FINAL
Site Inspection Report
Camp Beauregard, Louisiana

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

February 2023

Prepared for:

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

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Acronyms and Abbreviations

%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
µg/kg	micrograms per kilogram
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
amsl	above mean sea level
AOI	Area of Interest
ARNG	Army National Guard
ASTM	American Society for Testing and Materials
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CoC	chain of custody
CSM	conceptual site model
DA	Department of the Army
DoD	Department of Defense
DPT	direct push technology
DQO	data quality objective
DUA	data usability assessment
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
FTA	Fire Training Area
GPRS	Ground Penetrating Radar Systems, LLC
HDPE	high-density polyethylene
HFPO-DA	hexafluoropropylene oxide dimer acid
IDW	investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LAARNG	Louisiana Army National Guard
LC/MS/MS	liquid chromatography with tandem mass spectrometry
LNG	Louisiana National Guard
LWCR	light-weight center rods
NELAP	National Environmental Laboratory Accreditation Program
ng/L	nanograms per liter
NGVD 29	National Geodetic Vertical Datum of 1929
OSD	Office of the Secretary of Defense
OWS	oil/water separator
PA	Preliminary Assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid

PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
PQAPP	Programmatic UFP-QAPP
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality Systems Manual
SI	Site Inspection
SL	screening level
SOP	standard operating procedure
TOC	total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
US	United States
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventative Medicine
USAEH	United States Army Environmental Hygiene Agency
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

Executive Summary

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

The PA identified three Areas of Interest (AOIs) where PFAS-containing materials may have been used, stored, disposed, or released historically (see **Table ES-2** for AOI locations). The objective of the SI is to identify whether there has been a release to the environment from the AOIs identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on SLs for relevant compounds. This SI was completed at the Camp Beauregard Cantonment Area near Pineville, Louisiana and determined further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted for AOI 1: Retention Pond and AOI 2: Wash Rack; no further evaluation is warranted for AOI 3 at this time, as there are no known hazardous substances, pollutants, or contaminants that are the responsibility of the ARNG or Department of Defense (DoD). Camp Beauregard will also be referred to as the "facility" throughout this document.

Camp Beauregard occupies 13,618 acres and is separated into two distinct non-contiguous areas, the Training Site (locally known as Range Central) (12,889 acres) and the Cantonment Area (729 acres) (Louisiana ARNG, 2007). The Cantonment Area is the location of the former Camp Beauregard Army Aviation Support Facility, which was relocated to Esler Field in 2000-2001.

The PA identified three AOIs for investigation during the SI phase. SI sampling results from the three AOIs were 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: Retention Pond and AOI 2: Wash Rack. AOI 3: Firehouse Building 327 exceeded the SLs; however, at this location, there are no known hazardous substances, pollutants, or contaminants that are the responsibility of the ARNG or DoD, and no further action by the ARNG is recommended at this time. Based on the results of this SI, the State of Louisiana or the City of Pineville may consider the need for further evaluation in an RI for AOI 3: Firehouse Building 327.

[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, as screening values were established after SI planning and execution. However, ARNG will add HFPO-DA to the list of constituents sampled during the next phase of CERCLA if warranted.

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

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

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

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

b.) Screening values for HFPO-DA were established after SI planning and execution and thus not included as an analyte. Future CERCLA phases will include HFPO-DA if warranted.

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	Retention Pond	◐	●	●	Proceed to RI
2	Wash Rack	◐	●	◐	Proceed to RI
3	Firehouse Building 327	●	●	◐	No further action by the ARNG. The Firehouse Building 327 is not under control of the ARNG. Based on the results of the SI, the State of Louisiana and/or the City of Pineville may consider the need to proceed to RI.

Legend:
N/A = not applicable
● = detected; exceedance of the screening levels
◐ = detected; no exceedance of the screening levels
○ = not detected

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1. Introduction

1.1 Project Authorization

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

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

1.2 SI Purpose

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

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI, as screening values were established after SI planning and execution. However, ARNG will add HFPO-DA to the list of constituents sampled during the next phase of CERCLA if warranted.

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2. Facility Background

2.1 Facility Location and Description

Camp Beauregard is located in north-central Louisiana, northeast of Pineville and Alexandria (**Figure 2-1**). Camp Beauregard is approximately 13,618 acres and is separated into two distinct non-contiguous areas, the Training Site (locally known as Range Central) (12,889 acres) and the Cantonment Area (729 acres) (Louisiana ARNG [LAARNG], 2007). The Cantonment Area and most of the Training Site are in the Rapides Parish, although a portion of the Training Site extends into Grant Parish. This SI focuses on the Cantonment Area, where the former Camp Beauregard Army Aviation Support Facility (AASF) helicopter airfield was located before it was moved to Esler Field in 2000-2001. The Cantonment Area is bounded to the south and east by Esler Field Road (LA 116), by Monroe Highway (US Route 165) to the west, and by Flagon Bayou to the north.

Camp Beauregard was authorized by the War Department on 15 July 1917 for the training of troops for World War I, when it was determined that Camp Stafford was too small. After the war, the State of Louisiana acquired Camp Beauregard, and it became a training site for the National Guard. With the beginning of World War II in 1940, Camp Beauregard was federalized and used for the 1940 Louisiana Maneuvers and the Fifth Corps (LAARNG, 2007). Once World War II ended, Camp Beauregard came under control of the State of Louisiana for summer National Guard training. In 1973, Camp Beauregard was again used as an annual training facility (Malcolm Pirnie, Inc., 2003).

2.2 Facility Environmental Setting

Camp Beauregard is in the Upper West Gulf Coastal Plain physiographic region (US Army Corps of Engineers [USACE], 2014). The Cantonment Area topography ranges from around 100 to 160 feet above mean sea level (US Geological Survey [USGS], 2003; USGS, 2015) and is bisected by Flagon Bayou, which flows southeast across the Cantonment Area (**Figure 2-2**).

2.2.1 Geology

In general, the geology of central Louisiana is composed of marine sediments deposited by changing sea levels, and fluvial sediments deposited by the meandering Mississippi River system. These sediments dip less than 5 degrees toward the south-southeast, and their composition ranges from clays to sands (US Army Environmental Hygiene Agency [USAEHA], 1994).

The geology of Camp Beauregard includes Quaternary surficial deposits overlying Oligocene to Miocene deposits. The surficial geology consists of the alluvial and fluvial Bentley and Williana formations, which have two facies: a clayey and a sandy to gravelly facies (USAEHA, 1994). The Oligocene to Miocene deposits at Camp Beauregard consists of two formations, from oldest to youngest: the Catahoula Formation and the Fleming Formation, which comprises the Lena, Carnahan Bayou, Dough Hills, and Williamson Creek members. The Catahoula Formation contains thick beds of sand (fresh water bearing beds range from 10 to 230 feet thick) and thin layers of clay (US Army Center for Health Promotion and Preventive Medicine [USACHPPM], 2004). The Miocene-aged Fleming Formation is characterized by consolidated clays with discontinuous silts and sands (USAEHA, 1994).

At the Cantonment Area, the clayey facies of the Bentley and Williana formations are present in thicknesses ranging from 30 to over 100 feet. The clayey facies are predominant in the Cantonment Area and are underlain by the Williamson Creek, which is only present in the southernmost portion of the Cantonment Area, Dough Hills, Carnahan Bayou, and Lena members of the Flemings Formation and the Catahoula Formation. The geology at the Training Site differs slightly than that found at the Cantonment Area; the Williamson Creek and Dough Hills members

of the Flemings Formation are absent at the Training Site. The Williamson Creek member terminates at the southern part of the Cantonment Area, and the Dough Hills member terminates just north/northeast of the Cantonment Area and is therefore not present at the Training Site. Second, the sandy to gravelly facies of the Bentley and Williana formations predominate in the Training Site (USAEHA, 1994). The geology of Camp Beauregard Cantonment Area is shown on **Figure 2-3**.

Soil borings completed during the SI show a geology dominated by clay with or without lenses of coarser-material. At all nine boreholes, the top 2 to 5 feet are composed of sand with varying amounts of clay and silt. Underlying the surficial sands are clays and silts ranging in thickness from 4.5 to 38 feet. The thickest clays were observed in the western part of the Cantonment Area (AOI03-01, AOI03-02, and BEAU-01). On the eastern portion of the Cantonment Area, coarser-grained lenses, composed of clayey sand to poorly graded sand to well-graded sand with gravel, range from 0.5 to over 6 feet. The lenses of sand likely represent paleostreams, whereas thicker clay deposits represent isolated channel fill as the paleostreams migrated and abandoned former channel flow paths. These facility observations are consistent with the two facies of the Bentley and Williana formations.

Samples for grain size analyses were collected at three locations (one from each AOI), AOI01-02, AOI02-01, and AOI03-02, 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 (55.11 percent [%] to 70.36%) and clay (24.63% to 44.32%). These results and facility observations are consistent with the reported depositional environment of the region. Boring logs are presented in **Appendix E**, and grain size results are presented in **Appendix F**.

2.2.2 Soil

Soils at Camp Beauregard consist mostly of Quaternary-aged fine sandy loams and clay loams with marine or alluvial origins (US Department of Agriculture [USDA], 1980). Soils present at the Cantonment Area include Acadia silt loam, Cahaba fine sandy loam, Gore very fine sandy loams, Guyton complex, Kolin silt loam, Lucy loamy fine sand, Malbis fine sandy loam, Rexor-Nugent complex, and the Ruston fine sandy loam. The silty loams tend to have relatively low permeability, whereas the sandy loam has higher permeability. The pH of these soils ranges from 3.8-5.8 (USDA, 2019).

2.2.3 Hydrogeology

The hydrogeology at Camp Beauregard is characterized as a multi-layered system composed of four aquifers: the Bentley and Williana (often lumped with other surficial aquifers and described as the terrace aquifers), Williamson Creek, Carnahan Bayou, and Catahoula aquifers. The Jasper aquifer system comprises the Williamson Creek and Carnahan Bayou aquifers in Rapides Parish.

Freshwater from the Bentley and Williana aquifer is sourced in the minor sandy lenses in the clayey facies (USAEHA, 1994). Some geotechnical reports and Parish-wide aquifer studies do not identify this aquifer, which suggests it is not a major source of freshwater in Rapides Parish. Additionally, some sources incorrectly call this aquifer the Red River aquifer (USACHPPM, 2004), which terminates at the Red River south-southwest of the facility.

The Williamson Creek aquifer is situated in the Williamson Creek member of the Fleming Formation and is therefore only present in the southern portion of the Cantonment Area. The aquifer sits within well-sorted, fine- to medium-grained sand interbedded with clay. Average thickness of the sand beds is approximately 50 feet. The base of the aquifer ranges from 0 feet below National Geodetic Vertical Datum of 1929 (NGVD 29) in northwestern Rapides Parish to 2,500 feet below NGVD 29 in the south (Griffith, 2009; Tomaszewski, 2009). Potentiometric-surface maps for the Williamson Creek aquifer show groundwater at the Cantonment Area flowing

southwest, towards the Red River, directly between the cities of Alexandria and Pineville (Tomaszewski, 2009). Approximately 270 wells were screened in the Williamson Creek aquifer; 193 of these wells are domestic, and 44 are public supply wells (Griffith, 2009). The confining unit between the Williamson Creek and Carnahan Bayou aquifers is the Dough Hills member of the Fleming Formation.

The Carnahan Bayou aquifer is the major aquifer at Camp Beauregard and is located within the Carnahan Bayou member, which is composed of well-sorted, fine- to medium-grained sand interbedded with clay, which are interpreted to have deltaic and marine origins. The sand beds have an average thickness of approximately 38 feet. The base of the aquifer ranges from 0 feet below NGVD 29 in northwestern Rapides Parish to 4,000 feet below NGVD 29 in the south (Griffith, 2009; Tomaszewski, 2009). Potentiometric-surface maps for the Carnahan Bayou aquifer show groundwater at the Cantonment area flowing southwest towards the Red River, directly between the cities of Alexandria and Pineville (Tomaszewski, 2009). Approximately 210 wells are screened in the Carnahan Bayou aquifer; of these wells, 122 are domestic, and 71 are public supply wells (Griffith, 2009).

The Lena member of the Fleming Formation is the confining unit between the Carnahan Bayou aquifer and the underlying Catahoula Aquifer. However, at Camp Beauregard, the Catahoula aquifer contains saltwater (USACHPPM, 2004).

Water to the facility and surrounding area is supplied by the Water Works District No. 3 of Rapides Parish. The District distributes water sourced from seven groundwater wells (40%), with two supply wells (number [No.] 2 and No. 7) located within the Camp Beauregard Cantonment Area and screened within the Carnahan Bayou aquifer (**Figure 2-3**). The remaining 60% of the District's water is sourced from a surface water intake on Big Creek in Grant Parish, approximately 8 miles north of the facility (French, 2020). Using online resources, such as state and local geographic information system databases, wells were researched to a 4-mile radius of the facility. Well depths ranged from 15 to 1180 feet below ground surface (bgs). Several wells were noted as owned by the Louisiana National Guard (LNG), Camp Beauregard, and the USGS; furthermore, 17 records noted plugged/abandoned or destroyed wells (including several LNG wells). Eight wells were reported as monitoring wells installed to total depths ranging from 15 to 80 feet bgs. Water levels listed for two monitoring wells (E17 and E18 owned by the Louisiana Air National Guard and located immediately north of the facility) were reported as shallow as 3 feet bgs.

Depths to water measured in August 2021 during the SI ranged from 1.58 to 32.50 feet bgs. Groundwater elevation contours from the SI are presented on **Figure 2-4** and indicate the presence of a potential groundwater divide bisecting the Cantonment Area between AOIs 2 and 3. Groundwater to the west of the divide flows to the southwest toward the Red River, whereas groundwater to the east of the divide appears to flow to the northeast towards Flagon Bayou.

2.2.4 Hydrology

Camp Beauregard is situated in the watershed of Catahoula Lake, where surface water consists of intermittent streams, open water bodies, and wetlands (LAARNG, 2007; USACE, 2014). The Cantonment Area is in the Upper and Lower Flagon Bayou watersheds (**Figure 2-5**). The Flagon Bayou flows southeast from northwest Rapides Parish through the Cantonment Area and, eventually, northeast into Catahoula Lake. Local drainage features include a retention pond in the northeastern portion of the Cantonment area, which overflows into Flagon Bayou.

2.2.5 Climate

Camp Beauregard has a sub-tropical climate influenced by its proximity to the Gulf of Mexico (LAARNG, 2007). The average temperature near the facility is 66.0 degrees Fahrenheit (°F). Seasonally, temperatures vary from an average monthly high of 78.1 °F to an average monthly

low of 53.9 °F. Average precipitation in Pineville is 57.13 inches (National Oceanic and Atmospheric Administration, 2021). The mean annual relative humidity is 74% (LAARNG, 2007). Thunderstorm activity is most common during hurricane season (1 June–31 October), when tropical storms and hurricanes regularly develop in the Gulf of Mexico. The tropical disturbances cause high winds and excessive rainfall (LAARNG, 2007).

2.2.6 Current and Future Land Use

Camp Beauregard is primarily used for training LAARNG members but is also used for the following (LAARNG, 2007):

- Military training for various reserve and active units;
- Training for the Louisiana Youth Challenge Program;
- Branch headquarters for the Louisiana Office of Emergency Preparedness; and
- Recreational opportunities at the Training Site.

Adjacent land uses include residential, commercial/industrial, and institutional. Reasonably anticipated future land uses are not expected to change from the current land uses. Access to the facility is restricted and controlled by fencing and gates.

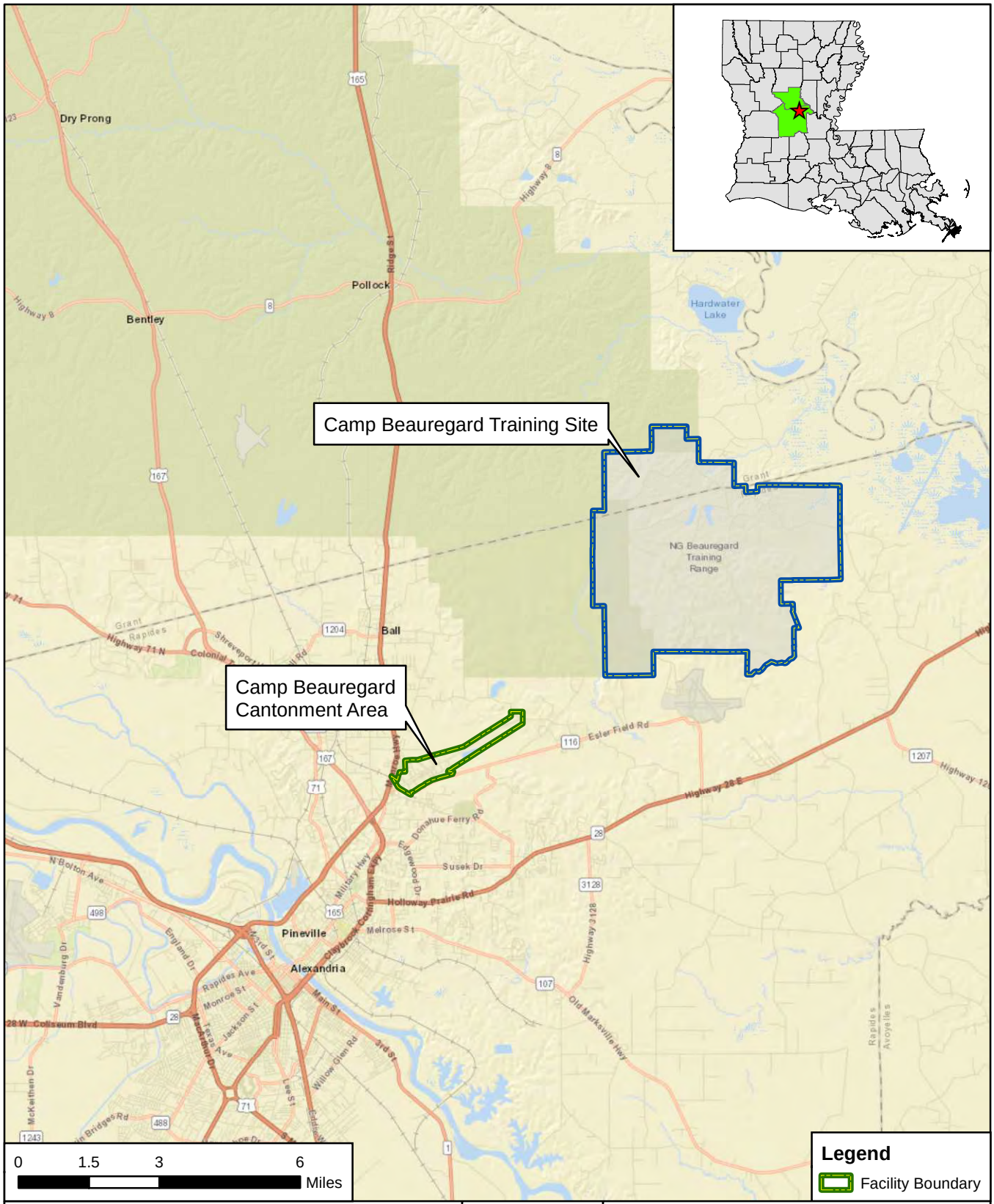
2.2.7 Sensitive Habitat and Threatened/ Endangered Species

The following birds, clams, insects, fish, mammals, and reptiles are federally endangered, threatened, proposed, and/ or are listed as candidate species in Rapides Parish and Grant Parish, Louisiana (US Fish and Wildlife Service, 2022a; 2022b).

- **Insects:** Monarch butterfly, *Danaus plexippus* (candidate).
- **Mammals**: Northern Long-Eared bat, *Myotis septentrionalis* (threatened).
- **Clams:** Louisiana pearlshell, *Margaritifera hembili* (threatened).
- **Fish:** Pallid sturgeon, *Scaphirhynchus albus* (endangered).
- **Birds:** Red-cockaded woodpecker, *Picoides borealis* (endangered).
- **Reptiles:** Louisiana pinesnake, *Pituophis ruthveni* (threatened); alligator snapping turtle, *Macrochelys temminckii* (proposed threatened).

2.3 History of PFAS Use

Three potential release areas where aqueous film forming foam (AFFF) may have been used or released historically were identified at the Camp Beauregard Cantonment Area during the PA (AECOM, 2020). Between 2000 and 2003, fire training activities took place at the Wash Rack during which AFFF may have been discharged. AFFF potentially released at the Wash Rack may have eventually drained into the Retention Pond. At the time of the PA, Firehouse Building 327 stored five 5-gallon AFFF containers and firetrucks that carried 5-gallon AFFF containers. Spray tests were historically conducted without the use of foam. The potential release areas were grouped into three AOIs based on proximity to one another and presumed groundwater flow. Descriptions of each of the AOIs are presented in **Section 3**.



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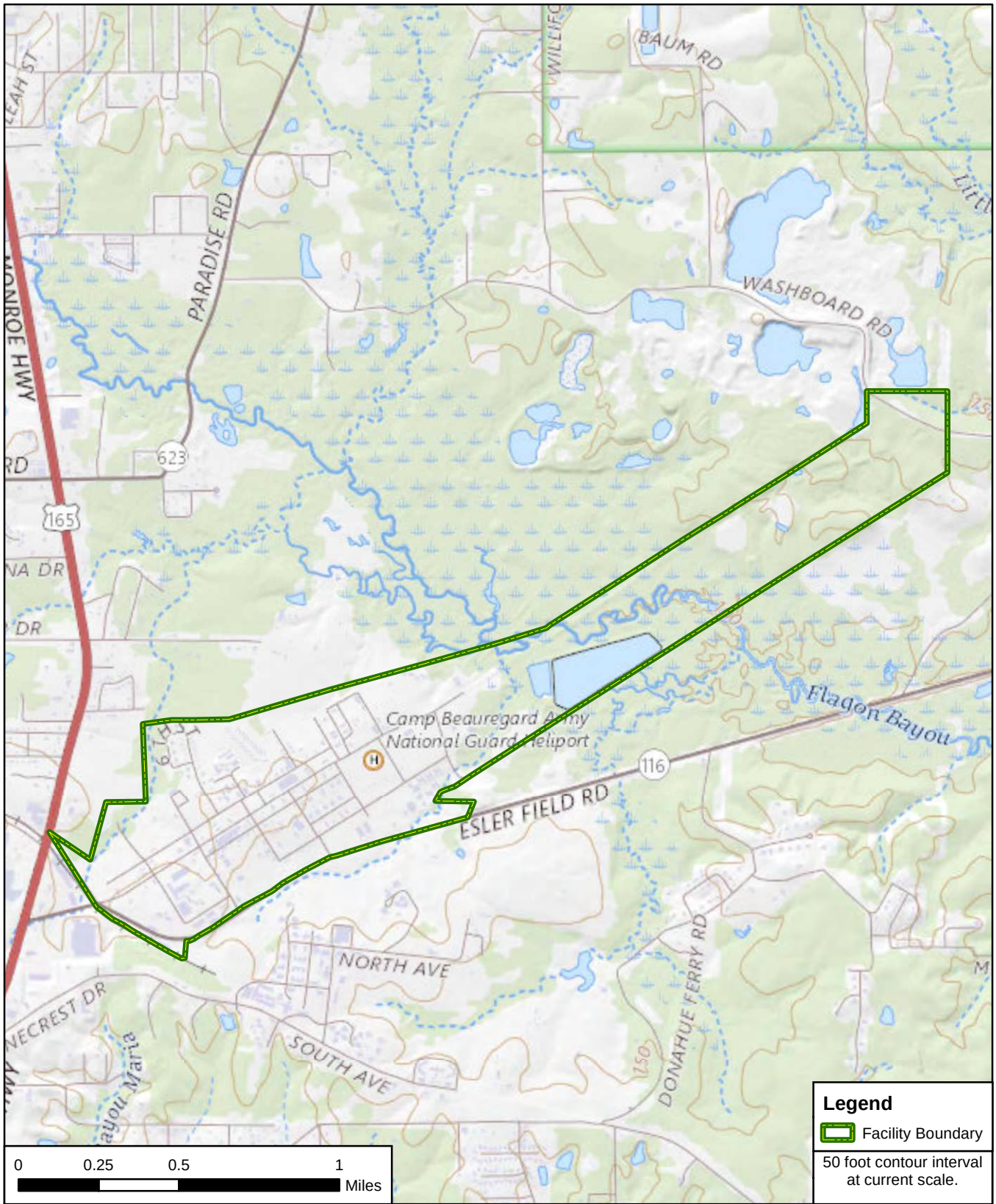
SCALE	1:190,080	CHK BY	CD	8/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	8/12/2022

N

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-1



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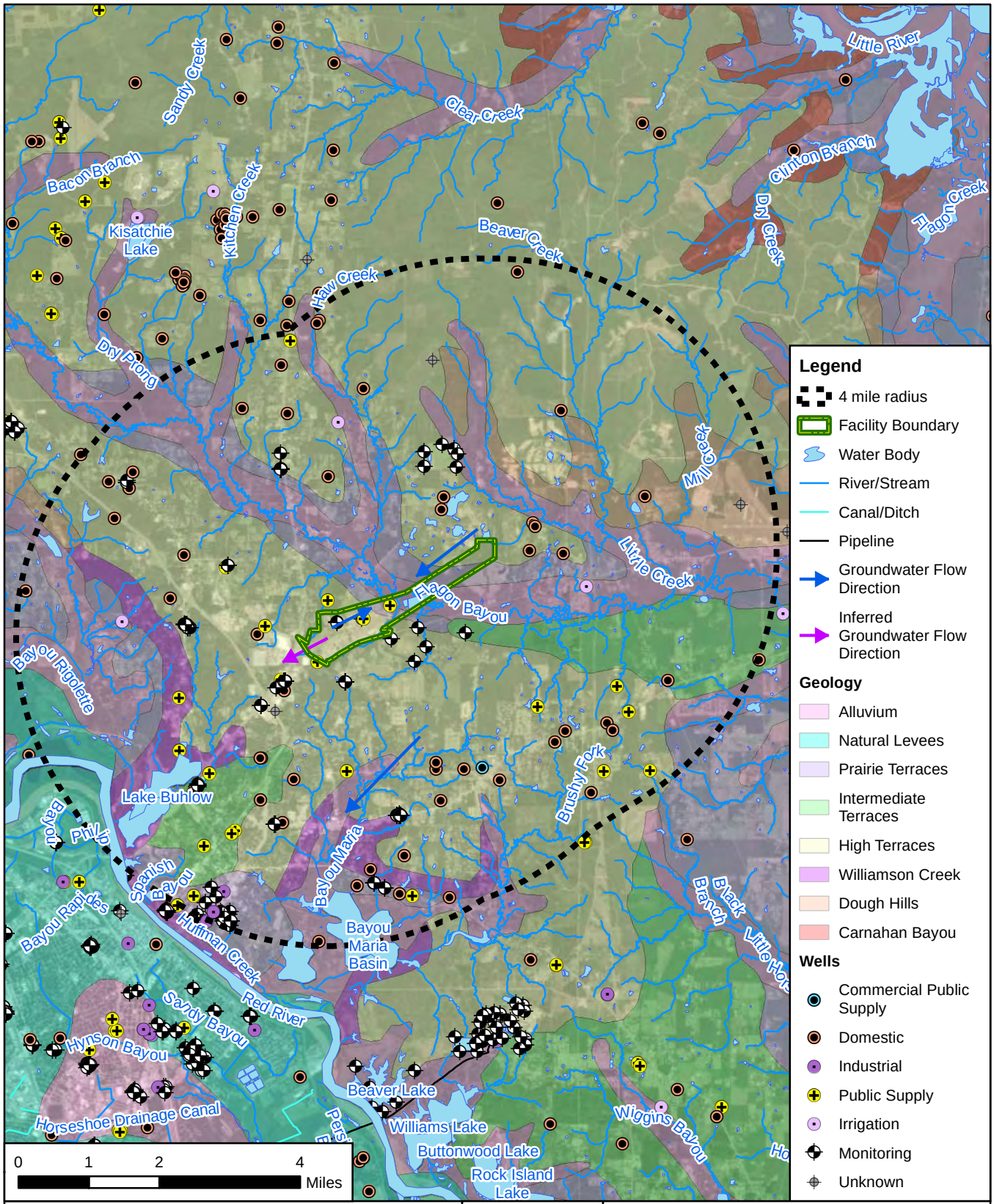
Base Map: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program,		PM	CM	8/12/2022

N

Facility Topography Map

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-2



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
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SCALE	1:126,720	CHK BY	JH	8/12/2022
Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community		PM	CM	8/12/2022

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-3

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/20/2022	GIS BY	MS	10/20/2022
SCALE	1:8,160	CHK BY	JH	10/20/2022
Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community		PM	CM	10/20/2022

- Soil Boring/Temporary Monitoring Well
- Facility Boundary
- Water Body
- River/Stream
- Potential Groundwater Divide
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Groundwater Flow Direction
- Inferred Groundwater Flow Direction

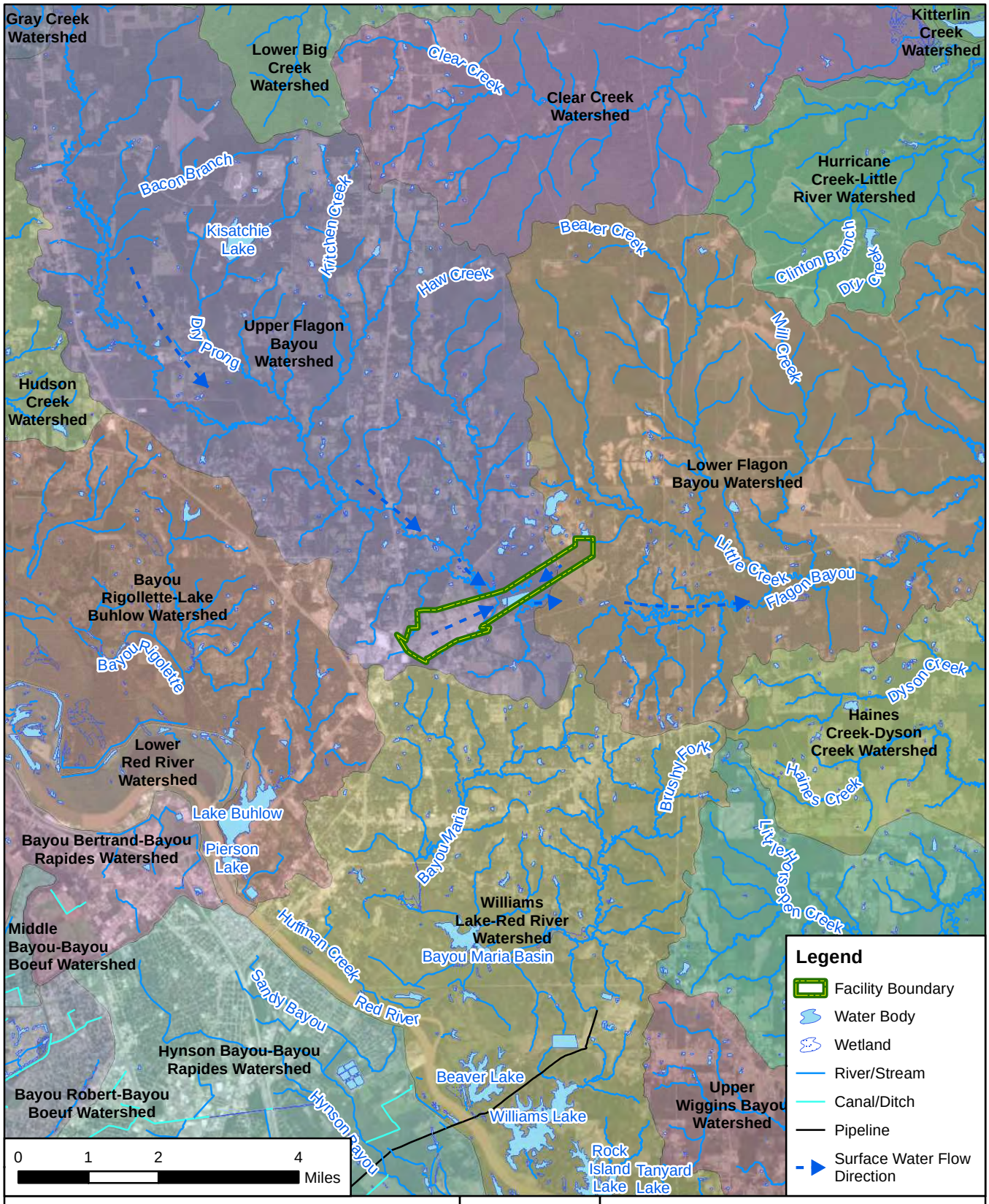
Groundwater elevations in ft NAVD88.
* AOI03-01 was not used in generating contours.

N

Groundwater Elevation Contours

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-4



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SCALE	1:126,720	CHK BY	JH	8/12/2022
Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community		PM	CM	8/12/2022

Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-5

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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. Based on the PA findings, three potential release areas were identified at Camp Beauregard Cantonment Area and grouped into three AOIs (AECOM, 2020). The potential release areas are shown on **Figure 3-1**.

3.1 AOI 1 Retention Pond

The Retention Pond is a former 33-acre large oxidation pond located on the eastern side of the Cantonment Area. In 2003, the Retention Pond was closed and converted into a natural wetlands area. Prior to 2003, AFFF potentially released at the Wash Rack would have been rinsed and drained into an oil/water separator (OWS) that flowed to the Retention Pond. The approximate coordinates of the Retention Pond are 31°22'45.2"N; 92°22'46.1"W.

3.2 AOI 2 Wash Rack

LAARNG personnel believe the Wash Rack was constructed sometime after the AASF was relocated to Esler Field in 2000-2001. AFFF was possibly discharged at the Wash Rack near Building 1338 during fire training activities. The Wash Rack is located on a concrete surface with a drain to an OWS. The OWS drained to the retention pond until 2003, when it was closed (**Section 3.1**). Since 2003, wastewater from the Wash Rack has been conveyed to and treated by the wastewater treatment plant adjacent to Pinecrest School. There are no documented instances of AFFF usage at the Wash Rack. The approximate coordinates of the Wash Rack are 31°22’32.8”N; 92°23’23.4”W. See the PA Report for photographs (AECOM, 2020).

3.3 AOI 3 Firehouse Building 327

Firehouse Building 327 was opened around 1995-1996 and remains active, with multiple firetrucks and response vehicles. The firehouse is operated by the City of Pineville Fire Department. At the time of the PA, the Firehouse Building 327 stored Chemguard© 6% AFFF in five 5-gallon containers near the emergency response vehicles. Firetrucks carried 5-gallon containers up until around 2017. Spray tests were performed with these vehicles; no foam was used on site but was used in training off-post. The interviewees had no recollection of any AFFF leaks. The geographic coordinates for the Firehouse Building 327 are 31°22'13.90"N; 92°24'10.89"W.

Tri-Max™ extinguishers were housed at Camp Beauregard in an unknown location until 2000, when they were transferred to Esler Field. Any fire extinguishers at the Cantonment Area may have been discharged prior to 1990 but have not been used since. It is unclear where the Tri-Max™ extinguishers were located, but it is possible that they were stored at the Firehouse. See the PA Report for photographs (AECOM, 2020).

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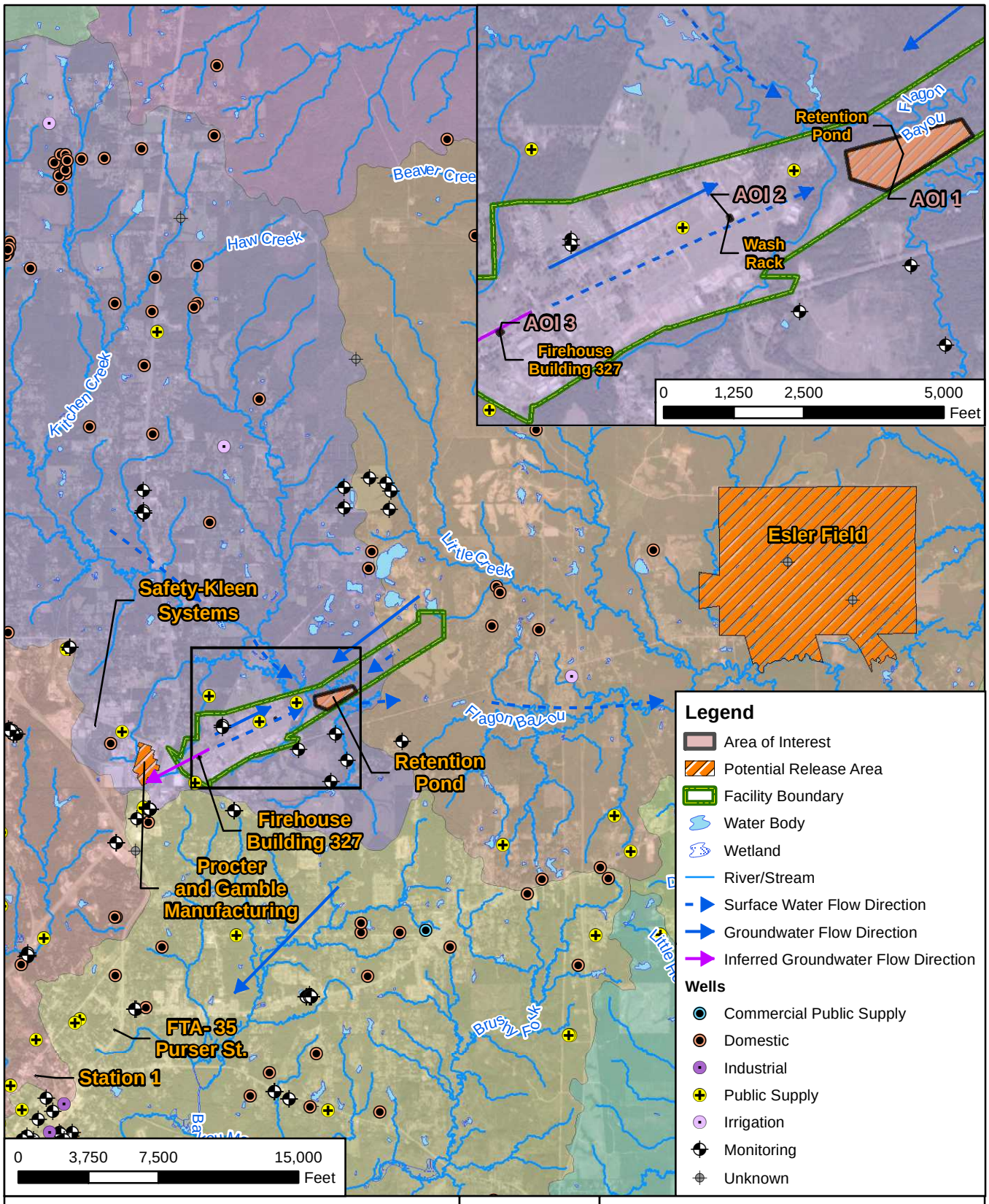

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/15/2022	GIS BY	MS	8/15/2022
SCALE	1:90,000	CHK BY	CD	8/15/2022
Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community		PM	CM	8/15/2022

N

Areas of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 3-1

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4. Project Data Quality Objectives

As identified during the Data Quality Objective (DQO) process and outlined in the SI Quality Assurance Project Plan (QAPP) Addendum (AECOM, 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 an AOI for Remedial Investigation (RI) if related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based SLs. The SLs are presented in **Section 6.1** of this report.

4.2 Information Inputs

Primary information inputs included:

- The PA for Camp Beauregard (AECOM, 2020);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific Uniform Federal Policy (UFP)-QAPP Addendum (AECOM, 2021a); and
- Field data collected during the SI, including groundwater elevation and water quality parameters measured at the time of sampling.

4.3 Study Boundaries

The scope of the SI was bounded by the property limits of the facility (**Figure 2-1**). 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 spring and early summer season, which was the earliest available time field resources were available to complete the study.

4.4 Analytical Approach

Samples were analyzed by Pace Analytical Gulf Coast, accredited under the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP; Accreditation Number 74960) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 01955). Data were compared to applicable SLs within this document and decision rules as defined in the SI QAPP Addendum (AECOM, 2021a).

4.5 Data Usability Assessment

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

Based on the DUA, the environmental data collected during the SI were found to be acceptable and usable for this SI evaluation with the qualifications documented in the DUA and its associated data validation reports. These data are of sufficient quality to meet the objectives and requirements of the SI QAPP Addendum (AECOM, 2021a).

5. Site Inspection Activities

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

- *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP)* dated March 2018 (AECOM, 2018a);
- *Final Programmatic Accident Prevention Plan* dated July 2018 (AECOM, 2018b);
- *Final Preliminary Assessment Report, Camp Beauregard, Louisiana* dated July 2020 (AECOM, 2020);
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Camp Beauregard, Louisiana* dated July 2021 (AECOM, 2021a); and
- *Final Site Safety and Health Plan, Camp Beauregard, Louisiana* dated July 2021 (AECOM, 2021b).

The SI field activities were conducted from 29 July to 4 August 2021 and consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2021a), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for a subset of 18 compounds by liquid chromatography with tandem mass spectrometry (LC/MS/MS) compliant with Quality Systems Manual (QSM) 5.3 Table B-15 to fulfill the project DQOs:

- Thirty-three (33) soil samples from 15 boring locations;
- Eight grab groundwater samples from eight temporary well locations; and
- Sixteen (16) quality assurance (QA)/quality control (QC) samples.

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

5.1 Pre-Investigation Activities

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

5.1.1 Technical Project Planning

The USACE TPP Process, Engineer Manual (EM) 200-1-2 (USACE, 2016) defines four phases to project planning: 1.) defining the project phase; 2.) determining data needs; 3.) developing data collection strategies; and 4.) finalizing the data collection plan. The process encourages stakeholder involvement in the SI, beginning with defining overall project objectives, including DQOs, and formulating a sampling approach to address the AOIs identified in the PA.

A combined TPP Meeting 1 and 2 was held on 26 May 2021, prior to SI field activities. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2. The stakeholders for this SI include the ARNG, LAARNG, USACE, Louisiana Department of Environmental Quality, and 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 SI QAPP Addendum (AECOM, 2021a).

A TPP Meeting 3 was held 18 January 2023 to discuss the results of the SI. Meeting minutes for TPP 3 are included in **Appendix D** of this report. Future TPP meetings will provide an opportunity to discuss the results and findings, and future actions, where warranted.

5.1.2 Utility Clearance

AECOM's drilling subcontractor, Tolunay-Wong Engineers, Inc. placed a ticket on 14 July 2021 with Louisiana 811 utility clearance provider to notify them of intrusive work. However, because Camp Beauregard is a private facility, the participating Louisiana 811 locators did not clear utilities at the entire facility. Therefore, AECOM contracted Ground Penetrating Radar Systems, LLC (GPRS), a private utility location service, to perform utility clearance. GPRS performed utility clearance of the proposed boring locations on 22 July 2021, with input from the AECOM field team and Camp Beauregard facility staff. General locating services and ground-penetrating radar were used to complete the clearance. Additionally, the first 5 feet of each boring were pre-cleared using a hand auger to verify utility clearance in shallow subsurface where utilities would typically be encountered.

5.1.3 Source Water and Sampling Equipment Acceptability

The potable water source used for decontamination of drilling equipment was confirmed to be acceptable for use in a PFAS investigation prior to the start of field activities. A sample from a potable water source at Camp Beauregard was collected on 17 June 2021, prior to mobilization, and analyzed for PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15. The results of the decontamination water sample are provided in **Appendix F**. A discussion of the results is presented in **Appendix A**. Non-drilling sampling equipment that was not dedicated were decontaminated with Alconox® and ASTM Type II deionized water.

Materials that were used within the sampling zone were confirmed as acceptable for use in the sampling environment. The checklist of acceptable materials for use in the sampling environment was provided in the Standard Operating Procedures (SOPs) appendix to the SI QAPP Addendum (AECOM, 2021a). Prior to the start of field work each day, a Sampling Checklist was completed as an additional layer of control. The checklist served as a daily reminder to each field team member regarding the allowable materials within the sampling environment.

5.2 Soil Borings and Soil Sampling

Soil samples were collected via direct push technology (DPT), in accordance with the SI QAPP Addendum (AECOM, 2021a). A GeoProbe® 7822DT Macro-Core® soil sampling system with Light-Weight Center Rods (LWCR) was used to collect continuous soil cores to the target depth. A hand auger was used to collect soil from the top 5 feet of the boring, in accordance with AECOM utility clearance procedures. The soil boring locations are shown on **Figure 5-1** and depths are provided **Table 5-1**.

In general, three discrete soil samples were collected from the vadose zone for chemical analysis from each soil boring: one surface soil sample (0 to 2 feet bgs), one subsurface soil sample

approximately 2 feet above the groundwater table, and one subsurface soil sample at the mid-point between the surface and the groundwater table.

The soil cores were continuously logged for lithological descriptions by an AECOM field geologist using the Unified Soil Classification System (USCS). A photoionization detector (PID) was used to screen the breathing zone during boring activities as part of personal safety requirements. Observations and measurements were recorded on sampling forms (**Appendix B2**) and in a non-treated field logbook (i.e., composition notebook). Depth interval, recovery thickness, PID concentrations, moisture, relative density, color (using a Munsell soil color chart), and texture (using the USCS) were recorded. The borings were completed at depths ranging between 15 to 40 feet bgs (**Table 5-2**). The boring logs are provided in **Appendix E**.

Each soil sample was collected into laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via a courier under standard chain of custody (CoC) procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15, total organic carbon (TOC) (USEPA Method 9060A), pH (USEPA Method 9045D), and grain size (ASTM Method D-422) in accordance with the SI QAPP Addendum (AECOM, 2021a).

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

DPT borings were converted to temporary wells. Borings were installed in grass areas to avoid disturbing concrete or asphalt surfaces.

5.3 Temporary Well Installation and Groundwater Grab Sampling

Temporary wells were installed using a GeoProbe® 7822DT Macro-Core® soil sampling system (LWCR) to collect continuous soil cores to the target depth. Once the borehole was advanced to the desired depth, wherever conditions allowed, a temporary well was constructed of a 5-foot section of 1-inch Schedule 40 polyvinyl chloride (PVC) screen with sufficient casing to reach ground surface. New PVC pipe and screen were used to avoid cross contamination between locations. The screen intervals for the temporary wells are provided in **Table 5-2**.

The temporary wells were allowed to recharge after installation before collection of groundwater samples. After the recharge period, groundwater samples were collected using either a peristaltic pump or a bladder pump, with PFAS-free HDPE tubing and bladders. The temporary wells were purged at a rate determined in the field to reduce turbidity and draw down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen, and oxidation-reduction potential) were measured using a water quality meter and recorded on the field sampling form (**Appendix B2**) before each grab sample was collected. Additionally, a subsample of each groundwater sample was collected in a separate container, and a shaker test was completed to identify if there were any foaming. No foaming was noted in any of the groundwater samples.

Each sample was collected into laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via a courier under standard CoC procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15 in accordance with the SI QAPP Addendum (AECOM, 2021a).

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

In accordance with the SI QAPP Addendum (AECOM, 2021a) temporary wells were abandoned at the completion of sampling/surveying activities by removing the PVC and backfilling the hole with bentonite chips.

5.4 Synoptic Water Level Measurements

A synoptic groundwater gauging event was performed on 3 August 2021 and included the nine new temporary monitoring wells. Water level measurements were taken from the northern side of the well casing. Depth to water at the time of sampling was used for temporary wells AOI03-01 and AOI03-02, due to the slow recharge after sampling on 2 and 3 August 2021. Based on survey data (**Section 5.5**), measurements were used to calculate groundwater elevations (**Table 5-2**) which were used to prepare a groundwater flow contour map provided as **Figure 2-4**.

5.5 Surveying

The northern side of each well casing was surveyed by Louisiana-licensed land surveyors following guidelines provided in the SOPs provided in the SI QAPP Addendum (AECOM, 2021a). Survey data from the newly installed wells on the facility were collected on 3 August 2021 in the applicable Universal Transverse Mercator zone projection with North American Datum 1983 (horizontal) and North American Vertical Datum 1988 (vertical). The surveyed well data are provided in **Appendix B4**.

5.6 Investigation-Derived Waste

As of the date of this report, the disposal of investigation-derived waste (IDW) is not regulated federally. IDW generated during the SI is considered non-hazardous waste and was managed in accordance with the SI QAPP Addendum (AECOM, 2021a) and with the DA Guidance for Addressing Releases of PFAS, Q18 (DA, 2018).

Solid (i.e., soil cuttings) and liquid (i.e., purge water and decontamination fluids) generated during SI activities were containerized in properly labeled and covered 5-gallon buckets. The IDW was stored at a secure and covered location designated by the Camp Beauregard Environmental Manager and LAARNG, pending the receipt of sample results. Solid and liquid IDW will be transferred to DOT-approved 55-gallon steel drums prior to disposal. The solid and liquid IDW will be disposed of via a Resource Conservation and Recovery Act Subtitle C landfill. The disposal contract is being managed under a separate contract (EA Engineering, Science, and Technology, Inc., 2021). Specifics on the disposal of solid and liquid IDW will be addressed in an IDW Treatment Memorandum.

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

5.7 Laboratory Analytical Methods

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

5.8 Deviations from SI QAPP Addendum

One deviation from the SI QAPP Addendum has resulted from a change in the soil and groundwater SLs for in the OSD Memo (dated 6 July 2022), which was issued after the submittal of the Final SI QAPP (Assistant Secretary of Defense, 2022).

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

- Temporary well BEAU-02 was installed to 25 feet bgs on 29 July 2021 but was dry. Based on the presence of swelling clays from 25-30 feet bgs, with overlying stiff silt and clay up to 11 feet bgs, drilling activities did not continue past 30 feet bgs in order to prevent drilling through a potential confining unit per the SI QAPP Addendum (AECOM, 2021a). Groundwater was allowed to accumulate in the well over the weekend to allow for sufficient groundwater accumulation. The well was checked on 1 August 2021, and no groundwater was observed in the well. As a result, a groundwater sample was not collected. A second borehole was not attempted because geologic observations at the site suggest small scale homogeneity exists within the varying facies (i.e., clay, sand, etc.) of the surficial geologic units; this action was documented in a field change request form provided in **Appendix B3**.

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Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Camp Beauregard, Louisiana

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
Soil Samples							
AOI01-01-SB-00-02	8/1/2021 8:03	0 - 2	x	x	x		
AOI01-01-SB-00-02-D	8/1/2021 8:03	0 - 2		x	x		FD
AOI01-01-SB-6.5-8.5	8/1/2021 8:25	6.5 - 8.5	x				
AOI01-01-SB-10-12	8/1/2021 8:45	10 - 12	x				
AOI01-02-SB-00-02	8/1/2021 10:07	0 - 2	x				
AOI01-02-SB-00-02-MS	8/1/2021 10:07	0 - 2	x				MS
AOI01-02-SB-00-02-MSD	8/1/2021 10:07	0 - 2	x				MSD
AOI01-02-SB-05-07	8/2/2021 13:00	5 - 7				x	
AOI01-02-SB-8.5-10.5	8/1/2021 10:17	8.5 - 10.5	x				
AOI01-02-SB-16-18	8/1/2021 11:15	16 - 18	x				
AOI01-03-SB-00-02	8/1/2021 9:15	0 - 2	x				
AOI01-04-SB-00-02	8/1/2021 8:45	0 - 2	x				
AOI02-01-SB-00-02	8/1/2021 13:12	0 - 2	x	x	x		
AOI02-01-SB-00-02-D	8/1/2021 13:12	0 - 2	x				FD
AOI02-01-SB-7.75-9.75	8/1/2021 13:32	7.75 - 9.75	x				
AOI02-01-SB-08-10	8/2/2021 13:30	8 - 10				x	
AOI02-01-SB-14.5-16.5	8/1/2021 13:50	14.5 - 16.5	x				
AOI02-02-SB-00-02	8/1/2021 14:13	0 - 2	x				
AOI02-02-SB-09-11	8/1/2021 14:45	9 - 11	x				
AOI02-02-SB-17-19	8/1/2021 14:52	17 - 19	x				
AOI02-03-SB-00-02	8/1/2021 11:53	0 - 2	x				
AOI02-03-SB-00-02-D	8/1/2021 11:53	0 - 2	x				FD
AOI02-04-SB-00-02	8/1/2021 11:15	0 - 2	x				
AOI03-01-SB-00-02	7/30/2021 10:10	0 - 2	x	x	x		
AOI03-01-SB-00-02-MS	7/30/2021 10:10	0 - 2		x	x		MS
AOI03-01-SB-00-02-MSD	7/30/2021 10:10	0 - 2		x	x		MSD
AOI03-01-SB-08-10	7/30/2021 10:22	8 - 10	x				
AOI03-01-SB-24.5-26.5	7/30/2021 16:08	24.5 - 26.5	x				
AOI03-02-SB-00-02	7/30/2021 12:50	0 - 2	x				
AOI03-02-SB-00-02-D	7/30/2021 12:50	0 - 2	x				FD
AOI03-02-SB-13-15	7/30/2021 13:10	13 - 15	x				
AOI03-02-SB-25-27	8/2/2021 13:20	25 - 27				x	
AOI03-02-SB-26-28	7/30/2021 14:40	26 - 28	x				
AOI03-03-SB-00-02	8/1/2021 10:20	0 - 2	x				
AOI03-04-SB-00-01	7/30/2021 16:45	0 - 1	x				
BEAU-01-SB-00-02	7/29/2021 10:07	0 - 2	x				
BEAU-01-SB-00-02-MS	7/29/2021 10:07	0 - 2	x				MS
BEAU-01-SB-00-02-MSD	7/29/2021 10:07	0 - 2	x				MSD
BEAU-01-SB-13-15	7/29/2021 10:30	13 - 15	x				
BEAU-01-SB-38-40	7/29/2021 11:50	38 - 40	x				
BEAU-02-SB-00-02	7/29/2021 15:25	0 - 2	x				
BEAU-02-SB-13-15	7/29/2021 15:43	13 - 15	x				
BEAU-02-SB-24-26	7/30/2021 7:50	24 - 26	x				
BEAU-03-SB-00-02	7/29/2021 13:05	0 - 2	x				
BEAU-03-SB-00-02-D	7/29/2021 13:05	0 - 2	x				FD
BEAU-03-SB-07-09	7/29/2021 13:23	7 - 9	x				
BEAU-03-SB-13-15	7/29/2021 13:30	13 - 15	x				

Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Camp Beauregard, Louisiana

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
Groundwater Samples							
AOI01-01-GW	8/1/2021 15:00	NA	x				
AOI01-01-GW-D	8/1/2021 15:00	NA	x				FD
AOI01-02-GW	8/1/2021 17:20	NA	x				
AOI02-01-GW	8/2/2021 13:05	NA	x				
AOI02-02-GW	8/2/2021 11:40	NA	x				
AOI03-01-GW	8/3/2021 7:10	NA	x				
AOI03-02-GW	8/2/2021 10:00	NA	x				
BEAU-01-GW	7/30/2021 9:13	NA	x				
BEAU-03-GW	7/30/2021 11:26	NA	x				
BEAU-03-GW-MS	7/30/2021 11:26	NA	x				MS
BEAU-03-GW-MSD	7/30/2021 11:26	NA	x				MSD
Quality Control Samples							
BEAU-FRB-01	8/1/2021 16:00	NA	x				
BEAU-ERB-01	7/29/2021 15:15	NA	x				from DPT shoe
BEAU-ERB-02	7/30/2021 12:40	NA	x				from hand auger
BEAU-ERB-03	8/1/2021 15:45	NA	x				from pump
BEAU DECON WATER	6/17/2021 8:10	NA	x				Decontamination water

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

Table 5-2
Soil Boring Depths, Temporary Well Screen Intervals, and Groundwater Elevations
Site Inspection Report, Camp Beauregard, Louisiana

Area of Interest	Boring Location	Soil Boring Depth (feet bgs)	Temporary Well Screen Interval (feet bgs)	Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Depth to Water (feet btoc)[2]	Depth to Water (feet bgs)	Groundwater Elevation (feet NAVD88)
1	AOI01-01	15	10 -15	107.91	107.20	6.32	5.61	101.59
	AOI01-02	25	20 - 25	111.17	110.87	14.25	13.95	96.92
	AOI01-03	2	NA	NA	NA	NA	NA	NA
	AOI01-04	2	NA	NA	NA	NA	NA	NA
2	AOI02-01	20	15 - 20	127.51	126.84	17.11	16.43	110.40
	AOI02-02	25	20 - 25	126.97	126.27	16.52	15.82	110.45
	AOI02-03	2	NA	NA	NA	NA	NA	NA
	AOI02-04	2	NA	NA	NA	NA	NA	NA
3	AOI03-01	40	28.5 - 33.5[1]	145.53	143.83	34.20	32.50	111.33
	AOI03-02	40	30 - 35[1]	145.68	144.88	12.48	11.67	133.20
	AOI03-03	2	NA	NA	NA	NA	NA	NA
	AOI03-04	1	NA	NA	NA	NA	NA	NA
Sitewide	BEAU-01	40	24 - 34[1]	142.99	140.91	20.44	18.36	122.55
	BEAU-02	30	21 - 26	119.33	117.29	dry	dry	---
	BEAU-03	25	13 - 18	132.77	130.78	3.57	1.58	129.20

Notes:

[1] Borehole collapsed. Well set shallower than total depth.

[2] Depth to water during time of sampling was used for AOI03-01 and AOI03-02 due to slow recharge between sampling and synoptic gauging.

bgs = below ground surface
btoc = below top of casing
NA = not applicable
NAVD88 = North American Vertical Datum 1988

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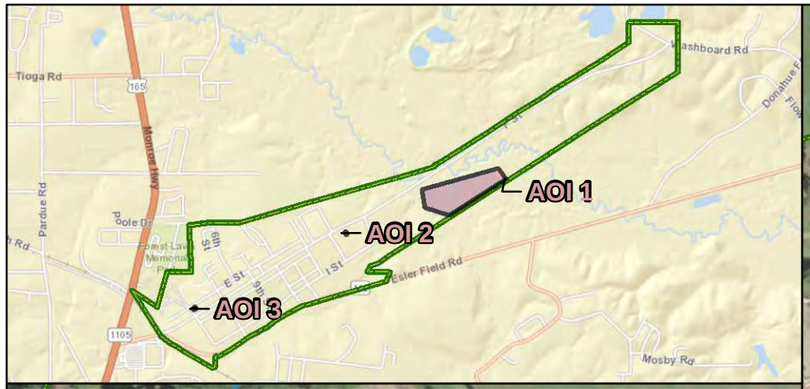

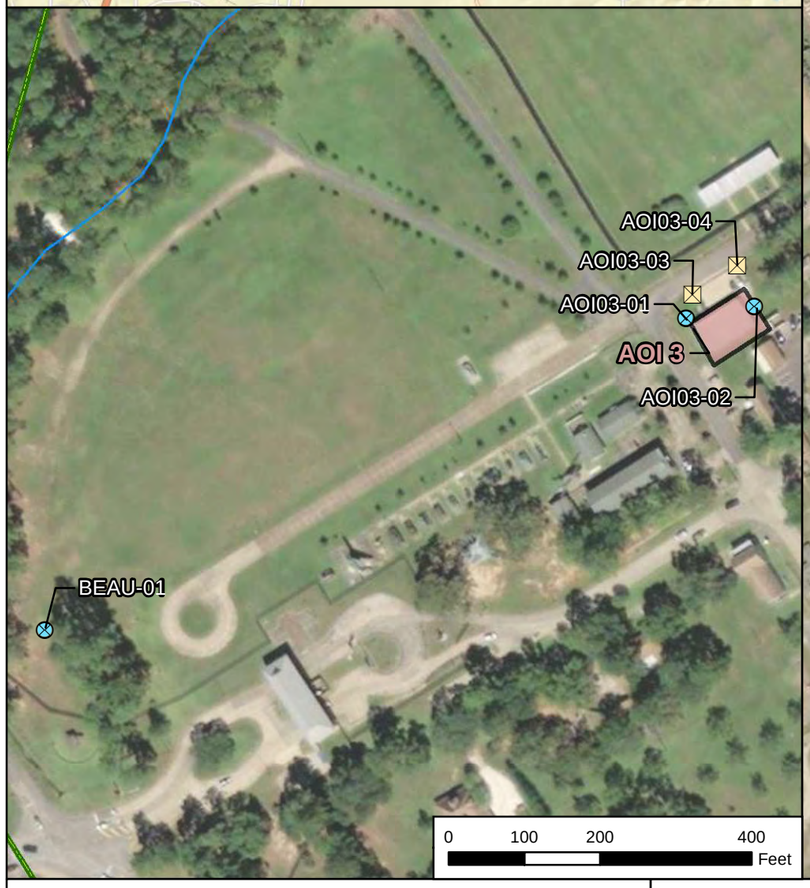

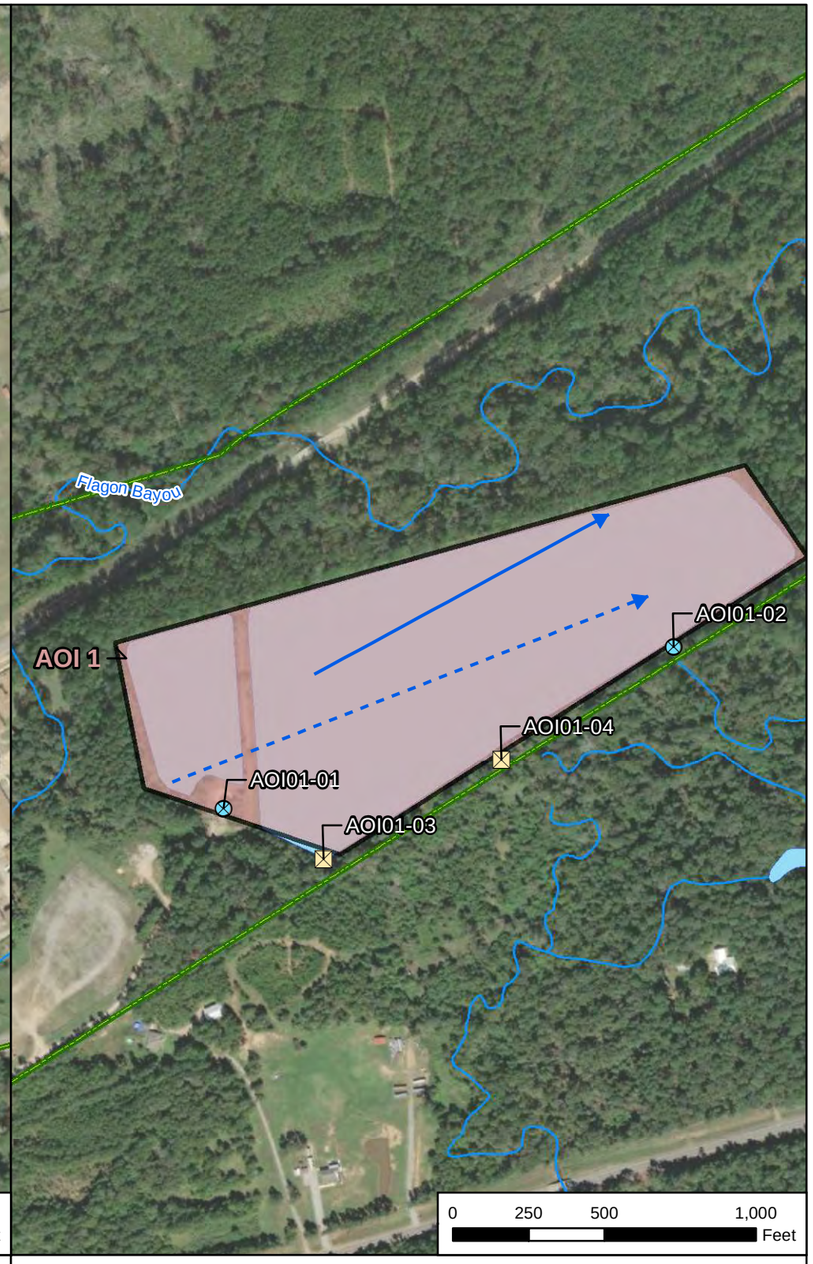

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/15/2022	GIS BY	MS	8/15/2022
SCALE	1:2,400	CHK BY	CD	8/15/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/15/2022

Legend

- Soil Boring/Temporary Monitoring Well
- Surface Soil Sample
- Area of Interest
- Facility Boundary
- Water Body
- River/Stream
- Groundwater Flow Direction
- Surface Water Flow Direction

N

Site Inspection Sample Locations

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

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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 each AOI is provided in **Section 6.3** through **Section 6.5**. **Table 6-2** through **Table 6-5** present results in soil or groundwater for the relevant compounds. Tables that contain all results are provided in **Appendix F**, and the laboratory reports are provided in **Appendix G**.

6.1 Screening Levels

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

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

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

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

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

b.) Screening values for HFPO-DA were established after SI planning and execution and thus not included as an analyte. Future CERCLA phases will include HFPO-DA if warranted.

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 feet bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil results (2 to 15 feet bgs). The SLs are not applied to deep subsurface soil results (>15 feet bgs) because 15 feet is the anticipated limit of construction activities.

6.2 Soil Physicochemical Analyses

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

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

6.3 AOI 1

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1: Retention Pond. The soil and groundwater results are summarized on **Table 6-2** through **Table 6-5**. Soil and groundwater results are presented on **Figure 6-1** through **Figure 6-21**.

6.3.1 AOI 1 Soil Analytical Results

Figure 6-1 through **Figure 6-15** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs) from boring locations AOI01-01 through AOI01-04. Soil was also sampled from AOI01-01 in shallow subsurface soil (6.5 to 8.5 feet bgs and 10 to 12 feet bgs). Soil from AOI01-02 was also sampled from shallow subsurface soil (8.5 to 10.5 feet bgs) and deep subsurface soil intervals (16 to 18 feet bgs). PFOA, PFOS, and PFHxS were detected in surface soil at concentrations below their respective SLs. PFOA was detected in one location, with a concentration of 0.112 J micrograms per kilogram (µg/kg) at AOI01-02. PFOS was detected in three of four locations, with concentrations ranging from 0.058 J µg/kg at AOI01-01 to 0.419 J µg/kg at AOI01-02. PFHxS was detected in one location, with a concentration of 0.034 J µg/kg at AOI01-02. PFBS and PFNA were not detected in surface soil at AOI 1.

PFOA, PFOS, PFHxS, PFBS, and PFNA were not detected in any of the three shallow subsurface soil samples. Similarly, PFOA, PFOS, PFHxS, PFBS, and PFNA were not detected in the deep subsurface soil sample collected at AOI01-02.

6.3.2 AOI 1 Groundwater Analytical Results

Figure 6-16 through **Figure 6-21** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater was sampled from temporary monitoring well locations AOI01-01 and AOI01-02. PFOA was detected in both well locations, with one sample exceeding the SL of 6 nanograms per liter (ng/L). Concentrations of PFOA were 5.68 ng/L at AOI01-01 and 27.3 ng/L at AOI01-02. PFOS was detected below the SL of 4 ng/L at both locations, with concentrations of 2.46 J ng/L at AOI01-01 and 1.83 J ng/L at AOI01-02. PFHxS was detected below the SL of 39 ng/L at both locations, with concentrations of 1.89 J ng/L at AOI01-01 and 2.55 J ng/L at AOI01-02. PFBS was detected below the SL of 601 ng/L at both locations, with concentrations of 4.44 ng/L at AOI01-01 and 3.09 J ng/L at AOI01-02. PFNA was not detected at either well location.

6.3.3 AOI 1 Conclusions

Based on the results of the SI, PFOA, PFOS, and PFHxS were detected in soil below their respective SLs. PFOA was detected in groundwater with concentrations exceeding the SL. Based on the exceedances of the SLs in 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: Wash Rack. The results in soil and groundwater are summarized on **Table 6-2** through **Table 6-5**. Soil and groundwater results are presented on **Figure 6-1** through **Figure 6-21**.

6.4.1 AOI 2 Soil Analytical Results

Figure 6-1 through **Figure 6-15** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs) from boring locations AOI02-01 through AOI02-04. Soil was also sampled from the shallow subsurface (7.75 to 9.75 feet bgs and 14.5 to 16.5 feet bgs) at AOI02-01. Lastly, AOI02-02 was sampled for shallow subsurface soil (9 to 11 feet bgs) and deep subsurface soil (17 to 19 feet bgs). PFOA, PFOS, PFHxS, and PFNA were detected in surface soil at concentrations below their respective SLs. All detections were observed in two borings (AOI02-01 and AOI02-03). PFOA was detected at concentrations of 1.29 µg/kg at AOI02-01 and 0.893 J µg/kg at AOI02-03. PFOS was detected at concentrations of 0.481 J µg/kg at AOI02-01 and 0.743 J µg/kg at AOI02-03. PFHxS was only detected in surface soil at AOI02-01, with a concentration of 0.039 J µg/kg. PFNA was detected in two borings, with concentrations of 0.255 J µg/kg at AOI02-01 and 0.228 J µg/kg at AOI02-03. PFBS was not detected in surface soil at any of the four borings.

In shallow subsurface soil, PFOA and PFNA were detected in one of three samples at concentrations below their SLs. PFOA and PFNA were both detected at AOI02-01 (14.5 to 16.5 feet bgs) at concentrations of 0.245 J µg/kg and 0.027 J µg/kg, respectively. PFOS, PFBS, and PFHxS were not detected in the shallow subsurface soil. PFOS and PFHxS were detected in the deep subsurface soil sample at AOI02-02, with concentrations of 0.153 J µg/kg and 0.045 J µg/kg, respectively. PFOA, PFBS, and PFNA were not detected in the deep subsurface soil sample.

Soil was also sampled at the side-gradient boring BEAU-02 and the upgradient/side-gradient boring BEAU-03. Soil was sampled from the surface soil (0 to 2 feet bgs) and shallow subsurface soil (13 to 15 feet bgs) in both borings. Another shallow subsurface soil (7 to 9 feet bgs) was collected at BEAU-03, whereas a deep subsurface soil (24 to 26 feet bgs) was collected at BEAU-02. PFOA, PFOS, PFHxS, PFBS, and PFNA were detected in surface soil at concentrations below their respective SLs in boring BEAU-03. There were no detections in surface soil at BEAU-02. PFOA and PFOS were detected at concentrations of 0.122 J µg/kg and 0.305 J µg/kg, respectively. PFHxS, PFBS, and PFNA were detected at concentrations of 0.100 J µg/kg, 0.030 J µg/kg, and 0.031 J µg/kg, respectively.

PFOS was detected below the SL in one of three subsurface soil samples, with a concentration of 0.523 J µg/kg at BEAU-03 (7 to 9 feet bgs). PFOA, PFHxS, PFBS, and PFNA were not detected in shallow subsurface soil. Similarly, PFOA, PFOS, PFHxS, PFBS, and PFNA were not detected in the one deep subsurface soil sample at BEAU-02.

6.4.2 AOI 2 Groundwater Analytical Results

Figure 6-16 through **Figure 6-21** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater was sampled from temporary monitoring well locations AOI2-01 and AOI2-02. PFHxS was detected above the SL of 39 ng/L in one of two well locations, with a concentration of 65.4 ng/L at AOI02-02. PFHxS was not detected in AOI02-01. PFBS was detected below the SL in both well locations, with concentrations of 0.714 J ng/L at AOI02-01 and 47.5 ng/L at AOI02-02. PFOA, PFOS, and PFNA were not detected in either well location.

Samples were also collected at the upgradient/side-gradient BEAU-03 facility boundary location. PFOS, PFHxS, and PFBS were all detected below their respective SLs with concentrations of 0.884 J ng/L, 6.53 ng/L, and 4.31 ng/L, respectively. PFOA and PFNA were not detected at BEAU-03.

6.4.3 AOI 2 Conclusions

Based on the results of the SI, PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in soil at concentrations below their respective SLs. PFHxS was detected in groundwater at concentrations greater than the SL. Based on the exceedance of the PFHxS SL in groundwater, further evaluation at AOI 2 is warranted.

6.5 AOI 3

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 3: Firehouse Building 327. The results in soil and groundwater are presented in **Table 6-2** through **Table 6-5**. Soil and groundwater results are presented on **Figure 6-1** through **Figure 6-21**.

6.5.1 AOI 3 Soil Analytical Results

Figure 6-1 through **Figure 6-15** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs) from boring locations AOI03-01 through AOI03-03. AOI03-04 was sampled for surface soil from 0 to 1 feet bgs. Soil was also sampled from shallow subsurface soil (8 to 10 feet bgs) and deep subsurface soil (24.5 to 26.5 feet bgs) from boring location AOI3-01. Additionally, soil was sampled from shallow subsurface soil (13 to 15 feet bgs) and deep subsurface soil (26 to 28 feet bgs) at AOI03-02.

In surface soil, PFOS was detected in all four borings, with concentrations exceeding the SL at two locations. PFOS detections ranged from 2.76 µg/kg to 47.5 µg/kg. The exceedances of the surface soil PFOS SL (13 µg/kg) occurred at AOI03-03 and AOI03-04, with concentrations of 18.1 µg/kg and 47.5 µg/kg, respectively. PFOA, PFHxS, PFBS, and PFNA were also detected in surface soil in all four borings but at concentrations below their respective SLs. PFOA was detected at concentrations ranging from 1.02 J µg/kg at AOI03-02 to 4.94 µg/kg at AOI03-03. PFHxS was detected at concentrations ranging from 0.772 J µg/kg at AOI03-02 to 10.9 µg/kg at AOI03-01. PFBS was detected at concentrations ranging from 0.059 J µg/kg at AOI03-02 to 0.215 J µg/kg at AOI03-03. Lastly, PFNA was detected at concentrations ranging from 0.503 J µg/kg at AOI03-01 to 11.9 µg/kg at AOI03-03.

PFHxS was detected below the SL in shallow subsurface soil at one of two boring locations, with a concentration of 0.097 J µg/kg at AOI03-01. PFOA, PFOS, PFBS, and PFNA were not detected in shallow subsurface soil at either boring location. PFOS and PFHxS were detected in one of

two deep subsurface soil samples collected at AOI 3, with concentrations of 0.074 J µg/kg and 0.078 J+ µg/kg, respectively. Both detections occurred at AOI03-02. PFOA, PFBS, and PFNA were not detected in deep subsurface soil.

Soil was also collected from the inferred downgradient BEAU-01 boring location from surface (0 to 2 feet bgs), shallow subsurface (13 to 15 feet bgs) and deep subsurface (38 to 40 feet bgs) soil. PFOA, PFOS, PFHxS, PFBS, and PFNA were not detected in any of the three soil samples collected at BEAU-01.

6.5.2 AOI 3 Groundwater Analytical Results

Figure 6-16 through **Figure 6-21** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater was sampled from temporary monitoring well locations AOI03-01 and AOI03-02. PFOA was detected above the SL of 6 ng/L in both well locations, with concentrations of 8.05 ng/L at AOI03-01 and 37.5 ng/L at AOI03-02. PFOS was detected above the SL of 4 ng/L at both well locations, with concentrations of 54.1 ng/L at AOI03-01 and 896 ng/L at AOI03-02. PFHxS was detected above the SL of 39 ng/L at one well location, with a concentration of 587 ng/L at AOI03-02. PFHxS was detected at AOI03-01 with a concentration of 33.6 ng/L. PFBS was detected below the SL at both well locations, with concentrations of 2.91 J ng/L at AOI03-01 and 84.0 ng/L at AOI03-02. PFNA was detected below the SL at both well locations, with concentrations of 2.37 J ng/L at AOI03-01 and 2.16 J ng/L at AOI03-02.

Groundwater was also sampled from the inferred downgradient temporary well BEAU-01. PFOS was detected below the SL, with a concentration of 1.93 J ng/L. PFOA, PFHxS, PFBS, and PFNA were not detected at BEAU-01.

6.5.3 AOI 3 Conclusions

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

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

Area of Interest		AOI01								AOI02											
Sample ID		AOI01-01-SB-00-02		AOI01-02-SB-00-02		AOI01-03-SB-00-02		AOI01-04-SB-00-02		AOI02-01-SB-00-02		AOI02-01-SB-00-02-D		AOI02-02-SB-00-02		AOI02-03-SB-00-02 (RE)		AOI02-03-SB-00-02-D		AOI02-04-SB-00-02	
Sample Date		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021	
Depth		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	1900	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	130	ND	U	0.034	J	ND	U	ND	U	0.039	J	0.034	J	ND	U	ND	U	ND	U	ND	U
PFNA	19	ND	U	ND	U	ND	U	ND	U	0.255	J	0.120	J	ND	U	0.028	J	0.228	J	ND	U
PFOA	19	ND	U	0.112	J	ND	U	ND	U	1.07	J	1.29		ND	U	0.386	J	0.893	J	ND	U
PFOS	13	0.058	J	0.419	J	0.114	J	ND	U	0.481	J	0.225	J	ND	U	0.096	J	0.743	J	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

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

Interpreted Qualifiers

J = Estimated concentration

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

Chemical Abbreviations

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

Acronyms and Abbreviations

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

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

Area of Interest		AOI03										Sitewide							
Sample ID		AOI03-01-SB-00-02		AOI03-02-SB-00-02		AOI03-02-SB-00-02-D		AOI03-03-SB-00-02		AOI03-04-SB-00-01		BEAU-01-SB-00-02		BEAU-02-SB-00-02		BEAU-03-SB-00-02		BEAU-03-SB-00-02-D	
Sample Date		07/30/2021		07/30/2021		07/30/2021		08/01/2021		07/30/2021		07/29/2021		07/29/2021		07/29/2021		07/29/2021	
Depth		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-1 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft	
Analyte	**OSD Screening Level [a]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																			
PFBS	1900	0.118	J	0.059	J	0.081	J	0.215	J	0.079	J	ND	U	ND	U	0.030	J	0.028	J
PFHxS	130	10.9		0.772	J	0.981	J	2.53		1.64		ND	U	ND	U	0.100	J	0.091	J
PFNA	19	0.503	J	1.37		3.93		11.9		2.24		ND	U	ND	U	0.023	J	0.031	J
PFOA	19	1.62		1.02	J	1.37		4.94		1.11	J	ND	U	ND	U	0.105	J	0.122	J
PFOS	13	12.9		2.76		4.16		18.1		47.5		ND	U	ND	U	0.305	J	0.299	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

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

Interpreted Qualifiers

J = Estimated concentration

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

Chemical Abbreviations

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

Acronyms and Abbreviations

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

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

Area of Interest		AOI01						AOI02						AOI03				Sitewide			
Sample ID		AOI01-01-SB-6.5-8.5		AOI01-01-SB-10-12		AOI01-02-SB-8.5-10.5		AOI02-01-SB-7.75-9.75		AOI02-01-SB-14.5-16.5		AOI02-02-SB-09-11		AOI03-01-SB-08-10		AOI03-02-SB-13-15		BEAU-01-SB-13-15		BEAU-02-SB-13-15	
Sample Date		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		08/01/2021		07/30/2021		07/30/2021		07/29/2021		07/29/2021	
Depth		6.5-8.5 ft		10-12 ft		8.5-10.5 ft		7.75-9.75 ft		14.5-16.5 ft		9-11 ft		8-10 ft		13-15 ft		13-15 ft		13-15 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	25000	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	1600	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	0.097	J	ND	U	ND	U	ND	U
PFNA	250	ND	U	ND	U	ND	U	ND	U	0.027	J	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	250	ND	U	ND	U	ND	U	ND	U	0.245	J	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	160	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

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

Interpreted Qualifiers

J = Estimated concentration

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

Chemical Abbreviations

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

Acronyms and Abbreviations

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

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

	Area of Interest	Sitewide			
	Sample ID	BEAU-03-SB-07-09		BEAU-03-SB-13-15	
	Sample Date	07/29/2021		07/29/2021	
	Depth	7-9 ft		13-15 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)					
PFBS	25000	ND	U	ND	U
PFHxS	1600	ND	U	ND	U
PFNA	250	ND	U	ND	U
PFOA	250	ND	U	ND	U
PFOS	160	0.523	J	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

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

Interpreted Qualifiers

J = Estimated concentration

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

Chemical Abbreviations

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

Acronyms and Abbreviations

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

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

Area of Interest	AOI01		AOI02		AOI03				Sitewide			
Sample ID	AOI01-02-SB-16-18		AOI02-02-SB-17-19		AOI03-01-SB-24.5-26.5		AOI03-02-SB-26-28		BEAU-01-SB-38-40		BEAU-02-SB-24-26	
Sample Date	08/01/2021		08/01/2021		07/30/2021		07/30/2021		07/29/2021		07/30/2021	
Depth	16-18 ft		17-19 ft		24.5-26.5 ft		26-28 ft		38-40 ft		24-26 ft	
Analyte	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)												
PFBS	ND	U	ND	U	ND	U	ND	UJ	ND	U	ND	U
PFHxS	ND	U	0.045	J	ND	U	0.078	J+	ND	U	ND	U
PFNA	ND	U	ND	U	ND	U	ND	UJ	ND	U	ND	U
PFOA	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	ND	U	0.153	J	ND	U	0.074	J	ND	U	ND	U

Interpreted Qualifiers

J = Estimated concentration

J+ = Estimated concentration, biased high

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

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

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

Acronyms and Abbreviations

AOI	Area of Interest
BEAU	Beauregard
DL	detection limit
ft	feet
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
µg/kg	micrograms per kilogram

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

Area of Interest		AOI01						AOI02				AOI03				Sitewide			
Sample ID		AOI01-01-GW		AOI01-01-GW-D		AOI01-02-GW		AOI02-01-GW		AOI02-02-GW		AOI03-01-GW		AOI03-02-GW		BEAU-01-GW		BEAU-03-GW	
Sample Date		08/01/2021		08/01/2021		08/01/2021		08/02/2021		08/02/2021		08/03/2021		08/02/2021		07/30/2021		07/30/2021	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)																			
PFBS	601	4.44		3.87	J	3.09	J	0.714	J	47.5		2.91	J	84.0		ND	U	4.31	
PFHxS	39	1.89	J	1.83	J	2.55	J	ND	U	65.4		33.6		587		ND	U	6.53	
PFNA	6	ND	U	ND	U	ND	U	ND	U	ND	U	2.37	J	2.16	J	ND	U	ND	U
PFOA	6	5.68		5.21		27.3		ND	U	ND	U	8.05		37.5		ND	U	ND	U
PFOS	4	2.41	J	2.46	J	1.83	J	ND	U	ND	U	54.1		896		1.93	J	0.884	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

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

Interpreted Qualifiers

J = Estimated concentration

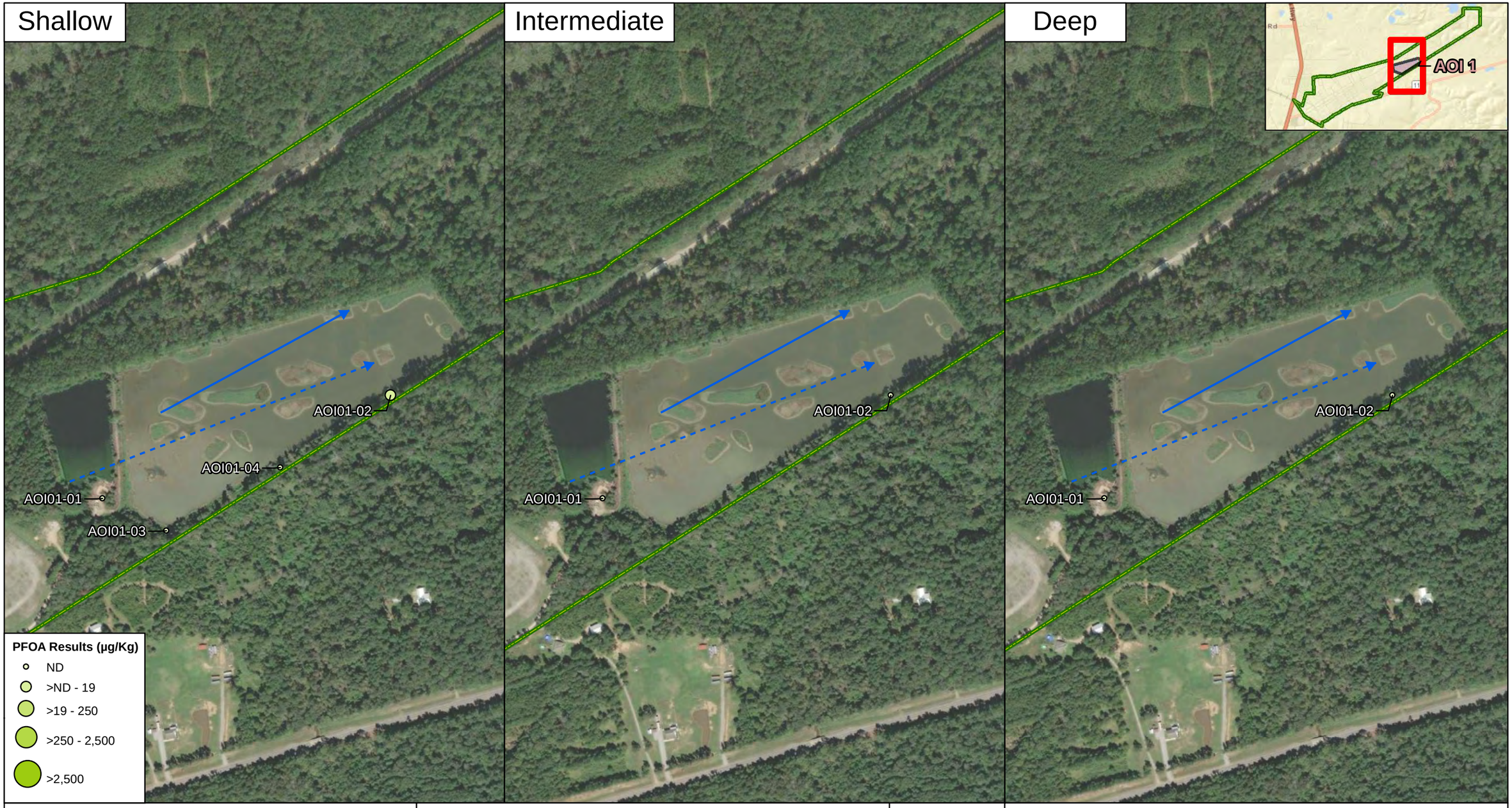
U = The analyte was not detected at a level greater than or equal to the adjusted DL

Chemical Abbreviations

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

Acronyms and Abbreviations

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



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/22/2022	GIS BY	MS	8/22/2022
SCALE	1:6,000	CHK BY	CD	8/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/22/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 250 500 1,000
Feet

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

N

PFOA Detections in Soil, AOI 1

AECOM
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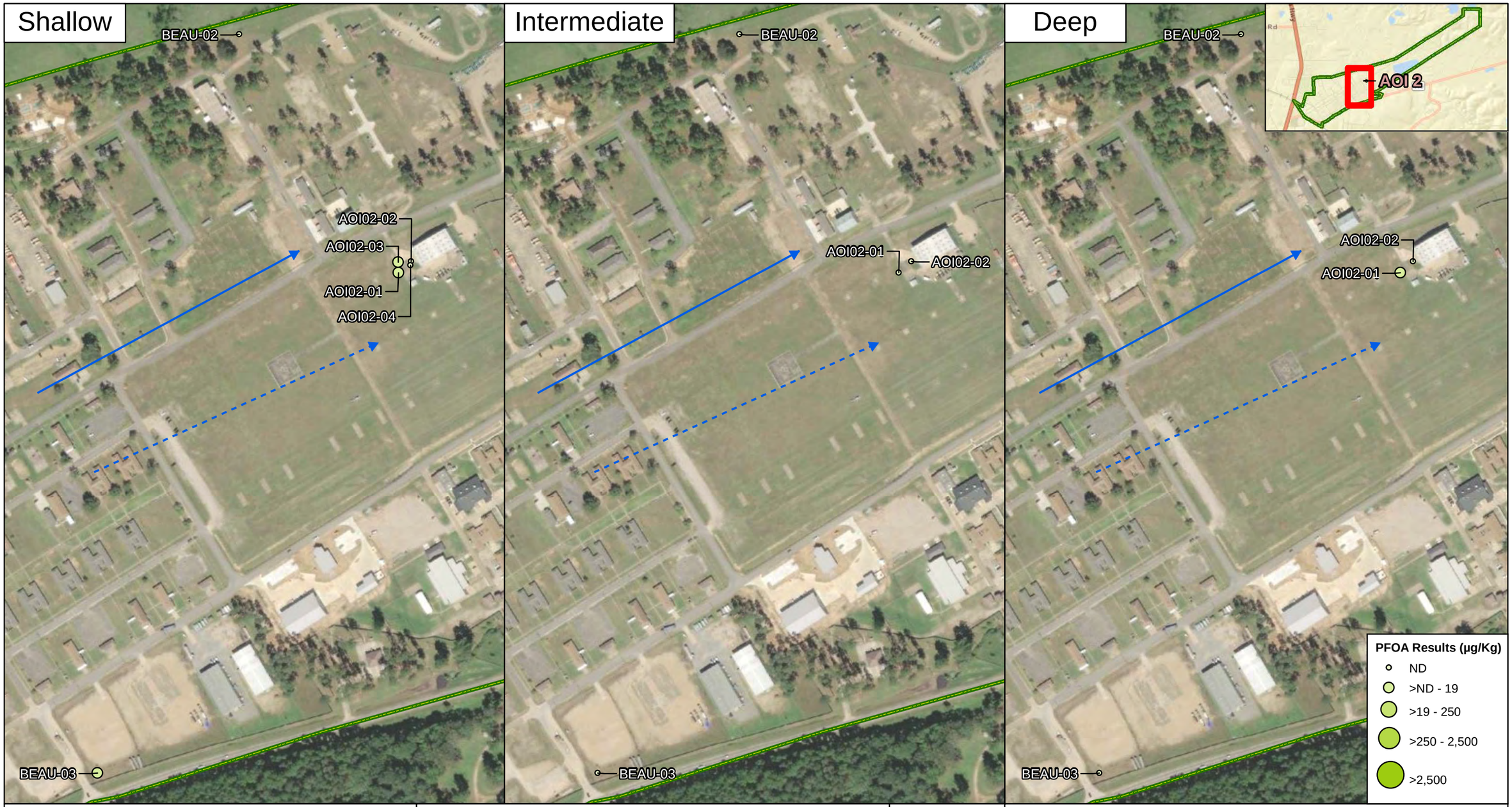
Figure 6-1



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/22/2022	GIS BY	MS	8/22/2022
SCALE	1:4,320	CHK BY	CD	8/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/22/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720
Feet

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

N

PFOA Results in Soil, AOI 2

AECOM
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Figure 6-2

Shallow

AOI03-04
AOI03-03
AOI03-01
AOI03-02
BEAU-01

Intermediate

AOI03-02
AOI03-01
BEAU-01

Deep

AOI 3
AOI03-02
AOI03-01
BEAU-01

PFOA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/22/2022	GIS BY	MS	8/22/2022
SCALE	1:2,400	CHK BY	CD	8/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/22/2022

Facility Boundary

Inferred Groundwater Flow Direction

0 100 200 400 Feet

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

N

PFOA Detections in Soil, AOI 3

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Figure 6-3

Shallow

Intermediate

Deep

AOI01-02

AOI01-04

AOI01-01

AOI01-03

PFOS Results (µg/Kg)

- ND
- >ND - 13
- >13 - 160
- >160 - 1,600
- >1,600

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/12/2022	GIS BY	MS	8/12/2022
SCALE	1:6,000	CHK BY	CD	8/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/12/2022

Facility Boundary

Groundwater Flow Direction

Surface Water Flow Direction

0 250 500 1,000

Feet

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

N

PFOS Detections in Soil, AOI 1

AECOM

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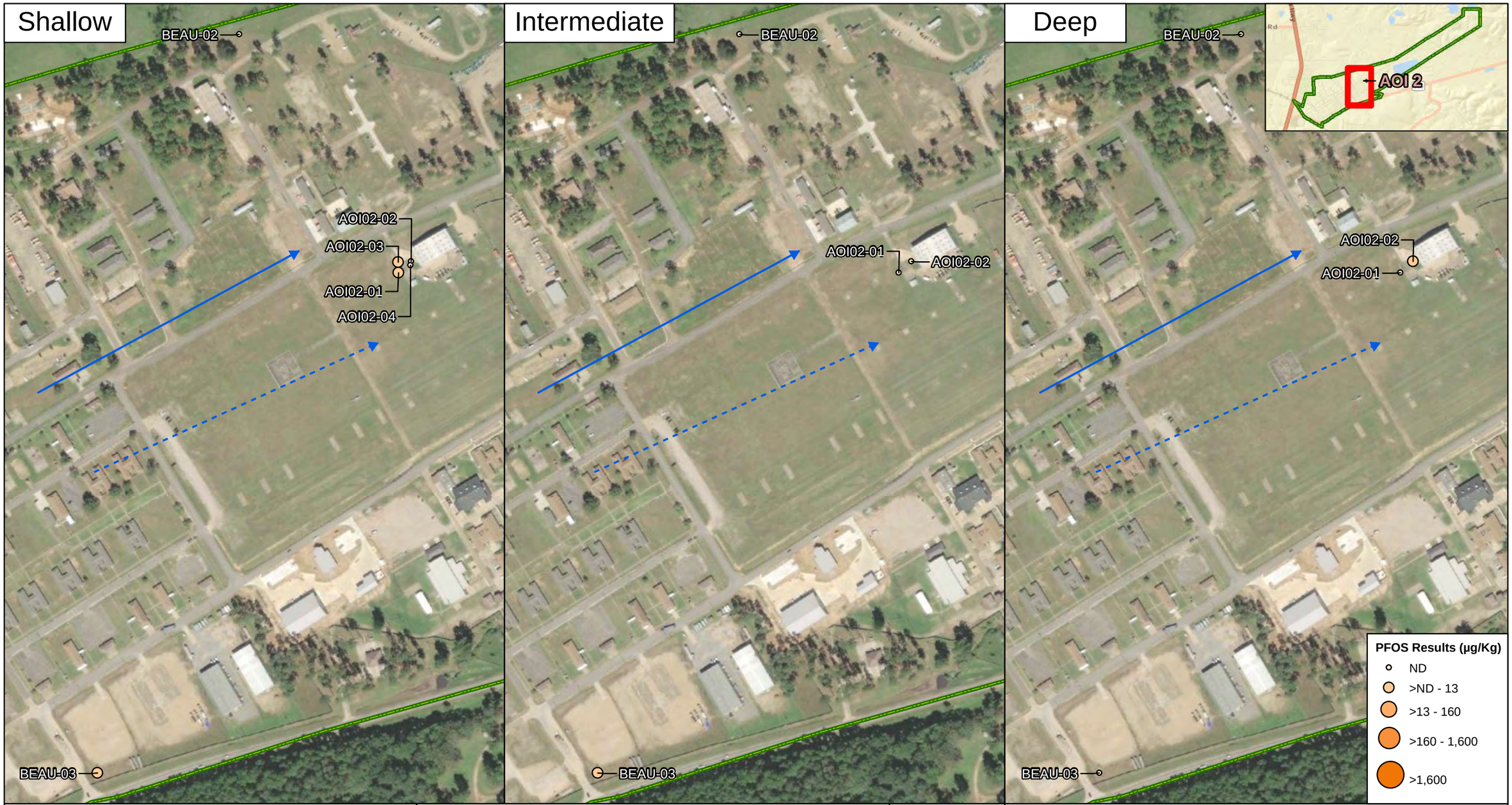
Germantown, MD 20876

Figure 6-4



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/12/2022	GIS BY	MS	8/12/2022
SCALE	1:4,320	CHK BY	CD	8/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/12/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720
Feet

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

N

PFOS Detections in Soil, AOI 2

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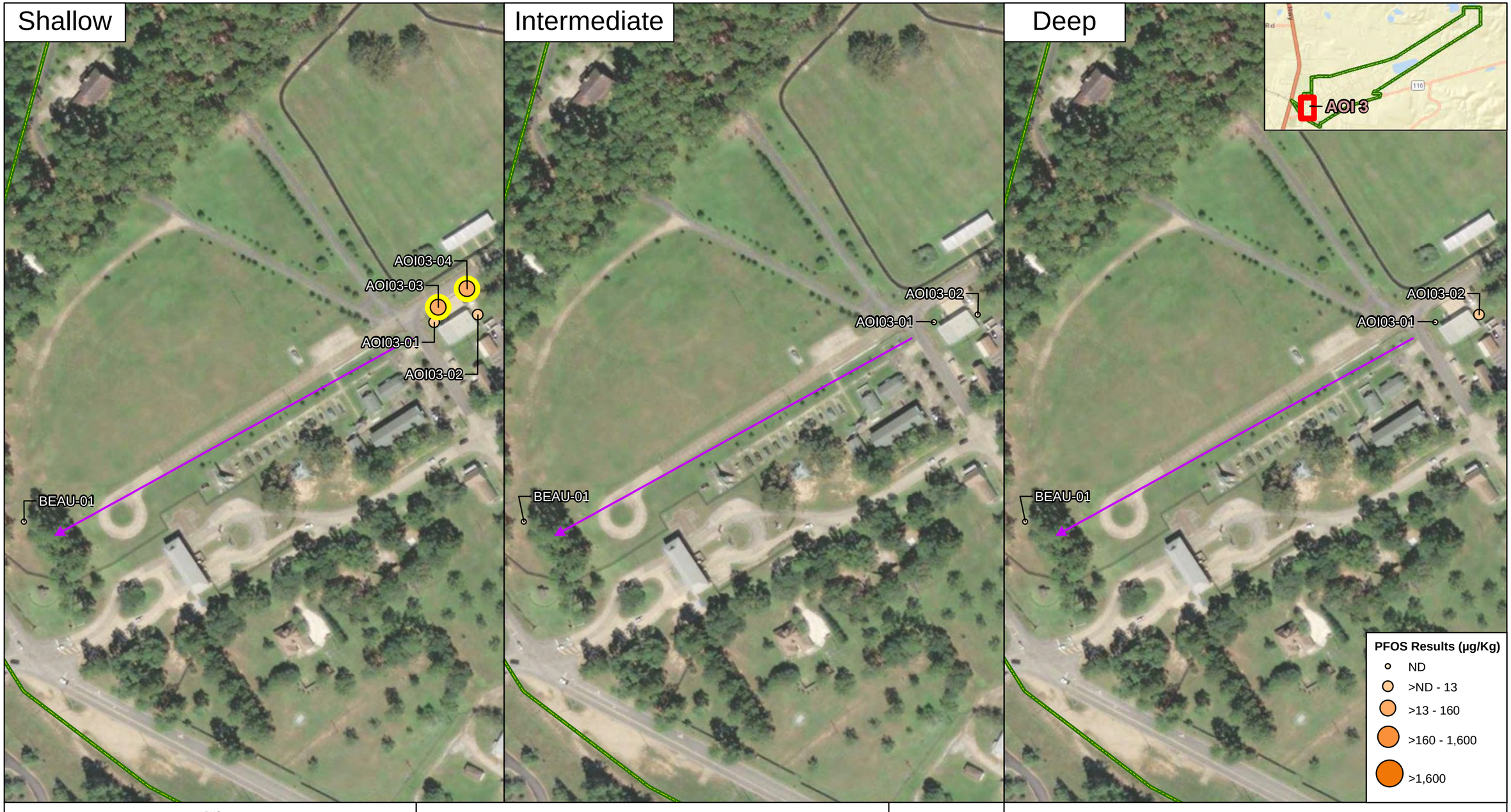
Figure 6-5



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
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SCALE	1:2,400	CHK BY	CD	8/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/12/2022

Inferred Groundwater Flow Direction

Facility Boundary

0 100 200 400 Feet

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

N

PFOS Detections in Soil, AOI 3

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Germantown, MD 20876

Figure 6-6

Shallow

Intermediate

Deep

AOI 1

AOI01-01

AOI01-02

AOI01-03

AOI01-04

PFBS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/12/2022	GIS BY	MS	8/12/2022
SCALE	1:6,000	CHK BY	CD	8/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/12/2022

Facility Boundary

Groundwater Flow Direction

Surface Water Flow Direction

0 250 500 1,000

Feet

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

N

PFBS Detections in Soil, AOI 1

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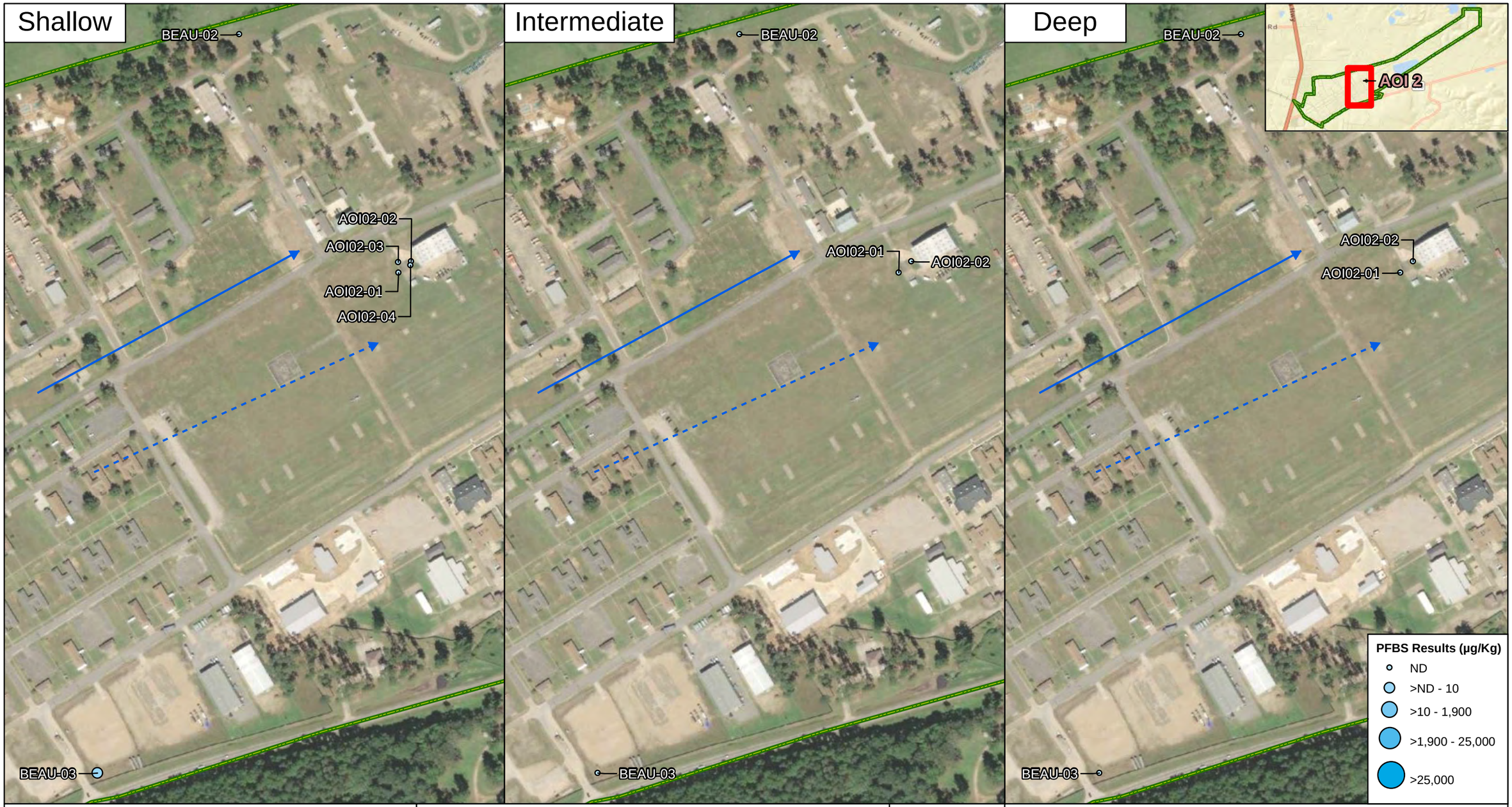
Figure 6-7



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/22/2022	GIS BY	MS	8/22/2022
SCALE	1:4,320	CHK BY	CD	8/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/22/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720
Feet

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

N

PFBS Detections in Soil, AOI 2

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Germantown, MD 20876

Figure 6-8

Shallow

Intermediate

Deep

AOI03-04
AOI03-03
AOI03-01
AOI03-02
BEAU-01

AOI 3

PFBS Results (µg/Kg)
- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/12/2022	GIS BY	MS	8/12/2022
SCALE	1:2,400	CHK BY	CD	8/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/12/2022

Facility Boundary
Inferred Groundwater Flow Direction

0 100 200 400 Feet

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

N

PFBS Detections in Soil, AOI 3

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Germantown, MD 20876

Figure 6-9

Shallow

Intermediate

Deep

AOI01-01

AOI01-02

AOI01-03

AOI01-04

AOI 1

PFHxS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/15/2022	GIS BY	MS	8/15/2022
SCALE	1:6,000	CHK BY	CD	8/15/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/15/2022

Facility Boundary

Groundwater Flow Direction

Surface Water Flow Direction

0 250 500 1,000 Feet

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

N

PFHxS Detections in Soil, AOI 1

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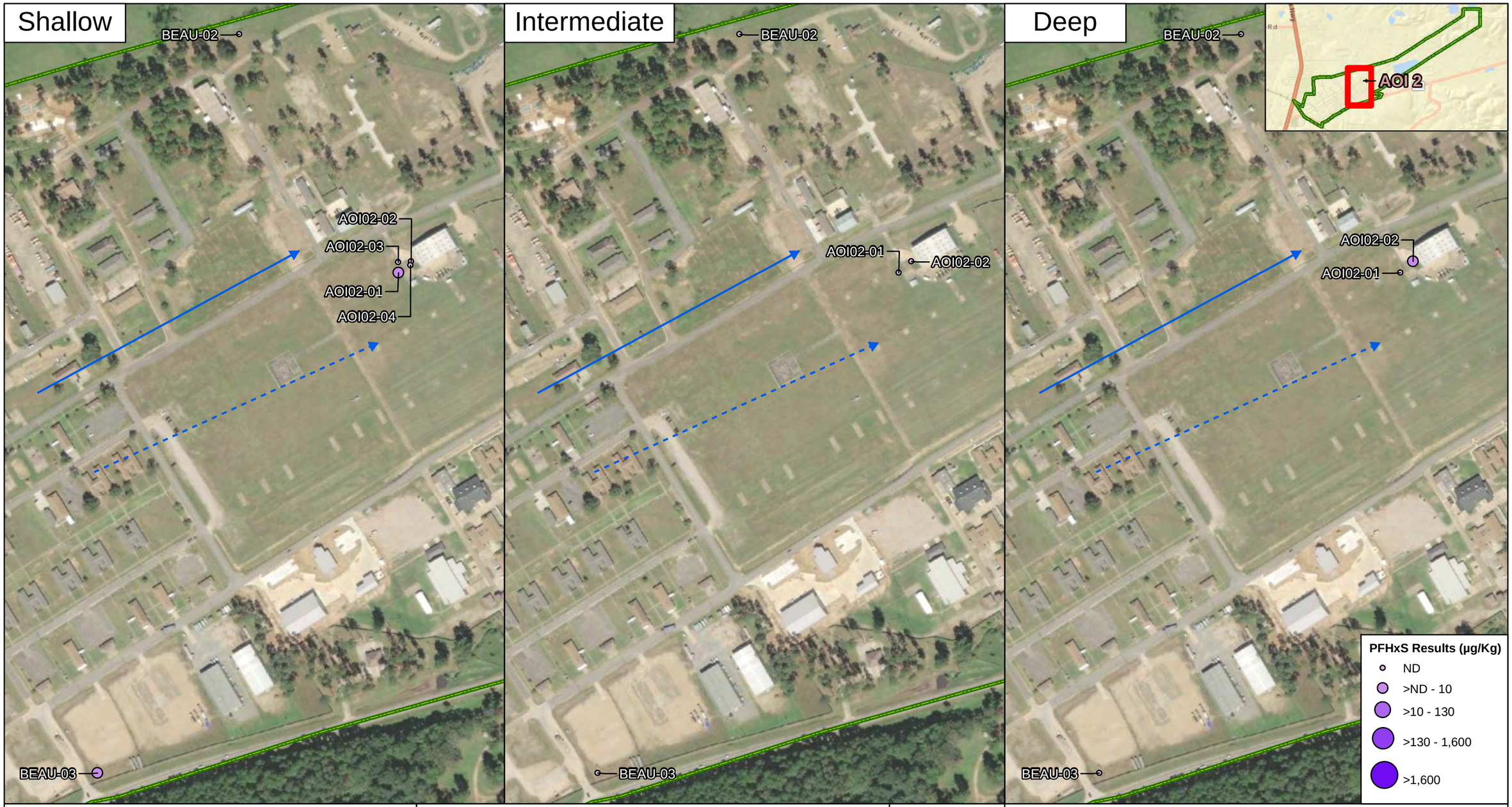
Germantown, MD 20876

Figure 6-10



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/22/2022	GIS BY	MS	8/22/2022
SCALE	1:4,320	CHK BY	CD	8/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/22/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720
Feet

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

N

PFHxS Detections in Soil, AOI 2

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Germantown, MD 20876

Figure 6-11

Shallow

Intermediate

Deep

AOI03-04
AOI03-03
AOI03-01
AOI03-02
BEAU-01

AOI 3

PFHxS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/15/2022	GIS BY	MS	8/15/2022
SCALE	1:2,400	CHK BY	CD	8/15/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/15/2022

Facility Boundary

Inferred Groundwater Flow Direction

0 100 200 400 Feet

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

N

PFHxS Detections in Soil, AOI 3

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Germantown, MD 20876

Figure 6-12

Shallow

Intermediate

Deep

AOI01-01

AOI01-02

AOI01-03

AOI01-04

PFNA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/15/2022	GIS BY	MS	8/15/2022
SCALE	1:6,000	CHK BY	CD	8/15/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/15/2022

Facility Boundary

Groundwater Flow Direction

Surface Water Flow Direction

0 250 500 1,000 Feet

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

N

PFNA Detections in Soil, AOI 1

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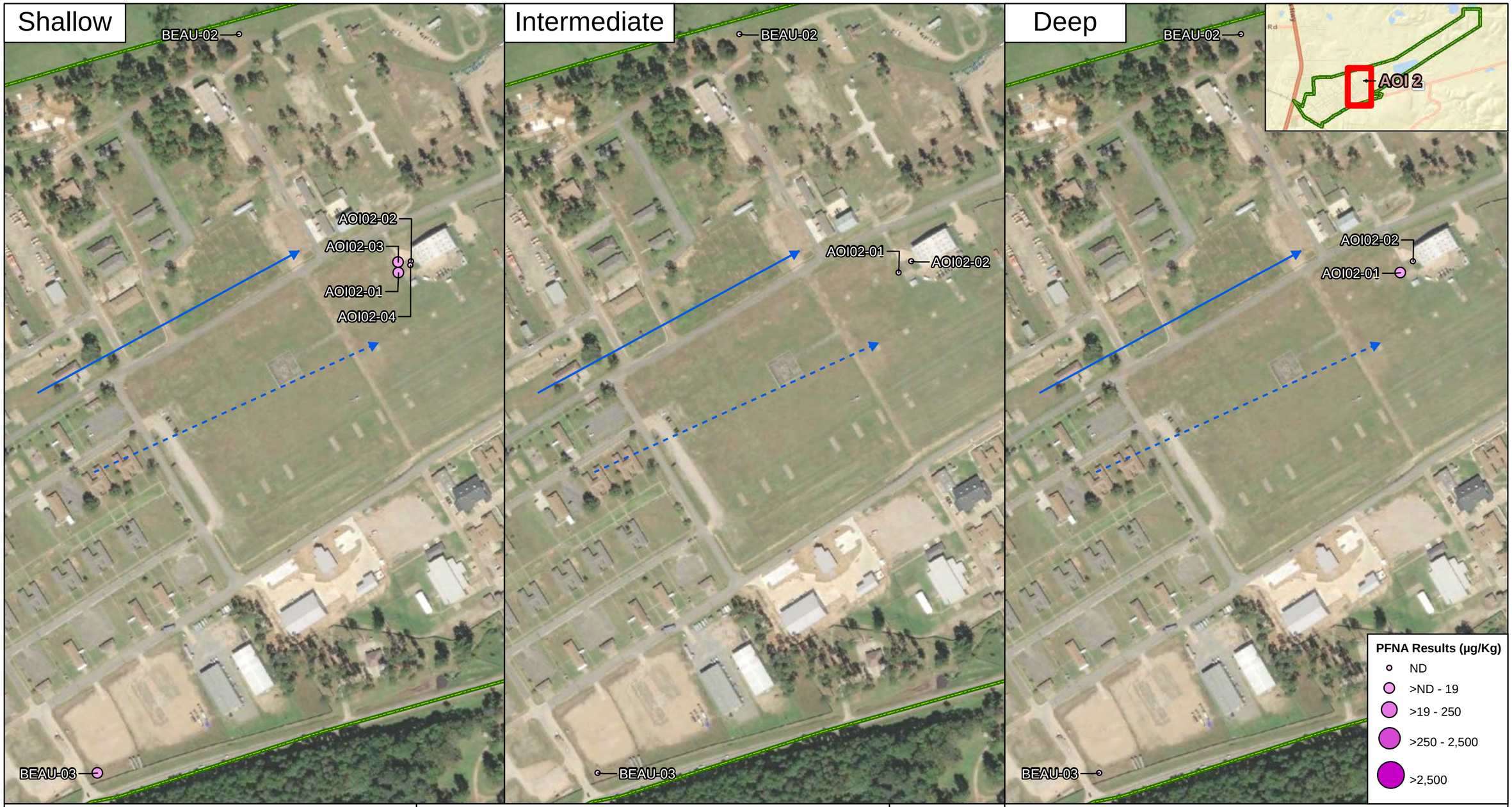
Germantown, MD 20876

Figure 6-13



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/22/2022	GIS BY	MS	8/22/2022
SCALE	1:4,320	CHK BY	CD	8/22/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/22/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720
Feet

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

N

PFNA Detections in Soil, AOI 2

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Germantown, MD 20876

Figure 6-14

Shallow

Intermediate

Deep

AOI03-04
AOI03-03
AOI03-01
AOI03-02
BEAU-01

AOI03-02
AOI03-01
BEAU-01

AOI03-02
AOI03-01
BEAU-01

PFNA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	8/15/2022	GIS BY	MS	8/15/2022
SCALE	1:2,400	CHK BY	CD	8/15/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	8/15/2022

Facility Boundary

Inferred Groundwater Flow Direction

0 100 200 400 Feet

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

N

PFNA Detections in Soil, AOI 3

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Germantown, MD 20876

Figure 6-15

PFOA

PFOS

PFBS

AOI01-02

AOI01-01

PFOA Results (ng/L)
- ND
- >ND - 6
- >6 - 40
- >40 - 70
- >70

PFOS Results (ng/L)
- ND
- >ND - 4
- >4 - 40
- >40 - 70
- >70

PFBS Results (ng/L)
- ND
- >ND - 100
- >100 - 601
- >601 - 2,000
- >2,000

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/12/2022	GIS BY	MS	10/12/2022
SCALE	1:6,000	CHK BY	CD	10/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	10/12/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 250 500 1,000 Feet

N

PFOA, PFOS, and PFBS Detections in Groundwater, AOI 1

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Germantown, MD 20876

Figure 6-16

PFOA

PFOS

PFBS

AOI02-02

AOI02-01

BEAU-03

PFOA Results (ng/L)
- ND
- >ND - 6
- >6 - 40
- >40 - 70
- >70

PFOS Results (ng/L)
- ND
- >ND - 4
- >4 - 40
- >40 - 70
- >70

PFBS Results (ng/L)
- ND
- >ND - 100
- >100 - 601
- >601 - 2,000
- >2,000

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/12/2022	GIS BY	MS	10/12/2022
SCALE	1:4,320	CHK BY	CD	10/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	10/12/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720 Feet

N

PFOA, PFOS, and PFBS Detections in Groundwater, AOI 2

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Germantown, MD 20876

Figure 6-17

PFOA

PFOS

PFBS

AOI03-02

AOI03-01

BEAU-01

AOI 3

Rd

116

PFOA Results (ng/L)

- ND
- >ND - 6
- >6 - 40
- >40 - 70
- >70

PFBS Results (ng/L)

- ND
- >ND - 4
- >4 - 40
- >40 - 70
- >70

PFBS Results (ng/L)

- ND
- >ND - 100
- >100 - 601
- >601 - 2,000
- >2,000

Facility Boundary

Inferred Groundwater Flow Direction

0 100 200 400 Feet

N

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/12/2022	GIS BY	MS	10/12/2022
SCALE	1:2,400	CHK BY	CD	10/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	10/12/2022

PFOA, PFOS, and PFBS Detections in Groundwater, AOI 3

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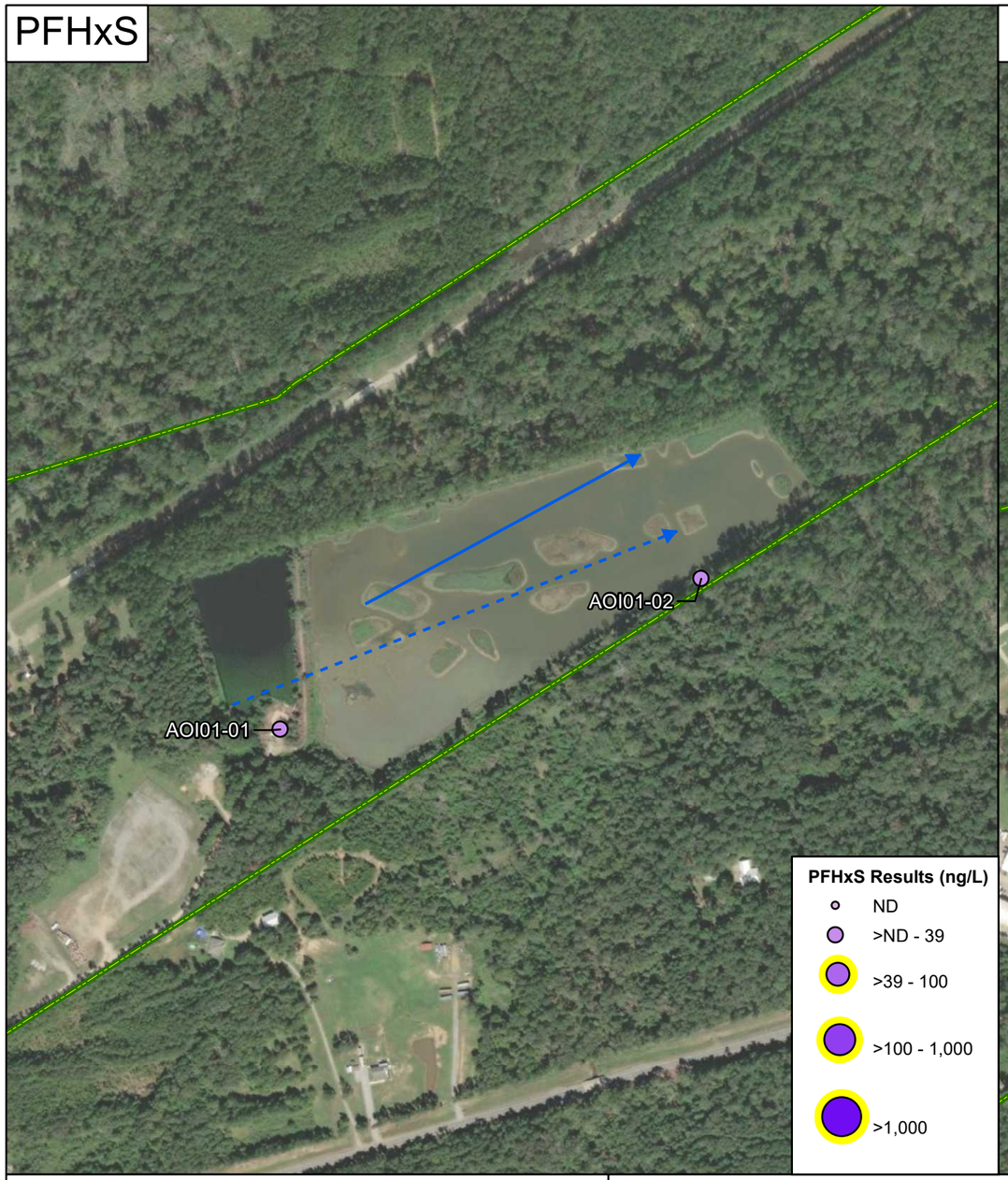
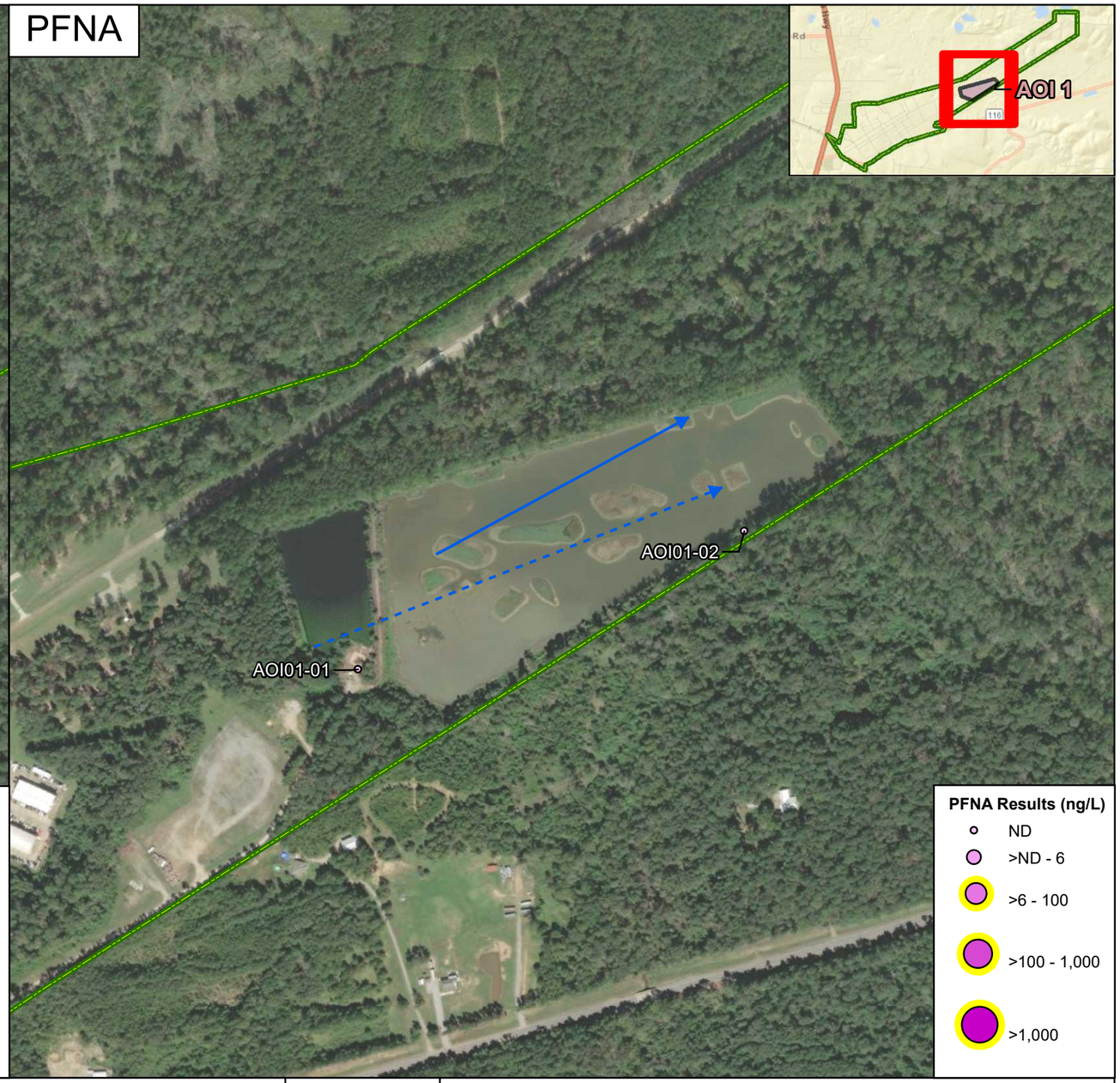
Figure 6-18

PFHxS



PFNA



PFHxS Results (ng/L)

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

PFNA Results (ng/L)

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

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/12/2022	GIS BY	MS	10/12/2022
SCALE	1:6,000	CHK BY	CD	10/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	10/12/2022

- Facility Boundary
- Groundwater Flow Direction
- Surface Water Flow Direction

0 250 500 1,000 Feet

N

PFHxS and PFNA Detections in Groundwater, AOI 1

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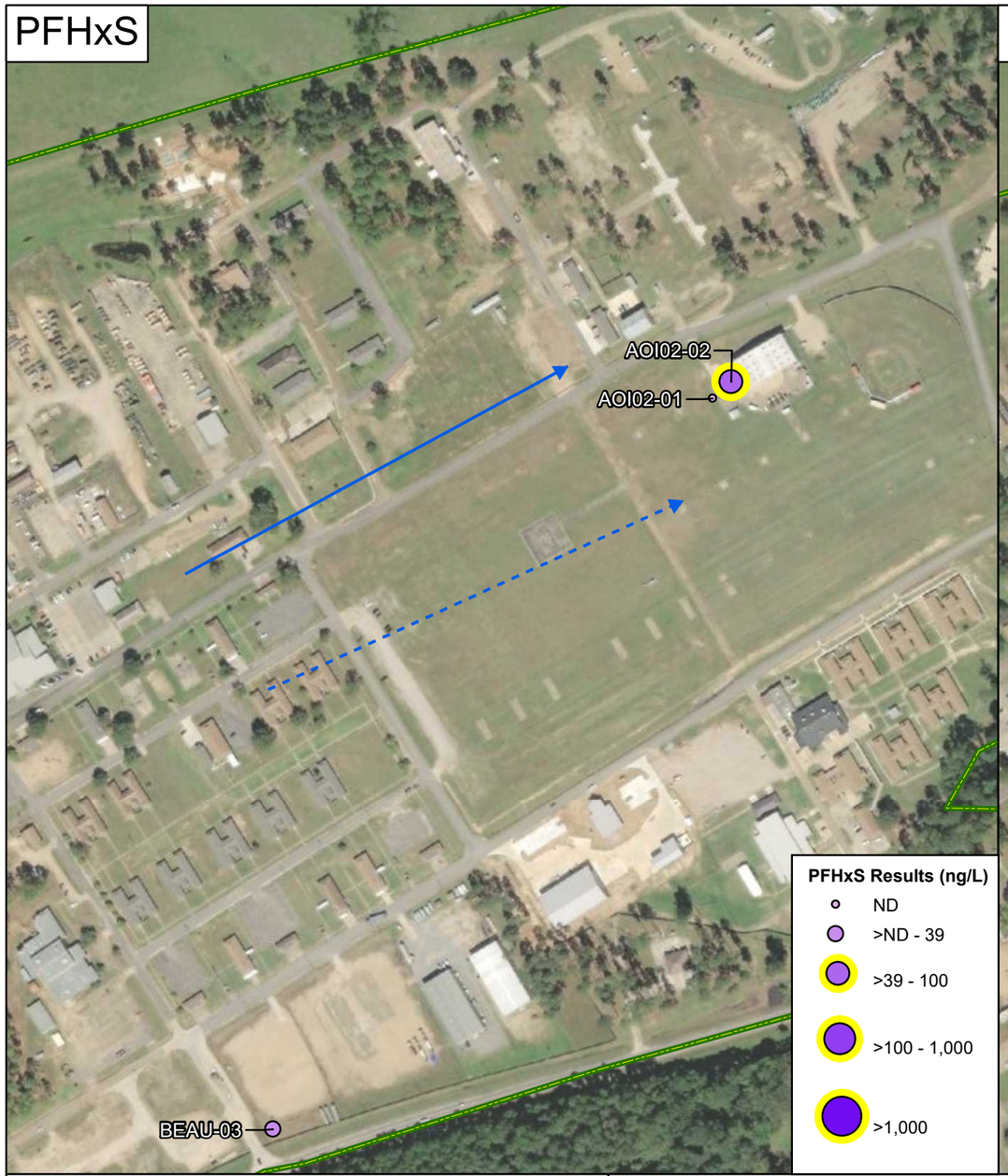
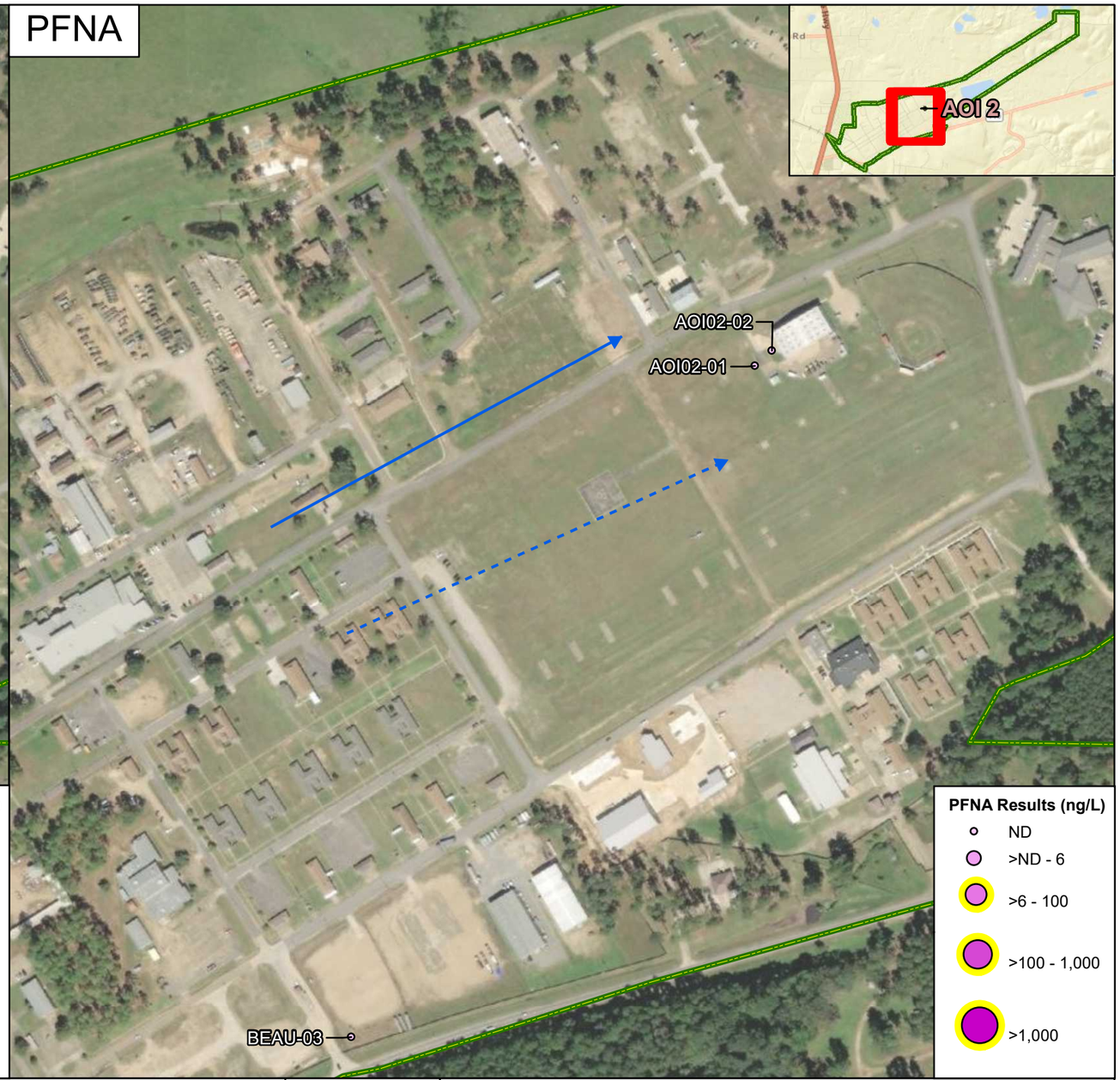
Figure 6-19

PFHxS



PFNA



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/12/2022	GIS BY	MS	10/12/2022
SCALE	1:4,320	CHK BY	CD	10/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	10/12/2022

Facility Boundary
Groundwater Flow Direction
Surface Water Flow Direction

0 180 360 720 Feet

N

PFHxS and PFNA Detections in Groundwater, AOI 2

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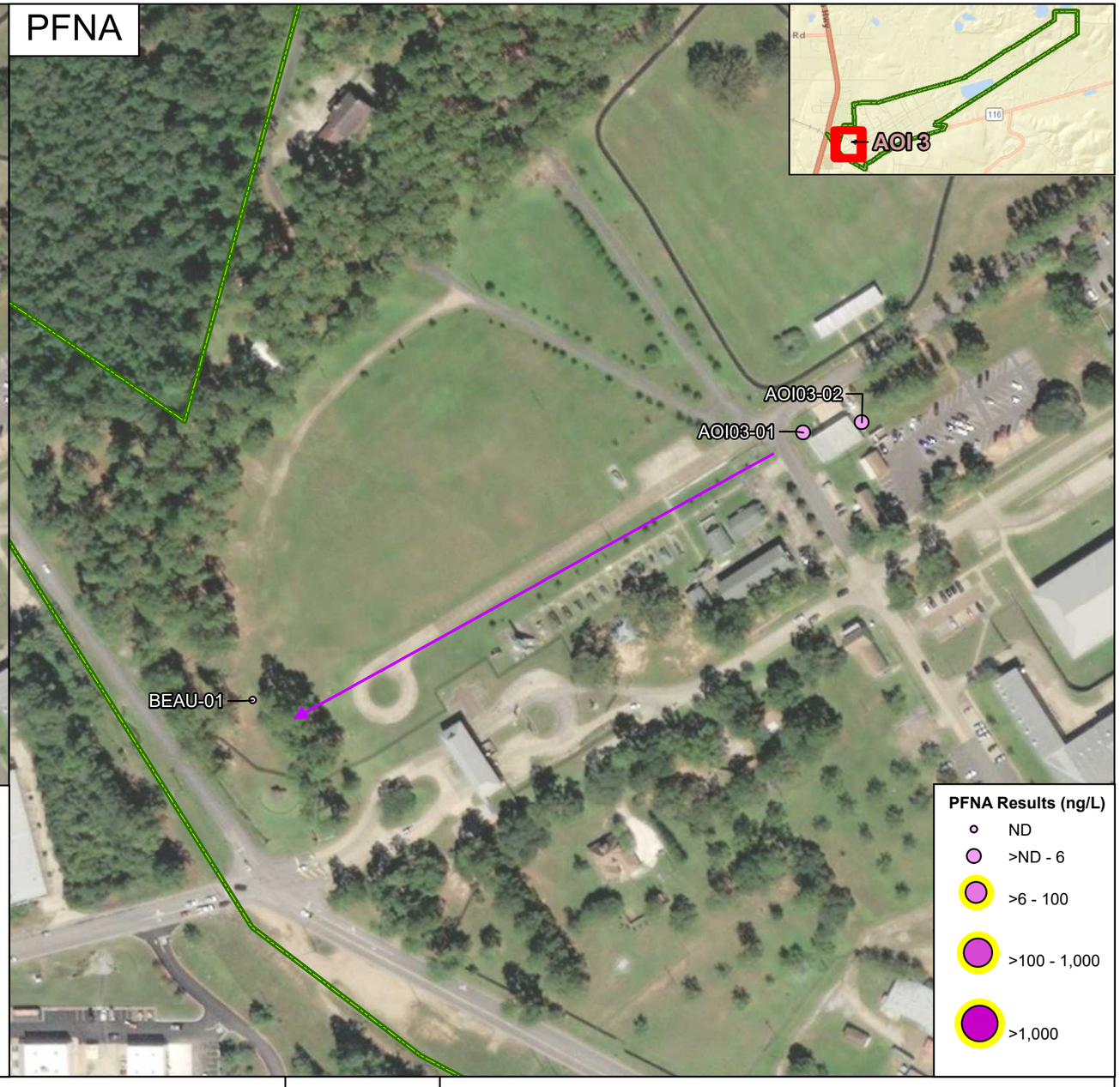
Figure 6-20

PFHxS

PFNA



PFHxS Results (ng/L)

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

PFNA Results (ng/L)

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

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Beauregard, LA			
REVISED	10/12/2022	GIS BY	MS	10/12/2022
SCALE	1:2,400	CHK BY	CD	10/12/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	10/12/2022

Facility Boundary

Inferred Groundwater Flow Direction

0 100 200 400 Feet

N

PFHxS and PFNA Detections in Groundwater, AOI 3

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Figure 6-21

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7. Exposure Pathways

The conceptual site models (CSMs) for each AOI, revised based on the SI findings, are presented on **Figure 7-1** through **Figure 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 based upon exceedances of the SLs for the relevant compounds and whether the release is more than likely attributable to the DoD. A CSM presents the current understanding of the site conditions with respect to known and suspected sources, potential transport mechanisms and migration pathways, and potentially exposed human receptors. A human exposure pathway is considered potentially complete when the following conditions are present:

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

If any of these elements are missing, the pathway is incomplete. The CSM figures use an empty circle symbol to represent an incomplete exposure pathway. Areas with an incomplete pathway generally warrant no further action. However, the pathway is considered potentially complete if the relevant compounds are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of relevant compounds above the SLs. Areas with an identified potentially complete pathway that have detections of the relevant compounds above the SLs may warrant further investigation. Although the CSMs indicate whether potentially complete exposure pathways may exist, the recommendation for future study in 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 routes of exposure to the relevant compounds are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of toxicological study. The receptors evaluated are consistent with those listed in USEPA guidance for risk screening (USEPA, 2001). Receptors at the facility include site workers (e.g., facility staff and visiting soldiers), construction workers, trespassers (though unlikely due to restricted access), residents outside the facility boundary, and recreational users outside of the facility boundary.

7.1 Soil Exposure Pathway

The SI results in soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at AOI 1, AOI 2, and AOI 3 based on the aforementioned criteria.

7.1.1 AOI 1

Between 2000/2001 and 2003, AFFF potentially released at AOI 2 during fire training activities would have been conveyed to the OWS and then drained to the Retention Pond. During wet seasons, water may have overflowed onto nearby surface soil, resulting in an impact to surface soil.

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

7.1.2 AOI 2

As early as 2000, it is possible AFFF were discharged at the Wash Rack during fire training activities. AFFF discharged at the Wash Rack may have migrated off the paved surface and onto surface soil.

PFOA, PFOS, PFHxS, and PFNA were detected in surface soil at AOI 2. Site workers, construction workers, and trespassers could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathway for site workers, construction workers, and trespassers are potentially complete. PFOA and PFNA were detected in shallow subsurface soil at AOI 2; therefore, the subsurface soil exposure pathway is potentially complete for construction workers. The CSM for AOI 2 is presented on **Figure 7-2**.

7.1.3 AOI 3

Firehouse Building 327 houses 5-gallon AFFF containers and firetrucks that historically carried AFFF. Spray tests were performed with the firetrucks; however, no foam was reportedly used on site.

PFOA, PFOS, PFHxS, PFBS, and PFNA were detected in surface soil at AOI 3, with PFOS exceeding the SL. Site workers, construction workers, and trespassers could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathway for site workers, construction workers, and trespassers are potentially complete. PFHxS was detected in shallow subsurface soil at AOI 3; therefore, the construction worker exposure pathway is potentially complete for subsurface soil. The CSM for AOI 3 is presented on **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 based on the aforementioned criteria.

7.2.1 AOI 1

PFOA was detected above the SL in groundwater samples collected at AOI 1. PFOS, PFHxS, and PFBS were also detected. There are multiple downgradient domestic wells screened within the surficial aquifer less than 2 miles northeast from the Retention Pond; therefore, the ingestion pathway for off-facility residents is considered potentially complete. The Camp Beauregard Cantonment Area receives its potable water from the confined Carnahan Bayou aquifer, which is supplied by the Water Works District No. 3 of Rapides Parish. Therefore, the ingestion exposure pathway for site workers is considered incomplete. Depths to water measured at AOI 1 in August 2021 during the SI ranged from 5.61 to 13.95 feet bgs. Therefore, the incidental ingestion exposure pathway for construction workers is considered potentially complete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.2.2 AOI 2

PFHxS was detected in groundwater at concentrations above the SL at AOI 2. PFBS was also detected, but at concentrations below the SL. There are multiple downgradient domestic wells around 2 to 2.5 miles northeast of the Wash Rack that are screened within the surficial aquifer. Consequently, the ingestion pathway for off-facility residents is considered potentially complete. The Camp Beauregard Cantonment Area receives its potable water from the confined Carnahan Bayou aquifer; therefore, the ingestion exposure pathway for site workers is considered incomplete. Depth to groundwater at AOI 2 in August 2021 ranged from 15.82 to 16.43 feet bgs. While this depth is too deep to be encountered during construction activities, the groundwater may rise in wet season. Therefore, the incidental ingestion exposure pathway is potentially complete for construction workers during trenching activities deep enough to encounter groundwater. The CSM for AOI 2 is presented on **Figure 7-2**.

7.2.3 AOI 3

PFOA, PFOS, and PFHxS were detected above their respective SLs in groundwater samples collected at AOI 3. PFBS and PFNA were also detected at concentrations below their SLs. AOI 3 is upgradient to multiple domestic and public supply wells, some of which are screened within the shallow unconfined aquifer. Thus, the ingestion pathway is potentially complete for residents sourcing their drinking water from downgradient wells screened within the shallow aquifer. Potable water at the facility is supplied by the Water Works District No. 3 of Rapides Parish, which sources its water from the confined Carnahan Bayou aquifer; therefore, the drinking water exposure pathway for site workers is incomplete. Depths to water measured in August 2021 during the SI ranged from 11.67 to 32.50 feet bgs. Therefore, ingestion pathway is potentially complete for construction workers during trenching activities deep enough to encounter groundwater. The CSM for AOI 3 is presented on **Figure 7-3**.

7.3 Surface Water and Sediment Exposure Pathway

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

7.3.1 AOI 1

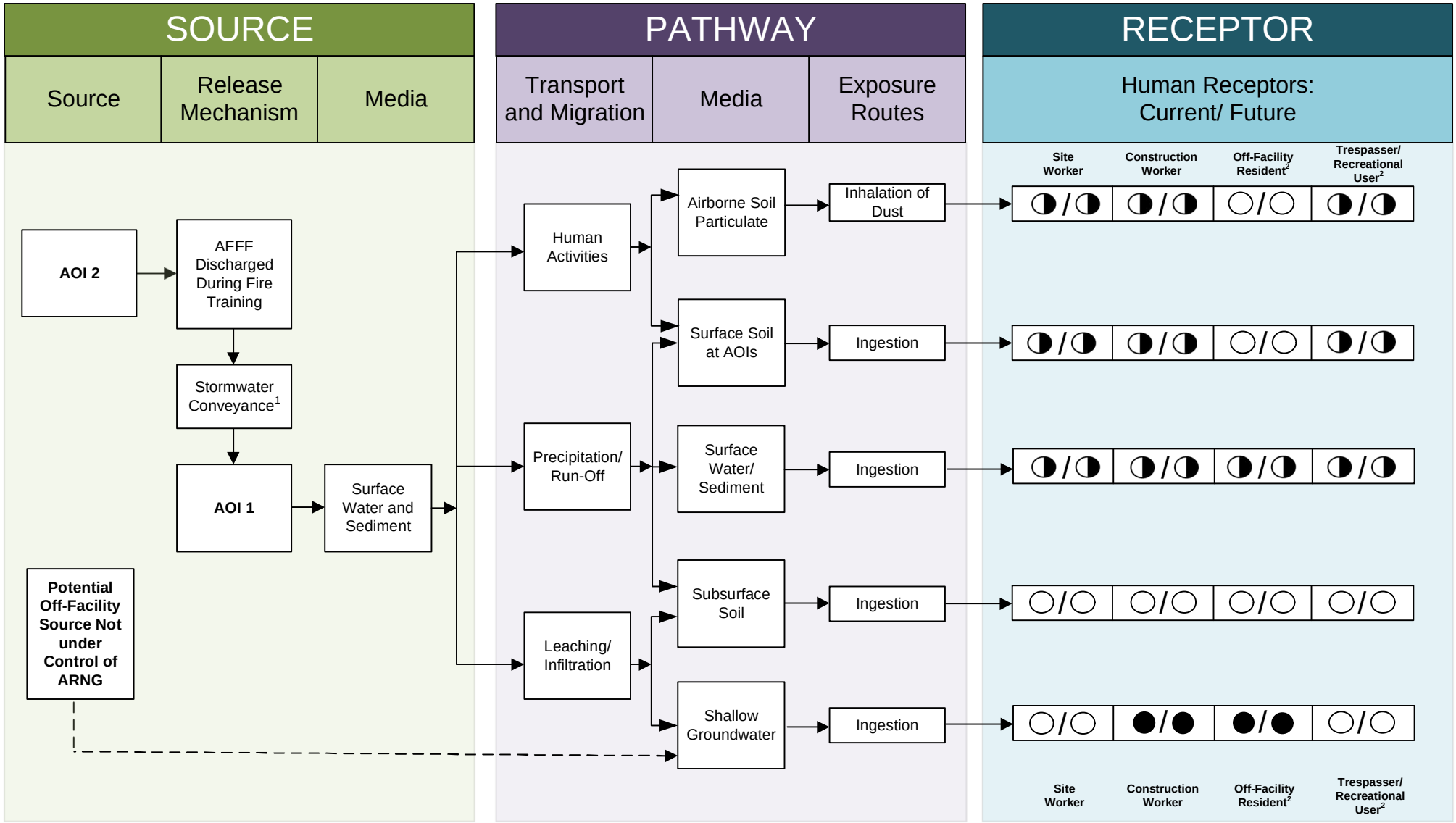
Releases at the Retention Pond would have been directly released to the surface water and sediment. PFOA, PFOS, PFHxS, and PFBS were detected in soil and groundwater at AOI 1, and as a result, it is possible that those compounds originated from the Retention Pond via pond overflow, leaching, and infiltration; therefore, the surface water and sediment ingestion exposure pathway for site workers, construction workers, and trespassers is considered potentially complete. During wet seasons, the Retention Pond may overflow, resulting in surface water from the Retention Pond being conveyed into Flagon Bayou. Flagon Bayou flows east/northeast towards Catahoula Lake. Consequently, recreational users of the bayou and offsite residents living on Flagon Bayou may be potentially exposed via the ingestion pathway. The CSM for AOI 1 is presented on **Figure 7-1**.

7.3.2 AOI 2

The Wash Rack drains to an OWS, which subsequently drained into the Retention Pond until 2003. Any AFFF releases prior to 2003 may have been conveyed to the Retention Pond and, therefore, the surface water and sediment pathway for AOI 2 is evaluated as part of AOI 1. The CSM for AOI 2 is presented on **Figure 7-2**.

7.3.3 AOI 3

Overland flow could result in the release migrating from the Firehouse Building 327 to the downgradient Retention Pond and Flagon Bayou, which is approximately 1.25 miles to the northeast. PFOA, PFOS, PFHxS, PFBS, and PFNA were detected at AOI 3 and as a result, it is possible they migrated to the Retention Pond or Flagon Bayou. Consequently, site workers, construction workers, trespassers, offsite residents, and recreational users using Flagon Bayou may be potentially exposed to contamination in surface water and sediment via ingestion. The CSM for AOI 3 is presented on **Figure 7-3**.

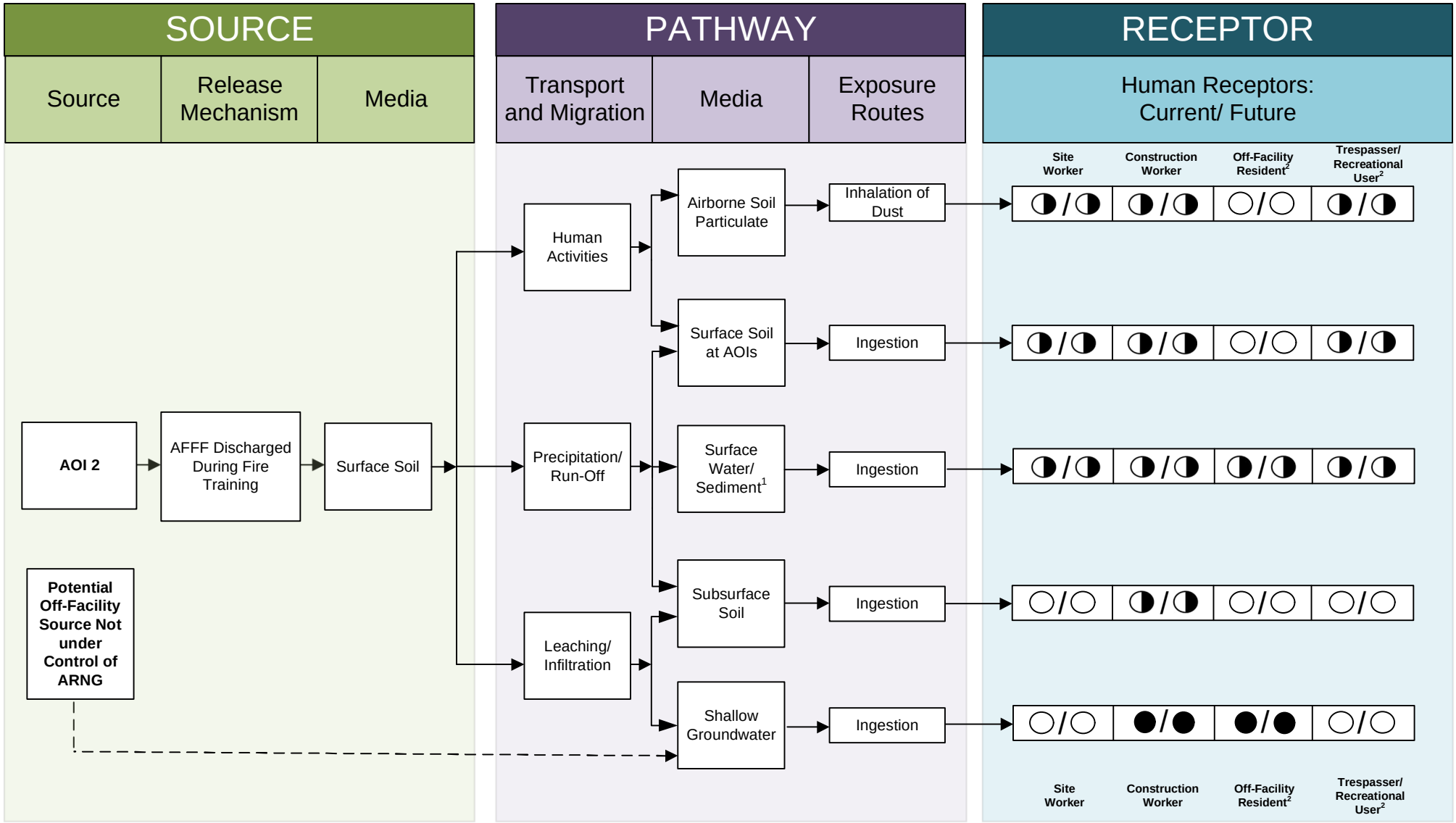


LEGEND

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

Notes:
1. AOI 2 drains to the oil/water separator, which flowed to AOI 1 until 2003.
2. The resident and recreational user receptors refer to an off-site resident and recreational user.

Figure 7-1
Conceptual Site Model, AOI 1
Camp Beauregard Cantonment Area, LA

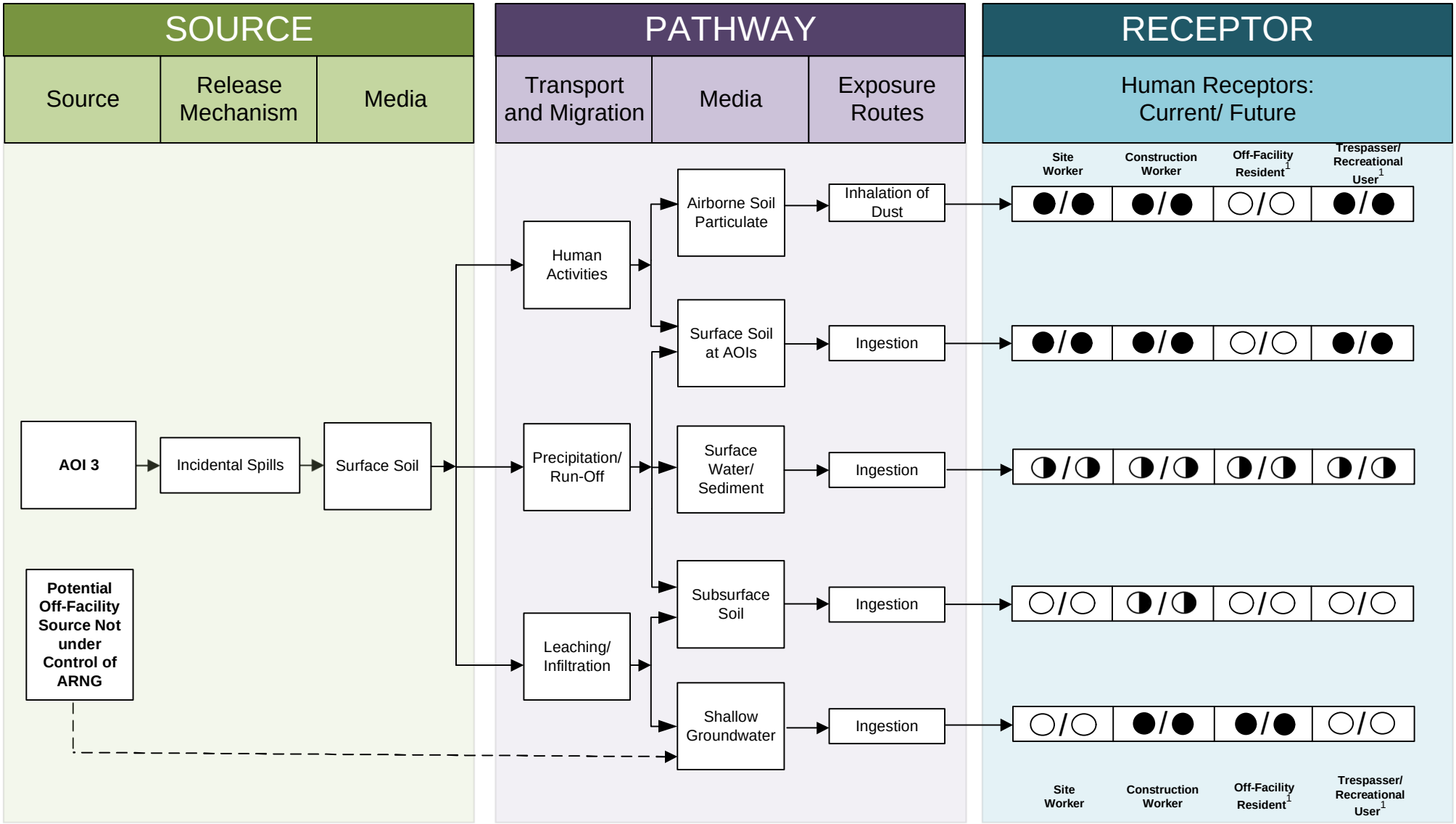


LEGEND

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

Notes:
1. Surface water and sediment pathways are assessed as part of AOI 1.
2. The resident and recreational user receptors refer to an off-site resident and recreational user.

Figure 7-2
Conceptual Site Model, AOI 2
Camp Beauregard Cantonment Area, LA



LEGEND

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

Notes:
1. The resident and recreational user receptors refer to an off-site resident and recreational user.

Figure 7-3
Conceptual Site Model, AOI 3
Camp Beauregard Cantonment Area, LA

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8. Summary and Outcome

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

8.1 SI Activities

The SI field activities were conducted from 29 July to 4 August 2021 and consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2021a), except as previously noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI QAPP Addendum (AECOM, 2021a), samples were collected and analyzed for a subset of 18 compounds by LC/MS/MS compliant with QSM 5.3 Table B-15 as follows.

- Thirty-three (33) soil samples from 15 boring locations;
- Eight grab groundwater samples from eight temporary well locations; and
- Sixteen (16) QA/QC samples.

An SI is conducted when the PA determines an AOI exists based on probable use, storage, and/or disposal of PFAS-containing materials. The SI includes multi-media sampling at 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 is warranted in a Remedial Investigation (RI) for AOI 1: Retention Pond and AOI 2: Wash Rack. Based on the CSMs developed and revised in light of the SI findings, there is potential for exposure to drinking water receptors from AOI 1 and AOI 2 from sources on the facility resulting from historical DoD activities. AOI 3: Firehouse Building 327 also exceeded the soil and groundwater SLs. However, at this location there are no known hazardous substances, pollutants or contaminants that are the responsibility of the ARNG or DoD and no further action by the ARNG is recommended at this time. Based on the results of this SI, the State of Louisiana or the City of Pineville may consider the need for further evaluation in an RI for AOI 3: Firehouse Building 327 (see **Table 8-1**). Sample analytical concentrations collected during the 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 the SLs is as follows:

- At AOI 1:
    - PFOA in groundwater exceeded the SL of 6 ng/L, with a maximum concentration of 27.3 ng/L at location AOI01-02. The detected concentrations of PFOS, PFHxS, and PFNA were below their respective SLs. Based on the results of the SI, further evaluation of AOI 1 is warranted in the RI.
    - The detected concentrations of PFOA, PFOS, and PFHxS in soil at AOI 1 were below their respective SLs.

- At AOI 2:
    - PFHxS in groundwater exceeded the SL of 39 ng/L, with a maximum concentration of 65.4 ng/L at AOI02-02. Detected concentrations of PFBS in groundwater were below the SL. Based on the results of the SI, further evaluation of AOI 2 is warranted in the RI.
    - The detected concentrations of PFOA, PFOS, PFHxS, and PFNA in soil at AOI 2 were below their respective SLs.
- At AOI 3:
    - PFOA, PFOS, and PFHxS in groundwater exceeded their respective SLs. PFOA exceeded the SL of 6 ng/L, with a maximum concentration of 37.5 ng/L at location AOI03-02. PFOS exceeded the SL of 4 ng/L, with a maximum concentration of 896 ng/L at AOI03-02. PFHxS exceeded the SL of 39 ng/L, with a maximum concentration of 587 ng/L at location AOI03-02. Detections of PFBS and PFNA in groundwater were below their respective SLs. AOI 3: Firehouse Building 327 was not removed from consideration based on exceedances of SLs. However, the ARNG and DoD are not responsible for the use or storage of AFFF at the AOI (the site is not under the control of the ARNG or DoD). Therefore, the State of Louisiana and/or the City of Pineville may consider the need to further evaluate any potential releases within their property.
    - PFOS in surface soil exceeded the SL of 13 µg/kg, with a maximum concentration of 47.5 µg/kg AOI03-04. Detected concentrations of PFOA, PFHxS, PFBS, and PFNA in soil were below their respective SLs.

Due to the large difference in groundwater levels obtained at AOI 3, there is uncertainty regarding groundwater flow in the southwestern portion of the facility. There appears to be a groundwater divide in the middle of the Cantonment Area and it is most likely that groundwater in the southwestern portion of the facility flows towards the Red River.

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, as screening values were established after SI planning and execution. However, ARNG will add HFPO-DA to the list of constituents sampled during the next phase of CERCLA if warranted.

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	Retention Pond	◐	●	●	Proceed to RI
2	Wash Rack	◐	●	◐	Proceed to RI
3	Firehouse Building 327	●	●	◐	No further action by the ARNG. The Firehouse Building 327 is not under control of the ARNG. Based on the results of the SI, the State of Louisiana and/or the City of Pineville may consider the need to proceed to RI.

Legend:

● = detected; exceedance of the screening levels

◐ = detected; no exceedance of the screening levels

○ = not detected

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