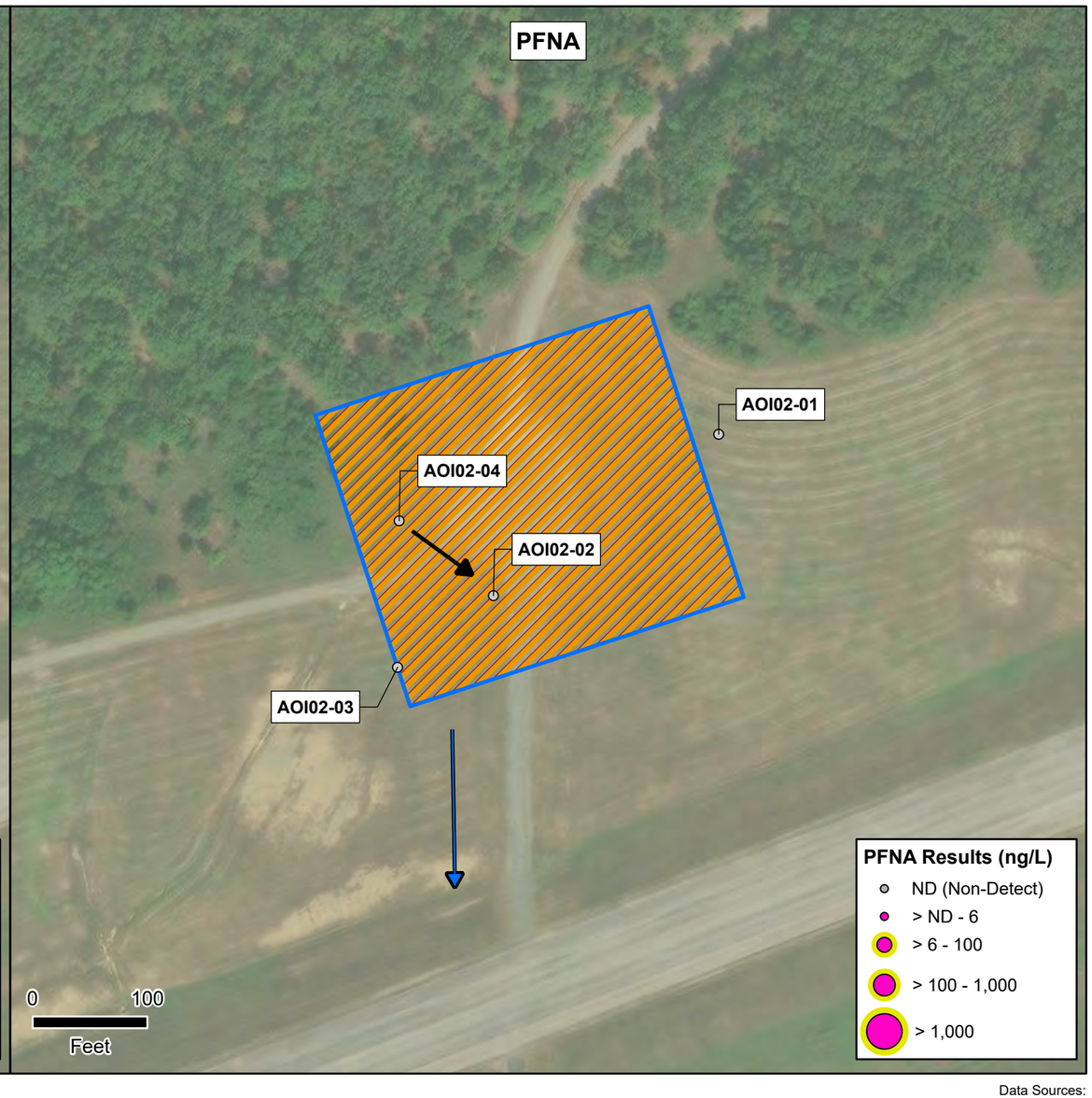
Robinson Maneuver Training Center, Arkansas

Figure 6-14
AOI 2
PFHxS and PFNA Detections in Groundwater





Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Surface Water Flow Direction
- Groundwater Flow Direction

Notes:
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
Exceedances of the OSD SL are depicted with a yellow halo.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

Path: C:\Users\kwheatley\Desktop\PFAS\RMTC\PROJECTS\RMTC_SI.aprx

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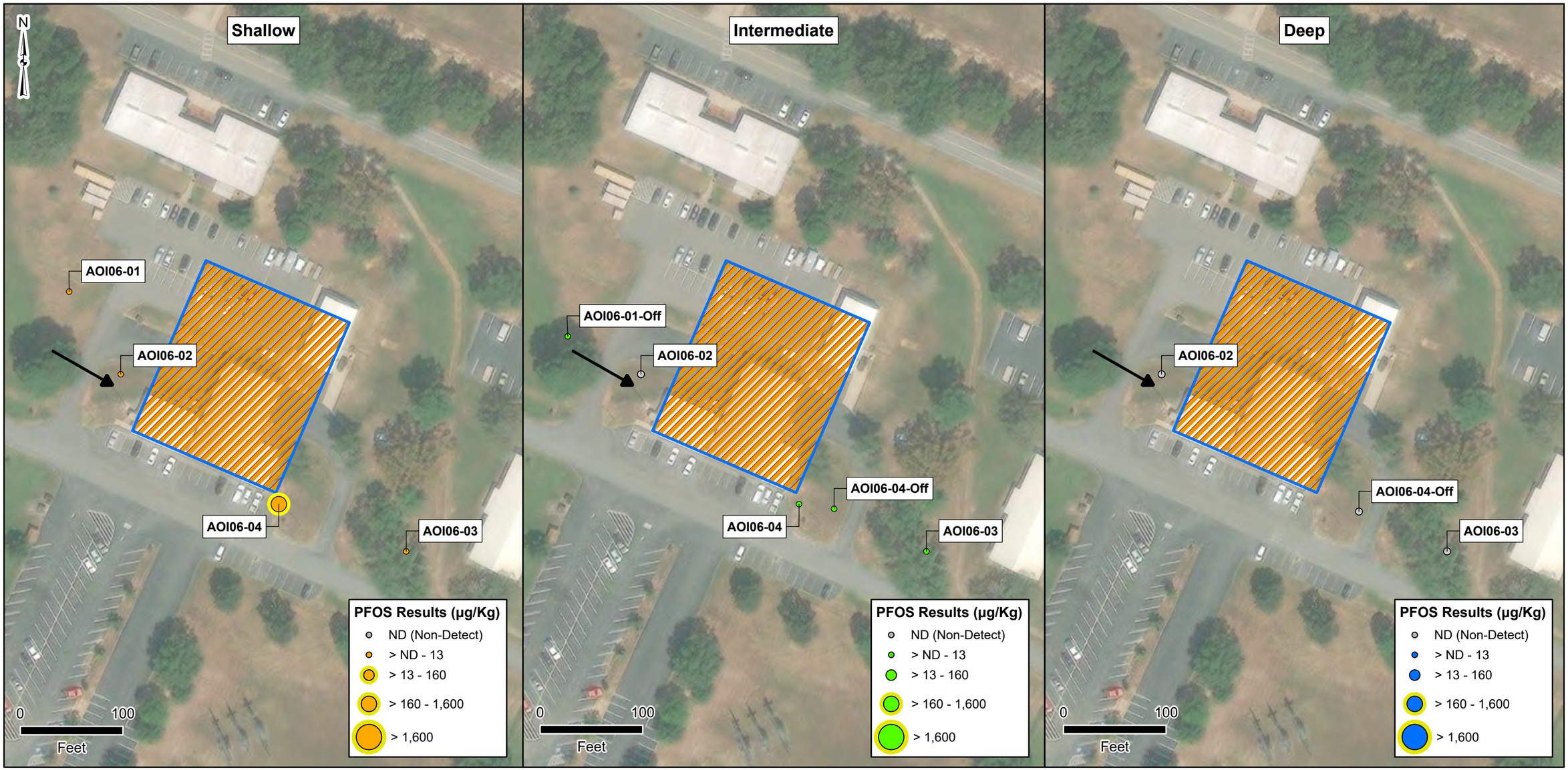
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 6-15
AOI 6
PFOS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Groundwater Flow Direction

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

Data Sources:
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AECOM 2019

Date:.....August 2022
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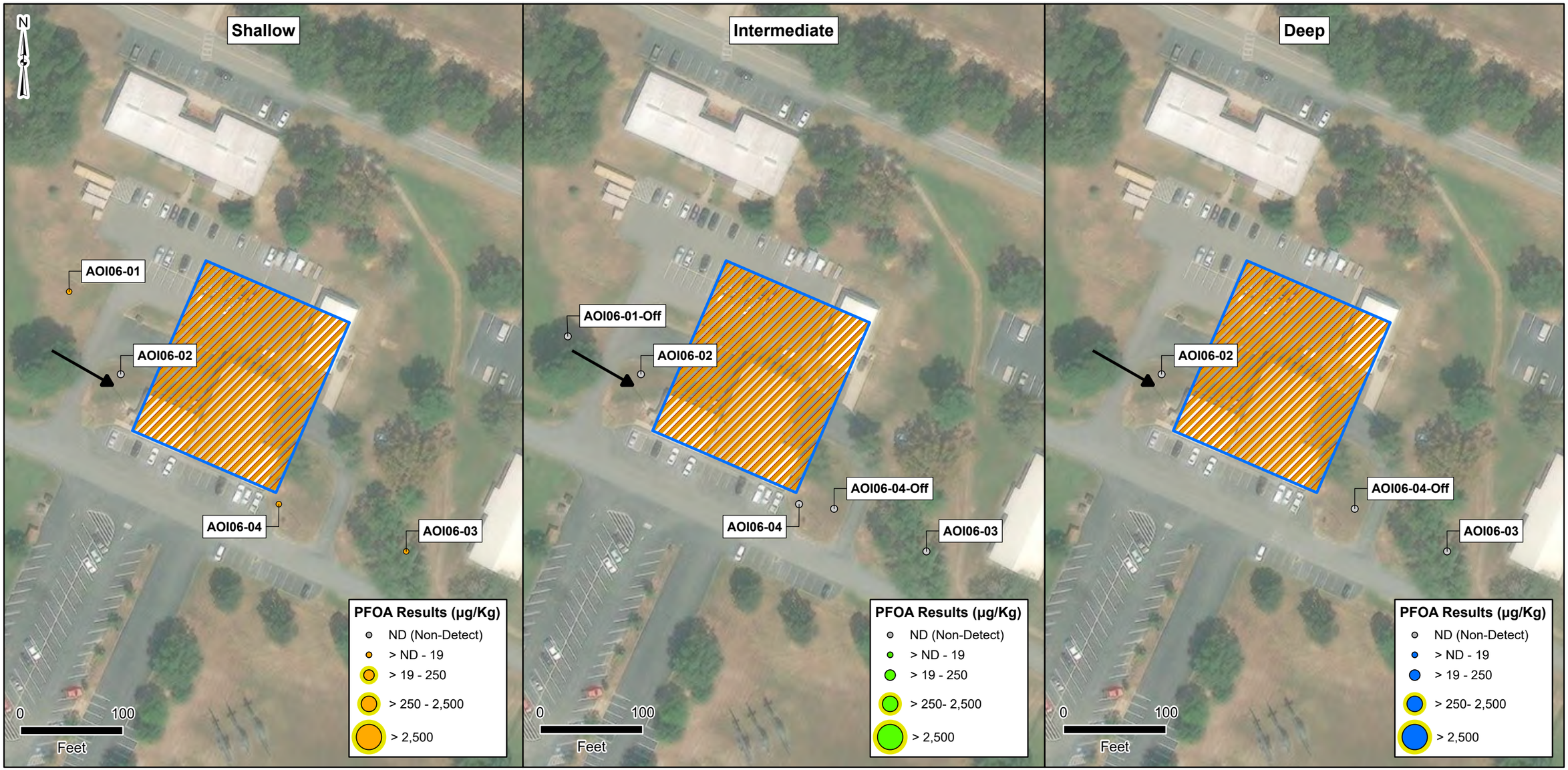
Figure 6-16
AOI 6
PFOA Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Groundwater Flow Direction

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

Data Sources:
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AECOM 2019

Date:.....August 2022
Prepared By:.....EA
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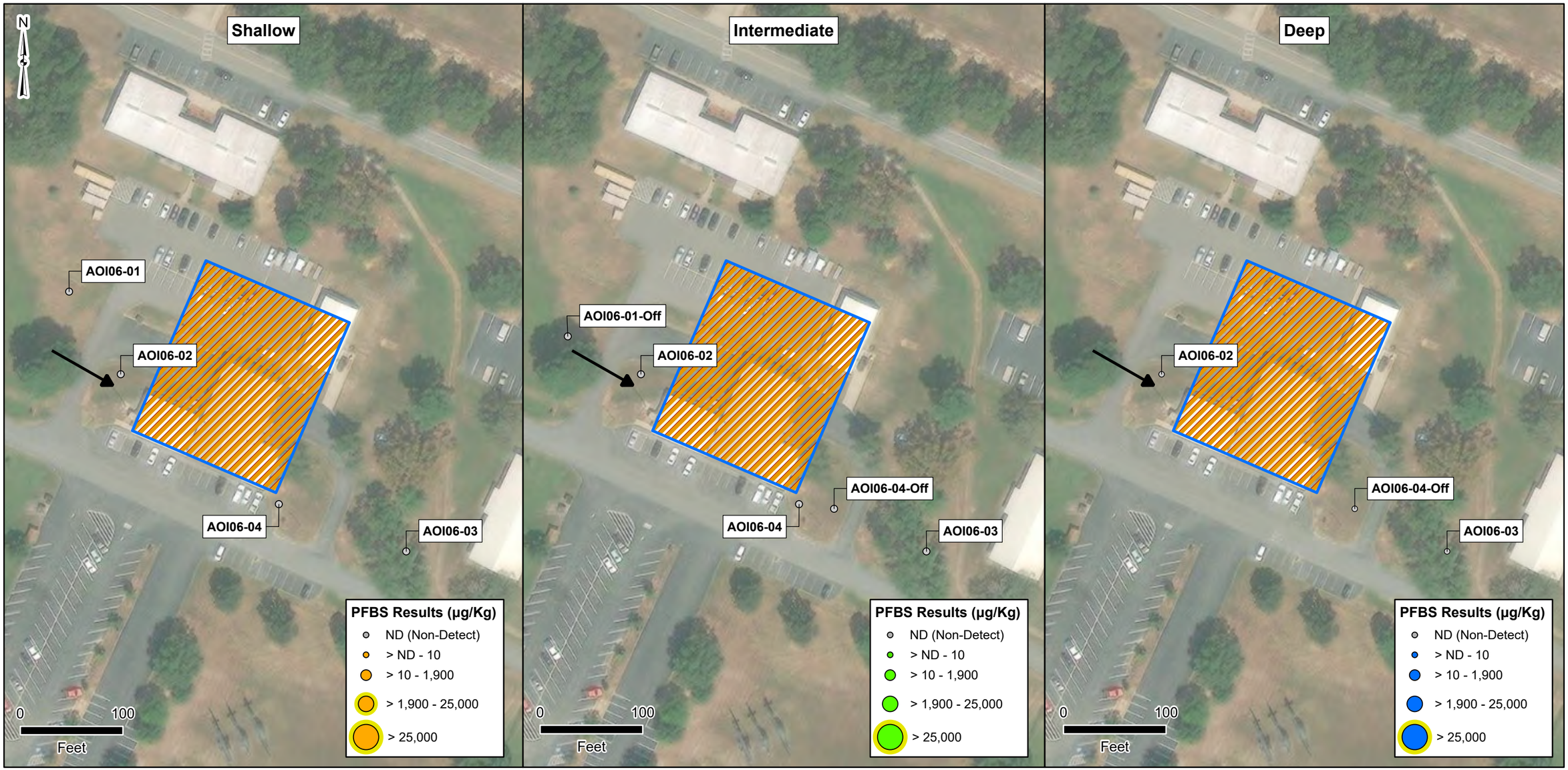
Figure 6-17
AOI 6
PFBS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Groundwater Flow Direction

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

Data Sources:
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Prepared For:.....USACE
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Army National Guard Site Inspections
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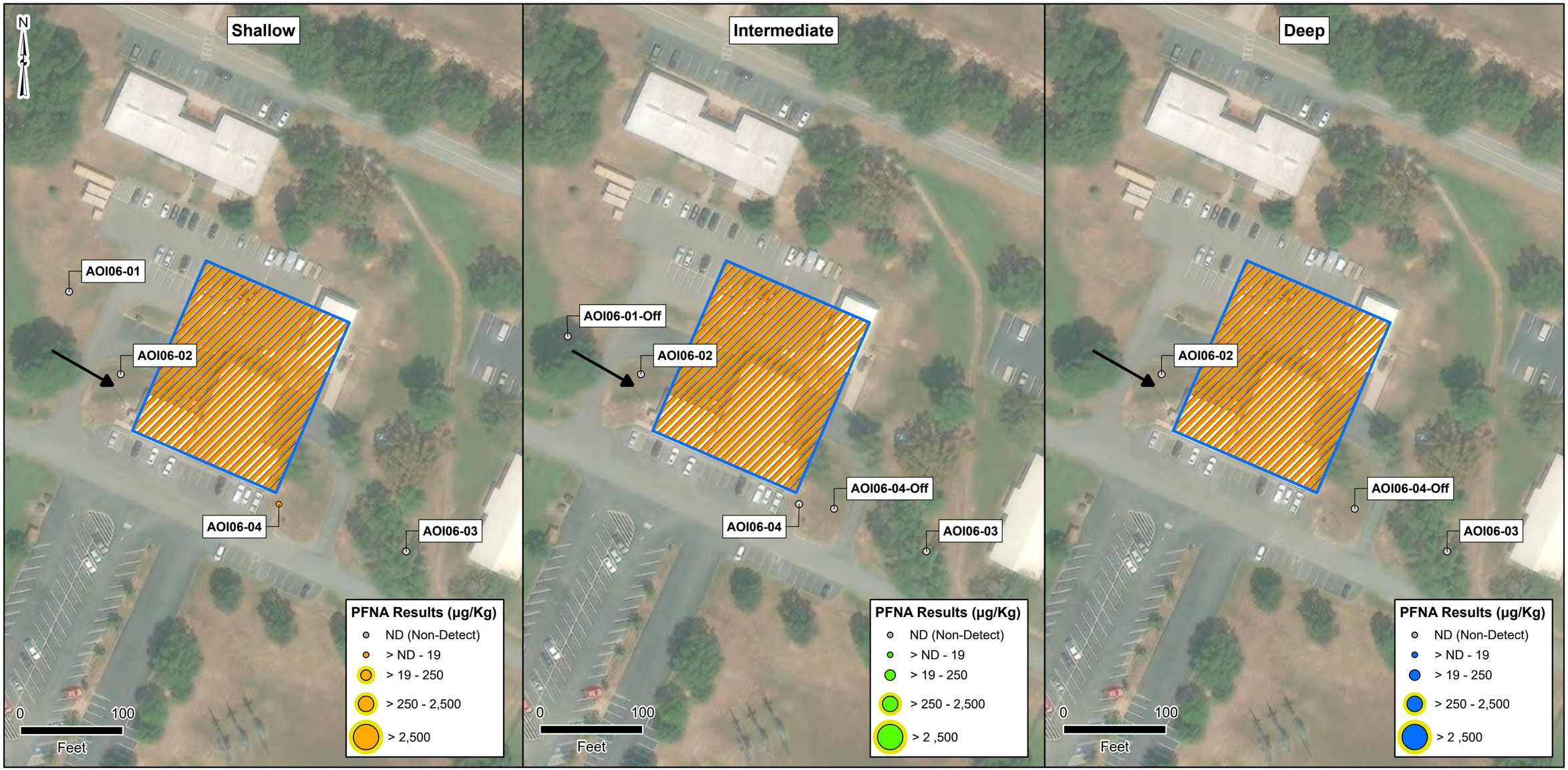
Robinson Maneuver Training Center, Arkansas

Figure 6-18
AOI 6
PFNA Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
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Prepared For:.....USACE
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Army National Guard Site Inspections
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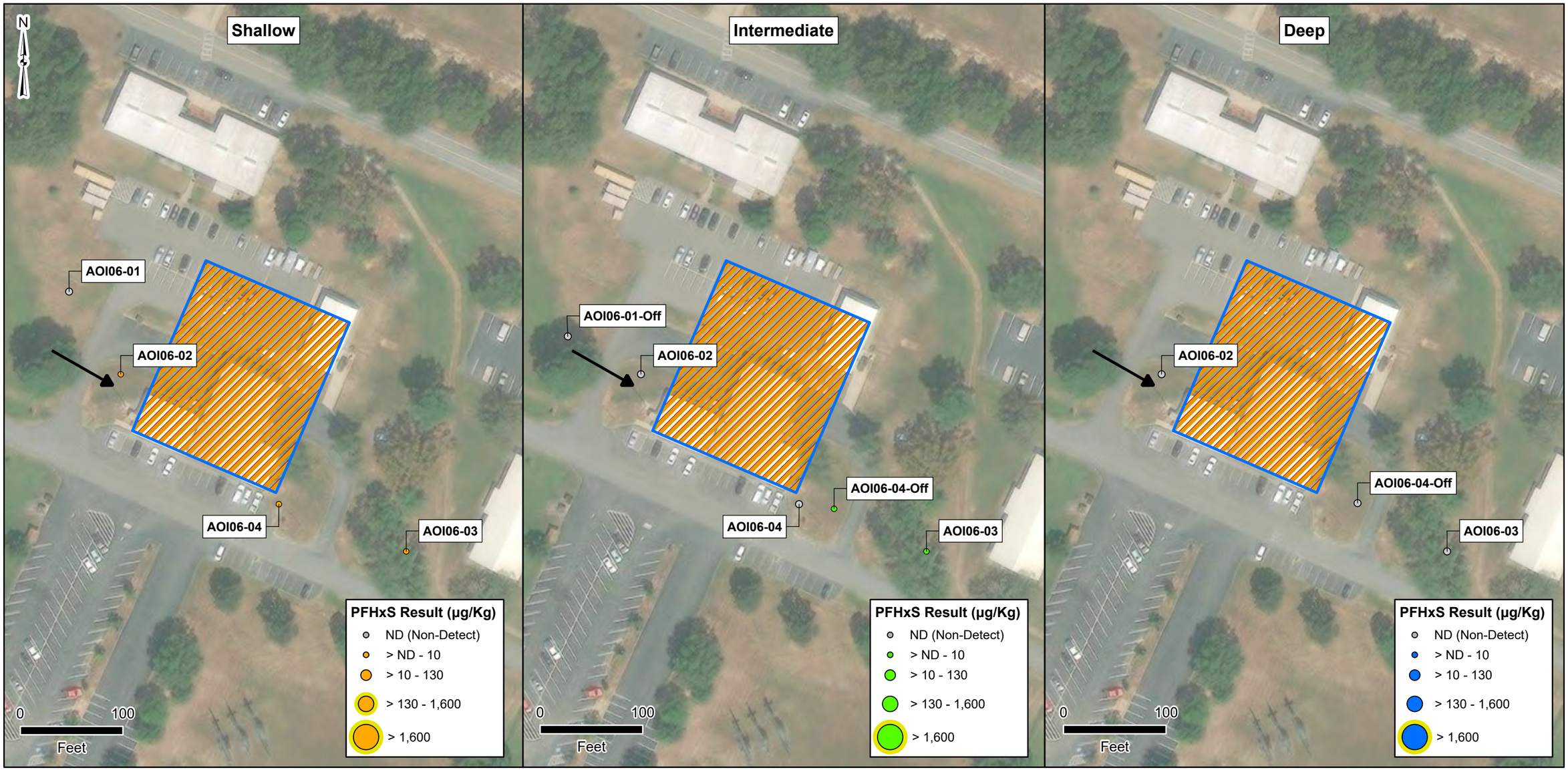
Robinson Maneuver Training Center, Arkansas

Figure 6-19
AOI 6
PFHxS Detections in Soil



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrogeology
- Groundwater Flow Direction

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

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

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Army National Guard Site Inspections
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Robinson Maneuver Training Center, Arkansas

Figure 6-20
AOI 6
PFOA, PFOS and PFBS Detections in Groundwater

Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Groundwater Flow Direction

Notes:
PFOA = Perfluorooctanesulfonic acid
PFOS = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
Exceedances of the OSD SL are depicted with a yellow halo.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
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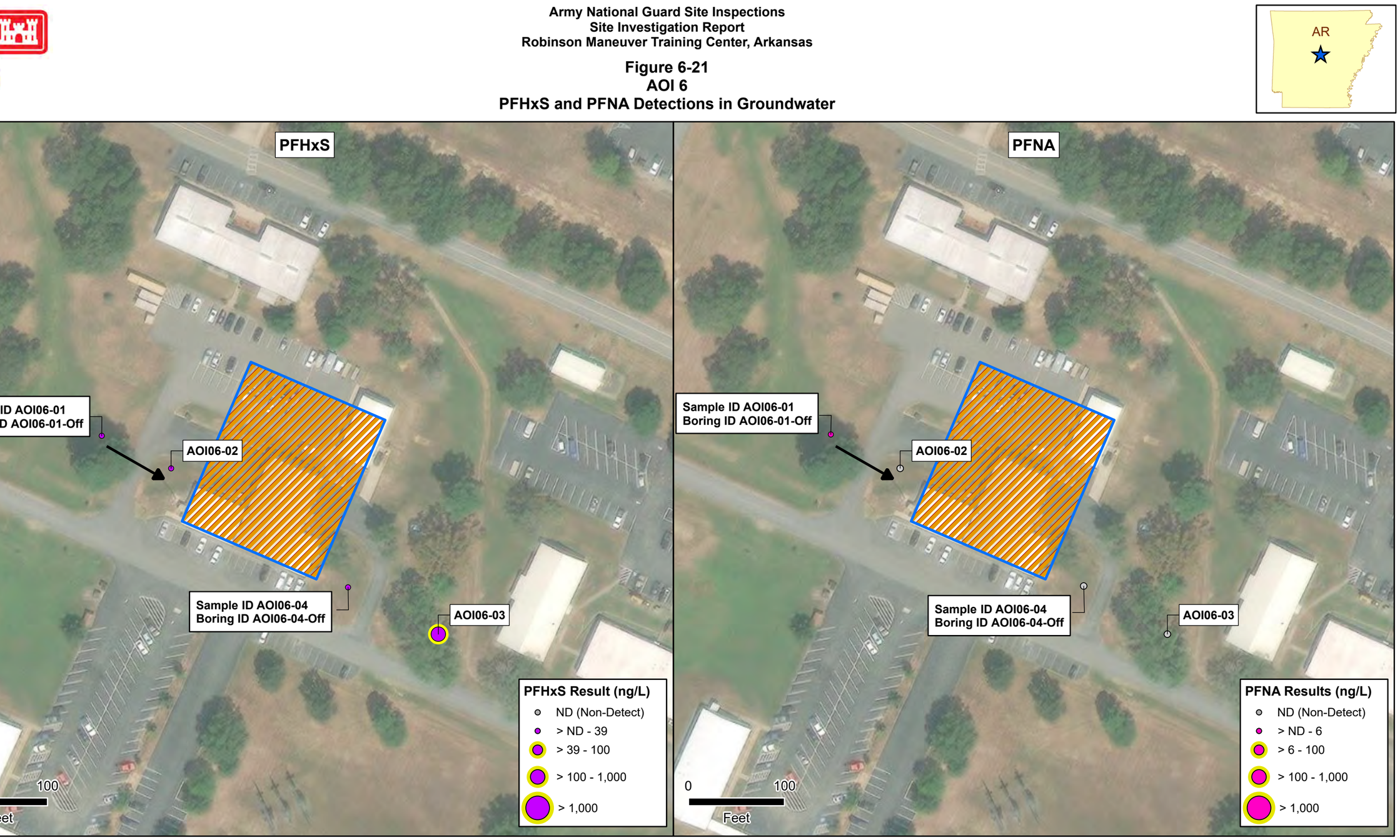
Army National Guard Site Inspections
Site Investigation Report
Robinson Maneuver Training Center, Arkansas

Figure 6-21
AOI 6
PFHxS and PFNA Detections in Groundwater



Facility Data
- Facility Boundary
- Area of Interest
- Potential PFAS Release

Hydrology/Hydrogeology
- Groundwater Flow Direction

Notes:
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
Exceedances of the OSD SL are depicted with a yellow halo.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....August 2022
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 15N

Path: C:\Users\kwheatley\Desktop\PFAS\RMTC\PROJECTS\RMTC_SI.aprx

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7. EXPOSURE PATHWAYS

The Conceptual Site Models (CSMs) for each AOI, revised based on the SI findings, are presented on **Figures 7-1** through **7-3**. 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 solely 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. SLs are presented in **Section 6.1** of this report.

1. Contaminant source
2. Environmental fate and transport
3. Exposure point
4. Exposure route
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 no identified complete 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 a 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 exposure pathways are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of PFAS toxicological study. 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, off-facility residents, trespassers (though unlikely due to restricted access), and recreational users. The public have access to portions of the facility for recreational activities like hunting and personnel assigned to the facility have access to recreational areas proximal to some of the AOIs, for example mountain biking trails are adjacent to AOI 4 (Little Rock Convention and Visitors Bureau 2022). The CSM for AOIs 1 through 6, revised based on the SI findings, is presented on **Figures 7-1** through **7-3**.

7.1 SOIL EXPOSURE PATHWAY

The SI results for soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at AOI 1 through AOI 6 based on the aforementioned

criteria. AOIs 1 (Echo Pad), 3 (Building 28001 – AASF), 4 (Building 28002), and 5 (Wash Bay) are co-located within the Robinson Army Airfield. Due to their proximity, the above AOIs have been grouped under one CSM.

7.1.1 AOIs 1, 3, 4, and 5

AOIs 1, 3, 4, and 5 are within the Robinson Army Airfield area. Controlled AFFF releases through familiarization training have occurred at AOI 1 – Echo Pad from an unknown date. The most recent event using AFFF at AOI 1 was a nozzle testing exercise that occurred in November 2018. AOIs 3, 4, and 5 were historic or current locations where storage of AFFF occurred. RMTC personnel reported a release of AFFF water mixture at AOI 5 after SI sampling had been completed (January 2022); this resulted in the removal of approximately 200 tons of soil from AOI 5.

PFOA, PFOS, PFHxS, PFNA, and/or PFBS were detected in surface soil associated with all four AOIs. Several detected concentrations exceeded SLs. Site workers, construction workers, trespassers (though unlikely due to restricted access), and recreational users could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathway for site workers, construction workers, trespassers, and recreational users is potentially complete. Public use recreational mountain biking trails are located adjacent north of AOIs 1,3,4, and 5 (Little Rock Convention and Visitors Bureau 2022). Additionally, PFOA, PFOS, PFHxS, PFNA, and/or PFBS were detected in subsurface soil associated with three of the four co-located AOIs. Ground-disturbing activities to subsurface soil could result in construction worker exposure to detected constituents via incidental ingestion. Therefore, the exposure pathway for subsurface soil is potentially complete for the construction worker. The CSM for these AOIs is presented in **Figure 7-1**.

7.1.2 AOI 2

AOI 2 encompasses the gravel parking area located along the northern runway where one Little Rock AFB firetruck containing AFFF is typically stationed. Potential leaks from the firetruck may have released AFFF onto the ground.

PFOS and PFHxS were detected in surface soil associated with AOI 2, but there were no exceedances of SLs in surface soils at AOI 2. Site workers and construction workers could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathway for site workers, construction workers, trespassers (though unlikely due to restricted access), and recreational users is potentially complete. PFOS was detected in subsurface soil associated with AOI 2 but there were no exceedances of SLs in subsurface soils at AOI 2. Ground-disturbing activities to subsurface soil could result in construction worker exposure to detected constituents via incidental ingestion. Therefore, the exposure pathway for subsurface soil is potentially complete for the construction worker. The CSM is presented in **Figure 7-2**.

7.1.3 AOI 6

AOI 6 encompasses Building 70200/70201, or the Fire Station. Potential leaks from the firetruck may have released AFFF onto the ground.

PFOA, PFOS, PFHxS, and PFNA were detected in surface soil associated with AOI 6, with one PFOS SL exceedance in surface soils. Site workers, construction workers, trespassers (though unlikely due to restricted access), and recreational users could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathway for site workers, construction workers, trespassers (though unlikely due to restricted access), and recreational users is potentially complete. PFOS and PFHxS were detected in subsurface soil associated with AOI 6, but there were no exceedances of SLs in subsurface soils at AOI 6. Ground-disturbing activities to subsurface soil could result in construction worker exposure to detected constituents via incidental ingestion. Therefore, the exposure pathway for subsurface soil is potentially complete for the construction worker. The CSM is presented in **Figure 7-3.**

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 at each AOI based on the aforementioned criteria.

7.2.1 AOIs 1, 3, 4, and 5

PFOA, PFOS, PFHxS, PFNA, and/or PFBS were detected in groundwater in all temporary wells associated with the Robinson Army Airfield source areas. Additionally, PFOA, PFOS, PFHxS, and/or PFNA exceeded the SLs in groundwater in multiple locations. There are no public water supply wells located within 5 miles of the Robinson Army Airfield. The installation and the majority of Central Arkansas receive potable water from Central Arkansas Water via surface water intakes at Lake Maumelle (URS Group, Inc. and Arcadis 2013). Groundwater is not used for any purposes at RMTC; however, due to the presence of groundwater at shallow occurrences, the exposure pathway for ingestion of groundwater is potentially complete for construction workers working in subsurface conditions. The exposure pathway for site workers, off-facility residents, and trespassers via the ingestion of groundwater is considered to be incomplete due to the absence of an exposure point or route to those receptors. The CSM is presented in **Figure 7-1**.

7.2.2 AOI 2

PFOA, PFOS, PFHxS, PFNA and PFBS were detected in groundwater from temporary wells at the AOI 2 source area; however, there were no exceedances of the SLs for groundwater. There are no public water supply wells located within 5 miles of AOI 2 and the Facility and majority of central Arkansas receive potable water from Central Arkansas Water via surface water intakes at Lake Maumelle (URS Group, Inc. and Arcadis 2013). Groundwater is not used for any purposes at RMTC; however, due to the presence of groundwater at shallow occurrences, the exposure pathway for ingestion of groundwater is potentially complete for construction workers working in subsurface conditions. The exposure pathway for site workers, off-facility residents, and

trespassers via the ingestion of groundwater is considered to be incomplete due to the absence of an exposure point or route to those receptors. The CSM is presented in **Figure 7-2**.

7.2.3 AOI 6

PFOA, PFOS, PFHxS, PFNA and PFBS were detected in groundwater from temporary wells at the AOI 6. Additionally, PFOA, PFOS, and/or PFHxS concentration in groundwater exceeded the SLs in multiple locations. There are no public water supply wells located within 5 miles of AOI 6 and the Facility and majority of central Arkansas receive potable water from Central Arkansas Water via surface water intakes at Lake Maumelle (URS Group, Inc. and Arcadis 2013). Groundwater is not used for any purposes at RMTC; however, due to the presence of groundwater at shallow occurrences, the exposure pathway for ingestion of groundwater is potentially complete (with an exceedance of SLs) for construction workers working in subsurface conditions. The exposure pathway for site workers, off-facility residents, and trespassers via the ingestion of groundwater is considered to be incomplete due to the absence of an exposure point or route to those receptors. The CSM is presented in **Figure 7-3**.

7.3 SURFACE WATER AND SEDIMENT EXPOSURE PATHWAY

No surface water bodies are present within any of the AOIs. Surface water and sediment samples were not collected as part of this SI.

7.3.1 AOIs within the Robinson Army Airfield (AOI 1, AOI 3, AOI 4, and AOI 5)

Drainage swales and Outfalls 001 through 005 surround the outer perimeter of the Robinson Army Airfield, leading to neighboring tributary creeks of the Arkansas River. Swales surrounding the Echo Pad (AOI 1) are connected to Outfalls 004 and 005. Swales and stormwater collector pipes surrounding Building 28001 (AOI 3) discharge to Outfall 002 (draining northwest of the building) and Outfall 001 (draining the paved areas surrounding the building). Building 28002 (AOI 4) and the Wash Bay (AOI 5) are also connected to Outfall 001. Outfalls 001, 002, and 004 drain to Newton Creek and White Oak Bayou before intersecting with the Arkansas River, located 14 miles away. Outfall 005 drains to Spring Creek, Miles Creek, Kellogg Creek, and Bayou Meto before intersecting with the Arkansas River. Outfall 003, which collects surface water runoff to the south from the surrounding paved areas, drains to Fivemile Creek, Brushy Island Creek, and Bayou Meto.

Temporary well location RMTC-01 is located proximal to Outfall 001. The PFOS concentration at RMTC-01 was reported above the SL. The PFOS concentration in the sample collected from RMTC-02 (upgradient and proximal to Outfall 003) was also in excess of the SL. Sample RMTC-03 was collected proximal and up gradient to Outfall 002. PFOA, PFOS, PFHxS, and PFNA concentrations were reported in excess of the SL at this location. Outfalls 001 and 002 drain to Newton Creek and White Oak Bayou before intersecting with the Arkansas River, located 14 miles away. Outfall 003 drains to Fivemile Creek, then to Bushy Island Creek, to Bayou Meto, and the Arkansas River. Site workers, construction workers, off-facility residents, and recreational users of the Arkansas River or its tributaries may be exposed to PFAS in surface water and sediment via ingestion.

PFOS, PFOA, PFHxS, PFNA, PFBS were detected in surface soils at AOIs 1, 3, 4, and 5, with three reported exceedances of the residential SL for PFOS in soil and one reported exceedance of the residential SL for PFNA in soil. Additionally, soil samples were collected in drainage swales leading to Outfalls 001, 002, and 003; PFOS, PFOA, PFHxS, and/or PFNA were detected in surface soils at all three locations; therefore, relevant compounds may be captured in surface water runoff. Site workers, construction workers, off-facility residents, and onsite recreational users, trespassers, and recreational users of the Arkansas River or its tributaries may be exposed to PFAS in surface water and sediment via ingestion. Additionally, recreational fishing of these waterbodies may potentially present another exposure pathway to PFAS via ingestion of contaminated fish. Public mountain biking trails are located adjacent north of AOIs 1,3,4 and 5. These trails cross drainage pathways located downgradient of outfalls 001, 002, and 004 and therefore provide direct exposure to surface water and sediment for trail users. No surface water or sediment sampling was conducted at RMTC; however, based on SI sampling, the pathways for these receptors are considered potentially complete.

7.3.2 AOI 2

PFOS and PFHxS was detected in surface soil at AOI 2. Relevant compounds may be captured in surface water runoff. AOI 2 is located within the Upper Bayou Meto Watershed. Surface water drains southeasterly, eventually reaching the Arkansas River. No surface water or sediment sampling was conducted at RMTC; therefore, the exposure pathways for site workers, construction workers, off-facility residents, and recreational users of the Arkansas River and its tributaries via ingestion of surface water and sediment are considered potentially complete. Additionally, recreational fishing of these waterbodies may potentially present another exposure pathway to relevant compounds via ingestion of contaminated fish.

7.3.3 AOI 6

PFOS was detected in surface soil in excess of the SL. Surface water runoff at AOI 6 drains by sheet flow into nearby swales, diverting the water south to an unnamed ephemeral stream and eventually discharging into Shilcotts Bayou and the Arkansas River at Greathouse Bend. Site workers, construction workers, off-facility residents, and recreational users of the Arkansas River or its tributaries may be exposed to PFAS in surface water and sediment via ingestion. Additionally, recreational fishing of these waterbodies may potentially present another exposure pathway to PFAS via ingestion of contaminated fish. No surface water or sediment sampling was conducted at RMTC; therefore, the pathways for these receptors are considered potentially complete.

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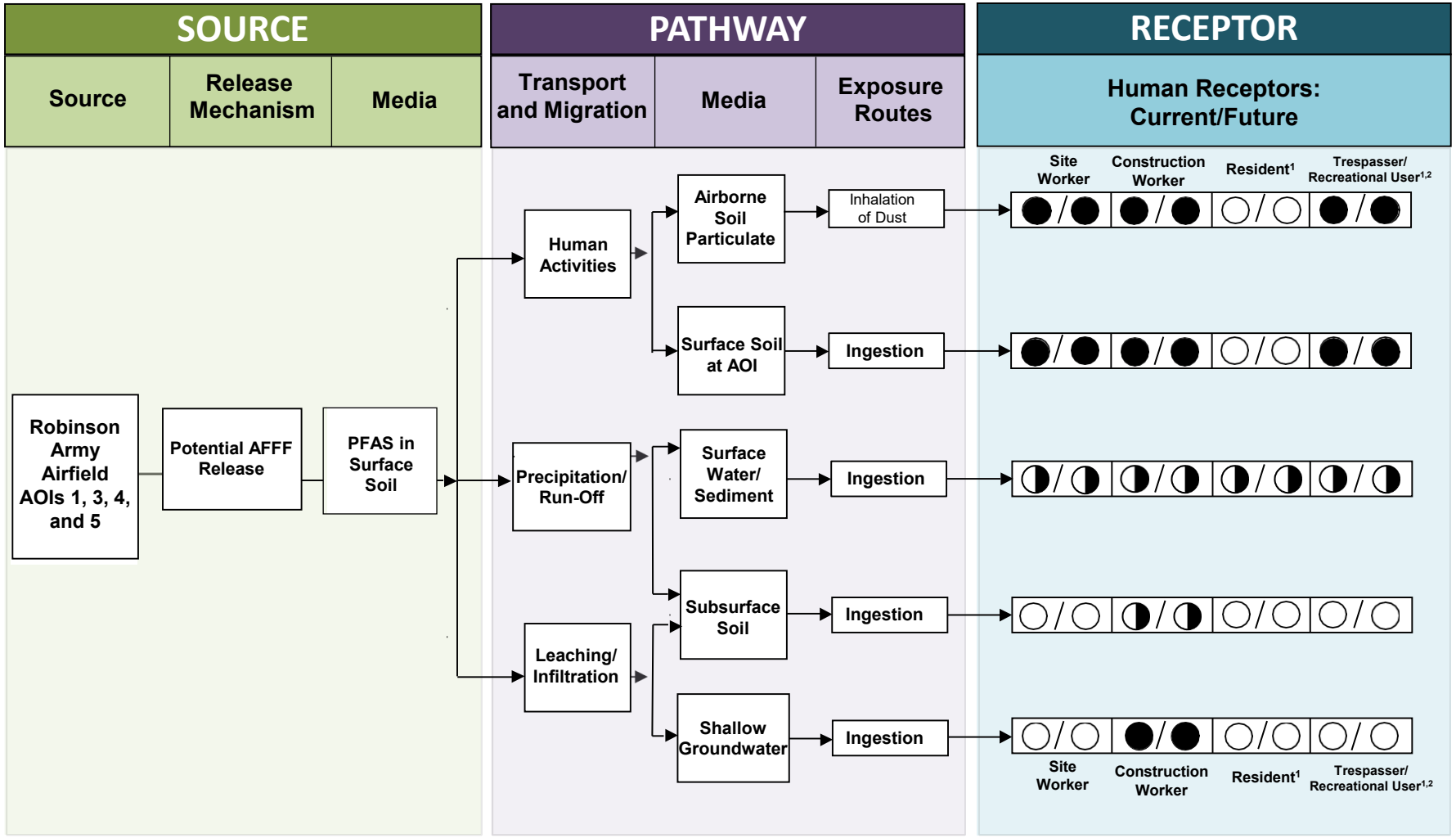


LEGEND

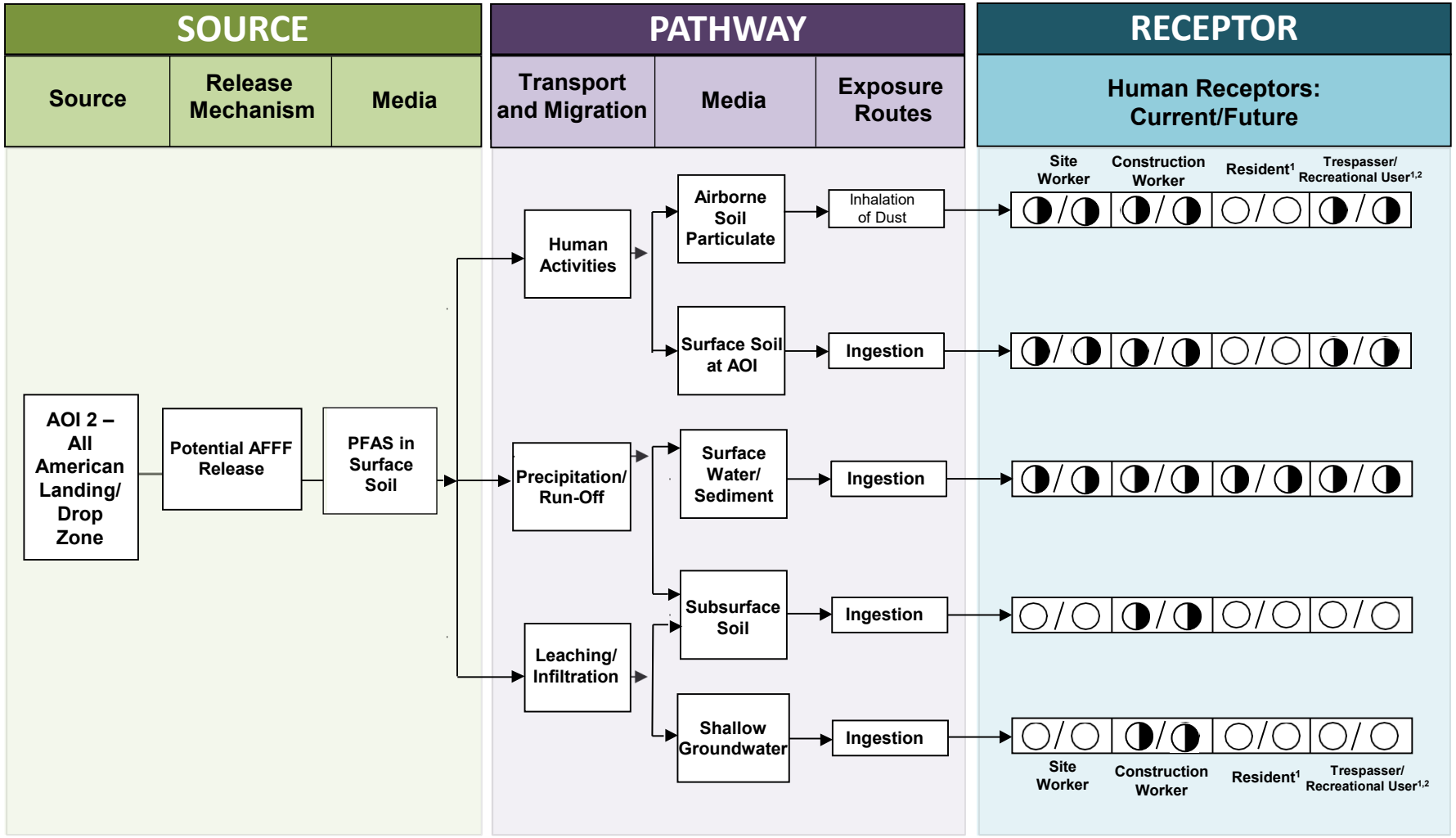
- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of Screening Level

Notes:

1. The resident and recreational users refer to on-site and off-site receptors.
2. Human consumption of fish potentially affected by PFAS is possible.
3. Inhalation of dust for off-site receptors is likely insignificant.

Figure 7-1
Conceptual Site Model
RMTC AOIs 1, 3, 4, and 5

2012 *This page intentionally left blank*



LEGEND

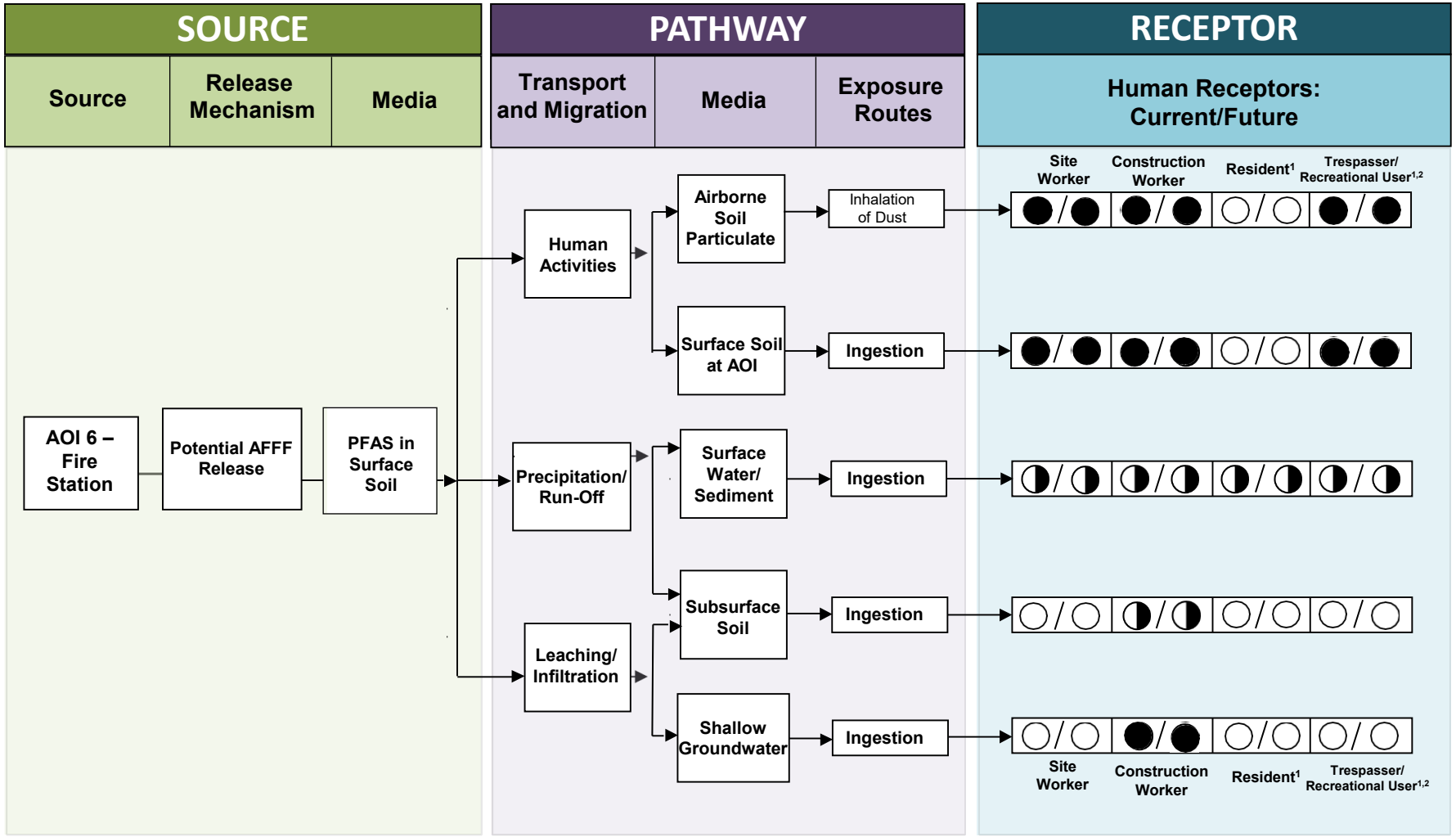
- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of Screening Level

Notes:

1. The resident and recreational users refer to on-site and off-site receptors.
2. Human consumption of fish potentially affected by PFAS is possible.
3. Inhalation of dust for off-site receptors is likely insignificant.

Figure 7-2
Conceptual Site Model
RMTC AOI 2 –
All American Landing/Drop Zone

2015 *This page intentionally left blank*



LEGEND

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

Notes:

1. The resident and recreational users refer to on-site and off-site receptors.
2. Human consumption of fish potentially affected by PFAS is possible.
3. Inhalation of dust for off-site receptors is likely insignificant.

Figure 7-3
Conceptual Site Model
RMTC AOI 6 – Fire Station

2018 *This page intentionally left 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 SITE INSPECTION ACTIVITIES SUMMARY

The SI field activities at the Facility were conducted from 18 to 29 October 2021. The SI field activities included soil and groundwater sampling. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA 2021a), except as previously noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI UFP-QAPP Addendum (EA 2021a), samples were collected and analyzed for a subset of 24 compounds by LC/MS/MS compliant with QSM Version 5.3 Table B-15 as follows:

- Sixty-seven (67) soil samples from 28 boring locations
- Twenty-five (25) grab groundwater samples from 26 temporary well locations (one location was dry)
- Seven (7) FBs
- Fifteen (15) equipment rinsate samples
- Nine (9) FD 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 AOIs 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 CSMs were refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOIs, which are described in **Section 7**.

8.2 OUTCOME

Based on the results of this SI, further evaluation in the form of a RI is warranted for AOIs 1 (the Echo Pad), 3 (Building 28001), 4 (Building 28002), 5 (the Wash Bay), and 6 (the Fire Station) and further evaluation is not warranted for AOI 2 (All American Landing/Drop Zone). Sample chemical analytical concentrations collected during this SI were compared against the project SLs in soil and groundwater, as described in **Table 6-1**.

A summary of the results of the SI data relative to SLs is as follows:

- AOI 1:
  - PFOS in surface soil exceeded the SL of 13 µg/kg in two locations in AOI 1 with a maximum concentration of 190 µg/kg. PFNA in surface soil exceeded the SL of 19 µg/kg in one location with a concentration of 20 µg/kg. The detected concentrations of PFOA, PFHxS, and PFBS in soil at AOI 1 were below their respective SLs.
  - PFOA, PFOS, PFHxS, PFNA and PFBS were detected in all seven temporary well locations at AOI 1. PFOA detections in groundwater exceeded the SL of 6 ng/L in six temporary well locations associated with AOI 1, with a maximum concentration of 540 ng/L. At the 7th temporary well location, the primary sample was below the SL but the duplicate sample exceeded the SL. PFOS detections in groundwater exceeded the SL of 4 ng/L in all seven temporary well locations associated with AOI 1, with a maximum concentration of 3,000 J+ ng/L. PFNA detections in groundwater exceeded the SL of 6 ng/L in five of the seven temporary well locations with a maximum concentration of 770 ng/L. PFHxS detections in groundwater exceeded the SL of 39 ng/L in six of seven temporary well locations associated with AOI 1, with a maximum concentration of 1,000 ng/L. Based on the results of the SI, further evaluation of AOI 1 is warranted.
- AOI 2:
  - The detected concentrations of PFOS and PFHxS in soil at AOI 2 were below their respective SLs.
  - PFOA, PFOS, PFHxS, PFNA and PFBS were detected at low levels in groundwater at AOI 2; however, there were no exceedances of the SLs in groundwater. Based on the results of the SI, no further evaluation of AOI 2 is warranted.
- AOI 3:
  - The detected concentrations of PFOA, PFOS, and PFNA in soil at AOI 3 were below their respective SLs.
  - PFOA detections in groundwater exceeded the SL of 6 ng/L in one temporary well location associated with AOI 3, with a concentration of 8.4 ng/L. PFOS detections in groundwater exceeded the SL of 4 ng/L in one temporary well location associated with AOI 3, with a concentration of 5.3 ng/L. The detected concentrations of PFHxS, PFNA and PFBS in groundwater at AOI 3 were below their respective SLs. Based on the results of the SI, further evaluation of AOI 3 is warranted.

- AOI 4:

  — The detected concentrations of PFOA and PFOS in soil at AOI 4 were below their respective SLs.

  — PFOA, PFOS, PFHxS, PFNA and PFBS were detected in groundwater at AOI 4, with PFOA exceeding the SL of 6 ng/L in one of two temporary well locations, and PFOS exceeding the SL of 4 ng/L in both temporary well locations. Based on the results of the SI, further evaluation of AOI 4 is warranted.

- AOI 5:

  — PFOS in surface soil exceeded the SL of 13 µg/kg in one location in AOI 5 with a concentration of 23 µg/kg. The detected concentrations of PFOA, PFHxS, PFNA and PFBS in soil at AOI 5 were below their respective SLs.

  — PFOA, PFOS, PFHxS, PFNA and PFBS were detected in groundwater at AOI 5. At one location, PFOA, PFOS, and PFHxS detections exceeded their SLs of 6 ng/L, 4 ng/L, 39 ng/L, respectively. RMTC personnel reported a recent release of AFFF (January 2022) resulting in the removal of approximately 200 tons of soil from the northern portion of the building at AOI 5. Based on the results of the SI, further evaluation of AOI 5 is warranted.

- AOI 6:

  — The detected concentrations of PFOA, PFHxS, PFNA, and PFBS in soil at AOI 6 were below their respective SLs. PFOS in surface soil exceeded the SL of 13 µg/kg in one location in AOI 6 with a concentration of 410 µg/kg.

  — PFOA, PFOS, PFHxS, PFNA and/or PFBS were detected in all four temporary well locations at AOI 6. PFOS detections in groundwater exceeded the SL of 4 ng/L in three of the four temporary well locations associated with AOI 6, with a maximum concentration of 120 ng/L. PFOA detections in groundwater exceeded the SL of 6 ng/L in one location with a concentration of 14 ng/L. PFHxS detections in groundwater exceeded the SL of 39 ng/L in one location associated with AOI 6, with a concentration of 310 ng/L. Based on the results of the SI, further evaluation of AOI 6 is warranted.

- Additional Facility Sample Locations:

  — PFOA, PFOS, PFHxS, and PFNA were detected in soil at the additional sample locations at concentrations below their respective SLs.

  — PFOA, PFOS, PFHxS, PFNA and/or PFBS were detected in groundwater associated with drainage pathways (swales and stormwater collector pipes) exiting the Robinson Army Airfield (RMTC-01, RMTC-02, and RMTC-03). These locations receive

runoff from AOIs 1, 3, 4, and 5. PFOA detections in groundwater exceeded the SL of 6 ng/L in one of the three temporary well locations, with a maximum concentration of 190 ng/L. PFOS detections in groundwater exceeded the SL of 4 ng/L in all three temporary well locations, with a maximum concentration of 1,000 ng/L. PFNA detections in groundwater exceeded the SL of 6 ng/L in one of the three temporary well locations, with a concentration of 31 ng/L. PFHxS detections in groundwater exceeded the SL of 39 ng/L in one of the three temporary well locations, with a concentration of 230 ng/L. These results indicate that relevant compounds from AOIs 1, 3, 4, and 5 are migrating away from source areas at concentrations exceeding respective SLs. These results also confirm/support the conclusion that further evaluation of AOIs, 1, 3, 4, and 5 are warranted.

Temporary wells were constructed using open boreholes which may allow surficial soil to enter the temporary well or annular space and contact groundwater. This has the potential for biasing groundwater data high where contaminated soil may have infiltrated the zone sampled. Consistent correlation between elevated soil values and groundwater results was not observed across SI data.

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	Groundwater Source Area	Groundwater Facility Boundary	Future Action
1	Echo Pad	●	●	NA	Proceed to RI
2	All American Landing/Drop Zone	◐	◐	NA	No further action
3	Building 28001	◐	●	NA	Proceed to RI
4	Building 28002	◐	●	NA	Proceed to RI
5	Wash Pad	●	●	NA	Proceed to RI
6	Building 70200/70201	●	●	NA	Proceed to RI

Legend:
● = Detected; exceedance of SLs
◐ = Detected; no exceedance of SLs
○ = Not detected

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