FINAL
Preliminary Assessment Report Lucius D. Clay National Guard Center, Georgia

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

February 2020

Prepared for:

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

U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

Prepared by:

AECOM
12420 Milestone Center Drive, Suite 150
Germantown, MD 20876
aecom.com

Contract Number: W912DR-12-D-0014
Delivery Order: W912DR17F0192

Table of Contents

Tables

Figures

Appendices

Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Clay NGC	Lucius D. Clay National Guard Center
CSM	conceptual site model
°F	degrees Fahrenheit
FTA	fire training area
IED	Installations & Environment Division
IWTP	Idustrial wastewater treatment plant
GAARNG	Georgia Army National Guard
HA	Health Advisory
NPDES	Nation Pollutant Discharge Elimination System
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
RI	Remedial Investigation
RSL	Regional screening limit
SI	Site Inspection
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VSI	visual site inspection
WWTP	waste water treatment plant

Executive Summary

The United States Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division, Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. The ARNG is assessing potential effects on human health related to processes at facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily in the form of aqueous film forming foam (AFFF) released as part of firefighting activities, although other PFAS sources are possible.

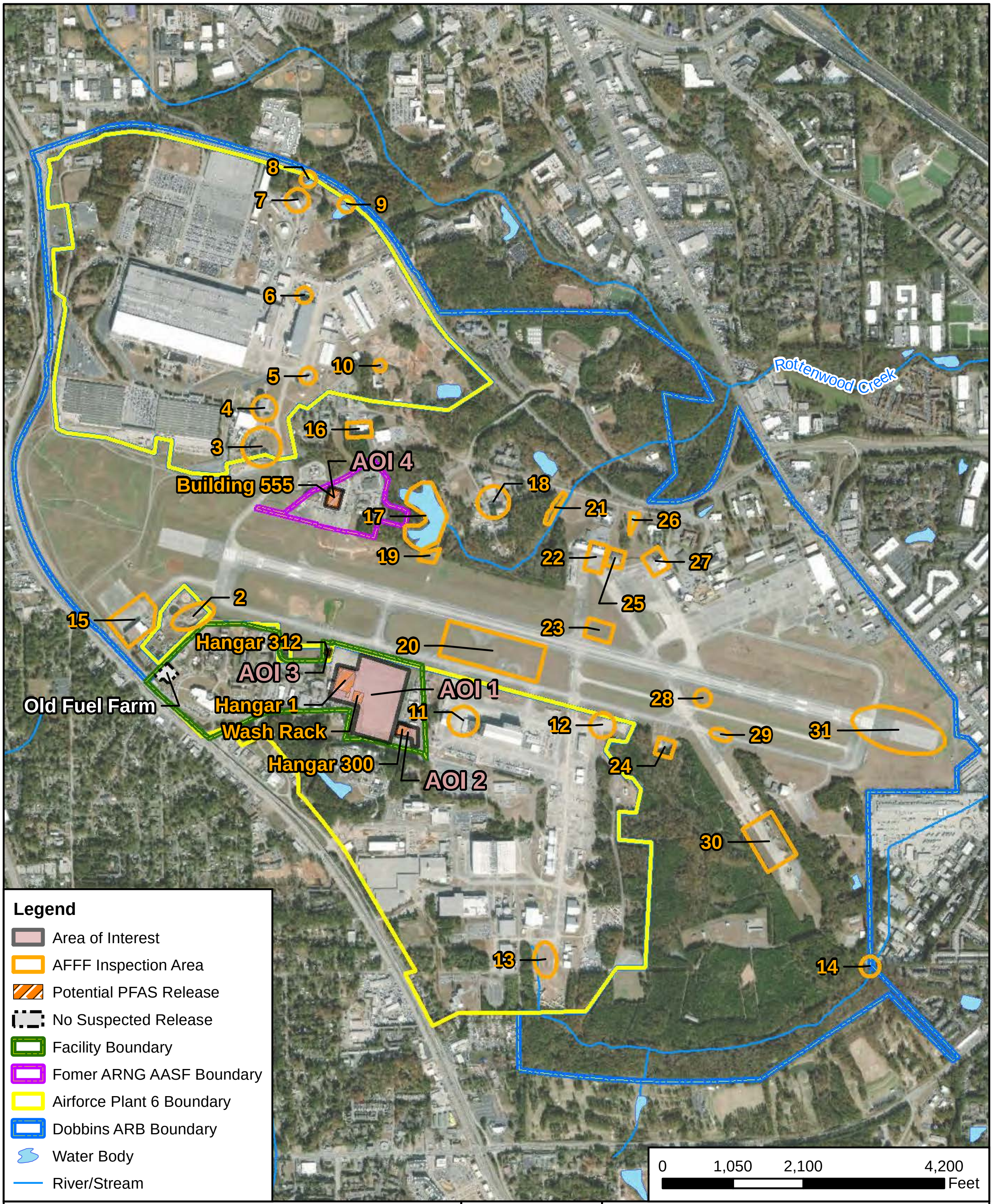
AECOM completed a PA for PFAS at the Lucius D. Clay National Guard Center (Clay NGC) in Marietta, Georgia, to assess potential PFAS release areas and exposure pathways to receptors. The Clay NGC is constructed on a parcel of land that has been owned and operated by the Georgia ARNG (GAARNG) since 2009. The performance of this PA included the following tasks:

- Reviewed data resources to obtain information relevant to suspected PFAS releases
- Conducted a site visit 19 February 2019
- Interviewed current and retired GAARNG personnel, GAARNG environmental managers, Air Force Plant 6 personnel, and operations staff
- Completed visual site inspections at known or suspected potential PFAS release locations and documented with photographs
- Developed a conceptual site model (CSM) to outline the potential release and pathway of PFAS for the Area of Interest (AOI) and the facility

Four AOIs related to potential PFAS releases were identified at the Clay NGC during the PA. The AOI is shown on **Figure ES-1** and described below:

Area of Interest	Name	Used by	Potential Release Date
AOI 1	Hangar 1/Ramp Area	US Navy	1960s to 2009
AOI 2	Hangar 300	US Navy	Early to Mid-2000
AOI 3	Hangar 312	US Navy	Early to Mid-2000
AOI 4	Building 555	GAARNG	1983 until 2011

Based on potential historical AFFF releases at the AOIs, there is potential for exposure to PFAS contamination in surface soil to site workers, construction workers, and trespassers via ingestion and inhalation; surface water and sediment to site workers, construction workers, trespassers, and off-facility residents via ingestion; subsurface soil to construction workers via ingestion; and groundwater to construction workers via ingestion. Potential off-facility PFAS release areas exist adjacent to the Clay NGC. Because these areas include property upgradient of the facility, it is unknown whether the off-facility sources affect the Clay NGC. The CSM for the Clay NGC is shown on **Figure ES-2**.



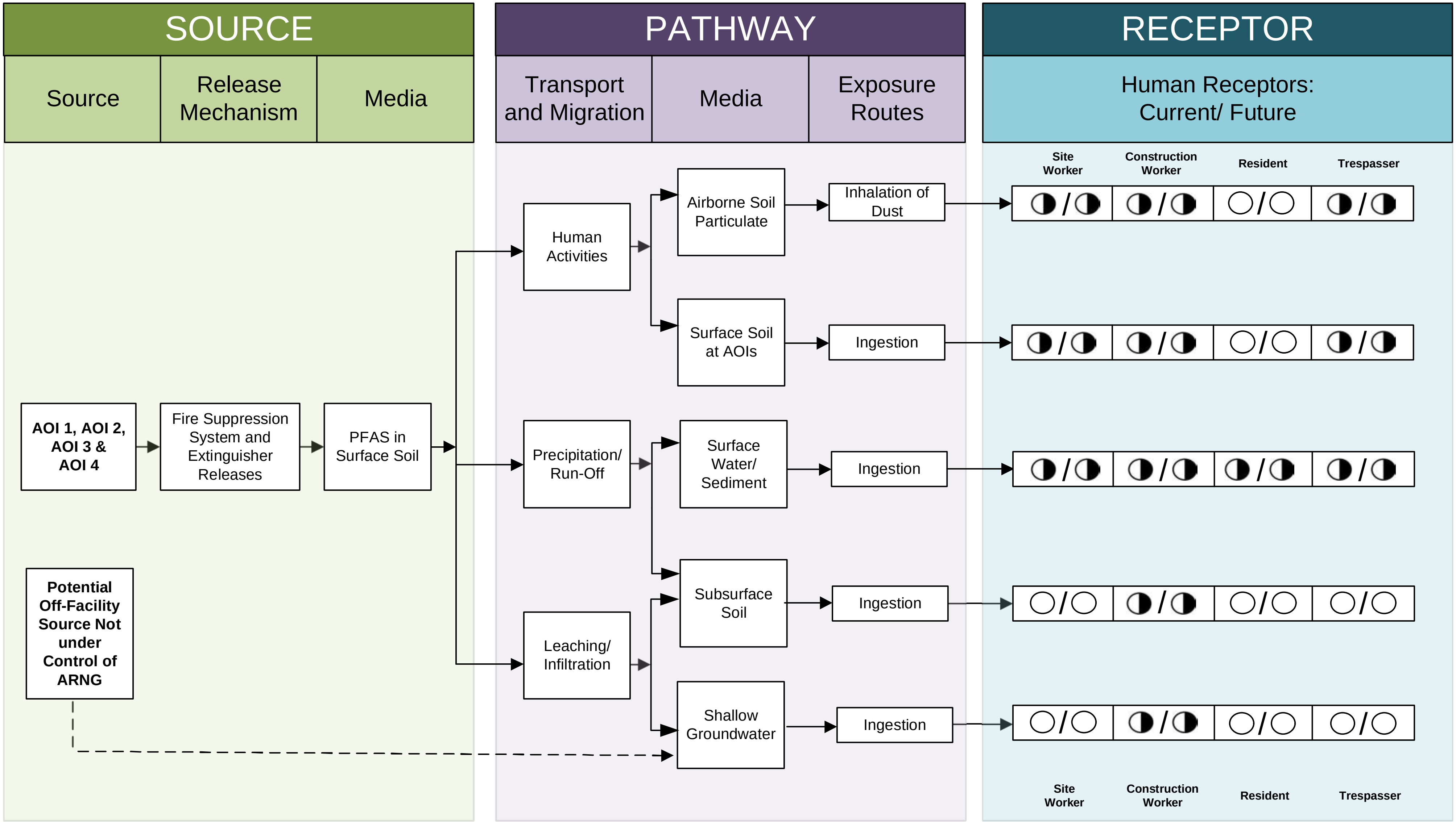
CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Clay National Guard Center, GA			
REVISED	10/14/2019	GIS BY	MS	10/14/2019
SCALE	1:25,200	CHK BY	SI	10/14/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	10/14/2019

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure ES-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_ES-1_Clay_Summary.mxd



	Site Worker	Construction Worker	Resident	Trespasser
Inhalation of Dust	◐/◐	◐/◐	○/○	◐/◐
Ingestion	◐/◐	◐/◐	○/○	◐/◐
Ingestion	◐/◐	◐/◐	◐/◐	◐/◐
Ingestion	○/○	◐/◐	○/○	○/○
Ingestion	○/○	◐/◐	○/○	○/○

LEGEND

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

Notes:
1. The resident receptors refer to an off-facility resident.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure ES-2
Preliminary Conceptual Site Model
Clay NGC

1. Introduction

1.1 Authority and Purpose

The United States Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division, Cleanup Branch contracted AECOM to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide* under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017. The ARNG is assessing potential effects on human health related to processes at facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily in the form of aqueous film forming foam (AFFF) released as part of firefighting activities, although other PFAS sources are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of PFAS compounds in the environment varies. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. In the absence of federal maximum contaminant levels, some states have adopted their own drinking water standards for PFAS. The State of Georgia does not currently have drinking water or soil standards for PFAS.

This report presents the findings of a PA for PFAS at the Lucius D. Clay National Guard Center (Clay NGC) in Marietta, Georgia, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300), and USACE requirements and guidance.

This PA documents the known locations where PFAS may have been released into the environment at the Clay NGC. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components of AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed data resources to obtain information relevant to suspected PFAS releases
- Conducted a site visit on 19 February 2019
- Interviewed current and retired GAARNG personnel, GAARNG environmental managers, Air Force Plant 6 personnel, and operations staff
- Completed visual site inspections at known or suspected potential PFAS release locations and documented with photographs
- Developed a conceptual site model (CSM) to outline the potential release and pathway of PFAS for the Area of Interest (AOI) and the facility

1.3 Report Organization

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

- **Section 1 – Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA
- **Section 2 – Fire Training Areas:** describes the fire training areas (FTAs) at the facility identified during the site visit
- **Section 3 – Non-Fire Training Areas:** describes other locations of potential PFAS releases at the facility identified during the site visit
- **Section 4 – Emergency Response Areas:** describes areas of potential PFAS release at the facility, specifically in response to emergency situations
- **Section 5 – Adjacent Sources:** describes sources of potential PFAS release adjacent to the facility that are not under the control of ARNG
- **Section 6 – Conceptual Site Model:** describes the pathways of PFAS transport and receptors for the AOIs and the facility
- **Section 7 –Conclusions:** summarizes the data findings and presents the conclusions of the PA
- **Section 8 – References:** provides the references used to develop this document
- **Appendix A** – Data Resources
- **Appendix B** – Preliminary Assessment Documentation
- **Appendix C** – Photographic Log

1.4 Facility Location and Description

The Clay NGC is located in Cobb County, approximately 1 mile south of Marietta, Georgia (**Figure 1-1**) and approximately 20 miles northwest of Atlanta, Georgia. The Clay NGC is adjacent to the Air Force Plant 6 facility (currently operated by Lockheed Martin) and Dobbins Air Reserve Base. The installation is accessible from Halsey Avenue from the east, Richardson Road from the south, and Atlantic Avenue from the west.

The Clay NGC is constructed on a parcel of land that has been owned and operated by the GAARNG since 2009 (**Appendix A**). From approximately 1943 to 2009, the property was owned by the US Navy and designated as Naval Air Station (NAS Atlanta). Collocated Dobbins Air Reserve and Air Force Plant 6 began operations in the early 1940s. The NAS Atlanta property was transferred to the Georgia Department of Defense in 2009, which opened Clay NGC at the site. To the north of the runway, building 555 was the location of the former GAARNG AASF and ramp from 1983 until 2011, and is currently licensed from Dobbins Air Reserve. Clay NGC includes several hangars, storage buildings, and administrative offices.

1.5 Facility Environmental Setting

The Clay NGC lies within the Central Uplands district, which is characterized by low ridges and large, open valleys with streams 150 to 200 feet below the ridge crests. The streams are generally transverse to the underlying geologic structure. The Clay NGC is located on a rolling plateau with streams and rivers throughout. The Rottenwood and Poorhouse Creeks are some of the main stream channels near the facility. The plateau is sloped gradually downward to the southeast (Aerostar Dobbins ARB, 2018). The elevation of the facility is approximately 1,082 feet above mean sea level.

1.5.1 Geology

The Clay NGC is underlain by the Powers Ferry Formation, which consists of intercalated gneiss, schist, and amphibolites in decreasing abundance. The Powers Ferr Formation is estimated to be more than 3,290 feet thick and dates form the late Precambrian and early Paleozoic eras. More specifically, the geology in the region includes mafic gneiss that are primarily composed of iron-magnesium silicates such as amphibolite, hornblende gneiss, and mafic hornblende. Additionally, biotite gneiss is found in the region. These crystalline rocks are composed of metamorphic rock that display gneissic banding, strong foliation, and relatively high biotite-mica content (Georgia Department of Natural Resources, 1977).

The surface soils have a sand-like consistency from micaceous silts and micaceous sandy silts originating from the weathering of underlying rock. The subsoils are characterized as a clay loam horizon. Overall, red-yellow podzolic soils persist and, in many areas, there are loose rock fragments scattered over the surface and outcrops of bedrock (Federal Emergency Management Agency, 2013).

1.5.2 Hydrogeology

The Clay NGC is in the northern Piedmont Physiographic Province that consists of superficial water tables and aquifers within the bedrock. Clay NGC is within the Rottenwood Creek watershed, which drains into the Chattahoochee River. The residual soil and fragmented bedrock below provide the primary pathway for groundwater flow. The groundwater occurs within joints and fractures in the bedrock and in the pore spaces of the residual soils. Aquifer recharge is predominantly through infiltration of precipitation, although some recharge occurs from open water sources. Depth to groundwater ranges from 12 feet below ground surface in the eastern region of the province to 60 feet below ground surface in the western region of the province (Stell, 2012).

No potable water wells are located within the boundary of the Clay NGC; however, United States Geological Survey wells exist within two miles of the facility (USGS, 2019) (**Figure 1-2**). No domestic or drinking well information was available. Drinking water for the Clay NGC is supplied by the Cobb County-Marietta Water Authority, which uses the Chattahoochee River and Lake Allatoona as its drinking water sources (Marietta Water, 2017).

1.5.3 Hydrology

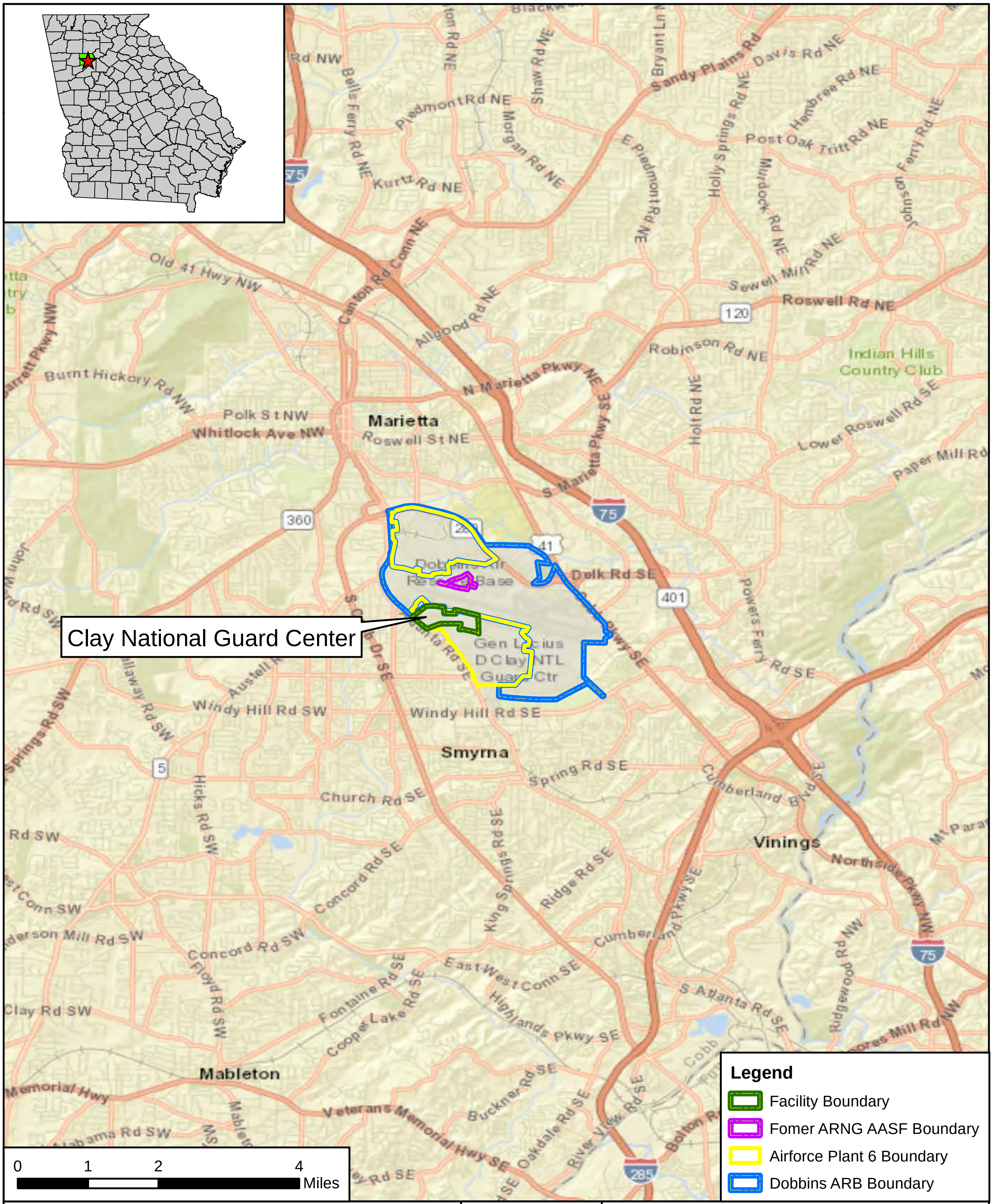
The Clay NGC has a freshwater pond to the south and the Poorhouse Creek to the east of the installation (**Figure 1-3**). The Poorhouse Creek is a tributary to the Chattahoochee River, which spans a total of 430 miles from the northern most part of Georgia, and down to the south, along the Alabama-Georgia border. The overland flow at the facility is predominantly in the southeast direction. A drainage ditch runs along the eastern boundary of Clay NGC and terminates into a retention basin with a storm drain that discharges into Poorhouse Creek, which ultimately discharges to the Chattahoochee River. The Chattahoochee River is 6 miles to the east of the facility.

1.5.4 Climate

The climate at Clay NGC consists of four clearly separated seasons, with predominant weather movement from west to east. Temperatures vary from average highs of 71.9 degrees Fahrenheit (°F) to average lows of 53.1 °F. The average annual temperature is 62.5 °F. Average precipitation is 54.4 inches of rain (World Climate, 2019).

1.5.5 Current and Future Land Use

The Clay NGC is a controlled access facility with public roads and is adjacent to the Air Force Plant 6 facility and Dobbins Air Reserve Base. Reasonably anticipated future land use is not expected to change from the current land use; however, future infrastructure improvements, land acquisitions, and land use controls at Air Force Plant 6 facility and Dobbins Air Reserve Base are unknown.



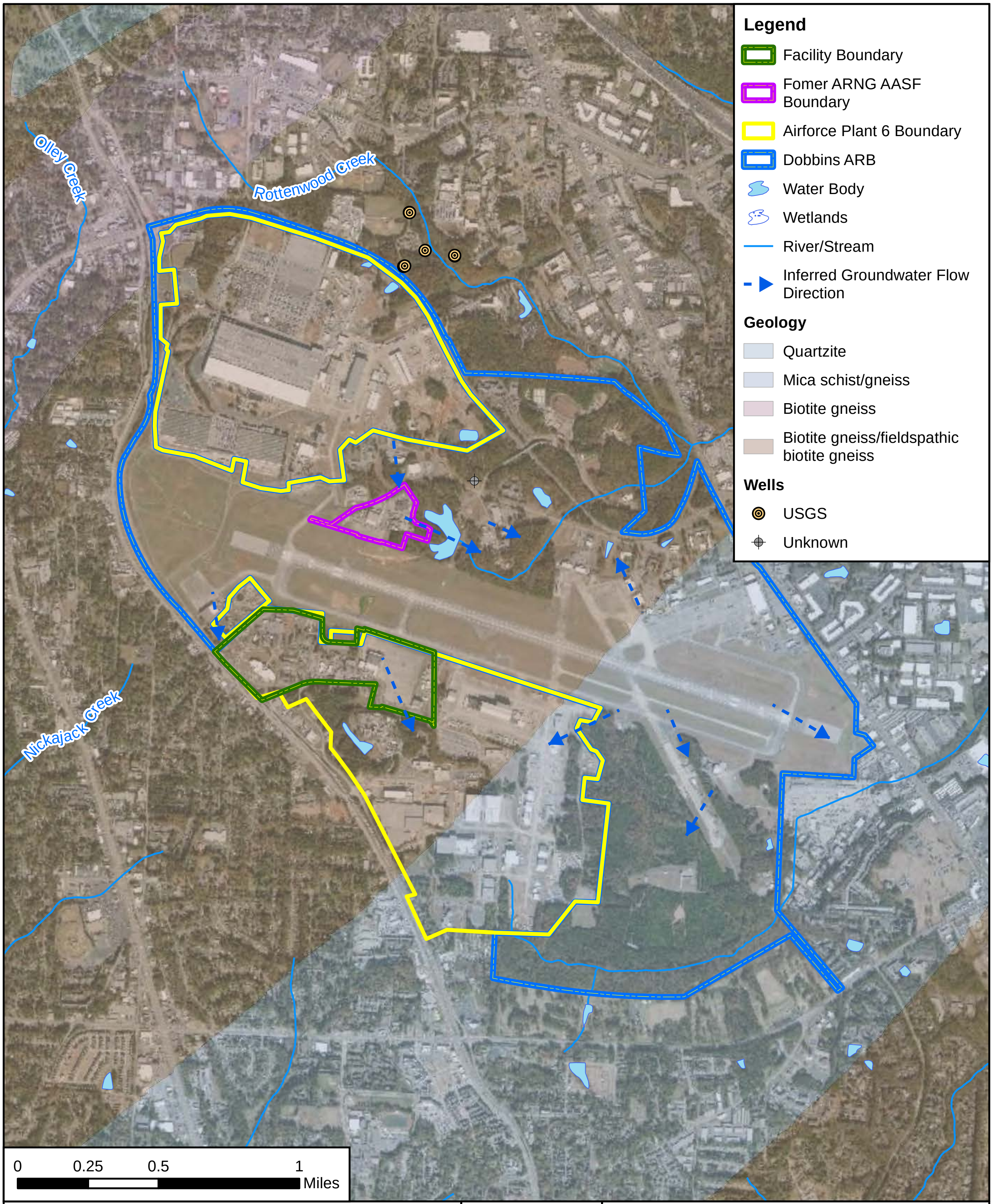
CLIENT	ARNG			
Preliminary Assessment for PFAS at Clay National Guard Center, GA				
REVISED	9/18/2019	GIS BY	MS	9/18/2019
SCALE	1:126,720	CHK BY	SI	9/18/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/18/2019

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_1-1_Clay_Facility_Location.mxd



CLIENT	ARNG			
Preliminary Assessment for PFAS at Clay National Guard Center, GA				
REVISED	9/18/2019	GIS BY	MS	9/18/2019
SCALE	1:31,680	CHK BY	BN	9/18/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/18/2019

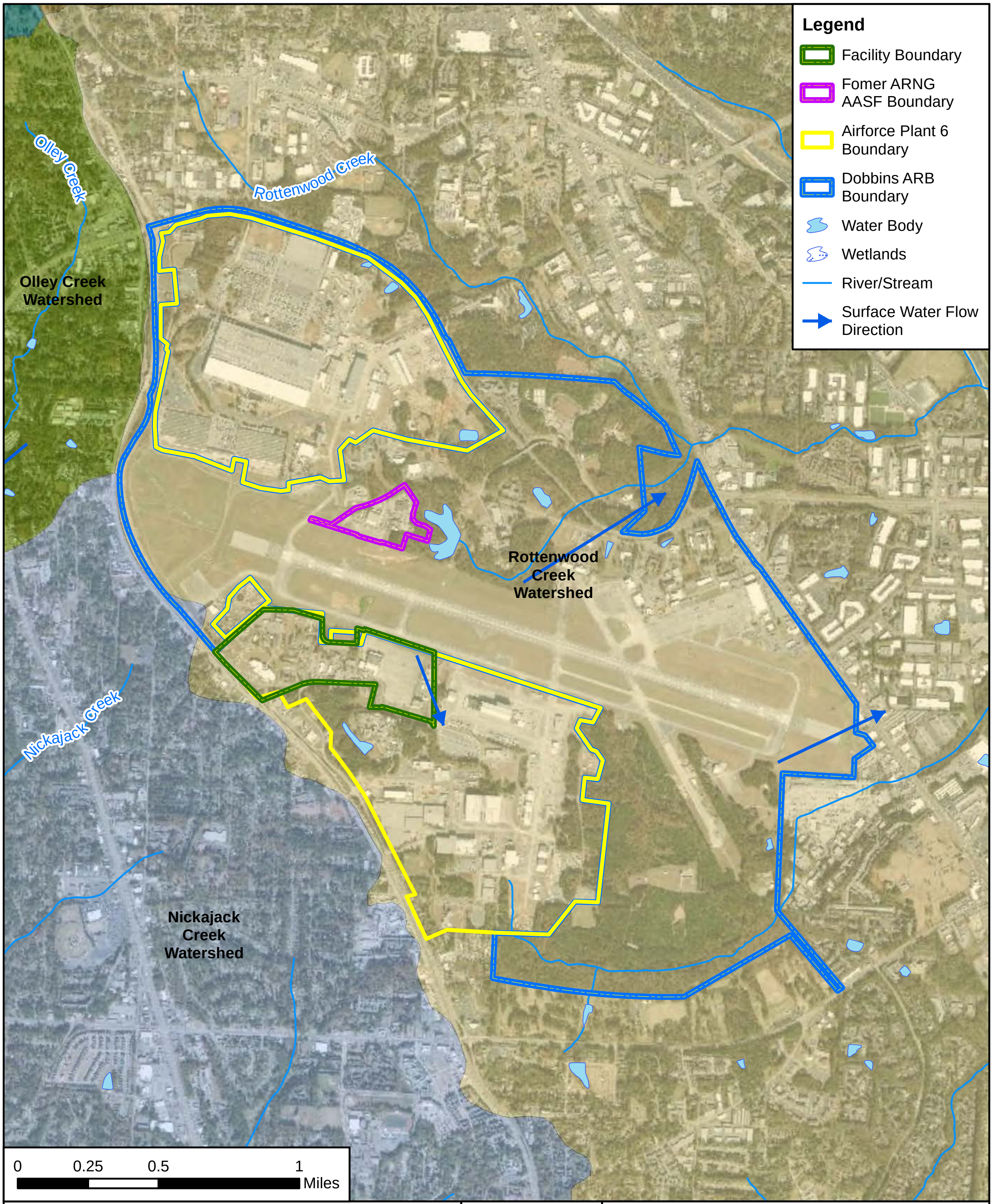
N

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-2

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_1-2_Clay_Groundwater.mxd



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Clay National Guard Center, GA			
REVISED	9/18/2019	GIS BY	MS	9/18/2019
SCALE	1:31,680	CHK BY	BN	9/18/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/18/2019

N

Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-3

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_1-3_Clay_Surface_Water.mxd

2. Fire Training Areas

No FTAs were identified within the Clay NGC facility during the PA through interviews or document review. The Dobbins Air Reserve Base Fire Department provides emergency services at the Clay NGC.

3. Non-Fire Training Areas

Five non-FTAs where AFFF were stored and/or potentially released were identified during the PA. A description of the non-FTA is presented below and shown on **Figure 3-1**.

The current Clay NGC property and buildings were transferred to the GAARNG from the US Navy in 2009. The US Navy did not complete a PFAS assessment prior to the transfer of the property to GAARNG. There are no records that document activities or incidents that may have released AFFF by the US Navy.

The GAARNG occupies three hangars at Clay NGC with AFFF fire suppression systems. The floor drains and trenches within the hangars dispense to the industrial waste water treatment plant (WWTP), then to the sanitary WWTP. The industrial WWTP and sanitary WWTP are both maintained by Airforce Plant 6, which is adjacent to the Clay NGC.

According to interviews, TriMax AFFF fire extinguishers may have been present on the ramp in the past, but the concentration and volume is unknown. Currently, mobile dry chemical classification B:C fire extinguishers are present on the ramp shared by the Hangar 1, Hangar 300, and Hangar 312. No information was available concerning training with TriMax AFFF fire extinguishers by GAARNG, or previously by the US Navy; however, historical aerial photographs show large numbers of fixed and rotary-winged aircraft present on the ramp and evidence of portable fire extinguisher units. It is not known whether or not these portable fire extinguishers contained AFFF.

Clay NGC kitchens are outfitted with non-AFFF fire suppression systems and fire extinguishers.

3.1 Hangar 1/Ramp Area

Hangar 1 was constructed in approximately 1959 by the US Navy (**Figure 3-1**). The Clay NGC Hangar 1 fire suppression system consists of eight 150-gallon tanks filled with 3 percent AFFF concentrate. There is no information available with regard to when the AFFF fire suppression system was installed; however, the system was in place when the GAARNG took over the facility in 2009. The AFFF tanks and pumps that supply the fire suppression system are housed within the hangar. There is no information on how frequently the pumps are tested. The Hangar 1 fire suppression system has been disabled but the AFFF tanks have not been emptied. There were no reported leaks or releases from the tanks since the GAARNG took possession of Hangar 1 in 2009. The hangar is currently outfitted with floor drains that drain to the industrial WWTP and then to the sanitary WWTP. Due to the age of Hangar 1, it is not known if the original drain configuration emptied to a treatment plant or to storm drainage. The fire extinguishers within the hangar are dry chemical Classification A fire extinguishers.

There is a wash rack near Hangar 1 on the ramp, used for washing aircraft (**Figure 3-1**). The wash rack currently drains to the industrial WWTP and then to the sanitary WWTP. No information was available regarding historical activities at the wash rack or whether or not there was a different drain configuration in the past.

3.2 Hangar 300

The Clay NGC Hangar 300 was built in the early 1990’s and was part of Air Force Plant 6 until the GAARNG took possession in 2009. Hangar 300 contains a fire suppression system supplied by two 1500-gallon tanks filled with AFFF concentrate (**Figure 3-1**). The AFFF tanks and pumps that supply the fire suppression system are housed within the hangar. Two known releases of AFFF from the fire suppression system have occurred. Both releases occurred in the early to mid-2000s, prior to GAARNG assuming occupancy of the building. During both releases, foam was released in the hangar, pushed onto the ramp, and ultimately into the retention basin east of Hangar 300. The retention basin contains a storm drain that discharges into Poorhouse Creek, which is a tributary of Rottenwood Creek. The Rottenwood Creek discharges to the Chattahoochee River. The concentration of AFFF and volume of the releases are unknown. The hangar is outfitted with trench drains that drain to the industrial WWTP and then to the sanitary WWTP. During the site visit, one 1500-gallon tank was observed to be empty. There is no information available on how frequently the pumps are tested.

3.3 Hangar 312

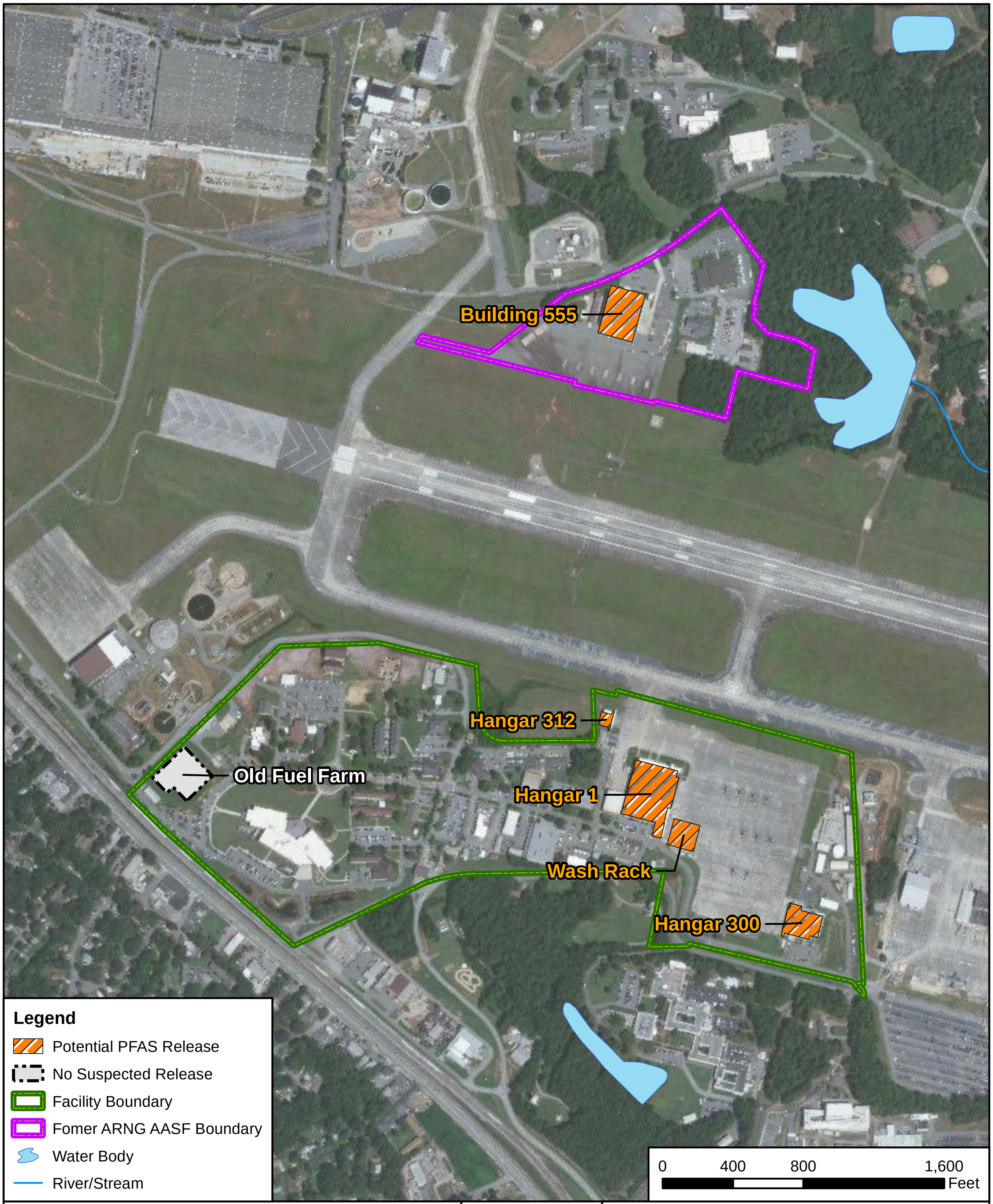
The Clay NGC Hangar 312 was built in 1998 and contains a fire suppression system supplied by a 300-gallon tank containing 3 percent of AFFF low expansion foam (**Figure 3-1**). The AFFF tank and pumps that supply the fire suppression system are housed in a room within the hangar that contains a floor drain that drains to the industrial WWTP and then the sanitary WWTP. There was no report of AFFF leaks or releases from the fire suppression system since the GAARNG took possession of the hangar in 2009. The fire suppression system is maintained by contractors, no information was available concerning testing of the suppression system. During the site inspection, evidence of corrosion down the side of the tank was observed and the gasket between the tank and the outline piping appeared to have been replaced with a gasket not intended for the fitting and that stuck out on the sides. The tank did not appear to be currently leaking.

3.4 Old Fuel Farm

Historically, there was an Old Fuel Farm in the west region of the Clay NGC. The date of construction is unknown; however, the Old Fuel Farm was removed in early 2011 (**Figure 3-1**). There is no information regarding the type of fire extinguishers used or if any AFFF was released. Currently, no buildings occupy the former location of the Old Fuel Farm.

3.5 Building 555

Building 555 was the location of the former GAARNG AASF and ramp from 1983 until 2011 (**Figure 3-1**). The building was renovated in 2013 or 2014 and turned into a parachute packing facility. Two 5-gallon buckets of AFFF were recently found in Building 555 during a site inspection by GAARNG environmental personnel. The buckets were removed from the building and disposed of off-site. The former hangar did not have a fire suppression system and no information was available about the use or presence of AFFF at the former GAARNG AASF; however, historical aerial photographs show evidence of portable fire extinguisher units on the ramp. It is not known if these portable fire extinguishers contained AFFF.



CLIENT	ARNG			
Preliminary Assessment for PFAS at Clay National Guard Center, GA				
REVISED	9/18/2019	GIS BY	MS	9/18/2019
SCALE	1:9,600	CHK BY	SI	9/18/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/18/2019

N

Non-Fire Training Areas

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 3-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_3-1_Clay_Non-Fire_Training_Areas.mxd

4. Emergency Response Areas

No emergency response areas were identified within the Clay NGC facility during the PA through interviews or document review. Additionally, it is not known whether any emergency response areas existed within the facility before the property was turned over to GAARNG in 2009. The Dobbins Air Reserve Base provides fire emergency services for the Clay NGC.

5. Adjacent Sources

Thirty one off-site PFAS sources adjacent to the Clay NGC were identified during the PA through interviews and document review (**Appendix A** and **Appendix B**). SIs were completed at the Air Force Plant 6 and Dobbins Air Reserve Base for use of fire fighting foam (Aerostar, 2018 a and b) (**Appendix A**). **Table 5-1** summarizes the findings of the SIs completed at Air Force Plant 6 and Dobbins Air Reserve Base. **Figure 5-1** presents the location of potential Clay NGC adjacent source areas.

Table 5-1: Adjacent Sources

Map ID	Area	Description	SI Findings
1 & 2	Sanitary WWTP*	This WWTP is a collection point for all the sanitary sewage systems within the installation, and an industrial WWTP effluent. The WWTP effluent discharges into the Nickajack Creek in an off-installation residential area.	PFAS contamination levels in surface soil, groundwater, and surface water exceeded USEPA Regional screening limit (RSL)/Health Advisory (HA) screening criteria. Recommended to proceed to a remedial investigation (RI).
3	Industrial WWTP*	A confirmed AFFF release occurred at the former Idustrial wastewater treatment plant aeration pond. The industrial WWTP is used as a collection point for manufacturing wastewater treatment	PFAS contamination levels in groundwater and surface water exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
4	Fire Prevention Headquarters (B-102)*	This facility has an AFFF fire suppression system and was originally used as a manufacturing facility.	PFAS contamination levels in groundwater and surface soil exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
5	Corporate Hangar (T-728)*	The hangar previously stored 55-gallon drums of AFFF and there was a confirmed release of AFFF.	PFAS contamination levels in groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
6	Fire Station #1 (B-4)*	An active fire station that stores AFFF equipment and vehicles. An AFFF release inside the fire hall was reported due to leaking equipment.	PFAS contamination levels in groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.

Table 5-1: Adjacent Sources

Map ID	Area	Description	SI Findings
7	C-5 Fuel System Test Facility (B-96)*	The C-5 fuel system contains an AFFF fire suppression system that has had a confirmed release that leaked out of the facility.	PFAS contamination levels in subsurface soil and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
8	Outfall 1*	Outfall 1 is the surface water collection and Nation Pollutant Discharge Elimination System (NPDES) discharge point for Drainage Basin 1, which has reported AFFF releases.	No PFAS contamination. No further action recommended.
9	Outfall 2*	Outfall 2 is the surface water collection and NPDES discharge point for Drainage Basin 2, which has reported AFFF releases.	PFAS contamination levels in surface water exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
10	Structural Fire Training Area (B-64)*	This FTA was constructed in 2003 and uses liquid propane gas as a fuel source. The training exercises release 2 to 3 gallons of AFFF per event.	No PFAS contamination in soil. Recommended to proceed to an RI based on lack of groundwater sampling.
11	Fire Station #2 (B-69)*	This is an active fire station that stores AFFF containing equipment and vehicles. An AFFF release inside the fire hall was reported due to leaking equipment.	No PFAS contamination. No further action recommended.
12	C-5 Engine Fire*	An unknown amount of AFFF was released to extinguish an engine fire.	PFAS contamination levels in ground water, and surface water exceeded USEPA HA screening criteria. Recommended to proceed to a RI.

Table 5-1: Adjacent Sources

Map ID	Area	Description	SI Findings
13	AFFF Spray Test Area*	The spray test area was used for annual testing of AFFF containing equipment/vehicles where approximately 2,200 gallons of AFFF have been discharged each test. The total volume of AFFF released over time and the dates of testing are unknown.	PFAS contamination levels in surface soil, ground water, and surface water exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
14	Outfall 5*	Outfall 5 is the surface water collection and NPDES discharge point for Drainage Basin 5, which has reported AFFF releases.	PFAS contamination levels in surface water exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
15	Hangar 5**	The hangar has an AFFF fire suppression system that reported two releases in the 1990s. One release of 600 gallons of AFFF concentrate and one release of 5,000 gallons of AFFF/water mixture. Both releases occurred outside the hangar.	PFAS contamination levels in surface soil exceeded USEPA RSL screening criteria. Recommended to proceed to a RI.
16	Motor Pool Facility (Building 516)**	A release of 2 to 5 gallons of AFFF occurred outside building on pavement and may have migrated to a nearby wooded area.	PFAS contamination levels in surface soil, subsurface soil, and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
17	Big Lake (OT-04)**	Visual confirmation of AFFF spilling into the Big Lake from Building 5 with an unknown volume of AFFF. Big Lake discharges directly into an unnamed tributary of Rottenwood Creek. Fish were confirmed dead following the release.	PFAS contamination levels in surface water and groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.

Table 5-1: Adjacent Sources

Map ID	Area	Description	SI Findings
18	L-100-20 Hercules Crash**	A release of approximately 1,000 gallons of AFFF/water mixture was applied to several fires from a crash in February 1993.	PFAS contamination levels in surface soil and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
19	Former FTA FT-03**	This FTA was operational from 1974 to the late 1980s. Unknown quantities of AFFF were used. AFFF was introduced to the Air Force in 1970.	PFAS contamination levels in surface soil, subsurface soil, and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
20	L-188CF Electra Crash**	An unknown quantity of AFFF was potentially applied to a crash that occurred in January 1985.	PFAS contamination levels in groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
21	Spill Pond 3**	Visual confirmation of an unknown type of foam spilling into the unlined pond from an unknown source. The depth to groundwater in the pond is 5 feet bgs. The pond discharges directly into a tributary of Rottenwood Creek. Fish were confirmed dead following the release.	PFAS contamination levels in surface water and groundwater exceeded USEPA HA screening criteria. Recommended to proceed to an RI.
22	Building 746 (Hangar)**	The hangar had an AFFF fire suppression system that reported a release of up to 1,500 gallons of AFFF that occurred between 1999 to 2004. The release flowed outside the hangar.	PFAS contamination levels in groundwater exceeded USEPA HA screening criteria. Recommended to proceed to an RI.
23	L-188CF Electra Crash Alternate Site**	An unknown quantity of AFFF was potentially applied to a crash that occurred in January 1985.	PFAS contamination levels in groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
24	Former FTA FT-02**	This FTA was operational from the early 1950s to 1974 and is constructed of an unlined, earthen pit. Potential unknown quantities	PFAS contamination levels in surface soil and groundwater exceeded USEPA RSL/HA

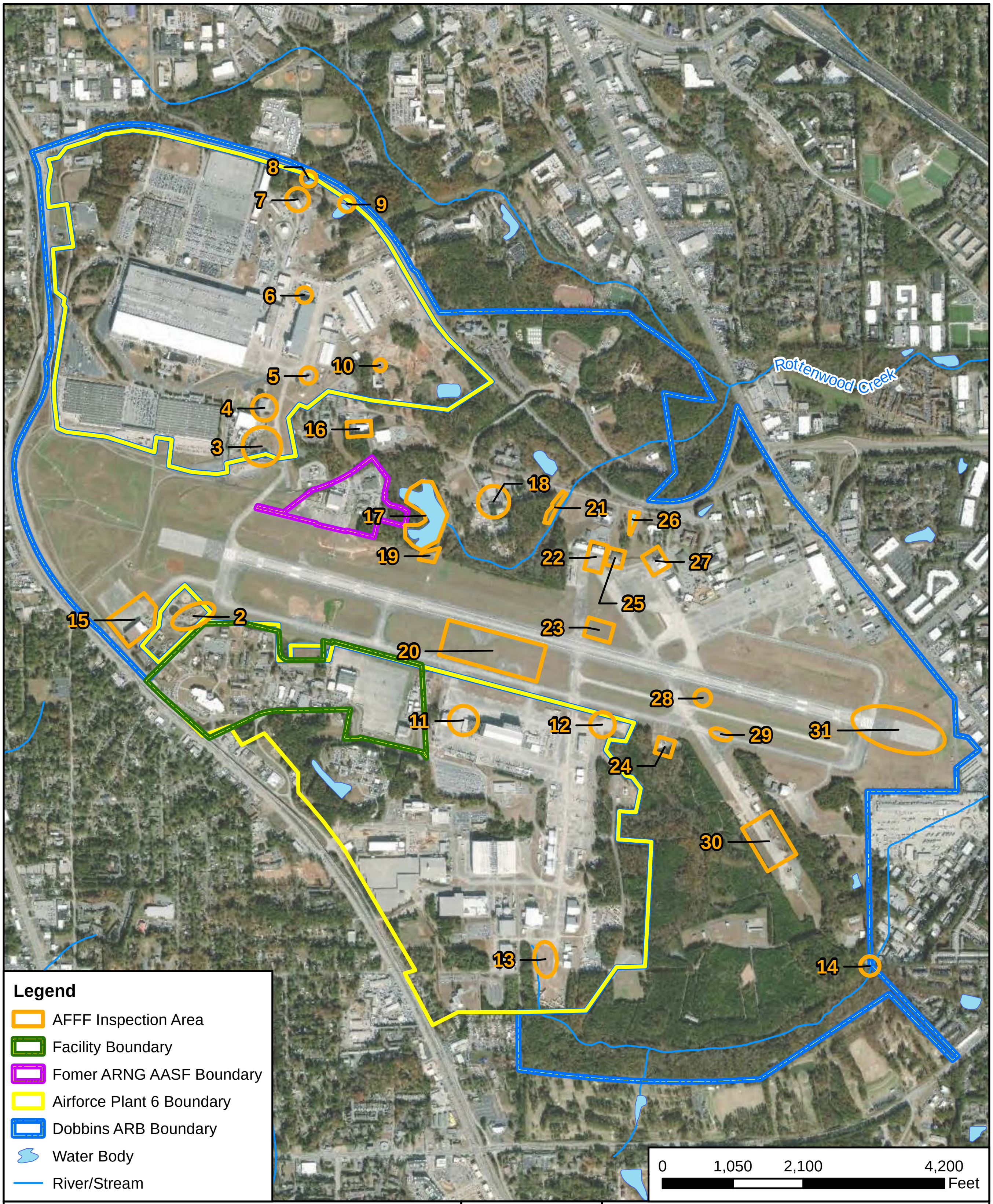
Table 5-1: Adjacent Sources

Map ID	Area	Description	SI Findings
		of AFFF was used. AFFF was introduced to the Air Force in 1970.	screening criteria. Recommended to proceed to a RI.
25	Current Fire Station (Building 745)**	A known release during resupply activities that occurred outside the building. Prior to 1999, the potential AFFF release occurred during fire engine cleaning activities outside the building. The quantity of AFFF released is unknown.	PFAS contamination levels in surface soil and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
26	Spill Pond 4**	A quantity of up to 1,500 gallons of AFFF was released from Building 731 and flowed into the unlined pond. The depth to groundwater in the pond is 5 feet bgs. The pond discharges directly into an unnamed tributary of Rottenwood Creek. Fish were confirmed dead following the release.	PFAS contamination levels in surface water, and groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.
27	Building 731**	This hangar formerly had an AFFF fire suppression system. A release of up to 1,500 gallons of AFFF occurred in 1999 and flowed outside the hangar toward grass areas. Another release of AFFF occurred in a mechanical room and spilled into the building drainage system.	PFAS contamination levels in surface soil and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
28	E-2 Tire Fire**	The use of approximately 50 to 100 gallons of AFFF/water mixture was used to extinguish a tire fire, and PFAS may have migrated to grassed areas nearby.	No PFAS contamination. No further action recommended.

Table 5-1: Adjacent Sources

Map ID	Area	Description	SI Findings
29	F-18 Tire Fire**	The use of approximately 100 gallons of AFFF/water mixture was used to extinguish a tire fire and PFAS may have migrated to grassed areas nearby.	No PFAS contamination. No further action recommended.
30	AFFF Spray Test Area**	The spray test area was used for annual testing where approximately 100 gallons of 3 percent AFFF/water mixture was discharged per year. The total volume of AFFF released over time and dates of testing are unknown.	PFAS contamination levels in surface soil and groundwater exceeded USEPA RSL/HA screening criteria. Recommended to proceed to a RI.
31	C-5A Galaxy Fire**	An unknown quantity of AFFF was potentially applied to a fire that occurred in October 1970.	PFAS contamination levels in groundwater exceeded USEPA HA screening criteria. Recommended to proceed to a RI.

* Area identified in Aerostar 2018a.
** Area identified in Aerostar 2018b.



CLIENT	ARNG			
Preliminary Assessment for PFAS at Clay National Guard Center, GA				
REVISED	9/18/2019	GIS BY	MS	9/18/2019
SCALE	1:25,200	CHK BY	SI	9/18/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/18/2019

Adjacent Sources

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_5-1_Clay_Adjacent_Sources.mxd

6. Preliminary Conceptual Site Model

Based on the PA findings, four AOIs were identified at the Clay NGC: AOI 1 Hangar 1/Ramp Area, AOI 2 Hangar 300, AOI 3 Hangar 312, and AOI 4 Building 555. The AOI locations are shown on **Figure 6-1**. The following sections describe the CSM components and the specific CSMs developed for the AOIs. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

In general, the potential PFAS exposure pathways are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways is sparse and continues to be the subject of PFAS toxicological study. Receptors at the current installation include site workers, construction workers, trespassers/recreational users, and off-facility residents. The CSM for the Clay NGC indicates which specific receptors could potentially be exposed to PFAS.

6.1 AOI 1 Hangar 1/Ramp Area

AOI 1 is Hangar 1/Ramp Area at Clay NGC. Hangar 1 was constructed in 1959 and contains a fire suppression system that consists of eight 150-gallon tanks filled with 3 percent AFFF concentrate. The fire suppression system has been disabled but the AFFF tanks have not been emptied. There is no information available on the fire suppression system installation, testing frequently of the system, or releases. The wash rack near Hangar 1 currently drains to the industrial WWTP and then to the sanitary WWTP. No information was available regarding historical activities at the wash rack or whether there was a different drain configuration in the past. If there were releases of AFFF at AOI 1, the concentration and volume are unknown. Potential PFAS releases to surface soil may have migrated to groundwater via leaching and to surface water.

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

PFAS are water soluble and can migrate readily from soil to surface water. Based on the inferred surface water flow direction, potential releases on the ramp and north and south of the ramp may have ultimately drained to the retention basin east of Hangar 300. The retention basin contains a storm drain that discharges into Poorhouse Creek, which is a tributary of Rottenwood Creek. The Rottenwood Creek discharges to the Chattahoochee River. Drinking water for the facility is supplied by Marietta/Cobb County, which is sourced from the Chattahoochee River and Lake Allatoona. Because potential PFAS releases may migrate to the retention basin, which indirectly discharges to Chattahoochee River, the exposure pathway for surface water to site workers, construction workers, trespassers, and off-facility residents is potentially complete. Because PFAS are water soluble and can migrate readily from soil to groundwater, the exposure pathway via ingestion for the construction worker is considered potentially complete. Based on groundwater and surface water flow patterns, identified adjacent sources are anticipated to have an impact on the Clay NGC. The CSM for AOI 1 is shown on **Figure 6-2**.

6.2 AOI 2 Hangar 300

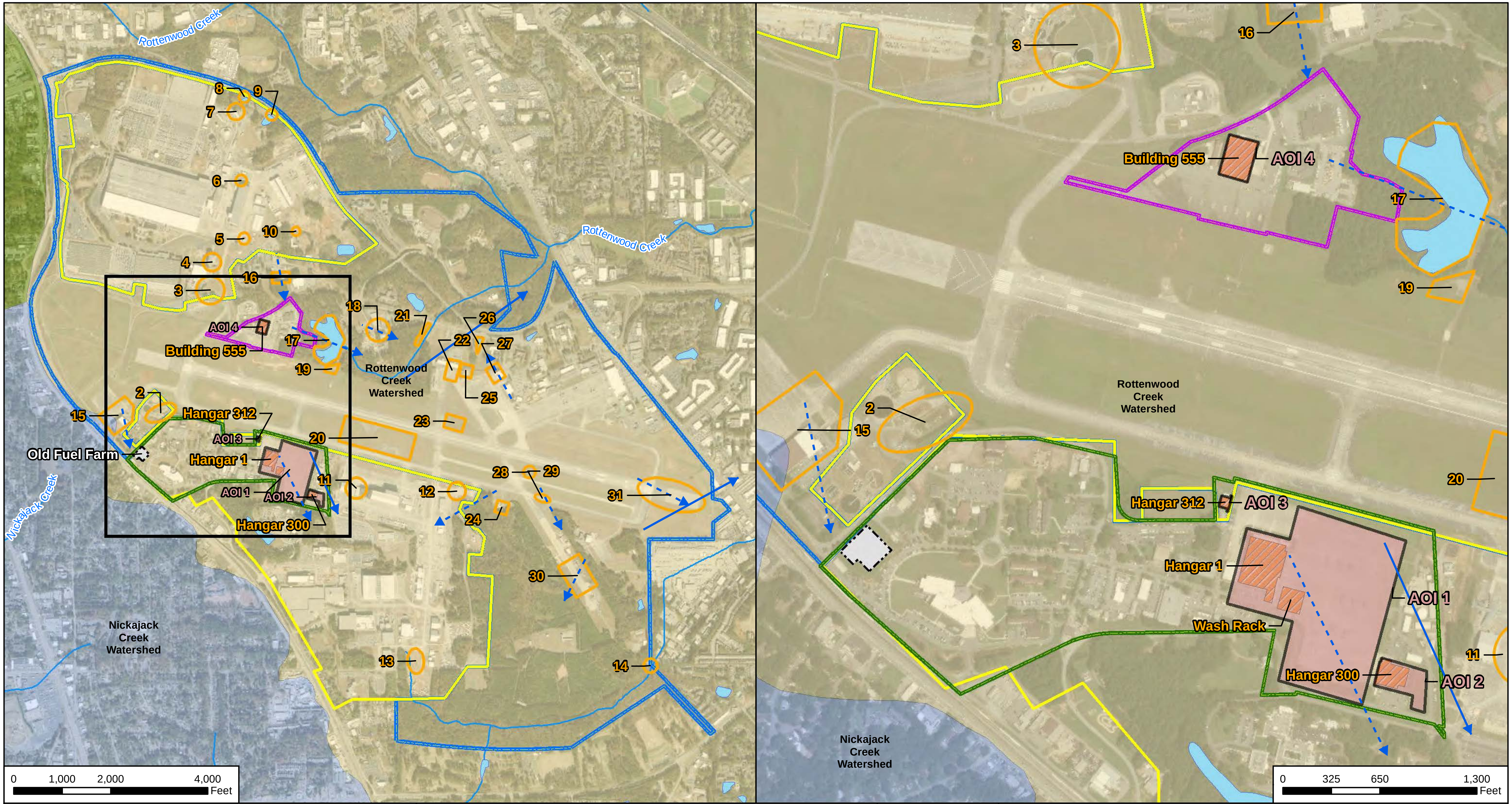
AOI 2 is the Hangar 300 at Clay NGC. Hangar 300 was built in the early 1990’s and contains a fire suppression system supplied by two 1500-gallon tanks filled with AFFF concentrate. Two known releases of AFFF from the fire suppression system have occurred. Both releases occurred in the early to mid-2000s, prior to GAARNG assuming occupancy of the building. During both releases, foam was released in the hangar, pushed onto the ramp, and ultimately into the retention basin east of Hangar 300. The retention basin contains a storm drain that discharges into Poorhouse Creek, which is a tributary of Rottenwood Creek. The Rottenwood Creek discharges to the Chattahoochee River. The concentration of AFFF and volume of the releases are unknown. Because potential PFAS releases may have occurred to surface soil at AOI 2 , the pathways and receptors for AOI 2 are the same as described in **Section 6.1**. The CSM for AOI 2 is shown on **Figure 6-2**.

6.3 AOI 3 Hangar 312

AOI 3 is the Hangar 312 at Clay NGC. Hangar 312 was built in 1998 and contains a fire suppression system supplied by a 300-gallon tank containing 3 percent of AFFF low expansion foam. The fire suppression system is maintained by contractors, no information was available concerning testing of the suppression system. Evidence of corrosion down the side of the tank was observed. If there were releases of AFFF, the concentration and volume are unknown. Potential PFAS releases to surface soil may have migrated to groundwater via leaching and surface water. Based on the inferred groundwater and surface water flow direction, potential releases may have drained to a retention basin directly west of Hangar 312 then east along the runway, ultimately draining to the retention basin east of Hangar 300. The retention basin east of Hangar 300 contains a storm drain that discharges into Poorhouse Creek, which is a tributary of Rottenwood Creek. The Rottenwood Creek discharges to the Chattahoochee River. Because potential PFAS releases may have occurred to surface soil at AOI 3 , the pathways and receptors for AOI 3 are the same as described in **Section 6.1**. The CSM for AOI 3 is shown on **Figure 6-2**.

6.4 AOI 4 Building 555

Building 555 was the location of the former GAARNG AASF from 1983 until 2011. The former hangar did not have a fire suppression system and no information was available regarding the use or presence of AFFF at the former GAARNG AASF. Historical aerial photographs show evidence of portable fire extinguisher units on the ramp, but it is unknown if the portable units contained AFFF. If there were releases of AFFF, the concentration and volume are unknown. Potential PFAS releases to surface soil may have migrated to groundwater via leaching and surface water. Based on the inferred groundwater and surface water flow direction, potential releases may have ultimately drained to the body of water east of the former GAARNG AASF. The retention basin discharges into unnamed tributary of Rottenwood Creek. The Rottenwood Creek discharges to the Chattahoochee River. Because potential PFAS releases to surface soil at AOI 4 have occurred, the pathways and receptors for AOI 4 are the same as described in **Section 6.1**. The CSM for AOI 4 is shown on **Figure 6-2**.



CLIENT	ARNG
PROJECT	Preliminary Assessment for PFAS at Clay National Guard Center, GA

REVISED	10/14/2019	GIS BY	MS	10/14/2019
SCALE	1:7,800	CHK BY	SI	10/14/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	10/14/2019

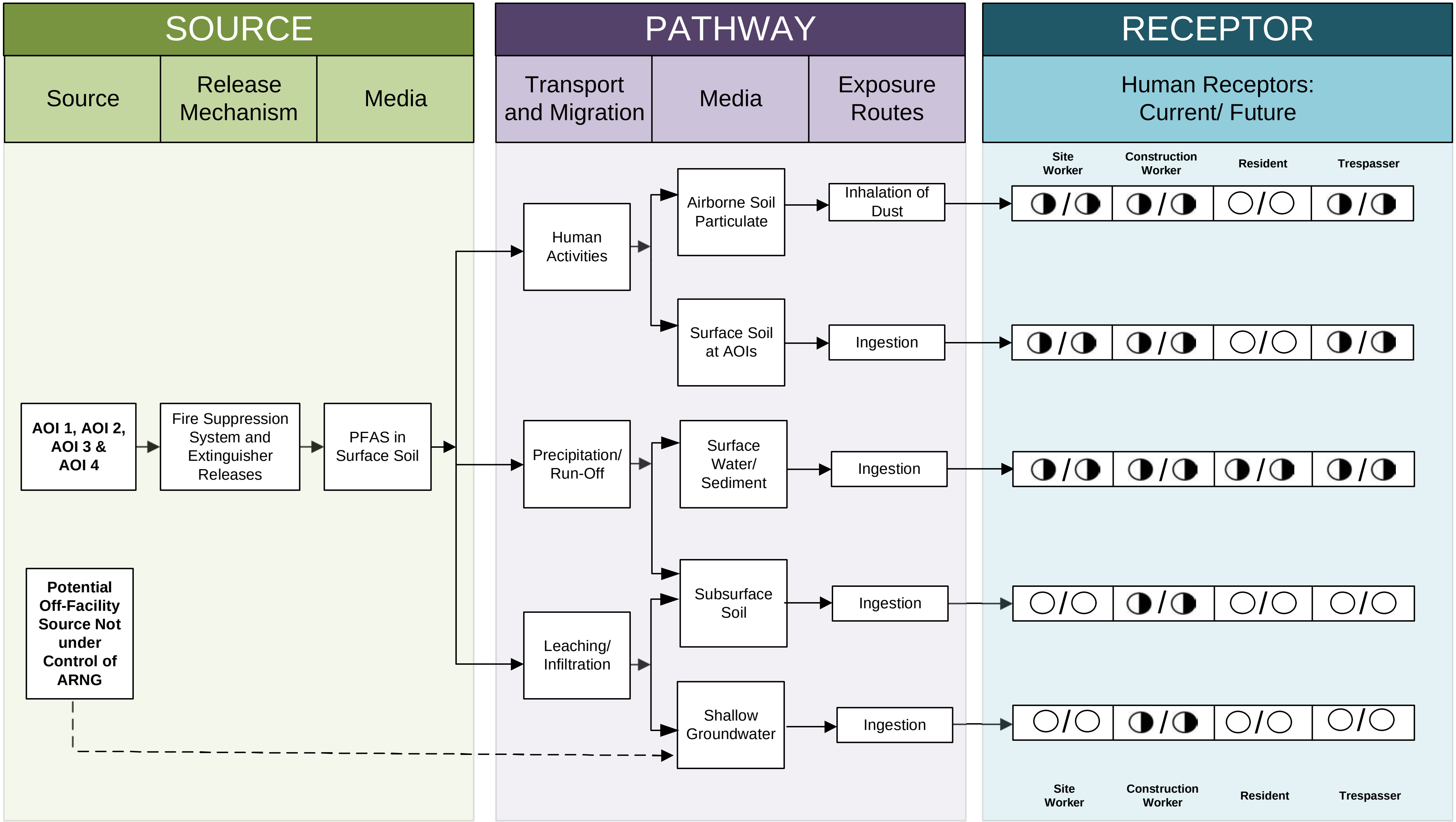
- ▨ Area of Interest
- ☐ AFFF Inspection Area
- ▨ Potential PFAS Release
- ⬚ No Suspected Release
- ☐ Facility Boundary
- ☐ Fomer ARNG AASF Boundary
- ☐ Airforce Plant 6 Boundary
- ☐ Dobbins ARB Boundary
- ▨ Water Body
- — River/Stream
- → Surface Water Flow Direction
- - → Inferred Groundwater Flow Direction

Areas of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_6-1_Clay_AOIs.mxd



	Site Worker	Construction Worker	Resident	Trespasser
Airborne Soil Particulate – Inhalation of Dust	◑/◑	◑/◑	○/○	◑/◑
Surface Soil at AOIs – Ingestion	◑/◑	◑/◑	○/○	◑/◑
Surface Water/ Sediment – Ingestion	◑/◑	◑/◑	◑/◑	◑/◑
Subsurface Soil – Ingestion	○/○	◑/◑	○/○	○/○
Shallow Groundwater – Ingestion	○/○	◑/◑	○/○	○/○

LEGEND

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

Notes:
1. The resident receptors refer to an off-facility resident.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 Hangar 300, AOI 2 Hangar 312,
AOI 3 Hangar 1, and AOI 4 Building 555

7. Conclusions

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

7.1 Findings

One AOI related to a potential PFAS release was identified (**Table 7-1**) at the Clay NGC during the PA (**Figure 7-1**).

Table 7-1: AOIs at Lucius D. Clay National Guard Center

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Hangar 1/Ramp Area	US Navy	1960s to 2009
AOI 2	Hangar 300	US Navy	Early to Mid-2000
AOI 3	Hangar 312	US Navy	Early to Mid-2000
AOI 4	Building 555	GAARNG	1983 until 2011

Based on potential historical AFFF releases at the AOIs, there is potential for exposure to PFAS contamination in surface soil to site workers, construction workers, and trespassers via ingestion and inhalation; surface water and sediment to site workers, construction workers, trespassers, and off-facility residents via ingestion; subsurface soil to construction workers via ingestion; and groundwater to construction workers via ingestion. Potential off-facility PFAS release areas exist adjacent to the Clay NGC. Because these areas include property upgradient of the facility, it is unknown whether or not the off-facility sources affect the Clay NGC.

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

Table 7-2: No Suspected Release Areas

No Suspected Release Area	Used by	Rationale for No Suspected Release Determination
Old Fuel Farm	United States Navy	There is no record of AFFF fire extinguishers present or a release of AFFF.

7.2 Uncertainties

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

The conclusions of this PA are predominantly based on the information provided during interviews with personnel who had direct knowledge of PFAS use at the facility. Sometimes the provided information was vague or conflicted with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (1969 to present), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and storage of PFAS were reviewed, retired and current personnel were interviewed, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected. **Table 7-3** summarizes the uncertainties associated with the PA.

Table 7-3: Uncertainties

Area of Interest	Source of Uncertainty
All AOIs	Potential off-facility PFAS release areas exist adjacent to the Clay NGC. Because these areas include property upgradient of the facility, it is unknown whether or not the off-facility sources affect the Clay NGC.
AOI 1, AOI 2, and AOI 3	Prior to GAARNG control of the facility, little or no information was available regarding maintenance or releases of the AFFF system.
AOI 1, AOI 2, and AOI 3	Prior to GAARNG control of the facility, little or no information was available regarding training with or maintenance of mobile AFFF fire extinguishers.
AOI 4	No information was available regarding the use or presence of AFFF. The former hangar did not have a fire suppression system, but historical aerial photographs show evidence of portable fire extinguisher units on the ramp. It is unknown if the portable units contained AFFF.

7.3 Potential Future Actions

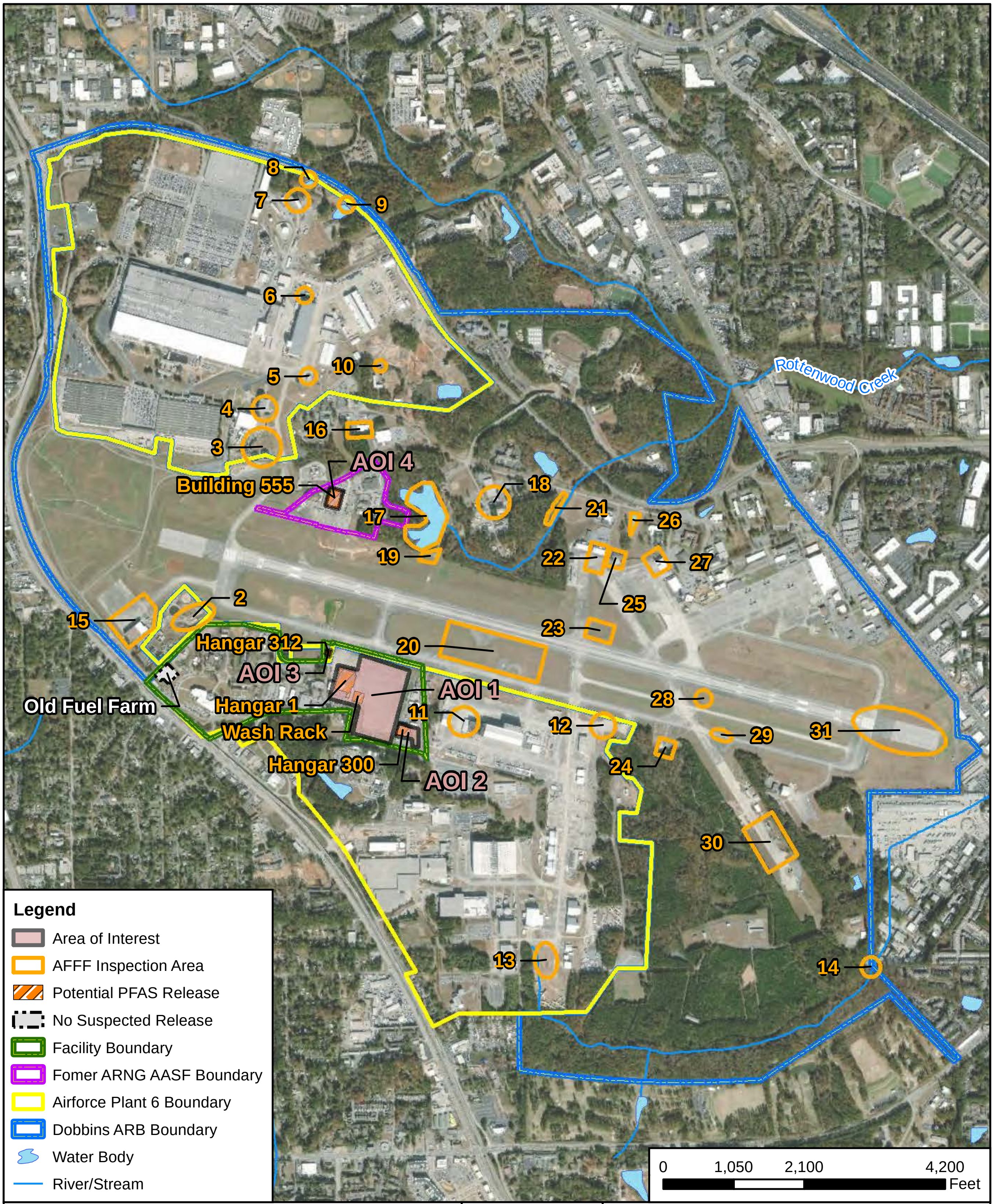
Interviews and records (covering 1960s to present) indicate that activities may have resulted in potential PFAS releases at the four AOIs identified during the PA. Based on the CSM developed for the AOI, there is potential for receptors to be exposed to PFAS contamination in soil, groundwater, surface water, and sediment at these AOIs. **Table 7-4** summarizes the rationale used to determine if the AOIs should be considered for further investigation under the CERCLA process and undergo a SI.

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

399 **Table 7-4: PA Findings Summary**

Area of Interest	Rationale	Potential Future Action
AOI 1 Hangar 1/Ramp Area	AFFF fire suppression system releases may have occurred. AFFF releases may have migrated to the retention basin equipped with a storm drain that eventually discharges to the Chattahoochee River.	Proceed to an SI, focus on soil, groundwater, surface water, and sediment
AOI 2 Hangar 300	AFFF fire suppression system release occurred in the hangar, and AFFF was pushed onto the ramp and into a retention basin equipped with a storm drain that eventually discharges to the Chattahoochee River.	Proceed to an SI, focus on soil, groundwater, surface water, and sediment
AOI 3 Hangar 312	AFFF fire suppression system releases may have occurred. AFFF releases may have migrated to the retention basin equipped with a storm drain that eventually discharges to the Chattahoochee River.	Proceed to an SI, focus on soil, groundwater, surface water, and sediment
AOI 4 Building 555	Historical aerial photographs show evidence of portable fire extinguisher units on the ramp, but it is unknown if the portable units contained AFFF.	Proceed to an SI, focus on soil, groundwater, surface water, and sediment

400



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Clay National Guard Center, GA			
REVISED	10/14/2019	GIS BY	MS	10/14/2019
SCALE	1:25,200	CHK BY	SI	10/14/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	10/14/2019

Summary of Findings

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 7-1

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\GA\Clay_Figures\Clay_PA_Figures\Fig_7-1_Clay_Summary.mxd

8. References

Aerostar SES LLC. 2018a. *Final Site Inspections Report of Fire Fighting Foam Usage at Air Force Plant 6 Cobb County, Georgia.* October.

Aerostar SES LLC. 2018b. *Final Site Inspections Report of Fire Fighting Foam Usage at Dobbins Air Reserve Base Cobb County, Georgia.* October.

Marietta Water. 2017. *Annual Water Quality Report.* January.

Federal Emergency Management Agency (FEMA). 2013. Flood Insurance Study for Cobb County, Georgia. March.

Georgia Department of Natural Resources (GADNR). 1977. *Geologic Map of Georgia*. Geologic and Water Resources Division, Georgia Geological Survey.

National Ground Water Association. 2018. *Groundwater and PFAS: State of Knowledge and Practice*. January.

Stell Environmental Enterprises. 2012. *Final Environmental Assessment Addressing a Proposed Commissary at Dobbins Aire Reserve Base, Georgia*. November.

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

United States Geological Survey. 2019. *USGS Water-Quality Daily Data for Georgia.* April.

World Climate. 2019. Available at http://www.worldclimate.com/cgi-bin/data.pl?ref=N33W084+1200+0051089G2 (Accessed April 4, 2019)

Appendix A

Data Resources

Data Resources will be provided separately on CD. Data Resources for Clay National Guard Center, Georgia.

Clay NGC Leases, Licenses, and Permits

- 2009 DACA License for Clay NGC

Clay NGC AFFF Release Documentation

- 2012 Environmental Assessment Addressing a Proposed Commissary at Dobbins Air Reserve Base, Georgia
- 2013 Excerpts from CNGC SWPPP
- 2018 Site Inspections Report of Fire Fighting Foam Usage at Air Force Plant 6
- 2018 Site Inspections Report of Fire Fighting Foam Usage at Dobbins Air Reserve Base
- 2018 CNGC Stormwater Map
- 2018 CNGC Wastewater and Industrial Map

EDR Report

- 2019 Clay NGC EDR Report

DACA21-3-09-4063
DEPARTMENT OF THE ARMY
LICENSE FOR
NATIONAL GUARD PURPOSES
GENERAL LUCIUS D. CLAY NATIONAL GUARD CENTER
COBB COUNTY, GEORGIA

THE SECRETARY OF THE ARMY, hereinafter referred to as the Secretary, under the authority of Title 32, United States Code, Section 503, hereby grants to the **STATE OF GEORGIA**, hereinafter referred to as the Grantee, a license to use and occupy 107 acres of land, together with improvements thereon known as the General Lucius D. Clay National Guard Center, excluding buildings 402 and 402A containing 1,860 sq. ft. which will be Permitted to the Department of the Navy by the Secretary of the Army, located in Cobb County, Georgia and identified in Exhibit A.

THIS LICENSE is granted subject to the following conditions.

1. TERM

This license is granted for an indefinite term, beginning September 30, 2009, but is revocable at will by the Secretary.

2. SUPERVISION BY THE U.S. PROPERTY AND FISCAL OFFICER

The use and occupancy of the premises shall be without cost to the regular establishment of the military departments of the Department of Defense and shall be under the general supervision of the US Property and Fiscal Officer hereinafter referred to as said officer, and subject to such rules and regulations as may be prescribed from time to time by said officer.

3. APPLICABLE LAWS AND REGULATIONS

The Grantee shall comply with all applicable Federal, state, county, and municipal laws, ordinances, and regulations wherein the premises are located.

4. FACILITY MAINTENANCE

The Grantee shall maintain and keep the premises in good repair and condition and all costs of operation, maintenance, and restoration shall be paid for from funds available to the Grantee, or from funds other than those appropriated for the regular establishment of the military departments.

5. RIGHT TO USE

The United States, hereinafter referred to as the Government, reserves the right to use the premises, or any part thereof, including all buildings and improvements situated thereon, for such purposes as said officer deems necessary in the interest of national defense.

6. COST OF UTILITIES

The Grantee shall pay the cost, as determined by the officer having immediate jurisdiction over the premises, of producing and/or supplying any utilities or other services furnished by the Government or through Government-owned facilities for the use of the Grantee, including the Grantee's proportionate share of the cost of operation and maintenance of the Government-owned facilities by which such utilities or services are produced and supplied. The Government shall be under no obligation to furnish utilities or services. Payment shall be made in the manner prescribed by the officer having such jurisdiction.

7. USE RESTRICTIONS

The buildings and improvements included in this license shall not be used for the quartering of personnel engaged in the National Guard activities except when such personnel are in the Federal service or are participating in authorized training.

8. IMPROVEMENTS AND ALTERATIONS

Additions to or alteration or improvement of the premises shall not be made without prior written approval of the US Property and Fiscal Officer. All such additions, alterations, or improvements shall be maintained by the Grantee in good repair and condition. All such work designated as permanent by said officer shall, upon completion, become property of the Government.

9. CONDITION OF PREMISES

The Grantee acknowledges that it has inspected the premises, knows its condition, and understands that the same is granted without any representations or warranties whatsoever and without any obligation on the part of the Government.

10. TERMINATION

This license may be terminated by the Grantee at any time by giving the District Commander at least thirty (30) days notice in writing.

11. RESTORATION

On or before the expiration of this license or its termination by the Grantee, the Grantee shall vacate the premises, remove its property (except those permanent additions, alterations, and improvements which have become property of the Government under provisions of Condition 8, **IMPROVEMENTS AND ALTERATIONS**) and restore the premises to a condition satisfactory to said officer. If, however, this license is revoked, the Grantee shall vacate the premises, remove said property and restore the premises within such time as the said officer may designate. In either event, if the Grantee fails to remove said property and restore the premises, then, at the option of said officer, the property shall either become the property of the Government without compensation therefor, or said officer may cause the property to be removed at the expense of the Grantee, and no claim for damages against the Government shall be created on account of such action.

12. USE BY OTHERS

The Grantee shall not transfer or assign this license, or any interest in the premises. However, upon concurrence of the Director, Army National Guard, National Guard Bureau, the Grantee may (1) permit the temporary or intermittent use of the premises by elements of the Department of Defense for joint use or individual training purposes, provided such use will not interfere with the National Guard use; or (2) issue licenses for nonprofit, community service-type activities under the same conditions as those allowed by active installation commanders by existing Army regulations.

13. PROTECTION OF PROPERTY

a. The Grantee shall keep the premises in good order and in a clean, safe condition by and at the expense of the Grantee. The Grantee shall be responsible for any damage that may be caused to property of the United States by the activities of the Grantee under this license, and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the Grantee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the Grantee to a condition satisfactory to said officer, or at the election of said officer, reimbursement made therefor by the Grantee in an amount necessary to restore or replace the property to a condition satisfactory to said officer.

b. Upon termination of the Grantee's requirement for the premises, the Grantee shall remain responsible to protect and maintain the premises until transfer to and acceptance by another accountability officer is accomplished or in accordance with applicable laws, rules and regulations.

14. ENVIRONMENTAL PROTECTION

a. Within the limits of their respective legal powers, the parties to this license shall protect the premises against pollution of its air, ground, and water. The Grantee shall comply with any laws, regulations, conditions or instructions affecting the activity hereby authorized if and when issued by the Environmental Protection Agency, or any Federal, state, interstate or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically prohibited. Such regulations, conditions or instructions in effect or prescribed by said Environmental Protection Agency, or any Federal, state, interstate or local governmental agency are hereby made a condition of this license. The Grantee shall not discharge waste or effluent from the premises in such a manner that the discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

b. The Grantee will use all reasonable means available to protect the environment and natural resources, and where damage nonetheless occurs from the Grantee's activities, the Grantee shall be liable to restore the damaged resources.

c. The Grantee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

15. ENVIRONMENTAL CONDITION OF PROPERTY (ECP) REPORT

The Environmental Condition of Property documenting the known history of the property with regard to the storage, release, or disposal of hazardous substances thereon, is contained in the following documents.

a. An Environmental Baseline Survey (EBS) Phase I dated August 2009 conducted by SpecPro.

b. A Phase II Soil and Groundwater Investigation Report for Bulk Farm, Two Hazardous Waste Storage Areas and the Georgia Army National Guard Headquarters Construction Site Footprint conducted in June 2009.

c. A Phase II Letter Report for Additional Investigation of Soil and Groundwater for Bulk Fuel Farm, Two Hazardous Waste Storage Areas and the Georgia Army National Guard Headquarters Construction Site Footprint was conducted May 2009.

d. A Phase II Environmental Condition of Property was conducted by Tetra Teach January 2008.

A copy of these documents are on file in the office of the National Guard Bureau, Arlington, Virginia and are by reference made a part hereof. The Grantee will be responsible for any recommendations contained in the Environmental Condition of Property documents.

Upon expiration, revocation or termination of this license, another ECP shall be prepared which will document the environmental condition of the property at that time. A comparison of the two reports will assist the said officer in determining any environmental restoration requirements. Any such requirements will be completed by the Grantee to the satisfaction of the said officer.

16. HISTORIC PRESERVATION

The Grantee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural, or other cultural artifacts, relics, or objects of antiquity. In the event such items are discovered on the premises, the Grantee shall immediately notify said officer and protect the site and material from further disturbance until the said officer gives clearance to proceed.

17. NON-DISCRIMINATION

The Grantee shall not discriminate against any person or persons or exclude them from participation in the Grantee's operations, programs or activities conducted on the licensed premises because of race, color, religion, sex, age, handicap or national origin. The Grantee, by acceptance of this license, hereby gives assurance that it will comply with the provisions of Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000d); the Age Discrimination Act of 1975 (42 U.S.C. 6102); the Rehabilitation Act of 1973, as amended (29 U.S.C. 794); and all requirements imposed by or pursuant to the Department of Defense Directive 5500.11 (32 CFR Part 195) issued on December 28, 1964.

18. NOTICES

All correspondence and notices to be given pursuant to this license shall be addressed, if to the Grantee, to Headquarters, Department of Army, National Guard Bureau, ATTN: NGB-ARI-RE, Chief Real Estate Branch, 111 South George Mason Drive, Arlington, Virginia 22204-1382, if to the United States, to the District Engineer, U.S. Army Engineer District, Savannah, ATTN: Chief, Real Estate Division, PO Box 889, Savannah, Georgia 31402-0889; or as may from time to time otherwise be directed by the parties. Notice shall be deemed to have been duly given if and when enclosed in a properly sealed envelope or wrapper, addressed as aforesaid, and deposited, postage prepaid, in a post office regularly maintained by the United States Postal Service, or a nationally-recognized overnight delivery service.

19. AUTHORIZED REPRESENTATIVES

Except as otherwise specifically provided, any reference herein to "Secretary," "District Commander," "Installation Commander," "U.S. Property and Fiscal Officer," or "said officer" shall include their duly authorized representatives. Any reference to "Grantee" shall include any duly authorized representatives.

20. GOVERNMENT LEASE TERMINATION

DELETED IN ITS ENTIRETY

21. TRANSFER OF ACCOUNTABILITY

This license is subject to the transfer of the premises from the Department of the Navy to the Department of the Army.

THIS LICENSE is not subject to Title 10, United States Code, Section 2662, as amended.

SIGNATURE PAGES FOLLOW

LICENSE NO. DACA21-3-09-4063
GENERAL LUCIUS D. CLAY NATIONAL GUARD CENTER

IN WITNESS WHEREOF, I have hereunto set my hand by authority of the Secretary of the Army this 15 day of Sept, 2009.

UNITED STATES OF AMERICA

Ralph J. Werthmann
RALPH J. WERTHMANN
Chief, Real Estate Division
Contracting Officer

Witness

Hilda R. Johnson
Notary Public

HILDA R. JOHNSON
NOTARY PUBLIC
CHATHAM COUNTY
STATE OF GEORGIA
My Commission Expires October 1, 2011

THIS LICENSE is also executed by the Grantee this 8th day of September, 2009.

STATE OF GEORGIA

By:

Name: MICHAEL R. FOWLER

Title: Deputy Adjutant General

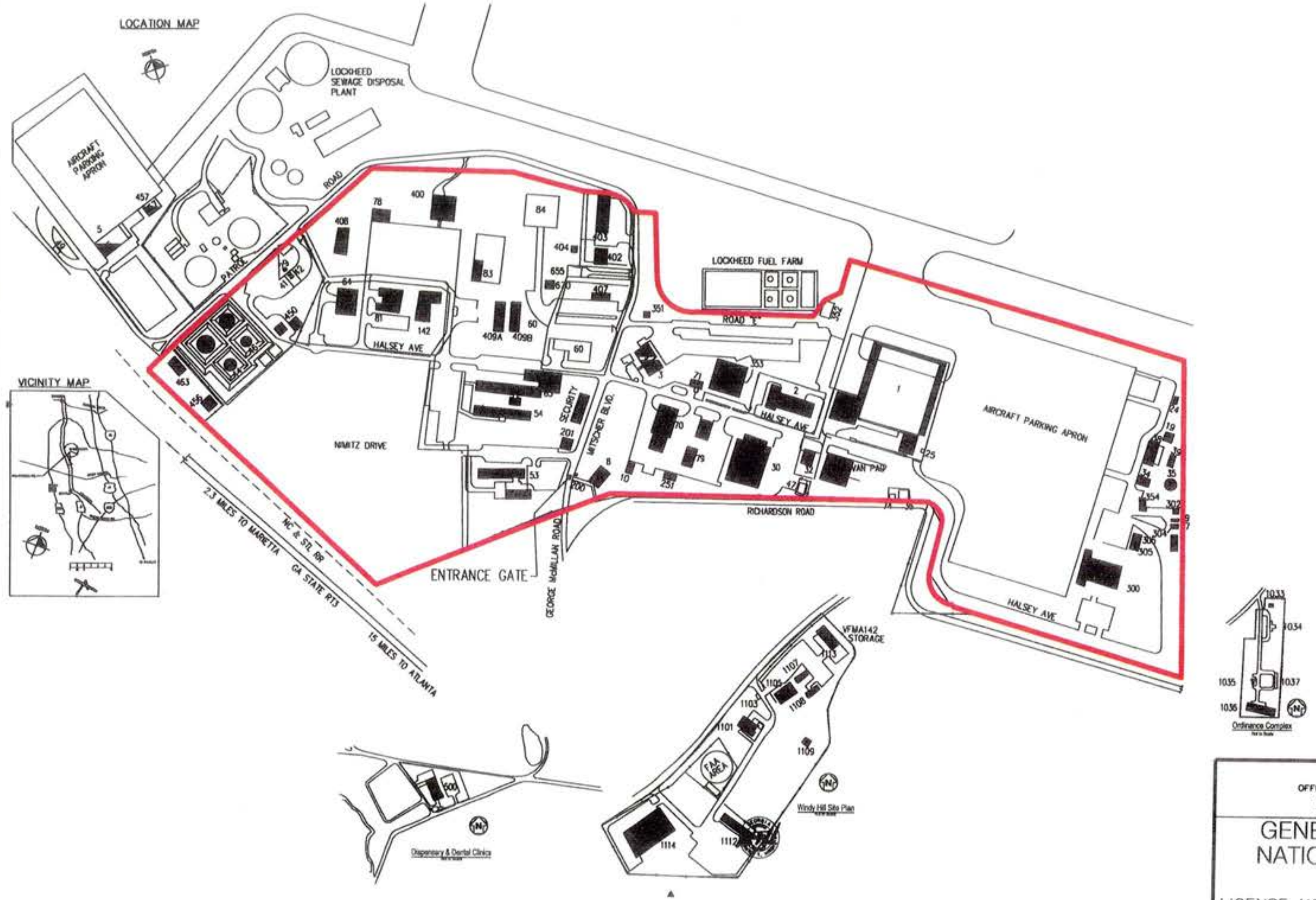
Shiela D. Robinson
Witness

Victoria Hightower
Notary Public

VICTORIA L. HIGHTOWER
My Comm. Expires 31 Oct 11

CORPS OF ENGINEERS

U.S. ARMY



DEPARTMENT OF THE ARMY
OFFICE OF THE SAVANNAH DISTRICT ENGINEER
SOUTH ATLANTIC DIVISION

GENERAL LUCIUS D. CLAY NATIONAL GUARD CENTER

MARIETTA, GEORGIA

LICENSE NO. DACA21-3-09-4063

GRANTEE: STATE OF GEORGIA

AREA: 107.00 ACRES ±

SCALE: N.T.S.

DATE: 19 MARCH 2009

EXHIBIT "A"

FINAL

ENVIRONMENTAL ASSESSMENT
ADDRESSING A PROPOSED COMMISSARY
AT
DOBBINS AIR RESERVE BASE, GEORGIA

AIR FORCE RESERVE COMMAND

94TH AIRLIFT WING

NOVEMBER 2012

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE
NOV 2012

2. REPORT TYPE

3. DATES COVERED
00-00-2012 to 00-00-2012

4. TITLE AND SUBTITLE
Final Environmental Assessment Addressing a Proposed Commissary at Dobbins Air Reserve Base, Georgia

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Stell Environmental Enterprises,25 East Main Street,Elverson,PA,19520

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSOR/MONITOR’S ACRONYM(S)

11. SPONSOR/MONITOR’S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:

a. REPORT	b. ABSTRACT	c. THIS PAGE	17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**173**	

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

ABBREVIATIONS AND ACRONYMS

700 AS	700th Airlift Squadron
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos-containing material
AFB	Air Force Base
AFI	Air Force Instruction
AFMC	Air Force Materiel Command
AFP-6	Air Force Plant-6
AFRC	Air Force Reserve Command
AICUZ	Air Installation Compatible Use Zone
AQCR	air quality control region
ARB	Air Reserve Base
AST	aboveground storage tank
BD/DR	Building Demolition/Debris Removal
BMP	best management practice
BRAC	Defense Base Closure and Realignment
BTU/hr	British Thermal Units per hour
BX	Base Exchange
C4I	Command, Control, Communications, Computer, and Information
CAA	Clean Air Act
CAP	Corrective Action Plan
CCMWA	Cobb County-Marietta Water Authority
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	carbon monoxide
CO_2	carbon dioxide
CRP	Compliance-Related Cleanup Program
CWA	Clean Water Act
dBA	A-weighted decibel
DCO	Dial Central Office
DERP	Defense Environmental Restoration Program
DNL	Day-Night Average Sound Level
DNR	Department of Natural Resources
DOD	Department of Defense
EA	Environmental Assessment
EBS	Environmental Baseline Survey
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
ELG	Final Effluent Limitations Guideline
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
ft^2	square feet
FUDS	formerly used defense sites
FY	Fiscal Year
GA SHPO	Georgia State Historic Preservation Office
GAARNG	Georgia Army National Guard
GADNR	Georgia Department of Natural Resources
GHG	greenhouse gas
HAP	hazardous air pollutant
HAZMART	Hazardous Material Pharmacy
HAZMAT	Hazardous Materials Emergency Planning and Response
HMMS	Hazardous Materials Management System
HQ	Headquarters
HUD	U.S. Department of Housing and Urban Development
HVAC	heating, ventilation, and air conditioning

continued on inside of back cover →

← *continued from inside of front cover*

I	Interstate
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IRP	Installation Restoration Program
ISDN	Integrated Service Digital Network
JFHQ	Joint Forces Headquarters
JP-8	jet propulsion number 8
kg	kilogram
LBP	lead-based paint
LID	low-impact development
LQG	large-quantity generator
mg/m^3	milligrams per cubic meter
MGD	million gallons per day
MMRP	Military Munitions Response Program
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NANSR	Nonattainment Major New Source Review
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOA	Notice of Availability
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
O_3	ozone
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
pCi/L	picoCuries per liter
percent g	percentage of the force of gravity
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
POL	petroleum, oil, and lubricants
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control, and Countermeasure
SSPP	Strategic Sustainability Performance Plan
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
SWPPP	Stormwater Pollution Prevention Plan
TCE	trichloroethylene
TMDL	Total Maximum Daily Load
tpy	tons per year
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
UFC	Unified Facilities Criteria
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S Geological Survey
UST	underground storage tank
VOC	volatile organic compound
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

ENVIRONMENTAL ASSESSMENT (EA) ADDRESSING A PROPOSED COMMISSARY AT DOBBINS AIR RESERVE BASE, GEORGIA

Pursuant to the Council on Environmental Quality's (CEQ's) regulations for implementing procedural provisions of the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] 1500-1508), 32 CFR Part 989 has prepared an Environmental Assessment (EA) for the proposed construction of a commissary at Dobbins Air Reserve Base (ARB), Georgia. The EA is incorporated by reference into this Finding of No Significant Impact (FONSI).

INTRODUCTION

The Air Force Reserve Command (AFRC) is proposing to construct a new commissary at Dobbins ARB. At this time the installation does not have a commissary. The Proposed Action is to construct a permanent commissary to provide service to patrons in the Atlanta metropolitan area that would be approximately 70,972 square feet (ft^2) in size. The commissary would include general sales and a Grab-N-Go area. In addition, the commissary would have electronic checkout registers, a receiving area, loading dock, meat and produce production areas, cold and freezer storage, and other supporting areas would be included. Four alternative site locations are evaluated in the EA.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to construct a permanent commissary for authorized patrons. Four alternative site locations were evaluated for the Proposed Action in the EA. The need for the Proposed Action is to provide a commissary in the Atlanta metropolitan area. A number of commissaries have closed in the Atlanta metropolitan area. As a result, there is not a Department of Defense commissary in the Atlanta metropolitan area. Patrons have to drive several hours to the nearest alternative commissary at Fort Benning, Robins Air Force Base, or Fort Gordon in Georgia, which are at least 2 hours away.

Populations in the Atlanta metropolitan area that use these commissaries include retirees, active-duty and Reserve personnel, and their dependents. Before the commissaries in the Atlanta metropolitan area closed, the annual sales totaled $33.3 million. It is estimated that there are 60,000 to 70,000 retirees in the area. The construction of a new commissary in the Atlanta metropolitan area would provide service to these patrons and retain the annual expenditures in this region.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Proposed Action. The Proposed Action consists of the construction of a permanent commissary. In addition to the general sales and Grab-N-Go area, the Proposed Action would include a receiving area, loading dock, and other supporting areas. In addition, a parking lot consisting of approximately 350 patron parking spaces, 50 employee spaces, and shopping cart corrals would be constructed. To accommodate deliveries, a paved parking area and loading docks would be built in the rear of the commissary. In addition, an access road that could accommodate the delivery trucks traveling to the back of the commissary would be constructed. The project would be constructed to satisfy current energy conservation policies, standards, and regulations as applicable and force protection measures meeting minimum Department of Defense standards.

This EA evaluated the impacts of the Proposed Action at four alternative site locations, which include the following: Site Alternative 1: Corps Lab Site; Site Alternative 2: Base Exchange (BX) Site; Site Alternative 3: Barclay Gate Site; and Site Alternative 4: City of Marietta Site.

Site Alternative 1, the Corps Lab Site, is in the northwestern corner of the installation near a former U.S. Army Corps of Engineers (USACE) Laboratory facility. This site consists of 24.3 acres and includes property owned by AFRC, Air Force Materiel Command (AFMC), and the Georgia DOD. Site Alternative 2 is the BX Site. At this site location, the proposed commissary would be built adjacent to the existing BX. This site includes 9.0 acres, is owned by AFRC, and is near the intersection of Industrial Drive and Atlantic Avenue. Site Alternative 3 is the Barclay Gate site. This site is owned by AFMC, includes 45.7 acres north of Alternative Site 2, and is southwest of South Cobb Drive. Site Alternative 4, the City of Marietta, is the site of Wildwood Park, which is east of South Cobb Drive and northeast of Alternative Site 3. This property is currently owned by the City of Marietta and consists of 23.2 acres.

No Action Alternative. Under the No Action Alternative, the Proposed Action would not be implemented. As a result, there would not be a commissary in the Atlanta metropolitan area for patrons, which include retirees, active-duty and Reserve personnel, and their dependents. Patrons would need to drive outside the Atlanta metro area to visit a commissary.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED ACTION AND THE NO ACTION ALTERNATIVE

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, the evaluation of potential environmental impacts presented in the EA focuses on those resources and conditions potentially subject to impacts and on potentially significant environmental issues deserving of study, and deemphasizes insignificant issues. The environmental resources that were analyzed in this EA includes air quality, noise, land use, geological resources, water resources, biological resources, cultural resources, infrastructure, hazardous materials and wastes, safety, and socioeconomic and environmental justice.

Implementation of the Proposed Action would result in short- and long-term, negligible to minor, adverse impacts on air quality, noise, land use, geological resources, water resources, biological resources, safety, and socioeconomics and environmental justice at Site Alternatives 1, 2, 3, and 4. No significant impacts would occur on cultural resources, infrastructure, and hazardous materials and wastes from the Proposed Action at Site Alternatives 1, 2, 3, and 4. In addition, no significant cumulative impacts would occur under the Proposed Action.

Under the No Action Alternative, the Proposed Action would not be implemented. There would be no commissary in the Atlanta metropolitan area and patrons would have to drive several hours to the nearest alternative commissary. In addition, the annual expenditures that patrons spent at commissaries in the Atlanta metropolitan area would be lost. Based on the analyses addressing the No Action Alternative presented in the EA, it was determined that no significant impacts on environmental resources would be expected.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

AFRC initiated the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process for the Proposed Action on December 13, 2011, in accordance with USAF policy. A 30-day public and agency review of the Description of Proposed Action and Alternatives for this EA was previously conducted.

A Notice of Availability (NOA) for this EA has been published in local newspapers. The published NOA solicits comments on the Proposed Action and is intended to involve the local community in the decisionmaking process. Comments received from the public and other Federal, state, and local agencies will be addressed in the EA. Public and agency comments on the Draft EA will be considered prior to a decision made as to whether or not to sign a FONSI.

FINDING OF NO SIGNIFICANT IMPACT

I conclude that the environmental effects of the proposed commissary at Dobbins ARB are not significant, that preparation of an Environmental Impact Statement is unnecessary, and that a FONSI is appropriate. The preparation of the EA is in accordance with NEPA, CEQ regulations, and 32 CFR Part 989, as amended and is herein incorporated by reference.

31 Oct 12

TIMOTHY E. TARCHICK, Colonel, USAFR
Commander

Date

Attachment: Environmental Assessment

COVER SHEET

FINAL
ENVIRONMENTAL ASSESSMENT ADDRESSING A PROPOSED COMMISSARY
AT
DOBBINS AIR RESERVE BASE, GEORGIA

Responsible Agencies: The Air Force Reserve Command (AFRC) and the 94th Airlift Wing at Dobbins Air Reserve Base (ARB), Georgia.

Affected Location: Dobbins ARB.

Proposed Action: Construction of a proposed commissary.

Report Designation: Draft Environmental Assessment (EA).

Abstract: The Proposed Action includes the construction of a new commissary at Dobbins ARB. At this time, the installation does not have a commissary. A commissary would be built to provide service to patrons in the Atlanta area and would consist of a facility that would be approximately 70,972 square feet (ft^2) in size. The commissary would include general sales and a Grab-N-Go area. In addition, electronic checkout registers, a receiving area, loading dock, meat and produce preparation areas, cold and freezer storage, and other supporting areas would be included.

The purpose of the Proposed Action is to construct a permanent commissary for authorized patrons. The need for the Proposed Action is to provide a commissary in the Atlanta metropolitan area. Four alternative site locations will be evaluated in the Environmental Assessment (EA). Site Alternative 1, Corps Lab Site, is on the north side of the installation near a former U.S. Army Corps of Engineers (USACE) Laboratory. This site consists of 24.3 acres and includes property owned by AFRC, Air Force Materiel Command (AFMC), and the Georgia Department of Defense (DOD). Site Alternative 2 is the Base Exchange (BX) Site, where the proposed commissary would be built adjacent to the existing BX. This property is near the intersection of Industrial Drive and Atlantic Avenue and includes 9.0 acres. Site Alternative 3 is the Barclay Gate Site. This site is owned by AFMC, includes 45.7 acres, and is southwest of South Cobb Drive. Site Alternative 4, the City of Marietta Site, is the location of Wildwood Park, which is east of South Cobb Drive and northeast of Alternative Site 3. This property is owned by the City of Marietta and consists of 23.2 acres.

Under the No Action Alternative, Dobbins ARB would not construct the proposed commissary. As a result, there would not be a commissary in the Atlanta metropolitan area for patrons, which include retirees, active-duty and Reserve personnel, and their dependents.

This EA has been prepared to evaluate the Proposed Action at four alternative site locations and the No Action Alternative. Resources that were considered in the impacts analysis are noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, infrastructure, hazardous materials and waste management, and safety.

FINAL

ENVIRONMENTAL ASSESSMENT
ADDRESSING A PROPOSED COMMISSARY
AT
DOBBINS AIR RESERVE BASE, GEORGIA

HEADQUARTERS AIR FORCE RESERVE COMMAND
ROBINS AIR FORCE BASE, GEORGIA

NOVEMBER 2012

FINAL
ENVIRONMENTAL ASSESSMENT ADDRESSING A PROPOSED COMMISSARY AT DOBBINS AIR RESERVE BASE, GEORGIA

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLE OF CONTENTS (CONTINUED)

APPENDICES

FIGURES

TABLES

1. Purpose, Need, and Scope

The Air Force Reserve Command (AFRC) is proposing to construct a new commissary at Dobbins Air Reserve Base (ARB). At this time, the installation does not have a commissary. The Proposed Action is to construct a permanent commissary to provide service to patrons in the Atlanta metropolitan area that would be approximately 70,972 square feet (ft^2) in size. The commissary would include general sales and a Grab-N-Go area. In addition, electronic checkout registers, a receiving area, loading dock, meat and produce preparation areas, cold and freezer storage, and other supporting areas would be included. Four alternative site locations are evaluated in this Environmental Assessment (EA).

1.1 Background

Dobbins ARB consists of 1,664 acres in Cobb County in northwestern Georgia, about 16 miles northwest of the City of Atlanta (see **Figure 1-1**). The 22nd Air Force is headquartered there, and is responsible for recruiting and training Reservists and maintaining subordinate units at the highest level of combat readiness. The 94th Airlift Wing is the host unit at Dobbins ARB and has 8 assigned C-130H *Hercules* aircraft. The 94th Airlift Wing is made up of 3 groups, 12 squadrons, and 5 flights; flying operations are conducted by the 94th Operations Group. Additional units that are based at Dobbins ARB include the AFRC, Georgia Army National Guard, Georgia Air National Guard, and the U.S. Army Reserve. This makes Dobbins ARB one of the largest multi-service reserve training installations in the world. Air Force Plant-6 (AFP-6), which is operated by Lockheed Martin Aeronautical Systems Corporation, is adjacent to and collocated with the installation. Lockheed Martin manufactures the C-130J *Hercules* and performs maintenance on the C-5 *Galaxy* and other aircraft. In addition, the General Lucius D. Clay National Guard Center, which is a Georgia Department of Defense (DOD) facility, is adjacent and collocated with the installation on the south and west sides.

1.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to construct a permanent commissary for authorized patrons. The need for the Proposed Action is to provide a commissary in the Atlanta metropolitan area. The Atlanta metropolitan area is defined by the U.S. Census Bureau as the Atlanta-Sandy Springs-Marietta Metropolitan Statistical Area, which includes 28 counties (U.S. Census Bureau 2010a). In 2011, commissaries in the Atlanta metro area were located at Fort Gillem and Fort McPherson in southern Atlanta and the Navy Supply Corps School in Athens, Georgia. In 2005, the Defense Base Closure and Realignment (BRAC) Commission made recommendations that affected Fort McPherson, Fort Gillem, and the Navy Supply Corps School. As a result of these recommendations, the Fort McPherson commissary is scheduled to be closed in 2012; the Fort Gillem commissary has already closed. In addition, the Navy Supply Corps School will be relocated to Naval Station Newport in Rhode Island in 2011. Upon closure of these facilities, there will not be a DOD commissary in the Atlanta metropolitan area. Patrons will have to drive several hours to the nearest alternative commissary at Fort Benning, Robins Air Force Base (AFB), or Fort Gordon in Georgia (see **Figure 1-1**). The approximate driving times from the Atlanta metropolitan area to the nearest commissaries are as follows:

- **Robins AFB:** 2-hour drive
- **Fort Benning:** 2-hour drive
- **Fort Gordon:** 3-hour drive.

Populations in the Atlanta metropolitan area that use these commissaries include retirees, active-duty and Reserve personnel, and their dependents. In 2010, sales at Fort McPherson, Fort Gillem, and the Navy Supply Corps School totaled $33.3 million. It is estimated that there are 60,000 to 70,000 retirees in the

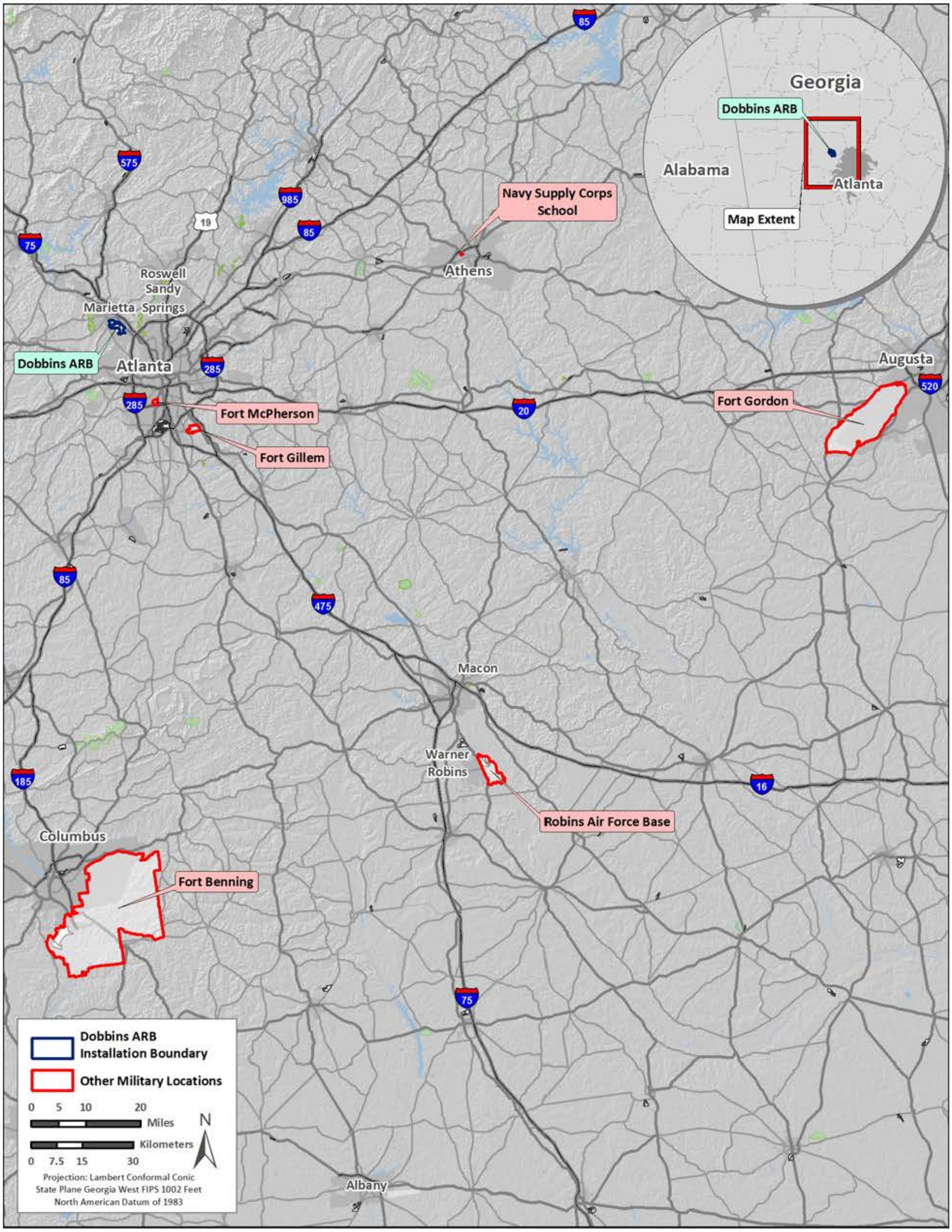


Figure 1-1. Vicinity Map and Surrounding Installations

area. The construction of a new commissary in the Atlanta metropolitan area would provide service to these patrons and retain the annual expenditures in this region.

1.3 Scope of the Analysis

This EA evaluates the impacts of the Proposed Action involving the construction of a proposed commissary, approximately 70,972 ft^2 in size, at four alternative site locations. The site locations that are evaluated in this EA are as follows and are shown in **Figure 1-2**:

- Site Alternative 1: Corps Lab Site
- Site Alternative 2: Base Exchange (BX) Site
- Site Alternative 3: Barclay Gate Site
- Site Alternative 4: City of Marietta Site.

Site Alternative 1, the Corps Lab Site, is in the northwestern corner of the installation near a former U.S. Army Corps of Engineers (USACE) Laboratory facility. This site consists of 24.3 acres and includes property owned by AFRC, Air Force Materiel Command (AFMC), and the Georgia DOD. Site Alternative 2 is the BX Site. At this site location, the proposed commissary would be built adjacent to the existing BX. This site includes 9.0 acres, is owned by AFRC, and is near the intersection of Industrial Drive and Atlantic Avenue. Site Alternative 3 is the Barclay Gate site. This site is owned by AFMC, includes 45.7 acres north of Alternative Site 2, and is southwest of South Cobb Drive. Site Alternative 4, the City of Marietta, is the site of Wildwood Park, which is east of South Cobb Drive and northeast of Alternative Site 3. This property is currently owned by the City of Marietta and consists of 23.2 acres.

The scope of this EA includes an evaluation of the Proposed Action and alternatives, including the No Action Alternative. Under the No Action Alternative, a commissary would not be built at Dobbins ARB and patrons would need to drive outside the Atlanta metropolitan area to visit a commissary.

This EA examines the potential effects of the Proposed Action and alternatives on 11 resource areas: noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, infrastructure, hazardous materials and wastes, and safety. These resources were identified as being potentially affected by the Proposed Action and include applicable elements of the human environment that are prompted for review by Executive Orders (EOs), regulation, or policy. The cumulative impacts analysis includes on-installation projects associated with the Proposed Action and other on-installation and off-installation projects.

1.4 Summary of Key Environmental Compliance Requirements

1.4.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] Section 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decisionmakers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. NEPA established the Council on Environmental Quality (CEQ), which was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis. This approach also requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action.

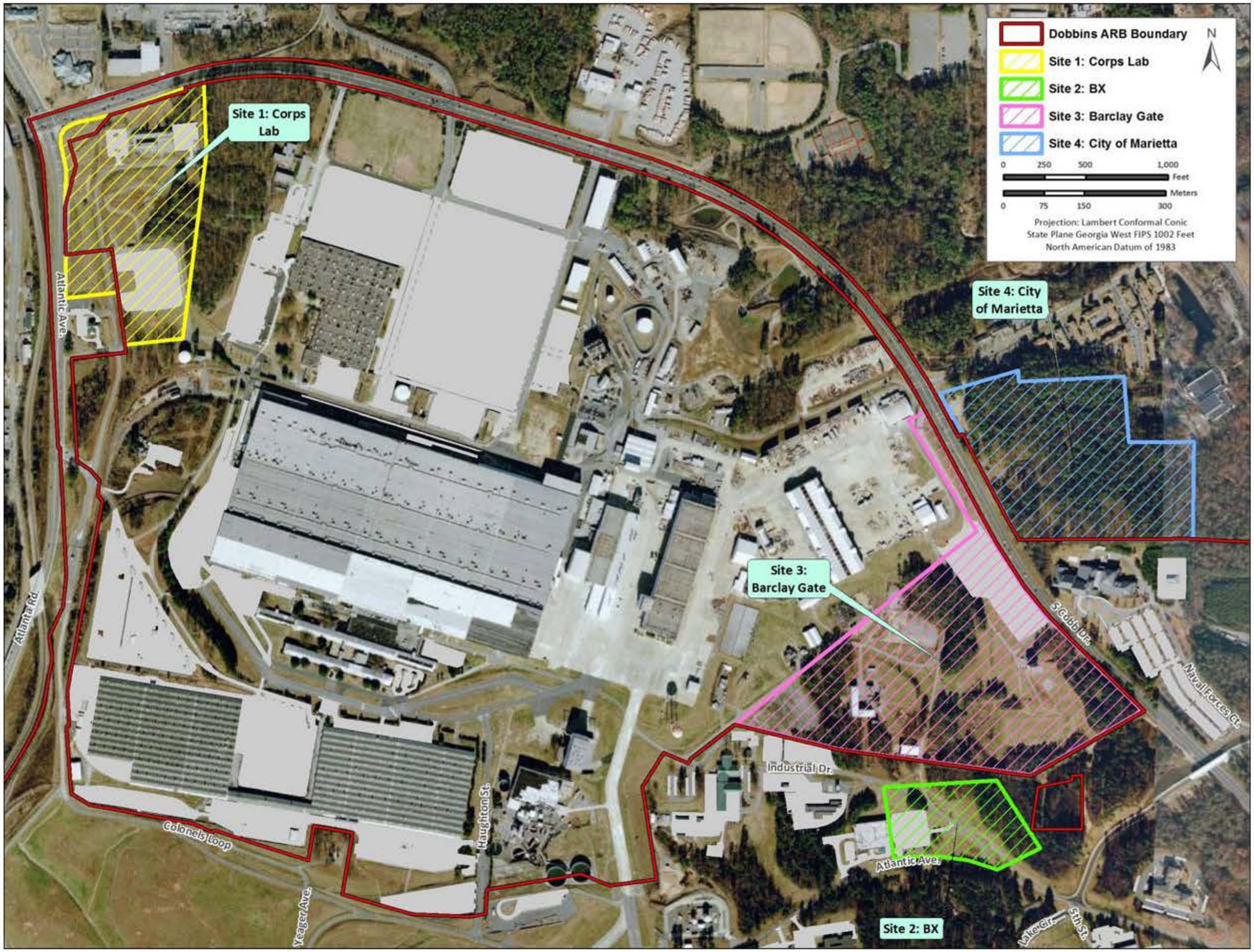


Figure 1-2. Alternative Site Locations Map

The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. CEQ regulations specify that the NEPA process should be used to identify and assess the reasonable alternatives to proposed actions that would avoid or minimize adverse effects of those actions upon the quality of the natural and human environment. CEQ regulations specify that an EA be prepared to briefly provide evidence and analysis for determining whether to prepare a Finding of No Significant Impact (FONSI), or whether the preparation of an Environmental Impact Statement (EIS) is necessary. If an EA is completed and significant impacts are not identified, the decisionmaker would sign and publish a FONSI. This EA can aid in an agency's compliance with NEPA by identifying when an EIS is unnecessary while organizing information when an EIS is required.

Air Force Policy Directive 32-70, *Environmental Quality*, states that the U.S. Air Force (USAF) will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is the *Environmental Impact Analysis Process* (EIAP), codified in 32 CFR Part 989, as amended.

1.4.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

While not comprehensive, a list of potentially applicable laws, regulations, policies, and planning criteria is provided in **Table 1-1**.

1.4.3 Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), Native American Tribal Consultation, and Public Involvement

IICEP. NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process. The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs*, require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. Air Force Instruction (AFI) 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, requires the USAF to implement the IICEP process, which is used for the purpose of agency coordination and implements scoping requirements. Through the IICEP process, Dobbins ARB notifies relevant Federal, state, and local agencies of the Proposed Action, identified alternatives, and provides sufficient time to present any specific environmental concerns associated with the Proposed Action. IICEP material related to this action will be included, as developed, in **Appendix A**, which will be expanded throughout the EA development process.

Table 1-1. Summary of Applicable Statutes and Regulations

Regulation	Source
Air Quality	
Clean Air Act of 1970 and Amendments of 1977 and 1990, including the General Conformity Rule and the Greenhouse Gas Tailoring Rule	42 U.S.C. 7401 et seq., as amended
Air Quality Compliance	AFI 32-7040
Federal Leadership in Environmental, Energy, and Economic Performance	EO 13514
Noise	
Noise Control Act of 1972	42 U.S.C. 4901 et seq., Public Law (P.L.) 92-574
Air Installation Compatible Use Zone Program	AFI 32-7063
Airspace	
Air Force Airspace Management	AFI 13-201
Aeronautical Informational Manual	Federal Aviation Administration Manual
Health and Safety	
Air Force Occupational and Environmental Safety, Fire Protection, and Health Program	AFI 91-301
USAF Mishap Prevention Program	AF 91-202
Protection of Children from Environmental Health and Safety Risks	EO 13045
Geology and Soils	
Farmland Protection Policy Act of 1981	7 U.S.C. 4201
Water Quality, Wetlands, Floodplains, and Coastal Zones	
Clean Water Act of 1972	33 U.S.C. 1251 et seq., as amended
Safe Drinking Water Act of 1974	42 U.S.C. 300
Water Quality Compliance	AFI 32-7041
Protection of Wetlands	EO 11990
Floodplain Management	EO 11988
Biological Resources	
Endangered Species Act of 1973	16 U.S.C. 1531–1543
Migratory Bird Treaty Act of 1918	16 U.S.C. 703–712
Bald and Golden Eagle Protection Act	16 U.S.C. 668–668c
Sikes Act Improvement Act of 1977	16 U.S.C. 670a–670o, 74 Stat. 1052
Invasive Species (3 February 1999)	EO 13112
Protection and Enhancement of Environmental Quality	EO 11514
Conservation of Migratory Birds	EO 13186
Integrated Natural Resources Management	AFI 32-7064

Regulation	Source
Land Use and Aesthetic Resources	
Land Use Planning Bulletin, Base Comprehensive Planning	Headquarters (HQ) Air Force Center for Engineering and the Environment, 1 August 1986
Land Use Planning	AFPAM 32-1010
Air Force Comprehensive Planning	AFI 32-7062
Cultural Resources	
National Historic Preservation Act of 1966	16 U.S.C. 470 et seq., as amended
Archaeological Resources Protection Act of 1979	16 U.S.C. 470a-11, as amended
American Indian Religious Freedom Act of 1978	P.L. 95-341 and 42 U.S.C. 1996, as amended
The Native American Graves Protection and Repatriation Act of 1990	P.L. 101-601 and 25 U.S.C. 3001–3013
Protection and Enhancement of the Cultural Environment	EO 11593
Indian Sacred Sites	EO 13007
Consultation and Coordination with Indian Tribal Governments	EO 13175
Preserve America	EO 13287
Cultural Resources Management	AFI 32-7065
Hazardous Materials and Waste Management	
Resource Conservation and Recovery Act of 1976	42 U.S.C. 6901, as amended
Comprehensive Environmental Response, Compensation, and Liability Act of 1980	42 U.S.C. 9601 et seq.
Pollution Prevention Act of 1990	42 U.S.C. 1301 et seq.
Toxic Substance Control Act of 1976	15 U.S.C. 53
Superfund Amendments and Reauthorization Act of 1986	26 U.S.C. 9507
Strengthening Federal Environmental, Energy, and Transportation	EO 13423
Solid and Hazardous Waste Compliance	AFI 32-7042
Environmental Restoration Program	AFI 32-7020
Federal Compliance with Pollution Control Standards	EO 12088
Defense Environmental Restoration Program	10 U.S.C. 2701 et seq.
Environmental Justice	
Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	EO 12898
Transportation	
Hazardous Material Transportation Act of 1975	49 U.S.C. 5101-5128

Native American Tribal Consultation. EO 13175, *Consultation and Coordination with Indian Tribal Governments* (6 November 2000), directs Federal agencies to coordinate and consult with federally recognized Native American tribal governments on a government-to-government basis whose interests might be directly and substantially affected by activities on federally administered lands. To comply with legal mandates, federally recognized tribes that are affiliated historically within the Dobbins ARB geographic region are invited to consult on all proposed undertakings that have a potential to affect properties of cultural, historical, or religious significance to the tribes. Because many tribes were displaced from their original homelands, tribes with cultural roots in an area might not currently reside in the region where the undertaking is to occur. Effective consultation requires identification of tribes based on ethnographic and historical data and not simply a tribe's proximity to a project area. The tribal consultation process is distinct from NEPA consultation or the IICEP processes and requires separate notification of all relevant tribes by Dobbins ARB. The timelines for tribal consultation are also distinct from those of intergovernmental consultations. The Dobbins ARB Cultural Resources Manager serves as the point-of-contact for day-to-day issues with Native American tribes, the Georgia State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP).

A letter requesting consultation will be sent to each affiliated tribe describing the Proposed Action on Dobbins ARB and asking them to identify any potential concerns they might have. The goal of the tribal consultation process is not simply to consult on a particular undertaking but rather to build constructive relationships with the appropriate Native American tribes. Consultation should lead to constructive dialogue in which Native American tribes are active participants in the planning process. A list of the Native American tribal governments who will be consulted regarding this action is included in **Appendix A**. Tribal consultation, which is part of the Section 106 of the NHPA, will occur once a preferred site has been chosen. At this time, a preferred site has not been chosen.

Public Involvement. A Notice of Availability (NOA) was published in the *Marietta Daily Journal* and the *Atlanta Journal-Constitution* that announced the Draft EA was available to the public for a 30-day review and comment period. The NOA was issued to solicit comments on the Proposed Action and involve the local community in the decisionmaking process.

2. Description of the Proposed Action and Alternatives

This section presents information on the Proposed Action of constructing a new commissary at Dobbins ARB. As discussed in **Section 1.4.1**, the NEPA process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. Reasonable alternatives must satisfy the purpose of and need for a proposed action, which are defined in **Section 1.2**. CEQ regulations specify the inclusion of a No Action Alternative against which potential effects can be compared. While the No Action Alternative would not satisfy the purpose of or need for the Proposed Action, it is analyzed in detail in accordance with CEQ regulations.

2.1 Proposed Action

The Proposed Action consists of the construction of a permanent commissary. The commissary would be approximately 70,972 ft^2 in size and would include general sales, a Grab-N-Go area, electronic checkout registers, receiving area, loading dock, meat and produce preparation areas, cold and freezer storage, and other supporting areas. Mechanical ventilation would be used where required and heat recovery would be used where possible with back-up from a self-contained system. Air conditioning would be installed in the sales areas and computer rooms and reclamation of cold air from commissary display cases would be used in conjunction with the air conditioning system. In addition, the project would include emergency building lighting, fire protection systems, and a refrigeration support system with automatic monitoring control. Supporting facilities would include electronic checkout registers, utilities, communications and alarms, power, pavement, curbs and gutters, sidewalks, storm drainage systems, landscaping, and other site improvements. The project would be constructed to satisfy current energy conservation policies, standards, and regulations as applicable and force protection measures meeting minimum DOD standards.

Under the Proposed Action, a parking lot consisting of approximately 350 patron parking spaces, 50 employee spaces, and shopping cart corrals would be constructed. To accommodate deliveries, a paved parking area and loading docks would be built in the rear of the commissary. In addition, an access road that could accommodate the delivery trucks traveling to the back of the commissary would need to be constructed.

2.2 Site-Selection Criteria

In order to identify sites where the proposed commissary could be built at Dobbins ARB, the following site-selection criteria were identified:

- The property must either be owned by DOD or be available for acquisition
- The site on Dobbins ARB should be near existing community service or commercial facilities so that existing utilities and roadways can be used
- The site must be within or adjacent to the military installation so that a controlled access point can be built and manned and emergency military personnel can respond to a crisis within the required 5-minute time period
- The site must be at least 9 acres
- The site must be consistent with future land uses and the Dobbins ARB General Plan
- The site must be consistent with state, regional, and local land use plans.

2.3 Alternative Site Locations

Several site alternatives presented in this EA are considered reasonable (i.e., economically and technically feasible) and practicable to be carried forward for further detailed analysis. Some alternatives could be deemed practicable or feasible even if the site location is not on property owned by DOD. Alternatives that did not satisfy the purpose of and need for the action or the site-selection criteria were not considered reasonable and practicable and, therefore, were eliminated from further detailed analysis in this EA. There are four site location alternatives that are evaluated in this EA.

2.3.1 Site Alternative 1: Corps Lab Site

Site Alternative 1 is in the northwest corner of the installation at the intersection of South Cobb Drive and Atlanta Road. This site consists of 24.3 acres on USAF-owned land. The eastern portion of the property is within AFP-6, which is owned by AFMC and operated and maintained by Lockheed Martin. Lockheed Martin is not currently using any of the buildings on this site to produce or perform maintenance on aircraft. A fitness trail runs through this property. The western portion of the property is within Dobbins ARB and is owned and maintained by AFRC. Approximately 5.8 acres in the northern portion is owned by the Georgia DOD.

There are several buildings on Site 1, including a former USACE laboratory facility. This facility was used as a soils and construction materials laboratory in the past; currently, the Georgia DOD uses the building for storage. Additional buildings and items on Site 1 include the Aviation Wing of the Marietta Museum of History; aircraft displays; and several trailers in a fenced-in area associated with the museum. The Aviation Wing of the Marietta Museum of History is managed by the Cobb County Historical Commission. If Site 1 were chosen for the Proposed Action, the museum might require relocation.

If the proposed commissary were built at this site, several development constraints require consideration. Property owned by AFMC would be transferred to AFRC. As previously mentioned, Lockheed Martin is not currently using facilities on this property to produce aircraft or perform maintenance on them. The USACE Laboratory facility potentially contains contaminants due to past use, and additional studies to properly characterize potential contamination at the facility would be required prior to redevelopment of the site (GAARNG 2010).

This site does not have a controlled access point, which means nonmilitary personnel can enter the site at any time. Controlled access points are required for commissaries that sell goods to military personnel. Currently, there is an entrance from Atlanta Road to AFP-6 and a separate controlled entrance to access Dobbins ARB, both of which are south of Site 1. If the proposed commissary were constructed on Site 1, the controlled access point would be relocated or a new entrance would be required, and accommodation of access for Lockheed Martin employees would continue. If a new controlled access point were constructed, additional security staffing at the gate would be required.

2.3.2 Site Alternative 2: BX Site

Site Alternative 2 is near the intersection of Industrial Drive and Atlantic Avenue. This site is 9.0 acres in size, which includes the area for the proposed commissary, it does not include the existing BX facility. The existing BX is at the southwest corner of Site 2 between and Industrial Drive and Atlantic Avenue. The land to the north of Industrial Drive is generally undeveloped. If this site were chosen, the proposed commissary would be built adjacent to the existing BX, which would likely be advantageous to patrons. All of the property is owned by AFRC.

If the proposed commissary were built at this site, several development constraints would require consideration. To accommodate a new commissary and the required parking spaces, Industrial Drive would be rerouted, likely to the west of the existing BX. Although Industrial Drive would not traverse through Site 2, delivery trucks would still be able to take the rerouted drive and access the BX and commissary from the north side. The new main entrance to the BX and commissary would be from Atlantic Avenue.

If the existing BX and proposed commissary were collocated, there would be an increase in the amount of traffic on the adjacent roadways. The new patrons and employees (about 400 vehicles a day) could cause congestion in the immediate area. In addition, although the site has adequate utilities to accommodate a commissary, some of the existing water pipelines north of Industrial Drive would likely require relocation. These pipes are fairly close to the surface; as a result the grading and construction under the Proposed Action would require the pipes to be moved.

2.3.3 Site Alternative 3: Barclay Gate Site

Site Alternative 3 is southwest of South Cobb Drive and includes 45.7 acres. All of the property at Site 3 is owned by AFMC and operated by Lockheed Martin. If this site were chosen, the property would need to be transferred to AFRC.

There are numerous buildings on this site, some of which are used for storage and some are vacant. Various items are stored on the property including trucks, trailers, and aging equipment. There are two trailers that are used as temporary explosive storage facilities on a parking lot at the north end of the site.

There are six Installation Restoration Program (IRP) sites on the property, including SWMU 1, SWMU 3, SWMU 5, SWMU 9, SWMU 32, and SWMU 78. The IRP was developed by the DOD to identify, evaluate, and clean up contamination from past operations on military installations. The IRP is designed to ensure DOD compliance with Federal and state regulations, while still allowing the military to carry out its mission. The two IRP sites on Site 3 are adjacent to each other. One of these sites is about 1 acre and is a former landfill. The second site is a former leachate pond about 100 x 100 feet in size. The contaminants in both of the IRP sites have been contained, and the sites are in long-term monitoring phase. Site 3 is large enough to accommodate the proposed commissary without encroaching upon the IRP sites.

2.3.4 Site Alternative 4: City of Marietta Site

Site Alternative 4 is east of South Cobb Drive and northeast of Site 3. It consists of 23.2 acres. This property is the site of Wildwood Park and is owned and operated by the City of Marietta. The majority of the park is forested and there are several streams that run through the property. There are numerous walking trails throughout the park and a dog park at the entrance. The City of Marietta has listed the current land use as parks and recreation, but it is zoned Office Institutional.

If the proposed commissary were built at this site, several development constraints would need to be considered. The existing controlled access gates on Dobbins ARB could be used to access this site. Patrons would need to take Gym Road bridge, which crosses over South Cobb Drive, to access the northern part of the installation and Site 4. However, the road network in this region of the installation would require upgrading to accommodate increases in traffic and commercial deliveries, and a new road would need to be constructed to directly access the site. In addition, fencing around the perimeter would need to be installed to ensure the entire site is secure.

There are several areas in the park that would need to be considered when siting the commissary. There are two potential cemeteries, an area with possible cultural significance, and a stream that bisects the site. In addition, there is a groundwater plume with trichloroethylene (TCE) contaminants that has migrated from AFP-6 along the western boundary of the site.

2.4 Alternative Site Considered but Eliminated from Detailed Analysis

Under NEPA, reasonable alternatives must be considered in the EA. Consequently, site alternatives that were considered reasonable and practicable and meet the site-selection criteria were considered. An alternative site that was considered but did not meet all the site-selection criteria is described in the following paragraph.

A.L. Burruss Park is on South Cobb Drive, southeast of Wildwood Park, and is owned and operated by the City of Marietta. The majority of the park is forested. There are numerous trails throughout the park; portions of several were closed in 2011 as a result of flooding. About half of the park is within the 100-year floodplain (FEMA 2008). Given the extensive land within the floodplain, it is also likely that a large portion of the property consists of wetlands. It is USAF policy to avoid constructing new facilities within the 100-year floodplain and in wetlands, if possible. Development within floodplains is avoided to protect the functions of floodplains and wetlands and minimize the potential damage to facilities. Given the potential impact on floodplains and the probable impact on wetlands, this alternative is not considered reasonable and practicable and is eliminated from further detailed analysis in this EA.

2.5 No Action Alternative

CEQ regulations require consideration of the No Action Alternative for all proposed actions. The No Action Alternative serves as a baseline against which the impacts of the Proposed Action and other potential action alternatives can be compared and consequently it is carried forward for further analysis in this EA.

Under the No Action Alternative, Dobbins ARB would not construct the proposed commissary. As a result, there would not be a commissary in the Atlanta metropolitan area for patrons, which include retirees, active-duty and Reserve personnel, and their dependents. As previously mentioned, sales at Fort McPherson, Fort Gillem, and the Navy Supply Corps School totaled $33.3 million in 2010. Patrons would need to drive outside the Atlanta metro area to visit a commissary. Therefore, there would be an annual loss of approximately $33 million in revenue in the Atlanta metro area under the No Action Alternative. This alternative is carried forward for analysis as a baseline against which the impacts of the Proposed Action and the potential action alternatives can be evaluated.

2.6 Decision to be Made and Identification of the Preferred Alternative

In this EA, Dobbins ARB evaluates whether the Proposed Action would result in any potentially significant impacts at the different alternative site locations. If such impacts are predicted, Dobbins ARB would provide mitigation to reduce impacts to below the level of significance, undertake the preparation of an EIS addressing the Proposed Action, or abandon the Proposed Action. This EA also can be used to guide Dobbins ARB in implementing the Proposed Action and choosing a site location in a manner consistent with USAF standards for environmental stewardship. The Preferred Alternative for the Proposed Action will be identified as planning progresses.

3. Affected Environment

All potentially relevant resource areas were initially considered for analysis in this EA. In compliance with NEPA and CEQ guidelines, the discussions of the affected environment in **Section 3** and the environmental consequences in **Section 4** focus only on those resource areas considered potentially subject to impacts and with potentially significant environmental issues. This section includes air quality, noise, land use, geological resources, water resources, biological resources, cultural resources, infrastructure, hazardous materials and wastes, safety, and socioeconomic and environmental justice.

3.1 Air Quality

3.1.1 Definition of the Resource

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of criteria pollutants in the atmosphere. The air quality in a region is a result of not only the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

Ambient Air Quality Standards. Under the CAA, the U.S. Environmental Protection Agency (USEPA) developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. The NAAQS represent the maximum allowable concentrations for ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb) (40 CFR Part 50). The CAA also gives the authority to states to establish air quality rules and regulations. The State of Georgia has adopted the NAAQS for federally listed criteria pollutants with the exception of some SO_2 standards. **Table 3-1** presents the USEPA NAAQS for federally listed criteria pollutants and the Georgia specific SO_2 standards.

Attainment Versus Nonattainment and General Conformity. The USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are therefore designated as either "attainment," "nonattainment," "maintenance," or "unclassified" for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than the NAAQS; nonattainment indicates that criteria pollutant levels exceed NAAQS; maintenance indicates that an area was previously designated nonattainment but is now attainment; and an unclassified air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR, so the area is considered attainment. USEPA has delegated the authority for ensuring compliance with the NAAQS in the State of Georgia to the Georgia Department of Natural Resources. In accordance with the CAA, each state must develop a State Implementation Plan (SIP), which is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS.

The General Conformity Rule applies only to significant actions in nonattainment or maintenance areas. The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan. More specifically, CAA conformity is ensured when a Federal action does not cause a new violation of the NAAQS; contribute to an increase in the frequency or severity of violations of NAAQS; or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS.

Table 3-1. National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard	Secondary Standard
CO	8-hour (1)	9 ppm (10 mg/m^3)	None
	1-hour (1)	35 ppm (40 mg/m^3)	None
Pb	Rolling 3-Month Average	0.15 μg/m^3 (2)	Same as Primary
NO$_2$	Annual (Arithmetic Average)	53 ppb (3)	Same as Primary
	1-hour (4)	100 ppb	None
PM$_{10}$	24-hour (5)	150 μg/m^3	Same as Primary
PM$_{2.5}$	Annual (6) (Arithmetic Average)	15.0 μg/m^3	Same as Primary
	24-hour (7)	35 μg/m^3	Same as Primary
O$_3$	8-hour (8)	0.075 ppm (2008 Standard)	Same as Primary
	8-hour (9)	0.08 ppm (1997 Standard)	Same as Primary
	1-hour (10)	0.12 ppm	Same as Primary
SO$_2$	Annual (Arithmetic Average)	0.03 ppm (11) (1971 Standard) 80 μg/m^3 (Georgia Standard)	0.5 ppm (3-hour) (1)
	24-hour (1)	0.14 ppm (11) (1971 Standard) 365 μg/m^3 (Georgia Standard)	0.5 ppm (3-hour) (1) 1,300 μg/m^3 (3-hour, Georgia Standard)
	1-hour	75 ppb (12)	None

Source: USEPA 2011a, GADNR 2011

Notes: Parenthetical values are approximate equivalent concentrations.

1. Not to be exceeded more than once per year.
2. Final rule signed 15 October 2008. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
3. The official level of the annual NO$_2$ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of cleaner comparison to the 1-hour standard.
4. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (effective 22 January 2010).
5. Not to be exceeded more than once per year on average over 3 years.
6. To attain this standard, the 3-year average of the weighted annual mean PM$_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 μg/m^3.
7. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 μg/m^3 (effective 17 December 2006).
8. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective 27 May 2008).
9. a. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
   b. The 1997 standard – and the implementation rules for that standard – will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
   c. USEPA is in the process of reconsidering these standards (set in March 2008).
10. a. USEPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").
    b. The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is $\leq$ 1.
11. The 1971 sulfur dioxide standards remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
12. Final rule signed on 2 June 2010. To attain this standard, the 3-year average of the 99th percentile of daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

Key: ppm = parts per million; ppb = parts per billion; mg/m^3 = milligrams per cubic meter; μg/m^3 = micrograms per cubic meter

Federal Prevention of Significant Deterioration. Federal Prevention of Significant Deterioration (PSD) regulations apply in attainment areas to a major stationary source (i.e., source with the potential to emit 250 tons per year [tpy] of any criteria pollutant), and a significant modification to a major stationary source (i.e., change that adds 10 to 40 tpy to the facility's potential to emit depending on the pollutant). Additional PSD major source and significant modification thresholds apply for greenhouse gases (GHGs), as discussed in the Greenhouse Gas Emissions subsection. PSD permitting can also apply to a proposed project if all three of the following conditions exist: (1) the proposed project is a modification with a net emissions increase to an existing PSD major source, and (2) the proposed project is within 10 kilometers of national parks or wilderness areas (i.e., Class I Areas), and (3) regulated stationary source pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 microgram per cubic meter ($\mu g/m^3$) or more (40 CFR 52.21[b][23][iii]). A Class I area includes national parks larger than 6,000 acres, national wilderness areas and national memorial parks larger than 5,000 acres, and international parks. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's Class designation (40 CFR 52.21[c]).

Title V Requirements. Title V of the CAA Amendments of 1990 requires states and local agencies to permit major stationary sources. A Title V major stationary source has the potential to emit criteria air pollutants and hazardous air pollutants (HAPs) at levels equal to or greater than Major Source Thresholds. Major Source Thresholds vary depending on the attainment status of an ACQR. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality. Section 112 of the CAA lists HAPs and identifies source categories.

Greenhouse Gas Emissions. GHGs are gaseous emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The most common GHGs emitted from natural processes and human activities include carbon dioxide (CO_2), methane, and nitrous oxide. On 22 September 2009, the USEPA issued a final rule for mandatory GHG reporting from large GHG emissions sources in the United States. The purpose of the rule is to collect comprehensive and accurate data on CO_2 and other GHG emissions that can be used to inform future policy decisions. In general, the threshold for reporting is 25,000 metric tons or more of CO_2 equivalent emissions per year but excludes mobile source emissions. The first emissions report is due in 2011 for 2010 emissions. GHG emissions will also be factors in PSD and Title V permitting and reporting, according to a USEPA rulemaking issued on 3 June 2010 (75 Federal Register 31514). GHG emissions thresholds of significance for permitting of stationary sources are 75,000 tons CO_2 equivalent per year and 100,000 tons CO_2 equivalent per year under these permit programs.

EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed in October 2009 and requires agencies to set goals for reducing GHG emissions. One requirement within EO 13514 is the development and implementation of an agency Strategic Sustainability Performance Plan (SSPP) that prioritizes agency actions based on lifecycle return on investment. Each SSPP is required to identify, among other things, "agency activities, policies, plans, procedures, and practices" and "specific agency goals, a schedule, milestones, and approaches for achieving results, and quantifiable metrics" relevant to the implementation of EO 13514. On 26 August 2010, DOD released its SSPP to the public. This implementation plan describes specific actions the DOD will take to achieve its individual GHG reduction targets, reduce long-term costs, and meet the full range of goals of the EO. All SSPPs segregate GHG emissions into three categories: Scope 1, Scope 2, and Scope 3 emissions. Scope 1 GHG emissions are those directly occurring from sources that are owned or controlled by the agency. Scope 2 emissions are indirect emissions generated in the production of electricity, heat, or steam purchased by the agency. Scope 3 emissions are other indirect GHG emissions that result from agency activities but from sources that are not owned or directly controlled by the agency. The GHG goals in the DOD SSPP include reducing Scope 1 and Scope 2 GHG emissions by 34 percent by 2020, relative to Fiscal Year (FY)

2008 emissions, and reducing Scope 3 GHG emissions by 13.5 percent by 2020, relative to FY 2008 emissions. The first GHG air quality emissions report is due in 2011 for 2010 emissions.

3.1.2 Affected Environment

All of the site location alternatives are in Cobb County, Georgia, which is within the Metropolitan Atlanta AQCR. The Metropolitan Atlanta AQCR also includes Butts, Carroll, Clayton, Coweta, De Kalb, Douglas, Fayette, Fulton, Gwinnett, Heard, Henry, Lamar, Meriwether, Pike, Rockdale, Spalding, Troup, and Upson counties in Georgia (USEPA 2011b). Cobb County has been designated by the USEPA as unclassified/attainment for CO, NO_2, SO_2, Pb, and PM_{10}. Cobb County has been designated as nonattainment for $PM_{2.5}$, moderate nonattainment for 8-hour O_3, and maintenance for 1-hour O_3 (USEPA 2011c). According to 40 CFR Part 81, no Class I areas are located within 10 kilometers of the site alternatives (USEPA 2011d).

The most recent emissions inventory for Cobb County and the Metropolitan Atlanta AQCR are shown in **Table 3-2**. Cobb County is considered the local area of influence, and the Metropolitan Atlanta AQCR is considered the regional area of influence for this air quality analysis. O_3 is not a direct emission; it is generated from reactions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), which are precursors to O_3. Therefore, for the purposes of this air quality analysis, VOCs and NO_x emissions are used to represent O_3 generation.

Table 3-2. Local and Regional Air Emissions Inventory for the Proposed Action (2002)

Area	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)
Cobb County	20,872	22,492	129,676	25,972	17,573	3,892
Metropolitan Atlanta AQCR	161,849	150,101	890,752	178,961	165,459	34,875

Source: USEPA 2008

Dobbins ARB currently holds an approved synthetic minor air operating permit with the Georgia Department of Natural Resources (GADNR). This permit contains operational limits in order for emissions from the facility to remain below the Title V operating permit thresholds. Any new stationary sources added to Dobbins ARB would need to be evaluated as to whether they would affect compliance with this permit. In addition, new sources could need to be added to this permit through approval by GADNR. (Dobbins ARB 2011c)

3.2 Noise

3.2.1 Definition of the Resource

Sound is defined as a particular auditory effect produced by a given source, for example the sound of rain on a rooftop. Noise and sound share the same physical aspects, but noise is considered a disturbance while sound is defined as an auditory effect. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Noise can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or as annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) areas in which occasional or persistent sensitivity to noise above ambient levels exists.

Noise Metrics and Regulations

Although human response to noise varies, measurements can be calculated with instruments that record instantaneous sound levels in decibels. A-weighted decibel (dBA) is used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency range to what the average human ear can sense when experiencing an audible event. The threshold of audibility is generally within the range of 10 to 25 dBA for normal hearing. The threshold of pain occurs at the upper boundary of audibility, which is normally in the region of 135 dBA (USEPA 1981a). **Table 3-3** compares common sounds and shows how they rank in terms of the effects of hearing. As shown, a whisper is normally 30 dBA and considered to be very quiet while an air conditioning unit 20 feet away is considered an intrusive noise at 60 dBA. Noise levels can become annoying at 80 dBA and very annoying at 90 dBA. To the human ear, each 10 dBA increase seems twice as loud (USEPA 1981b).

Table 3-3. Sound Levels and Human Response

Noise Level (dBA)	Common Sounds	Effect
10	Just audible	Negligible*
30	Soft whisper (15 feet)	Very quiet
50	Light auto traffic (100 feet)	Quiet
60	Air conditioning unit (20 feet)	Intrusive
70	Noisy restaurant or freeway traffic	Telephone use difficult
80	Alarm clock (2 feet)	Annoying
90	Heavy truck (50 feet) or city traffic	Very annoying Hearing damage (8 hours)
100	Garbage truck	Very annoying*
110	Pile drivers	Strained vocal effort*
120	Jet takeoff (200 feet) or auto horn (3 feet)	Maximum vocal effort
140	Carrier deck jet operation	Painfully loud

Source: USEPA 1981b and *HDR extrapolation

Federal Regulations

OSHA Standards. The Federal government has established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. Under the Noise Control Act of 1972, the Occupational Safety and Health Administration (OSHA) established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits (29 CFR Part 1910.95).

DOD Guidelines. Sound levels, resulting from multiple single events, are used to characterize noise effects from aircraft or vehicle activity and are measured in Day-Night Average Sound Level (DNL). The DNL noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure levels over a given 24-hour period. DNL is the designated noise metric of the Federal Aviation Administration (FAA), U.S. Department of Housing and Urban Development (HUD), USEPA, and DOD for modeling airport environments.

According to the USAF, the FAA, and the HUD criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds 75 dBA DNL, "normally unacceptable" in regions exposed to noise between 65 and 75 dBA DNL, and "normally acceptable" in areas exposed to noise of 65 dBA DNL or less. The Federal Interagency Committee on Noise developed land use compatibility guidelines for noise in terms of a DNL sound level (FICON 1992). For outdoor activities, the USEPA recommends 55 dBA DNL as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (USEPA 1974).

State Regulations. The State of Georgia does not have a comprehensive noise control regulation (State of Georgia 2011). Therefore, the sound level limits contained in the Cobb County or City of Marietta Code of Ordinances would apply to the Proposed Action.

Local Regulations. Dobbins ARB is located in Cobb County, and Site Alternative 4 is located within the Marietta city limits. Noise regulations for Cobb County are contained in Chapter 50, Article VII of the *Cobb County Code of Ordinances.* Per the ordinance, "loud noise" from construction activities (e.g., pile driver, pneumatic hammer, electric saws, and drills) are only permitted between 7:00 a.m. and 9:00 p.m., Monday through Saturday (Cobb County 2010).

Noise regulations for the City of Marietta are contained in Chapter 10-6 of the *Marietta Code of Ordinances*. Per the ordinance, operation of any sound-producing source cannot exceed the following limits (City of Marietta 2009). However, these sound level limits could be exceeded if a special administrative permit is obtained.

- At the boundary of a residential, public space, institutional, commercial, or business area, sound levels cannot exceed 65 dBA between 7:00 a.m. and 11:00 p.m., and 60 dBA between 11:00 p.m. and 7:00 a.m.
- At the boundary of a industrial or manufacturing area, sound levels cannot exceed 70 dBA at any time.

In addition, construction activities within 1,000 feet of any residential area are not permitted between 7:00 p.m. and 7:00 a.m. or anytime on Sundays. However, a permit may be granted for construction activities during these times if the city engineer determines that these activities would not impair the public's health or safety (City of Marietta 2009).

Construction Sound Levels

Building demolition and construction work can cause an increase in sound that is well above the ambient level. A variety of sounds are emitted from loaders, trucks, saws, and other work equipment. **Table 3-4** lists noise levels associated with common types of construction equipment. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3-4. Predicted Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Clearing and Grading	
Bulldozer	80
Grader	80–93
Truck	83–94
Roller	73–75
Excavation	
Backhoe	72–93
Jackhammer	81–98
Building Construction	
Concrete mixer	74–88
Welding generator	71–82
Pile driver	91–105
Crane	75–87
Paver	86–88

Source: USEPA 1971

3.2.2 Affected Environment

The ambient noise environment throughout Dobbins ARB is affected mainly by aircraft operations and automobile traffic, with military aircraft operations being the primary sound sources. Flying units at Dobbins ARB include the 94th Airlift Wing of AFRC, the Georgia Army National Guard (GAARNG), and the U.S. Army Reserve. In addition, aircraft from AFP-6 fly out of Dobbins ARB. Aircraft include the C-130, UH-60, and UH-72; and the C-5, and C-130 aircraft delivered by AFP-6. As shown on **Figure 3-1**, the 2011 DNL noise contours extend along the runway centerline to the east and west (Dobbins ARB 2011b). The 2011 DNL noise contours are directly south and west of the four alternative sites; no land within the alternative site boundaries is encompassed by the 2011 noise contours.

Vehicle use associated with military operations at Dobbins ARB consists of passenger, delivery trucks, and military vehicles. Passenger vehicles compose most of the vehicles present at Dobbins ARB and the surrounding community roadways. Roadways around the installation include South Cobb Drive to the north, Route 41 (Cobb Parkway) to the east, Atlanta Road to the west, and Windy Hill Road to the south. Atlanta Road borders Site Alternative 1 to the west; South Cobb Drive borders Site Alternative 1 to the north. South Cobb Drive borders Site Alternative 3 to the north, and Site Alternative 4 to the south. Within the installation boundary, Atlanta Avenue borders Site Alternative 2 to the south.

Site Alternative 1 is at the northwest corner of the installation, and Site Alternative 4 is outside the installation boundary to the north. Therefore, these site alternatives are bordered by potentially noise-sensitive land uses outside of the installation boundary. The land use west of Site Alternative 1 is a mix of businesses, industrial areas, and residential homes. Public/semi-public land use borders Site Alternative 1 to the north including the Cobb County Water Department. Site Alternative 4 is surrounded by public/semi-public land use to the north and east, which includes Life University, Southern Polytechnic State University, their associated facilities, and the Bright LIFE childcare and education center.

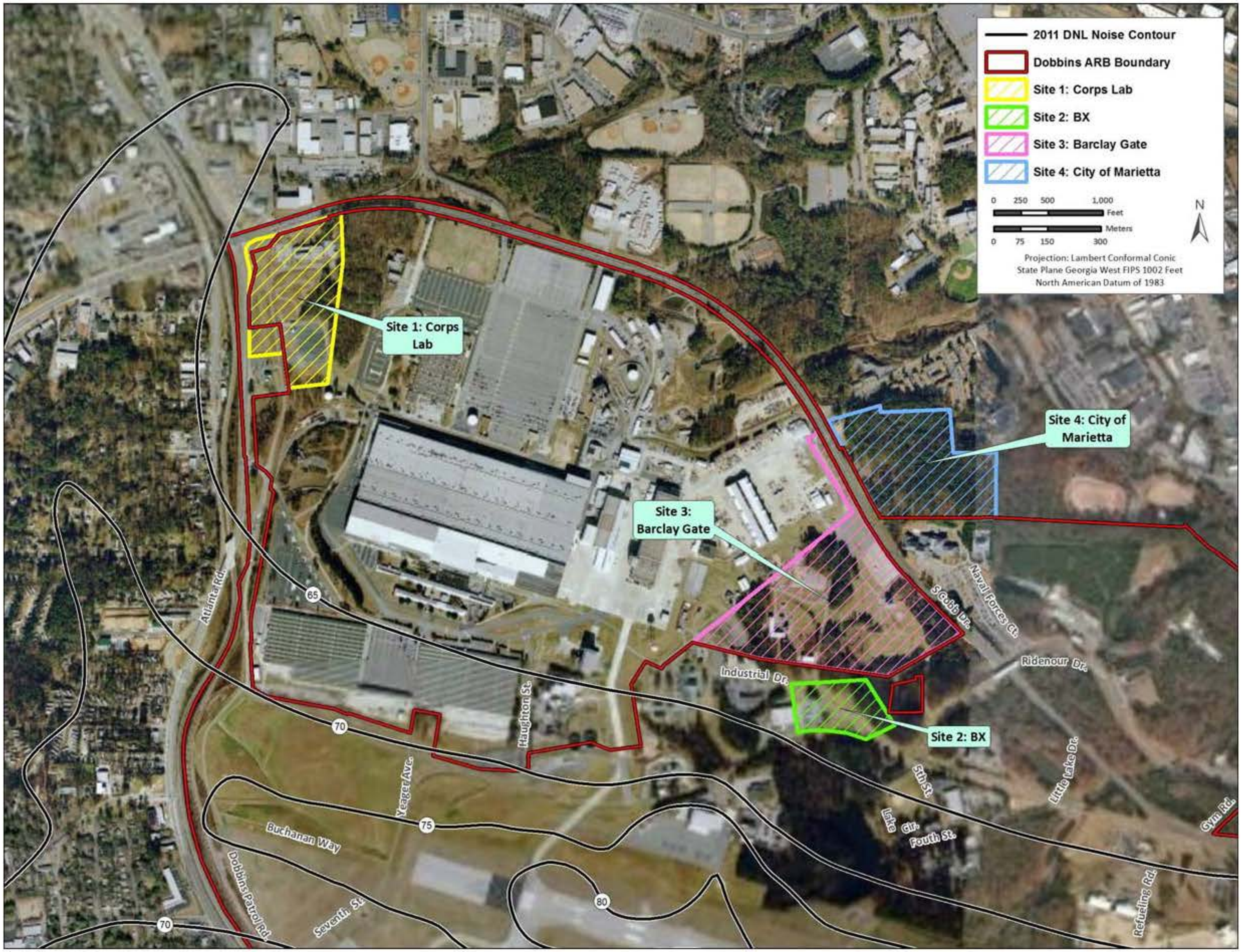


Figure 3-1. 2011 DNL Noise Contours at Dobbins ARB

Considering the military aircraft operations and vehicle traffic at and adjacent to Dobbins ARB, the ambient sound environment around the four site alternatives is likely to resemble a noisy urban residential area.

3.3 Land Use

3.3.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, "labels," and definitions vary among jurisdictions.

Natural conditions of property can be described or categorized as unimproved, undeveloped, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. According to AFI 32-7062, *Air Force Comprehensive Planning*, the site planning process must address potential noise impacts and consider the location of buildings. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

3.3.2 Affected Environment

Dobbins ARB is a compact installation bounded by South Cobb Drive to the north, Route 41 (Cobb Parkway) to the east, Atlanta Road to the west, and Windy Hill Road to the south. The dominant features on the northern side of the installation are the AFP-6 facilities. All of land within Site Alternative 3 and the majority of Site Alternative 1 are within AFP-6. Site Alternative 2 is within the Dobbins ARB installation boundary in the northern portion of the installation. Site Alternative 4 is adjacent to the northern installation boundary in the City of Marietta.

The eastern portion of Site Alternative 1 is owned by AFMC. AFMC leases property to AFP-6 and Cobb County. The land that is leased to AFP-6 is operated and maintained by Lockheed Martin. Lockheed Martin is not currently using any of the buildings on this site to perform maintenance on aircraft. The land that is leased to Cobb County is sub-leased to the Marietta Museum of History. This property accommodates the Aviation Wing of the Marietta Museum of History, has aircraft displays, and several trailers in a fenced-in area associated with the museum. Additional buildings on Site 1 include a former USACE laboratory facility, which the Georgia DOD uses for storage. A fitness trail runs through this property. The western portion of the property is within Dobbins ARB and is owned and maintained by AFRC. Approximately 5.8 acres in the northern portion is owned by the Georgia DOD.

Site Alternative 2 is adjacent to the existing BX facility. The BX is at the southwest corner of Site 2 between Industrial Drive and Atlantic Avenue. All of the property is owned by AFRC.

All of the property at Site Alternative 3 is owned by AFMC and operated by Lockheed Martin. There are numerous buildings on this site, some of which are used for storage and some are vacant. There are two trailers that are used as temporary explosive storage facilities on a parking lot at the north end of the site.

Site Alternative 4 consists of Wildwood Park and is owned and operated by the City of Marietta. The majority of the park is forested and there are several streams that run through the property. There are numerous walking trails throughout the park and a dog park at the entrance.

On-Installation Land Use. The on-installation land use was obtained from the 2010 Dobbins ARB General Plan (Dobbins ARB 2010a). The General Plan identifies 10 land use categories: administrative, aircraft operations and maintenance, airfield pavements, community commercial, community service, housing, industrial, medical, open space, and outdoor recreation. As shown on **Figure 3-2**, the Lockheed Martin facilities are adjacent to Dobbins ARB to the northwest. As such, Site Alternative 3 and the majority of Site Alternative 1 are designated as Lockheed Martin land use. The western portion of Site Alternative 2 is designed commercial, and the eastern portion is designated open space.

Off-Installation Land Use. The off-installation land use was obtained from the *2011 Air Installation Compatible Use Zone (AICUZ) Study for Dobbins ARB* (Dobbins ARB 2011b). The 2011 AICUZ Study identifies five land use categories: commercial, industrial, public/semi-public, recreational, and residential. As shown in **Figure 3-2**, the northern portion of Site Alternative 1 is not part of AFP-6, it is designated as public/semi-public. Site Alternative 4 is designated as recreational land use. Site Alternative 4 is surrounded to the north and east by public/semi-public land use, which includes Life University, Southern Polytechnic State University, their associated facilities, and the Bright LIFE childcare and education center. Dobbins ARB borders Site Alternative 1 to the west and south. On-installation land use to the west of Site 1 is designated Lockheed Martin, and to the south is designated administrative.

Future Land Use. According to the 2010 Dobbins ARB General Plan, future land use will continue to support current missions, and provide for potential expansion of missions and activities. Future land use at the installation is defined by functional uses, which allow for development within each land use category, and provide adequate infrastructure to support growth (Dobbins ARB 2010a). The future land use is shown on **Figure 3-3**.

The construction of a new commissary is one of the 13 “Planned, Programmed, and Recommended Projects” in the 2010 General Plan. The recommendations include constructing the proposed commissary at one of two locations: either at the intersection of South Cobb Drive and Atlanta Road, which encompasses the former USACE Lab (Site Alternative 1); or adjacent to the existing BX (Site Alternative 2). Site Alternative 1 is part of AFP-6; therefore, the General Plan does not make any future land use recommendations for this site. As discussed previously, the current land use within the Site Alternative 2 boundary is part commercial and part open space. The future land use shows this area being almost entirely commercial, with some open space in the eastern portion of the site.

Site Alternative 3 is part of AFP-6 and, as such, is not included in the future land use portion of the General Plan. Site Alternative 4 is outside the installation boundary within the City of Marietta. The *Marietta, Georgia Official Future Land Use Map* designates this parcel as parks/recreation. The future land use to the north and east of Site Alternative 4 is community service and institutional, which would be essentially the same as existing land use (City of Marietta 2010a).

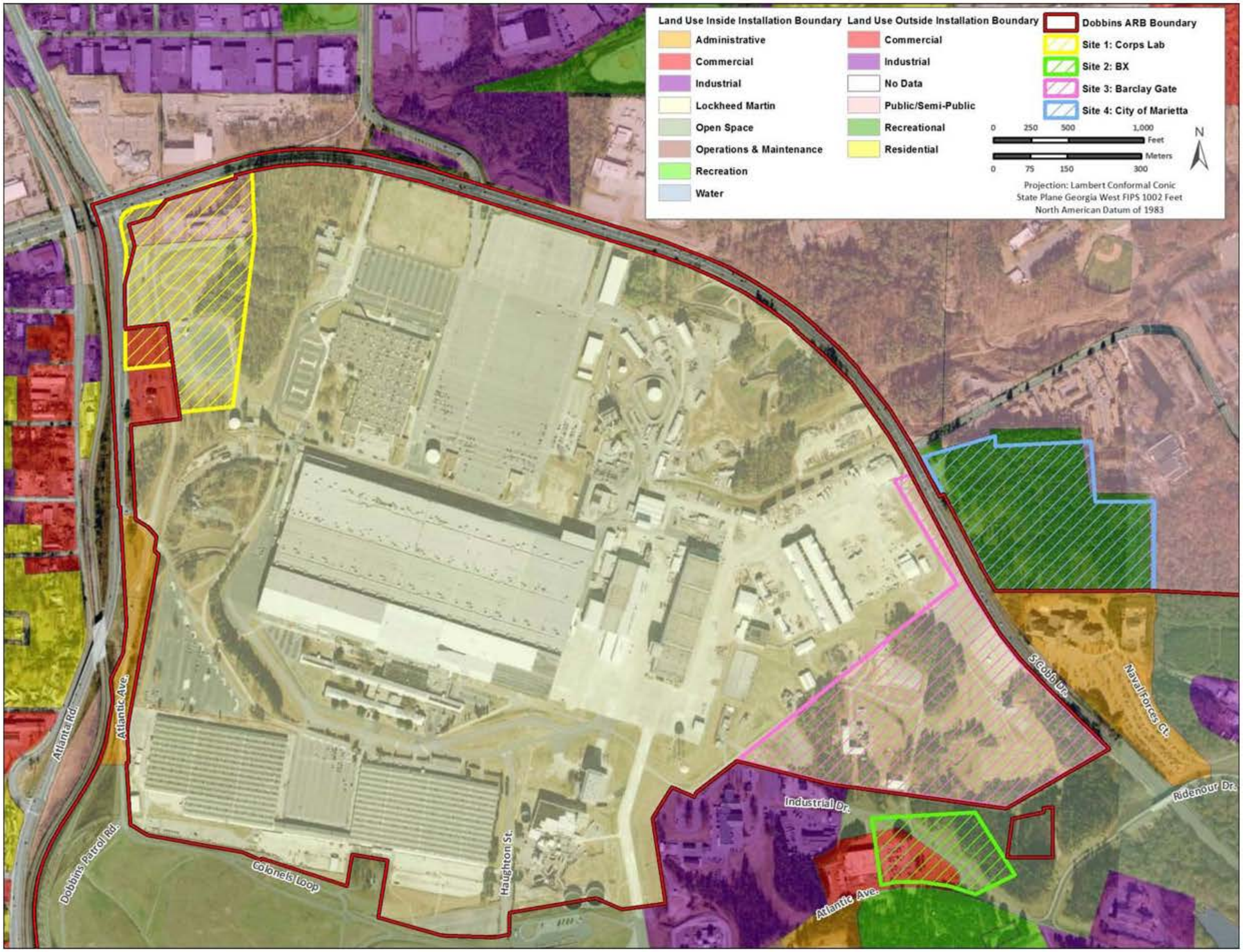


Figure 3-2. Current Land Use at Dobbins ARB

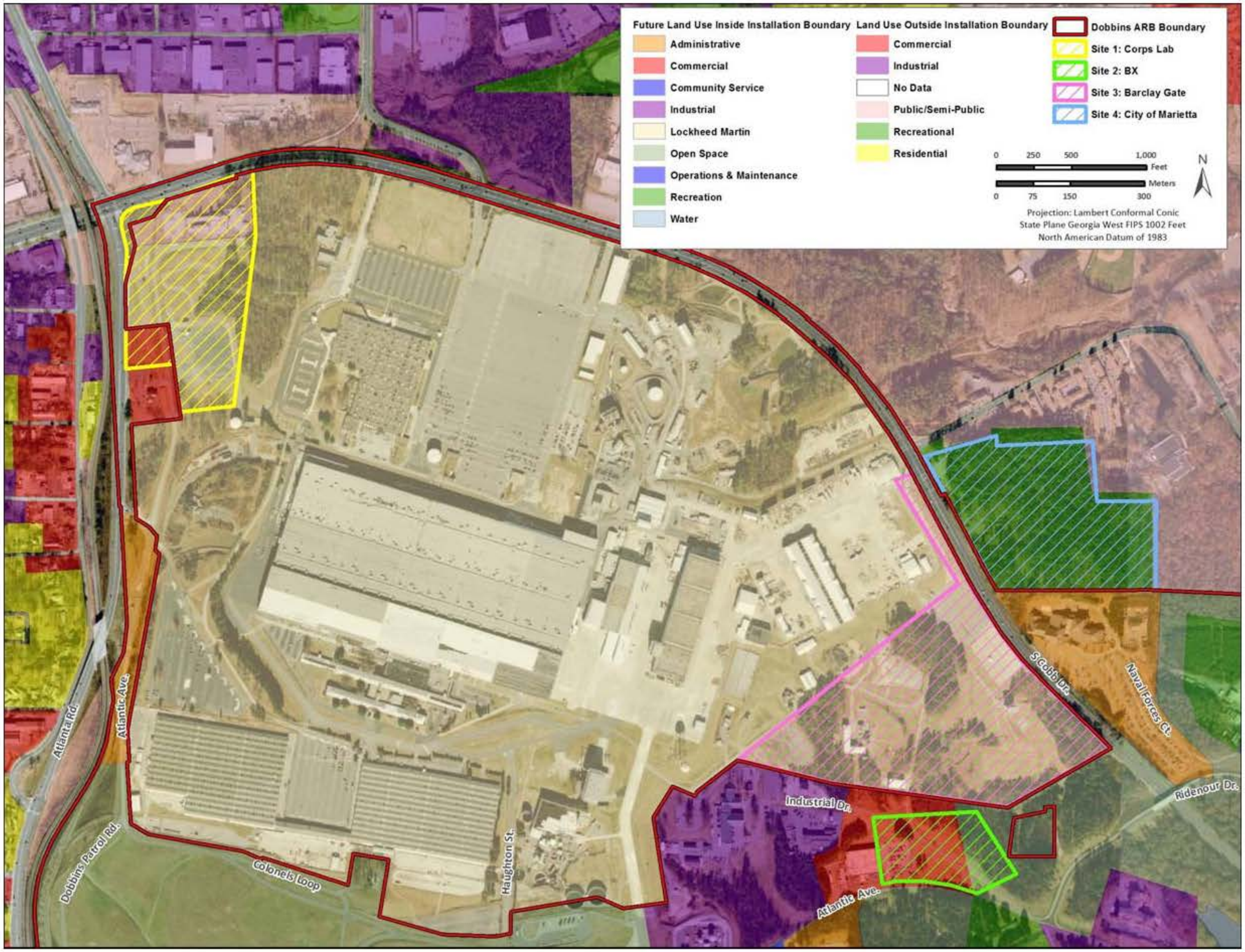


Figure 3-3. Future Land Use at Dobbins ARB

3.4 Geological Resources

3.4.1 Definition of the Resource

Topography. Topography refers to the general shape and arrangement of a land surface, including its elevation and the position of both natural and artificial features.

Geology. Geology is the study of Earth's composition and provides information on the structure of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition.

Soils. Soils are the unconsolidated materials overlaying bedrock or other parent materials. Soils are usually described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

Prime Farmland. Prime farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land or water. The intent of the FPPA is to minimize the extent that Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses.

Geologic Hazards. Geologic hazards are defined as a natural geologic event that can endanger human lives and property. Examples include earthquakes, landslides, rock falls, ground subsidence, and avalanches.

3.4.2 Affected Environment

Topography

Dobbins ARB is within the Central Uplands District of the Piedmont Physiographic Province, and the topography of the installation is gently to moderately rolling, with broad ridges dissected by several drainages. Elevations range from 950 feet above mean sea level along the eastern boundary to 1,100 feet above sea level along the western boundary (Dobbins ARB 2007c).

Corps Lab Site. The Corps Lab site is relatively level, with elevations about 1,100 feet above mean sea level.

BX Site. The BX Site is relatively level, with some rolling terrain and an elevation of 1,000 to 1,040 feet above mean sea level.

Barclay Gate Site. The Barclay Gate site is generally level, with some rolling terrain and an elevation of 1,000 to 1,040 feet above mean sea level.

City of Marietta Site. The City of Marietta Site is generally wooded, relatively level, with some steeper slopes. Elevations range from 1,000 to 1,070 feet above mean sea level (USGS 2011c)

Geology

The installation and the alternative site locations are underlain by the Powers Ferry Geologic Formation. The formation consists of intercalated gneiss, schist, and amphibolites in decreasing abundance. It is estimated to be more than 3,290 feet thick and dates from the late Precambrian and early Paleozoic eras (500–600 million years ago) (USGS 2011a).

Soils

The Natural Resources Conservation Service (NRCS) mapped soil on Dobbins ARB in the vicinity of the alternative site locations. Surface soils are predominantly micaceous silts and micaceous sandy silts derived from the weathering of underlying rock. The two main soil associations at the installation are the Madison-Gwinnett-Cecil and the Madison-Gwinnett-Pacolet Associations. Both are characterized by well-drained soils with a sandy loam and clay loam surface horizon and clayey to loamy subsurface horizon (Dobbins ARB 2007c).

Figure 3-4 shows the locations of soils mapped on Dobbins ARB that underlie the alternative site locations. The following text describes the soil series relevant to the Proposed Action mapped on the installation, and the soil complexes underlying each proposed site.

Appling. The Appling series consists of very deep, well-drained, moderately permeable soils on ridges and side slopes of the Piedmont uplands. They are deep to saprolite and very deep to bedrock. They formed in residuum, weathered from felsic igneous and metamorphic rocks. Slopes range from 2 to 10 percent on site. The Appling series has a low shrink-swell potential.

Madison. The Madison series consists of well-drained, moderately permeable soils that formed in residuum weathered from metamorphic or igneous rocks high in mica content. They are very deep to bedrock and moderately deep to saprolite. They are on gently sloping to steep uplands in the Piedmont. Slopes range from 2 to 25 percent on site. The Madison series has a low shrink-swell potential.

Pacolet. The Pacolet series consists of very deep, well-drained, moderately permeable soils that formed in residuum weathered mostly from felsic igneous and metamorphic rocks of the Piedmont uplands. Slopes range from 10 to 25 percent on site. The Pacolet series has a low shrink-swell potential.

Urban Land. Urban land consists of areas where the original soil has been removed or altered during excavation and construction activities. Buildings, roads, parking lots, and residences are located in these areas.

Corps Lab Site. The primary soil complexes at the Corp Lab Site are the Urban land-Appling complex and the Urban land-Madison Complex.

BX Site. The primary soil complexes at the BX Site are the Madison-Pacolet complex and the Pacolet sandy clay loam complex.

Barclay Gate Site. The primary soil complexes at the Barclay Gate Site are the Madison-Pacolet complex and Urban land.

City of Marietta Site. The primary soil complexes at the City of Marietta Site are the Madison clay loam complex and Urban land.

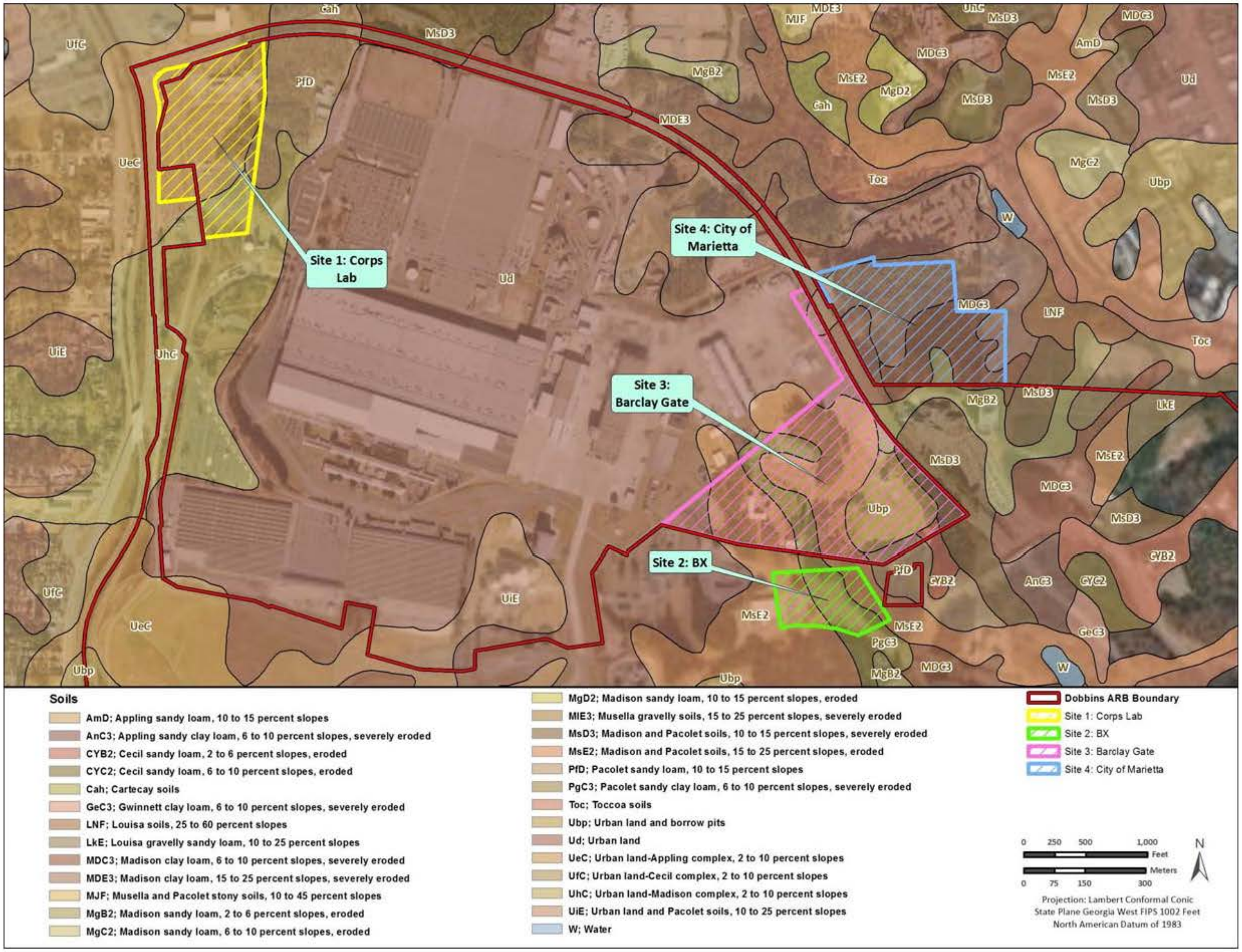


Figure 3-4. Mapped Soils Underlying the Proposed Commissary Sites at Dobbins ARB

Due to agricultural use prior to the establishment of the installation in 1942 and subsequent development, many of the native soil profiles on Dobbins ARB have been disturbed or destroyed. Much of the original topsoil has been eroded, exposing clayey subsoils (Dobbins ARB 2007c).

Prime Farmland

Dobbins ARB contains no agricultural land and there are no parcels of prime or unique farmland adjacent to the installation (Dobbins ARB 2004); therefore, the FPPA documents do not apply.

Geologic Hazards

Dobbins ARB is at minimal risk from geologic hazards such as volcanism and earthquakes, since Georgia lies on a passive continental margin with a stable transition between continental and oceanic crust. The U.S Geological Survey (USGS) produced seismic hazard maps based on current information about the frequency and intensity of earthquakes. The maps show the levels of horizontal shaking that have a 2 in 100 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of the force of gravity (percent g) and is proportional to the hazard faced by a particular type of building. In general, little or no damage is expected at values less than 10 percent g, moderate damage could occur at 10 to 20 percent g, and major damage could occur at values greater than 20 percent g. The 2008 National Seismic Hazard map produced by the USGS shows that Dobbins ARB has a seismic hazard rating of approximately 8 to 10 percent g (USGS 2011b), making the risk of damage from seismic activity minimal.

3.5 Water Resources

3.5.1 Definition of the Resource

Hydrology consists of the redistribution of water through the processes of evapotranspiration, surface runoff, and subsurface flow. Hydrology results primarily from (1) temperature and total precipitation that determine evapotranspiration rates, (2) topography that determines rate and direction of surface flow, and (3) soil and geologic properties that determine rate of subsurface flow and recharge to the groundwater reservoir.

Groundwater consists of subsurface hydrologic resources. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

Waters of the United States are defined within the Clean Water Act (CWA), as amended, and jurisdiction is addressed by the USEPA and the USACE. These agencies assert jurisdiction over (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-around or have continuous flow at least seasonally, and (4) wetlands that directly abut such tributaries. Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into waters of the United States including wetlands. Encroachment into waters of the United States and wetlands requires a permit from the state and the Federal government. An encroachment into wetlands or other "waters of the United States" resulting in displacement or movement of soil or fill materials has the potential to be viewed as a violation of the CWA if an appropriate permit has not been issued by the USACE. In Georgia, the USACE has primary jurisdictional authority to regulate wetlands and waters of the United States.

A water body can be deemed impaired if water quality analyses conclude that exceedances of water quality standards, established by the CWA, occur. The CWA requires that states establish a Section 303(d) list to identify impaired waters and establish Total Maximum Daily Loads (TMDLs) for the sources causing the impairment. A TMDL is the maximum amount of a substance that can be assimilated by a water body without causing impairment.

The USEPA published the technology-based Final Effluent Limitations Guidelines (ELGs) and New Performance Standards for the Construction and Development Point Source Category on 1 December 2009 to control the discharge of pollutants from construction sites. The Rule became effective on 1 February 2010. After this date, all USEPA- or state-issued construction general permits were to be revised to incorporate the ELG requirements. The USEPA currently regulates large and small construction activity through the 2008 Construction General Permit (CGP), which will expire on 15 February 2012. A proposed new CGP would be finalized prior to the expiration of the 2008 CGP; therefore, all new construction sites would need to meet the requirements outlined in the proposed new CGP, including technology-based and water-quality-based effluent limits that apply to all discharges, unless otherwise specified in the CGP. Permittees must select, install, and maintain effective erosion- and sedimentation-control measures as identified and as necessary to comply with the proposed new CGP, including the following:

- Sediment controls, such as sediment basins, sediment traps, silt fences, and vegetative buffer strips
- Offsite sediment tracking and dust control
- Runoff management
- Erosive velocity control
- Post-construction stormwater management
- Construction and waste materials management
- Non-construction waste management
- Erosion control and stabilization
- Spill/release prevention.

Construction activities, such as clearing, grading, trenching, and excavating, result in the disturbance of soils and sediment. If not managed properly, disturbed soils and sediments can easily be washed into nearby water bodies during storm events, where water quality is reduced. Section 438 of the Energy Independence and Security Act (EISA) (42 U.S.C. 17094) establishes into law new stormwater design requirements for Federal construction projects that disturb a footprint of greater than 5,000 ft^2 of land. EISA Section 438 requirements are independent of stormwater requirements under the CWA. The project footprint consists of all horizontal hard surface and disturbed areas associated with project development. Under these requirements, predevelopment site hydrology must be maintained or restored to the maximum extent technically feasible with respect to temperature, rate, volume, and duration of flow. Predevelopment hydrology shall be modeled or calculated using recognized tools and must include site-specific factors such as soil type, ground cover, and ground slope. Site design shall incorporate stormwater retention and reuse technologies such as bioretention areas, permeable pavements, cisterns/recycling, and green roofs to the maximum extent technically feasible. Post-construction analyses would be conducted to evaluate the effectiveness of the as-built stormwater reduction features

(DOD 2010a). These regulations have been incorporated into applicable DOD Unified Facilities Criteria (UFC) in April 2010, which stated that low-impact development (LID) features would need to be incorporated into new construction activities to comply with the restrictions on stormwater management promulgated by EISA Section 438. LID is a stormwater management strategy designed to maintain site hydrology and mitigate the adverse impacts of stormwater runoff and nonpoint source pollution. LIDs can manage the increase in runoff between pre- and post-development conditions on the project site through interception, infiltration, storage, or evapotranspiration processes before the runoff is conveyed to receiving waters. Examples of the methods include bioretention, permeable pavements, cisterns/recycling, and green roofs (DOD 2010b). Additional guidance is provided in the USEPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA 2009).

In addition, wetlands are protected under EO 11990, *Protection of Wetlands*, the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands. This order directs Federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands. In furtherance of NEPA, agencies shall avoid undertaking or assisting in new construction in wetlands unless there is no practical alternative. Each agency will provide opportunity for early public review of plans and proposals for construction in wetlands, including those whose impact is not significant to require EIS preparation. The Deputy Assistant Secretary of the Air Force - Environment, Safety, and Occupational Health or another designated official must sign a Finding of No Practicable Alternative (FONPA) before any action within a Federal wetland may proceed as specified in Secretary of the Air Force Order 780.1. The recently revised AFI 32-7064 grants approval authority to the chairperson of the Headquarters AFRC Environmental Protection Committee for wetlands encroachment FONPAs. In preparing a FONPA, the installation must consider the full range of practicable alternatives that will meet justified program requirements, are within the legal authority of the U.S. Army, meet technology standards, are cost-effective, do not result in unreasonable adverse environmental impacts, and other pertinent factors. Once the practicality of alternatives has been fully assessed, only then should a statement regarding the FONPA be made into the associated FONSI or record of decision.

As a result of the above-mentioned state and Federal regulations, it is the responsibility of the USAF to identify jurisdictional waters of the United States (including wetlands) occurring on USAF installations that have the potential to be impacted by installation activities. Such impacts include construction of roads, buildings, runways, taxiways, navigation aids, and other appurtenant structures; or activities as simple as culvert crossings of small intermittent streams, rip-rap placement in stream channels to curb accelerated erosion, and incidental fill and grading of wet depressions.

Floodplains are areas of low-level ground along rivers, stream channels, or coastal waters. The living and nonliving parts of natural floodplains interact with each other to create dynamic systems in which each component helps to maintain the characteristics of the environment that supports it. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and a diversity of plants and animals. Floodplains provide a broad area to inundate and temporarily store floodwaters. This reduces flood peaks and velocities and the potential for erosion. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body (FEMA 1986).

Floodplains are subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of FEMA Flood Insurance Rate Maps (FIRMs), which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative.

3.5.2 Affected Environment

Groundwater. Groundwater under Dobbins ARB consists of a surficial water table and bedrock aquifers; however, the bedrock aquifers beneath the installation are generally not productive and contain a high concentration of minerals (Dobbins ARB 2010a). The aquifer beneath the sites is unconfined, characterized by three geologic strata (residual soils, underlying fractured bedrock, and the competent bedrock). The residual soils and underlying fractured bedrock provide the dominant pathway for groundwater flow. Average hydraulic conductivities in the vicinity are between 0.00005 to 0.002 feet per minute (USAF 2010). Groundwater in the northern Piedmont Physiographic Province occurs predominantly in joints and fractures in the bedrock and in the pore spaces of the overlying residual soils. Recharge is principally from rainfall that either seeps downward through the residuum or flows into openings in exposed rock (USAF 2010). Depth to groundwater changes from approximately 12 feet below ground surface on the eastern portion of the area (Site 1) to 60 feet below ground surface to the west (Site 3) (USAF 2010).

An overall groundwater plume for the AFP-6 Industrial Area sits underneath portions of Sites 2 and 4 and adjacent to Site 3, and is currently being more thoroughly defined. TCE and other VOCs are the most significant contaminants and remediation efforts began in 1999 with the installation of interim corrective measures. The remediation process involves nine vapor extraction wells, three dual-phase recovery wells northeast of Site 3, and seven recovery wells across the AFP-6 boundary where the groundwater has migrated off site (USAF 2010).

Surface water. Dobbins ARB is within the Rottenwood Creek and Poorhouse Creek watersheds, which drain into the Chattahoochee River approximately 3.5 miles southeast of the installation. There are 2 man-made lakes on the installation (Big Lake and Little Lake), 28 delineated streams and tributary stream reaches, 5 spill retention ponds, 3 sedimentation detention basins, and 4 stormwater retention basins. The spill retention ponds act as containment basins for potential petroleum, oil, and lubricants (POL) spills that could occur near the flight line, while the sedimentation basins are used for stormwater and sediment retention. The installation is drained throughout by a series of storm sewers and ditches. Stormwater exits through outfalls surrounding the installation boundary. The southern outfalls of the installation drain into Poorhouse Creek and the northern outfalls drain into Rottenwood Creek (Dobbins ARB 2007c).

A drainage ditch crosses the northwestern most portion of Site 1. No other surface water features occur within the site. No surface waters occur within Site 2; however, adjacent unnamed streams can be found to the east and southwest. Surface water from Site 3 drains via a small unnamed stream along the western border of the site into a culvert that directs drainage under the parking lot for Building 600. No other surface water features occur within the site (Dobbins ARB 2007c). An intermittent stream crosses Site 4 and is used to collect surface runoff from nearby properties. The stream only flows during storm events and no other surface waters are found on Site 4.

Wetlands/Floodplains. Dobbins ARB has 21 wetland areas totaling approximately 23 acres as determined in a 2009 wetland delineation. The wetlands are predominantly found along Rottenwood

Creek, Poorhouse Creek, and surrounding Big Lake and Little Lake (Dobbins ARB 2009a). **Figure 3-5** provides a map of the delineated wetlands and their proximity to the proposed development sites.

No wetlands are present within any of the proposed sites. The nearest wetlands to Sites 1 and 2 are adjacent to Big Lake, approximately 1 mile to the southeast and 0.1 mile to the south, respectively. The nearest wetlands found on installation from Sites 3 and 4 are associated with Little Lake approximately 0.1 and 0.4 miles, respectively to the southeast (Dobbins ARB 2009a).

The nearest off-installation wetlands to Site 4 are approximately 0.2 miles to the east and are associated with a lake near Life University. However, drainage patterns on the site flow southeast and no impacts would be expected on this water body. Therefore, impacts on this water body are not analyzed further in this document.

None of the proposed sites occur within the 100-year floodplain. Site 1 has no adjacent floodplains. Sites 2, 3, and 4 are approximately 0.4 miles northwest of the nearest floodplain (USAF 2010).

3.6 Biological Resources

3.6.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats (e.g., grasslands, forests, and wetlands) in which they exist. Protected and sensitive biological resources include Endangered Species Act (ESA) - listed species (threatened or endangered) and those proposed for ESA listing as designated by the U.S. Fish and Wildlife Service (USFWS); state-listed threatened, endangered, or special concern species; migratory birds; and bald and golden eagles. Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the ESA and as sensitive ecological areas designated by state or other Federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or limited in distribution, and important seasonal use areas for wildlife (e.g., migration routes, breeding areas, crucial summer and winter habitats).

The ESA (16 U.S.C. §1531 et seq.) establishes a Federal program to protect and recover imperiled species and the ecosystems upon which they depend. The ESA requires Federal agencies, in consultation with the USFWS, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. Under the ESA, "jeopardy" occurs when an action is reasonably expected, directly or indirectly, to diminish numbers, reproduction, or distribution of a species so that the likelihood of survival and recovery in the wild is appreciably reduced. An "endangered species" is defined by the ESA as any species in danger of extinction throughout all or a significant portion of its range. A "threatened species" is defined by the ESA as any species likely to become an endangered species in the foreseeable future. Candidate species are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as threatened or endangered under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. The ESA also prohibits any action that causes a "take" of any listed species. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

State-protected species in Georgia are protected under the Georgia Wildflower Preservation Act of 1973 and the Georgia Endangered Wildlife Act of 1973. The Rules and Regulations of the Georgia Department of Natural Resources (DNR), Wildlife Resources Division for the Protection of Endangered, Threatened, Rare, or Unusual Species (Chapter 391-4-10) establish the procedures to be followed in the protection of endangered species of plant and animal life, as authorized by these acts.

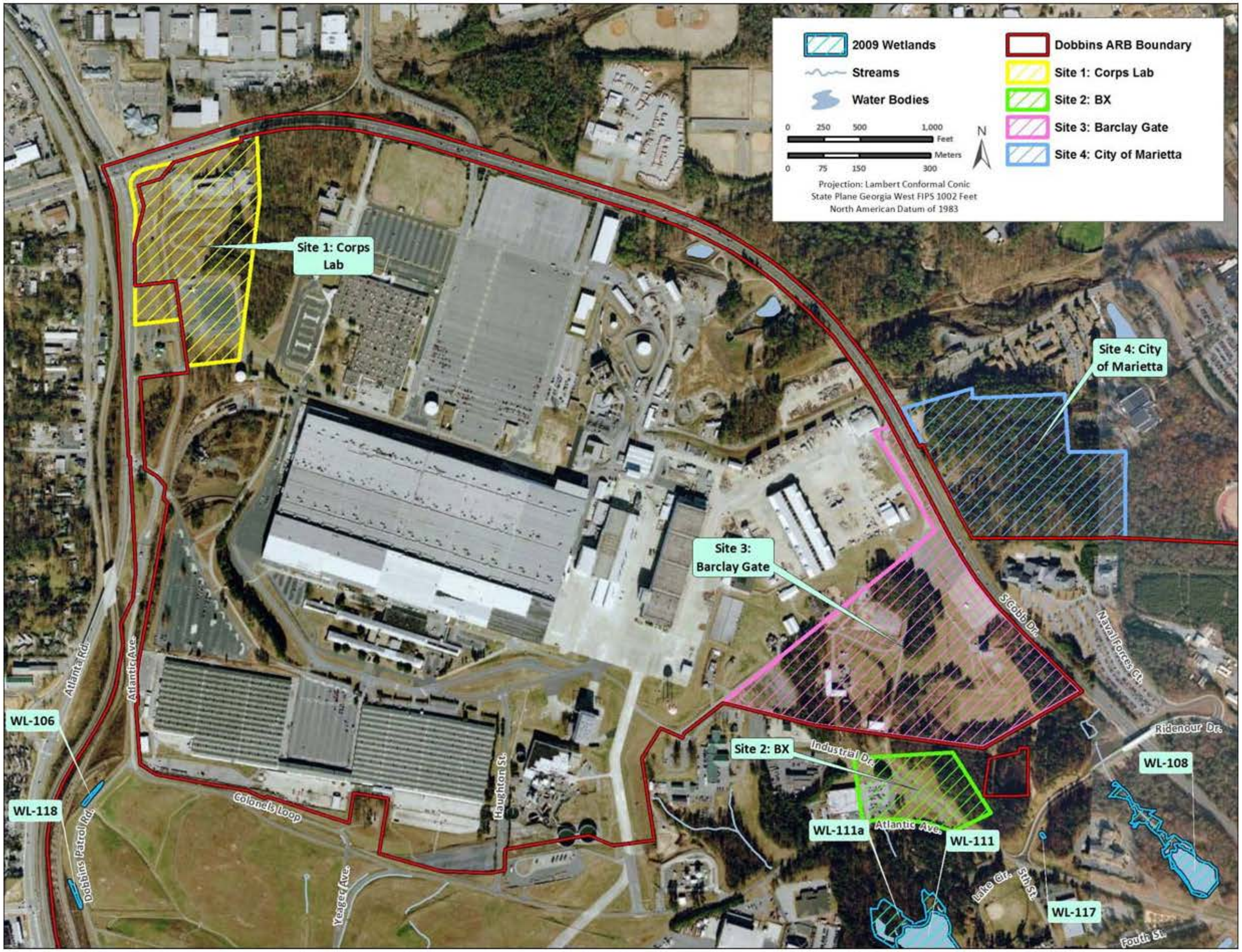


Figure 3-5. Wetlands and Stream Delineation Map for Dobbins ARB

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–712), as amended, and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds,* require Federal agencies to minimize or avoid impacts on migratory birds. Unless otherwise permitted by regulations, the Migratory Bird Treaty Act makes it unlawful to (or attempt to) pursue, hunt, take, capture, or kill any migratory bird, nest, or egg. If design and implementation of a Federal action cannot avoid measurable negative impacts on migratory birds, EO 13186 directs the responsible agency to develop and implement, within 2 years, a Memorandum of Understanding with the USFWS that shall promote the conservation of migratory bird populations.

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c), as amended, which prohibits the "take" of bald or golden eagles in the United States. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." For purposes of these guidelines, "disturb" means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause: (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" based on the best scientific information available. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

3.6.2 Affected Environment

Vegetation. The majority of land on Dobbins ARB is either improved or semi-improved and is dominated by domestic grasses such as Bahia grass (*Paspalum notatum*) and Bermuda grass (*Cynodon dactylon*) (Dobbins ARB 2010a). Forested vegetation accounts for the vast majority of unimproved land and is primarily pine/pine hardwood forests. These forests are dominated by loblolly pine (*Pinus taeda*) though lesser amounts of short-leaf pine (*P. echinata*) and Virginia pine (*P. virginiana*) also occur (Dobbins ARB 2007a).

The majority of Site 1 is developed and in open space. The eastern-central portion of the site is forested.

The western and central portions of Site 2 consist of developed land and open areas dominated by maintained grasses and landscaping. The eastern portion is forested. According to the *2007–2011 Forest Management Plan* prepared for Dobbins ARB (Dobbins ARB 2011a), the western edge of forest stand DN-6 overlaps Site 2, as shown in **Figure 3-6** (Dobbins ARB 2011a). This stand consists of primarily loblolly pine and yellow poplar (*Liriodendron tulipifera*) with mixed hardwoods and shortleaf pine components. The health of DN-6 is considered good.

The majority of Site 3 is developed and in open space; however, various wooded areas occur throughout the site. According to the *Forest Management Plan* (Dobbins ARB 2011a), forest stand DN-6 also extends into Site 3. The portion of this forest stand was not delineated on Site 3 because it is not Dobbins ARB property.

The majority of Site 4 is forested, unimproved land that is primarily pine/pine hardwood forests. These forests are dominated by loblolly pine (*Pinus taeda*) with lesser amounts of short-leaf pine (*P. echinata*) and Virginia pine (*P. virginiana*). According to the *Forest Management Plan* (Dobbins ARB 2011a), the delineated forest stand adjacent to Site 4 to the south (stand DN-1) is a pine/hardwood stand consisting of primarily loblolly pine, yellow poplar, and other soft hardwoods with mixed hardwood and shortleaf pine components. Stand health is considered excellent (Dobbins ARB 2011a). It is assumed that forest conditions at Site 4 are very similar to the adjacent stand DN-1.

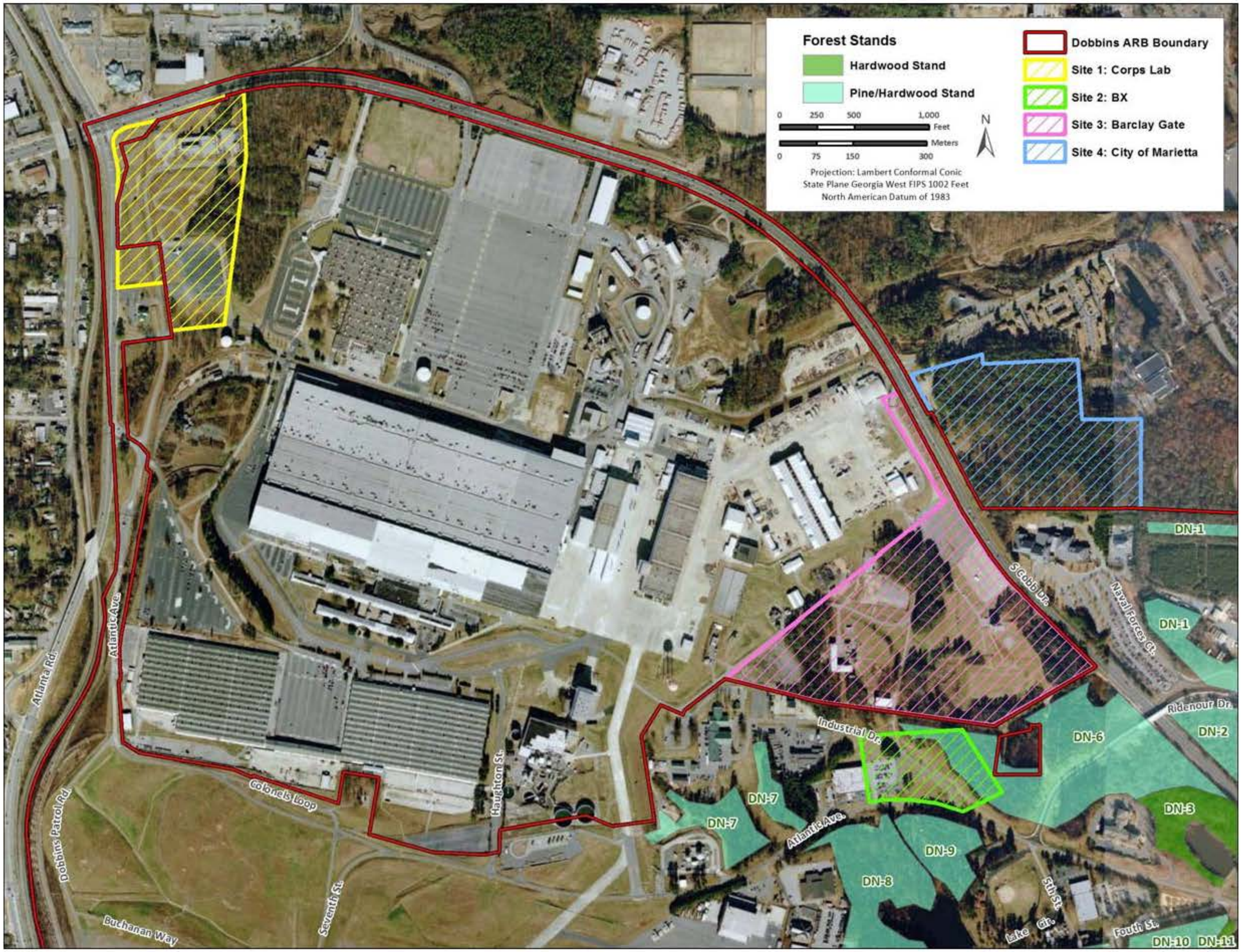


Figure 3-6. Forest Stands on Dobbins ARB

The most widespread and invasive plant species found on Dobbins ARB are privet (*Ligustrum sinensis* and *L. japonicum*), Japanese honeysuckle (*Lonicera japonica*), Chinese wisteria (*Wisteria sinensis*), mimosa (*Albizia julibrissin*), and Japanese stiltgrass (*Microstegium vimineum*). Autumn olive (*Elaeagnus umbellata*), English ivy (*Hedera helix*), princess tree (*Paulownia tomentosa*), sericea lespedeza (*Lespedeza cuneata*), multiflora rose (*Rosa multiflora*), and tree of heaven (*Ailanthus altissima*) are other less abundant, nonnative species that have been documented at Dobbins ARB (Dobbins ARB 2007a). Before the implementation of an installation-wide eradication program, kudzu (*Pueraria lobata*) was considered the primary nuisance species on the installation. Control efforts have been extremely successful and little kudzu was observed on the installation during 2004 field surveys. Continued monitoring and treatment will be required for the long-term control of this species, particularly along the shared Dobbins ARB/AFP-6 border and Route 280, where its presence is still extensive (Dobbins ARB 2007a).

Wildlife. The most abundant native birds in the vicinity of Dobbins ARB include the wild turkey (*Meleagris gallopavo*), northern bobwhite (*Colinus virginianus*), mourning dove (*Zenaida macroura*), northern cardinal (*Cardinalis cardinalis*), tufted titmouse (*Baeolophus bicolor*), and eastern towhee (*Pipilo erythrophthalmus*). Canada geese (*Branta canadensis*), common grackles (*Quiscalus quiscula*), red-winged blackbirds (*Agelaius phoeniceu*s), and rusty blackbirds (*Euphagus carolinus*) are also common native species. European starlings (*Sturnus vulgaris*) and house sparrows (*Passer domesticus*) are common nonnative bird species at Dobbins ARB (Dobbins ARB 2007a). Mammalian species that dominate the ecoregion include the white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), and opossum (*Didelphia virginiana*) (Dobbins ARB 2007a). The eastern box turtle (*Terrapene carolina*), common garter snake (*Thamnophis sirtalis*), northern watersnake (*Nerodia sipedon*), and eastern kingsnake (*Lampropeltis getula*) are characteristic reptilian species. Commonly observed amphibians include spring peeper (*Pseudacris crucifer*) and chorus frog (*Pseudacris triseriata*) (Dobbins ARB 2007a).

Protected and Sensitive Species. No federally listed threatened, endangered, or candidate species are known to occur on Dobbins ARB. Six populations of pink ladyslipper (*Cypripedium acaule*), which is listed as unusual by the Georgia DNR and protected under the State of Georgia Wildflower Protection Act of 1973, have been documented on Dobbins ARB. An “unusual species” is defined by Georgia DNR as any resident species that exhibits special or unique features and because of these features deserves special consideration in its continued survival in the State (Georgia DNR Rules, 391-4-10.02). These pink ladyslipper populations range in size from less than 10 to more than 2,000 individuals on the installation and occur in open portions of the mature pine/pine hardwood stands on Dobbins ARB. A colony of pink ladyslippers was documented in the understory of the south-central portion of forest stand DN-6, just east of Ridenour Road (Dobbins ARB 2011a). Forest stand DN-6 overlaps portions of Site 2; however, no occurrences of pink ladyslipper have been documented within these sites. The known colony within stand DN-6 is approximately 500 feet west-southwest of Site 2 and 700 feet southwest of Site 3. No known pink ladyslipper populations are located within or in the vicinity of Site 1. Since Site 4 is currently owned by the City of Marietta, it is not known if populations of pink ladyslippers occur; however, due to existing forest conditions, it is likely that pink ladyslippers could occur within Site 4.

The U.S. Forest Service, in cooperation with Georgia DNR, recommends protecting populations of the pink ladyslipper that have more than 100 plants within a 50-foot radius. Five such populations of pink ladyslipper have previously been documented on Dobbins ARB (Dobbins ARB 2007a). According to the Forest Management Plan for Dobbins ARB, stands that have unique sites such as inclusions of pink ladyslipper colonies shall be carefully managed to promote the uniqueness of the area or protected where healthy stand conditions persist (Dobbins ARB 2011a). The Forest Management Plan states that all management activities planned in these stands should be executed in such a manner as not to impact pink ladyslippers negatively (Dobbins ARB 2011a).

No known threatened or endangered species surveys have been conducted within Site 4. Therefore, it is not known if any federally or state-listed threatened, endangered, or candidate species or Georgia DNR special concern species occur within Site 4. **Table 3-5** lists threatened, endangered, candidate, and special concern species occurring in Cobb County with potential to occur within Site 4 based on existing habitats.

Table 3-5. Federally and State-listed Species with Potential to Occur in Site 4

Common Name	Scientific Name	Federal Status	State Status	General Habitat Requirements
Animals				
Highscale shiner	*Notropis hypsilepis*	NL	R	Flowing areas of small to large streams over sand or bedrock substrates as typified by streams in the southern edge of the Piedmont near the Fall Line
Plants				
Pink ladyslipper	*Cypripedium acaule*	NL	U	Upland oak-hickory-pine forests; primarily in acid soils of pine dominated forests
Indian olive	*Nestronia umbellula*	NL	R	Found in dry, open, upland forests of mixed hardwood and pine; often in transition areas between flatwoods and uplands
Bay starvine	*Schisandra glabra*	NL	T	Rich woods on stream terraces and lower slopes; alluvial communities
Georgia aster	*Symphyotrichum georgianum*	C	T	Upland oak-hickory-pine forests and openings; adjacent to woodland borders and in openings; sometimes with *Echinacea laevigata* or over amphibolites

Sources: USFWS 2011a, USFWS 2011b, Georgia DNR 2011a, Georgia DNR 2011b, Dobbins ARB 2007b

Key:

E = listed as endangered by the USFWS or Georgia DNR
T = listed as threatened by the USFWS or Georgia DNR
R = listed as rare by Georgia DNR
U = listed as unusual by Georgia DNR
NL = not listed by the USFWS or Georgia DNR

The majority of birds on Dobbins ARB and the vicinity are migratory species as defined in 50 CFR 10.13 and are therefore protected under the Migratory Bird Treaty Act and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*.

The bald eagle is not known to nest near Dobbins ARB but is transient through the area (Dobbins ARB 2007a). No large bodies of water suitable as bald eagle habitat occur within the vicinity of Dobbins ARB.

3.7 Cultural Resources

3.7.1 Definition of the Resource

Cultural resources is a term of art or an “umbrella term” for many heritage-related resources, including prehistoric and historic sites, buildings, structures, districts, objects, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason.

Several Federal laws and regulations govern protection of cultural resources, including the National Historic Preservation Act (NHPA) (1966), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). Cultural resources are commonly subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing), architectural resources (buildings or other structures or groups of structures that are of historic architectural, or other significance), and traditional cultural resources (for example, traditional gathering areas).

The NHPA defines historic properties as properties eligible for or listed in the National Register of Historic Places (NRHP). The NRHP is the official listing of properties significant in U.S. history, architecture, or prehistory, and includes both publicly and privately owned properties. The NRHP list is administered by the National Park Service. Historic properties might be buildings, structures, prehistoric or historic archaeological sites, districts, or objects that are generally 50 years of age or older, are historically significant, and that retain integrity that conveys this significance. More recent resources, such as Cold War-era buildings, might warrant listing if they have the potential to gain significance in the future or if they meet “exceptional” significance criteria.

Section 106 of the NHPA requires agencies to take into account the effect of their undertakings on properties listed in or eligible for listing in the NRHP and to afford the ACHP a reasonable opportunity to comment on the undertaking.

3.7.2 Affected Environment

Dobbins ARB occupies a 1,664-acre site between the cities of Marietta and Smyrna in Cobb County, Georgia. A portion of the installation consists of a runway that is shared with Lockheed Martin, which operates AFP-6. The site of Dobbins ARB and AFP-6 has been occupied since prehistoric eras, and was the site of several farms and communities as early as 1832 and until the establishment of the installation in the 1940s (Dobbins ARB 2007c)

Compliance with the NHPA, in consultation with the Georgia State Historic Preservation Office (GA SHPO) has resulted in the identification of a number of historic resources at Dobbins ARB and its associated facilities. Of the resources that predate the installation, the Bankston Rock House is listed in the NRHP and the Big Lake Dam, has been determined eligible for listing in the NRHP (Dobbins ARB 2007c). The Sibley-Gardner is an antebellum structure that has been determined not eligible for listing in the NRHP due to the loss of context created by the construction of AFP-6. Likewise, the Little Lake Dam has been determined ineligible (USAF 2005). The Mount Sinai Cemetery, dating to the 1890s, has not been evaluated for NRHP eligibility, but is treated as a sacred space (Dobbins ARB 2007c).

Several archaeological investigations have occurred on Dobbins ARB. These include reconnaissance surveys of both specific suspected archaeological sites and of construction sites for compliance with cultural resource laws. No surveys have identified any NRHP-eligible archaeological sites. Despite the presence of other important Civil War-related sites in the Dobbins ARB vicinity, it is suspected that none exist on the installation due to the land disturbance over time by farming and construction (Dobbins ARB 2007c). No investigations have been undertaken but there is demonstrated concern that there might be archaeological resources related to the Sibley-Gardner house and possible occupation of the home site as a field hospital during the Civil War. Additionally, oral history relates the presence of an early spring near the house, which indicates prehistoric occupation. A sensitivity zone was defined in the *Integrated Cultural Resources Management Plan, Air Force Plant 6*, 2006-2010 which is outside of the boundaries of the Corps Lab Site (USAF 2005).

Buildings older than 50 years of age on Dobbins ARB have been surveyed though not all have been evaluated for NRHP eligibility. Most of these buildings are located on the eastern end of the installation and would not be affected by the Proposed Action (Dobbins ARB 2007c). Though the proposed commissary would be constructed on Dobbins ARB, it would be in physical proximity to AFP-6. In consultation with the GA SHPO, the USAF has determined that an NRHP-eligible Bell Bomber Historic District exists on AFP-6, including eight contributing buildings (a ninth building was demolished in 2004). The district comprises the main manufacturing facilities and essential auxiliary buildings, such as the steam plant and water pumping station (USAF 2005).

Two small historic-era cemeteries have been found at Site Alternative 4. One cemetery is just north of the USAF property, behind the Navy Reserve Center. This cemetery has been surveyed and found to have three graves. Adjacent to it is a house site with foundation and chimney remnants visible. The other cemetery, which contains four graves, is centrally located at this site. Based on the single extant, non-historic, grave marker and census research, the cemetery might be that of an African-American family. They are both likely connected to the historic African-American community of Jonesville. As part of a proposal to construct a disc golf course on the western edge of the site, investigations were made to find another cemetery or set of unmarked graves that were said to have been located there. A pedestrian survey and surface probing were completed in May 2011 and no evidence of graves was found. The City of Marietta has marked the boundaries of the two known cemeteries on this site. Neither cemetery has been evaluated for eligibility for the NRHP (Cobb County 2011).

3.8 Infrastructure

3.8.1 Definition of the Resource

Infrastructure can be defined as the basic physical systems (e.g., utilities, water, and sewage) that enable a community to function. The infrastructure information provided herein was obtained from the *2010 Dobbins ARB General Plan* (Dobbins ARB 2010a) and the 2011 *Environmental Baseline Surveys* for the Corps Lab Site (Dobbins ARB 2011g), Barclay Site (Dobbins ARB 2011f), and the City of Marietta Site (Dobbins ARB 2011d). This section provides a brief summary of the infrastructure components that currently exist at the Dobbins ARB and the four site alternatives. The infrastructure components to be discussed in this EA include utilities (electrical, natural gas, liquid fuel, central heating and cooling, water supply, sanitary sewage/wastewater, stormwater, and communications systems), solid waste management, and transportation (existing roadways).

EO 13514, *Federal Leadership In Environmental, Energy, And Economic Performance*, dated October 5, 2009, directs Federal agencies to improve water use efficiency and management; implement high performance sustainable Federal building design, construction, operation, and management; and advance regional and local integrated planning by identifying and analyzing impacts from energy usage and alternative energy sources. EO 13514 also directs Federal agencies to prepare and implement a Strategic Sustainability Performance Plan to manage its greenhouse gas emissions, water use, pollution prevention, regional development and transportation planning, and sustainable building design; and promote sustainability in its acquisition of goods and services. Section 2(g) requires new construction, major renovation, or repair and alteration of buildings to comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*. The CEQ regulations at 40 CFR 1502.16(e) directs agencies to consider the energy requirements and conservation potential of various alternatives and mitigation measures.

3.8.2 Affected Environment

Electrical System. The Georgia Power Company provides electrical power to Dobbins ARB. The power is supplied through the Lockheed Martin substation on the north side of AFP-6. Lockheed Martin solely owns the equipment from the reclosers and switching gear through the distribution equipment. Within the boundaries of the installation, Lockheed Martin acts as the purveyor of electricity to the Air Force Reserve and the Georgia Guard Bureau (Dobbins ARB 2010a).

Two primary electrical feeders enter AFP-6 at South Cobb Drive and feed the substation. A backup power supply is also provided, which enters AFP-6 from the northwest along Atlanta Road. The substation is designed to serve only the installation. No off-installation facilities are supplied electricity by this substation.

Two main feeder lines and an alternate feeder line enter the installation from Industrial Drive and serve facilities on Dobbins ARB through an overhead and underground distribution system. A network of underground and overhead electrical distribution lines traverses the east end of the runway and supplies the U.S. Army Reserve Training Center.

The electrical system was privatized with the Georgia Power Company in April 2004. The entire overhead system was upgraded under the privatization. The feeder line from Lockheed Martin that enters the installation from AFP-6 was also upgraded with replacement of the regulators. In addition to the electricity provided by the Georgia Power Company, the installation also maintains a series of diesel fuel-powered emergency generators at various buildings where power outages would seriously undermine the ability of the installation to complete its mission (Dobbins ARB 2010a).

According to the Georgia Power Company, peak electrical demand occurs in the summer months when total daily demand surpasses 37 megawatt-hours. Based on the current capacity of the substation, 38 percent of the substation's capacity is in surplus during the peak periods (Dobbins ARB 2010a).

Existing electrical infrastructure exists within the boundaries of Alternatives 1, 2, and 3 (Dobbins ARB 2010a).

The Georgia Power Company also provides electrical power to the City of Marietta. Currently Site Alternative 4 does not receive any electricity. However, electrical infrastructure exists in the populated areas adjacent to the site (City of Marietta 2006b).

Natural Gas and Propane. Natural gas is supplied to Dobbins ARB by Atlanta Gas Light Company. The natural gas main enters the installation via a 6-inch steel pipe near the main gate and distributes the natural gas through a limited-access, looped system. The natural gas distribution system consists of a network of underground gas mains ranging from 3 to 8 inches in diameter.

The Atlanta Gas Light Company can meet virtually any requirement for natural gas. However, during periods of particularly cold weather, the demand for natural gas is extremely high, which forces the Atlanta Gas Light Company to curtail supplies of natural gas to its industrial customers, including those facilities at Dobbins ARB that are provided interruptible service (Dobbins ARB 2010a).

Based on the Dobbins ARB General Plan dated 2010, Natural Gas Distribution Map, natural gas lines do not extend to the parcel of land that contains Site Alternative 1, the Corps Lab Site. Active natural gas lines traverse Site Alternative 2 and are also within the general vicinity of Site Alternative 3 (Dobbins ARB 2010a).

Gas South provides natural gas to the City of Marietta; no known pipelines are present within or at the Site (Dobbins ARB 2011d).

Liquid Fuel. The liquid fuels used at Dobbins ARB include jet propulsion number 8 (JP-8) aviation gasoline, unleaded gasoline, and diesel fuel. The fuels are stored in aboveground storage tanks (ASTs) and underground storage tanks (USTs), tank trucks, and bowsers. Tank trucks and bowsers are only used for temporary storage and transportation of fuels on a limited basis. Dobbins ARB storage tanks hold approximately 400,000 gallons of fuel. A Spill Prevention, Control, and Countermeasure (SPCC) Plan is in place and implemented to prevent and clean up spills from oil storage tanks.

Diesel fuel, which is used for both military vehicles and as a backup fuel source for emergency generators, is stored in a variety of ASTs dispersed throughout the installation that range in size from 300 to 10,000 gallons (Dobbins ARB 2010a). In addition, unleaded fuel is stored in one 10,000-gallon UST. Nearly 300,000 gallons of JP-8 are stored in two aboveground, vertical, fixed-roof tanks at the POL bulk fuels storage complex. No USTs at the installation are used to store JP-8.

Additionally, the installation has refueler trucks located at the refueler parking area that are used to transport JP-8 from the storage tanks to the flightline for aircraft refueling.

Liquid oxygen is stored in two ASTs at Building 990, near the main gate of the installation. The total capacity of these tanks is 1,000 gallons. No other supplies of liquid oxygen or nitrogen are kept on-installation (Dobbins ARB 2010a).

No active ASTs or USTs are present within Site Alternative 1. Tanks formally existed at the site and have been removed or closed in accordance with Georgia Environmental Protection Division. No known liquid fuel ASTs or USTs exist within the boundaries of Site Alternatives 2 and 4. Site Alternative 3 contains two existing, inactive 3,000- and 8,000-gallon fuel oil ASTs, located at Building B-64 and one active 2,000-gallon fuel oil AST existing at Building B-90. For more information on USTs and ASTs see the *Environmental Baseline Survey* for the Corps Lab Site (Dobbins ARB 2011g) and the City of Marietta Site (Dobbins ARB 2011d), and the *Environmental Baseline Survey* prepared for the Barclay Site (Dobbins ARB 2011f). An Environmental Baseline Survey (EBS) was not prepared for the BX Site.

Central Heating and Cooling. No central heating or cooling plant exists at Dobbins ARB. The majority of the buildings on the installation are heated by natural gas and some electric. A central (steam) heating plant formerly serviced the majority of Dobbins ARB but was demolished more than a decade ago (Dobbins ARB 1999).

Water Supply System. The Cobb County-Marietta Water Authority (CCMWA) provides potable drinking water to the Dobbins ARB through a contract agreement with Lockheed Martin. According to the Dobbins ARB General Plan dated June 2010, the CCMWA has two surface water treatment facilities: (1) the Quarles Treatment Plant located on Lower Roswell Road at the Chattahoochee River, and (2) the Wyckoff Treatment Plant located on Mars Hill Road in the northwest corner of Cobb County. The Quarles plant draws its water from the Chattahoochee River and the Wyckoff plant draws its water from Lake Allatoona. Collectively, these two plants can provide a maximum of 136 million gallons per day (MGD) of water to residential, commercial, and industrial customers in Cobb County. CCMWA also has nine water storage tanks dispersed throughout the county with a total capacity of 37 million gallons.

Potable drinking water is supplied to the Dobbins ARB through a 20-inch steel water main near the main entrance to a looped supply system. The water distribution system was originally constructed between 1954 and 1956 and consists mostly of cast-iron pipes ranging in size from 2 to 16 inches in diameter. Potable water is provided to the installation at an average of 110 to 120 pounds per square inch (psi), but pressures can be as high as 150 psi.

Upgrades to the potable water system at the installation have included the replacement of system components that have degraded, including (1) the replacement of the old cast-iron pipes with polyvinyl chloride (PVC) piping at various locations; (2) replacing several distribution mains, valves, branch lines, and fittings; and (3) the extension of dead-end branch lines to form a looped supply system. Other projects have replaced worn system components and water valves on the 18-inch water mains, and extended water service into areas north of South Cobb Drive that are proposed for new construction.

Existing and projected demands for potable water at the installation will continue to be satisfied by the county's potable water system (Dobbins ARB 2010a). The water distribution system is adequate to support all existing and future requirements. The CCMWA will continue to provide high-quality water to the installation through the lease with Lockheed Martin and meet the installation's water requirements for consumption and fire-fighting purposes.

Two active water main lines exist within the boundaries of Site Alternative 1. One line runs north to south along the western boundary and the other line runs northeast to southwest along the northwestern boundary (Dobbins ARB 2010a).

Three active water main lines exist within Site Alternative 2 and within the general vicinity of Site Alternative 3, all running generally southeast. In addition, numerous water hydrants and fire connections exist just south of the boundary of Site Alternative 2 (Dobbins ARB 2010a).

The CCMWA supplies water to the City of Marietta, including the populous areas surrounding the vicinity of Site Alternative 4. However, no potable water is currently supplied to Site Alternative 4 (City of Marietta 2006c).

Sanitary/Sewer Wastewater System. Wastewater generated at Dobbins ARB is treated at the tertiary sewage treatment plant located on the southwest side of the installation and to the west of the Georgia Guard Bureau. The wastewater treatment plant is operated by AFP-6 and has a maximum treatment capacity of 7 MGD of wastewater and a historic average daily flow of 1.1 MGD.

The installation's wastewater collector system is Government-owned and -operated, and consists mostly of vitrified clay pipes ranging in size from 6 to 10 inches in diameter, with some newer collection lines constructed of reinforced concrete pipe. Sewage is transported to the treatment plant via a network of six lift stations aligned along the collection system adjacent to the north side of the runway. The few recent upgrades to the system have been those associated with the construction of new buildings; in which case PVC piping was used in place of vitrified clay or reinforced concrete piping (Dobbins ARB 2010a).

The treated wastewater is discharged to Nickajack Creek, approximately 8 miles southwest of the installation. Nickajack Creek is a tributary to the Chattahoochee River. Wastewater from U.S. Army Reserve facilities discharge directly into a collector line of the Cobb County sanitary sewer system that passes through the eastern edge of the installation.

No industrial wastewater treatment plant is located on Dobbins ARB. The only available industrial wastewater pre-treatment occurring on the installation is through oil/water separators that are located at various maintenance shops and in areas where petroleum-based products are used (Dobbins ARB 2010a).

The runoff from these separators is discharged to the sanitary sewer system or to the stormwater drainage system.

Industrial wastewater is pre-treated at a wastewater treatment plant operated by Lockheed Martin and is located at AFP-6. The Lockheed Martin industrial wastewater treatment plant system services only the GAARNG hangar (Building 555) and the former remediation system at the Bulk Fuels Storage facility. These lines discharge to the Lockheed Martin Industrial Treatment Plant, which in turn discharges to the Tertiary Treatment Plant. All other waste lines on Dobbins ARB discharge directly to the Tertiary Treatment Plant through the sanitary sewer system. Lockheed Martin/AFP-6 operates the wastewater treatment plant under Georgia National Pollutant Discharge Elimination System (NPDES) Permit No. 0001198 (Dobbins ARB 2010a).

The installation's wastewater collection system currently exists within the vicinity of Site Alternatives 1, 2, and 3. An active sanitary sewer line exists along the western boundary of Site Alternative 1 and an active sanitary sewer line exists along or close to the western boundary of Site Alternative 2 and within the general vicinity of Site Alternative 3 (Dobbins ARB 2010a).

The City of Marietta is serviced by the CCMWA. The CCMWA operates more than 275 miles of wastewater collection pipe and one wastewater pump station (City of Marietta 2006c). However, because Site Alternative 4 is undeveloped, the Site is not currently serviced or linked into the city's system.

Stormwater Sewer System. The watersheds associated with the Dobbins ARB surface drainage system include Rottenwood Creek watershed in the northern portion of the installation and the Poorhouse Creek watershed in the southern portion of the installation (Dobbins ARB 2010a).

The stormwater drainage system at the Dobbins ARB consists of culverts, man-made ditches, and natural drainageways, which transport the collected water to one of nine outfalls. Eight of the nine outfalls (outfalls 001 through 008) discharge to a separate municipal storm sewer system or a natural drainage way. Outfalls 001, 003, 004, and 005 are located on the north side of the installation and eventually discharge into Rottenwood Creek. Outfall 002 discharges into the municipal storm sewer and is located on the east side of the installation near the main entrance. Outfalls 006, 007, and 008 are on the south side of the installation and eventually discharge into Poorhouse Creek. Outfall 009 discharges directly to Poorhouse Creek itself. The piping network for the installation is constructed of metal, vitrified clay, concrete, or reinforced concrete (Dobbins ARB 2010a).

Stormwater discharges from areas where industrial activities are conducted are currently authorized by the facility's NPDES Permit dated July 2011. As required by the NPDES Permit, Dobbins ARB drafted and implements a Stormwater Pollution Prevention Plan (SWPPP), which includes an assessment of the installation's potential to release contaminants into the drainage system and a series of procedures required to minimize contaminants entering stormwater. In addition, all on-installation construction complies with state and local regulations concerning stormwater detention for development.

Site Alternative 1 has existing storm sewer lines, culverts, and a storm sewer open drainage line which run north to south and are mostly located along the western and northwestern boundaries. Site Alternative 2 has an existing storm sewer line which runs northwest to southeast within the western portion of the site. Storm sewer culverts and a storm sewer line that run in a west-to-east direction are present within the northern portion of Site Alternative 2 near the intersection of 6th Street and Industrial Drive. Although no stormwater drainage systems are in the immediate area of Site Alternative 3, an existing infrastructure network exists on its western boundary (Dobbins ARB 2010a).

The City of Marietta currently has a progressive stormwater management program implemented to eliminate nonpoint source pollution. An unpaved gully exists and flows southwest to northeast across

Site Alternative 4 (Dobbins ARB 2011d). The gulley discharges low volume, infrequent, or short duration flow.

Communications System. The communications system at Dobbins ARB includes the current installation-level Command, Control, Communications, Computer, and Information (C4I) system infrastructure (Dobbins ARB 2010a). The C4I is a blueprint to provide a installation-wide network. Currently, communications at Dobbins ARB are provided by a series of copper and fiber optic cable networks.

The existing copper cable plant is owned by the Government and managed/maintained by an operations and maintenance contractor. It is a mix of underground cables installed in conduit and direct buried cables. Multimode cable is installed to most buildings within the AFRC community. The fiber backbone allows network services to be extended to most major C4I users, allowing ample growth into high-speed, bandwidth-intensive applications. This infrastructure improves bandwidth and provides higher reliability of the transport network. All buildings on Dobbins ARB are connected through fiber optic cables. However, some buildings currently require additional fiber optic strands to support their missions due to high usage.

Existing cable facilities between the Dobbins ARB and Lockheed Martin are more than 30 years old. Several cuts of the air core copper cable have made the direct connection between the USAF facilities and the Lockheed Martin faculties difficult. The interconnecting cable is owned by AT&T, but was recently abandoned. AT&T now uses other cable to interconnect these two sites (Dobbins ARB 2010a).

Voice communications at Dobbins ARB are controlled by the installation Dial Central Office (DCO), which provides point-to-point connectivity between users on-installation and the long-haul networks. The communications system uses a MSL-100 telephone switch to provide administrative telephone and operator service to Dobbins ARB, hot lines, conferencing capability, and advanced digital features, such as Integrated Service Digital Network (ISDN). The telephone switch is an MSL-100 that has the capability of providing up to 10,000 telephone lines. Only 4,800 telephone lines are currently in service (Dobbins ARB 2010a).

Dobbins ARB provides navigation aids through the use of the AN/FRN-45 Tactical Air Navigation system, which is augmented by a dual-channel AN/GPN-20 Airport Surveillance Radar with a tower-mounted antenna and the Mark 20A Instrument Landing Systems and an AN/FPN-62 Precision Approach Radar. The tactical air navigation system generates a radio beacon that pilots use to accurately determine heading and distance from the installation during terminal and en-route phases of flight. The 20A Instrument Landing Systems and the AN/FPN-62 Precision Approach Radar systems emit signals that are used as horizontal and vertical guidance information for aircraft on final approach. Dobbins ARB also employs the Meteorological/Navigational cable system that interconnects the indicators and systems that provide weather and navigational information in support of installation operations.

All buildings on the installation and within Site Alternatives 1, 2, and 3 have the infrastructure needed for the communications system (i.e., fiber optic cable and telephone lines) (Dobbins ARB 2010a).

The major communications providers to the City of Marietta include AT&T, BellSouth, and MicroCorp which consists of a large distribution network of more than 1,500 Telecommunication Agents. Site Alternative 4 is forested land with no installed communications systems (Dobbins ARB 2011d, MicroCorp 2011).

Solid Waste Management. There are currently no active landfills located at Dobbins ARB. Municipal solid waste generated at the installation is discarded into waste receptacles and dumpsters located throughout the facility. Solid waste generated at the installation is collected and transported to state-permitted municipal landfills by a private hauler. Solid waste collection disposal in Cobb County involves both the public and private sector (Dobbins ARB 1999). Private commercial haulers and county municipalities collect solid waste and offer curbside recycling throughout the county. The remaining solid waste that is generated in the county is temporarily stored in private transfer stations and subsequently transported to county landfills for disposal.

Dobbins ARB manages a comprehensive recycling program to reduce the amount of solid waste generated. Recyclable items are collected in separate receptacles than solid waste and transported to the installation's Recycling Center for processing. Recyclable items include paper, aluminum cans, cardboard, wood, fiberboard, scrap metal, tires, and polystyrene. Construction and demolition wastes are separated from the solid waste stream and recycled at the installation (Dobbins ARB 2011g).

The installation operated an on-installation landfill from the 1940s until 1974. This landfill is now considered an IRP site and is located within the boundaries of Site Alternative 1. This IRP site, known at Landfill 01 (or LF-01) had soil and groundwater contamination from the landfilling of waste, but is currently closed with No Further Action required (Dobbins ARB 2011g).

Solid waste services are available throughout the installation; therefore these services are available at Site Alternatives 1, 2, and 3.

Solid wastes generated at Site Alternative 4 are collected by a private contractor for offsite disposal at a municipal landfill. Various trash bins are located around picnic areas and a dog park at Site Alternative 4 (Dobbins ARB 2011d).

Transportation. Roads within Dobbins ARB that would be used to access the sites include Atlantic Avenue, Industrial Drive, and Gym Road. Atlanta Avenue and Gym Road are primary transportation routes on the installation. Access to most of the facilities on Dobbins ARB is provided by secondary roads that connect to Atlanta Avenue. Industrial Drive is a tertiary road; these roads have the lowest traffic volumes and speeds (Dobbins ARB 2010a).

There are two major roadways around the alternative site locations; Atlanta Road and South Cobb Drive. Atlanta Road is directly west of Site 1 and provides access to the Georgia National Guard facilities and Lockheed Martin. South Cobb Drive is north and east of Sites 1, 2, and 3 and south of Site 4. Atlanta Road northwest of the installation (State Route 5) is considered a principal arterial roadway (Cobb County 2008). Principal arterials connect activity centers (such as towns) and carry large volumes of traffic at moderately high speeds. Atlanta Road southwest of Site 1 and South Cobb Drive are considered minor arterial roadways. Minor arterials are continuous routes through urban areas that connect town centers, corridors, main streets, and neighborhoods.

Access to Dobbins ARB from the surrounding region is provided by several major roadways. Interstate- (I) 75 is approximately 1 mile east of the installation and connects to Cobb Parkway Southeast (US 41) and downtown Atlanta. I-285 runs east-west and is adjoined to I-75. I-285 is connected to I-85 on the east and I-20 on the west. Atlanta Road connects to South Cobb Drive and Windy Hill Road, both of which have access to I-75. The main gate on the installation is on South Cobb Drive and Cobb Parkway Southeast.

In 2008, the *Cobb County 2030 Comprehensive Transportation Plan* assessed existing transportation conditions and projected future needs in the region (Cobb County 2008). Several methods were used to evaluate the roadway system. One of the methods assesses the roadway capacity during peak traffic hours. According to the Plan, the assessment indicated that traffic can move freely during peak hours on

South Cobb Drive, portions of Delk Road, and Atlanta Road (southwest of the installation) under the existing conditions (Cobb County 2008). In this Plan, 2005 baseline traffic data were used for existing conditions. The assessment on Atlanta Road (State Route 5) adjacent to the Site 1, portions of Delk Road, and most of I-75 indicated that vehicle speed and freedom of movement declines slightly due to increasing volume.

3.9 Hazardous Materials and Wastes

3.9.1 Definition of the Resource

Hazardous substances include both hazardous materials and hazardous waste. A hazardous substance, pursuant to Comprehensive Environmental Response, Compensation, and Liability Act **(**CERCLA) (42 U.S.C. §9601(14)), is defined as "(A) any substance designated pursuant to Section 1321(b)(2)(A) of Title 33; (B) any element, compound, mixture, solution, or substance designated pursuant to section 9602 of this title; (C) any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, (42 U.S.C. §6921); (D) any toxic pollutant listed under Section 1317(a) of Title 33; (E) any hazardous air pollutant listed under section 112 of the Clean Air Act (42 U.S.C. §7412); and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator of USEPA has taken action pursuant to Section 2606 of Title 15. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas)."

Hazardous materials are defined by 49 CFR 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions" in 49 CFR Part 173. Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations within 49 CFR Parts 105–180.

RCRA defines a hazardous waste in 42 U.S.C. §6903, as "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed."

The Toxic Substances Control Act (TSCA) of 1976 provides USEPA with authority to require reporting, record-keeping and testing requirements, and issue restrictions relating to chemical substances or mixtures. TSCA addresses the production, importation, use, and disposal of specific chemicals including PCBs, asbestos, radon, and LBP. Special hazards are those substances that might pose a risk to human health but are not regulated as contaminants under the hazardous wastes statutes.

3.9.2 Affected Environment

Several hazardous waste-type management plans exist and are implemented at Dobbins ARB. These plans and instructions include the following:

- The Hazardous Waste Management Plan
- SWPPP for Municipal and Industrial Activities

- Integrated Pest Management Plan
- AFI, 401, Managing Radioactive Materials in the U.S. Air Force which implements AFPD 40-2, Radioactive Material-Non-Nuclear Weapons
- Air Force Technical Order 00.110N22, Radioactive Waste Disposal
- AFI 32-7042, Solid and Hazardous Waste Compliance
- AFI 32-1052, Facilities Asbestos Management
- Dobbins ARB Asbestos Operations and Management Plan
- Dobbins ARB Lead Based Paint Management Plan.

The information discussed in this EA will be limited to the information contained in the recently completed ESB reports for the following:

- Site Alternative 1 – The Corps Laboratory Site
- Site Alternative 3 – The Barclay Gate Site
- Site Alternative 4 – The City of Marietta Site.

The EBSs were conducted in accordance with the guidelines set forth in AFI 32-7066 with additional guidance provided by ASTM D6008-96 and ASTM E1527-05. Detailed information can be obtained in the EBS reports for each site investigated. An EBS was not conducted on Site Alternative 2.

In addition, Hazardous Waste information regarding Site Alternative 2, was obtained from the EBS completed for the adjacent AFP-6 property in 2010 (Dobbins ARB 2010a).

Hazardous Materials and Petroleum Products

AFI 32-7086, *Hazardous Materials Management*, creates procedures and standards that govern the management of hazardous materials throughout the USAF and establishes roles, responsibilities, and requirements for a hazardous materials management program. Two plans, *USAF Management Action Plan* and the *Hazardous Materials Emergency Planning and Response Plan* for Dobbins ARB are currently established to describe the procedures and instruction in managing hazardous waste spills.

Site Alternative 1. No hazardous materials or petroleum products were observed at this site. Building interiors were not inspected due to access restrictions; however, each building is assumed to contain limited quantities of hazardous materials (e.g., household cleaners, oils, lubricants, and solvents) based on known building uses. Numerous hazardous materials were historically stored from 1969 until 1999 at the full-service analytical and materials testing laboratory at the former USACE Laboratory facility. There is no evidence of the past or present use of hazardous materials within any other building at Site Alternative 1 (Dobbins ARB 2011g).

Site Alternative 2. No hazardous materials or petroleum products were observed at this site. Therefore, no known hazardous material or petroleum product concerns are associated with this site (Dobbins ARB 2010a).

Site Alternative 3. No known hazardous materials or petroleum products are currently used or stored at this site. Former operations at the onsite buildings likely required the use of moderate quantities of hazardous materials. Building B-64 formerly was used as an avionics testing facility, and Building B-90 formerly was used for stripping radomes. Several chemicals such as acetone, toluene, dimethylformamide, TCE, naphtha, and polyurethane paint thinner have been documented as being historically used at Site Alternative 3 (Dobbins ARB 2011f).

Site Alternative 4. No hazardous materials or petroleum products were observed at this site. As the site was historically vacant land and might have been used at one time as residential property, and is currently used as a public park, it is unlikely that there are hazardous material or petroleum product concerns associated with the site (Dobbins ARB 2011d).

Hazardous and Petroleum Wastes

A Hazardous Waste Management Plan is implemented at Dobbins ARB for the proper management of hazardous and other regulated wastes generated on its installation. This plan provides waste programs management policies and procedures for the proper management of hazardous and other wastes generated during installation operations. The *Hazardous Waste Management Plan*, in conjunction with the installation's *Spill Prevention, Control, and Counter Measure Plan* (Dobbins ARB 2010c) and *Stormwater Pollution Prevention Plan for Municipal and Industrial Activities* (Dobbins ARB 2010d), provides guidance in reducing the amount of hazardous wastes generated and properly managing hazardous wastes to avoid environmental contamination.

Dobbins ARB operates as a large-quantity generator (LQG) of hazardous waste under RCRA. LQGs generate more than 1,000 kilograms (kg) of hazardous waste, or more than 1 kg of acutely hazardous waste, per month. Hazardous wastes that might be present at the Dobbins ARB include asbestos and lead-based paint (LBP), radon, regulated wastes, petroleum products, and solid wastes (Dobbins ARB 2011g).

Site Alternative 1. No hazardous wastes were observed; however, small quantities of hazardous wastes are present at the existing, onsite buildings at Site Alternative 1. These limited quantities are assumed to be disposed of in accordance with Federal, state, and local regulations and would not pose a threat to the environmental condition of the Corps Laboratory Site.

Moderate quantities of hazardous wastes were generated from 1969 to 1999 at the USACE Laboratory. At the time the laboratory was closed, the majority of the remaining waste was removed from the property for proper disposal. However, a substance identified as sodium salt of an organic acid, is still present in Room E139 of the former USACE Laboratory. A GAARNG memorandum recommended profiling, characterization, and disposal of this waste.

A 180-day hazardous waste storage area was historically located within the loading dock area outside of the USACE Laboratory and was used for the storing of hazardous wastes generated on site during operation. Chemicals including PCBs, pesticides, semi-volatile organic compounds (SVOCs), VOCs, and heavy metals were temporarily stored here and contaminated the soil and concrete as solvents leaked from storage drums prior to offsite disposal. The area has been remediated and is considered closed (Dobbins ARB 2011g).

A concrete acid neutralization pit (laboratory sump), located on the exterior west side of the USACE Laboratory, contained unknown materials. Elevated concentrations of heavy metals (mercury, antimony, barium, lead, silver, and thallium) were found in the sludge from the pit and in surrounding soils. The acid pit, its contents, and surrounding soils were removed in 2002, but confirmation soil sampling following the excavation identified mercury concentrations above the Georgia DNR threshold levels (Dobbins ARB 2011g).

A November 2002 hazardous waste investigation at the USACE Laboratory identified trace levels of PCBs (Aroclor 1254), organochlorine pesticides (components of chlordane), and heavy metals (cadmium, chromium, cobalt, and lead) on surfaces within the analytical laboratory physical testing areas, and in the basement on the walls, floors, and countertops. Chromium and lead were detected on every floor of the facility; lead was detected inside the buildings heating, ventilation, and air conditioning (HVAC) system ductwork, and the sink traps were found to contain materials contaminated with heavy metals (i.e., lead and mercury) and polynuclear aromatic hydrocarbons. All surfaces were professionally cleaned. Post-cleaning wipe samples from most surfaces were found to be below the Georgia DNR threshold levels; however, samples taken from the building's HVAC system still showed elevated levels of lead. A 2010 GAARNG memorandum recommends that all surfaces be professionally cleaned again and, in places, appropriately sealed with paint, carpeting, or tiles (GAARNG 2010).

The former USACE Laboratory contained two sumps, located in Rooms 131 and 148, that accumulated sludge. Sludge samples were taken from the sumps and were found to contain elevated levels of barium, manganese, mercury, and thallium. There is no record of sludge removal or cleanup of either sump. A 2010 GAARNG memorandum indicated the sludge remaining in the sumps should be managed as a hazardous waste until analytical tests show otherwise.

A solid waste management unit (SWMU)-23 associated with Building B-68 at AFP-6 is approximately 500 feet east of Site Alternative 1. The building contained floor, roof, sink, and eye wash station drains that discharged into a wooded area behind the building contaminating the soils with petroleum hydrocarbons and lead. Sampling and analysis of soils at the discharge point indicated high levels of total petroleum hydrocarbons and 15 parts per million (ppm) of lead by the toxicity characteristic leaching procedure. The estimated area of soil affected by this discharge was approximately 800 cubic feet. Lockheed Martin prepared a Corrective Action Plan (CAP) for over-excavating the area and then collecting samples to determine whether any further remediation was necessary. The CAP also included terminating or sealing the drains in the building. The CAP was implemented and completed in 1998. Lockheed Martin received a No Further Action letter from Georgia DNR in April 1998 (Dobbins ARB 2011g).

Site Alternative 2. No hazardous wastes or petroleum products are known to historically or currently be generated or stored at this site (Dobbins ARB 2010a).

Site Alternative 3. No hazardous wastes or petroleum products are currently generated or stored at this site. Former operations of the buildings located within Site Alternative 3 generated moderate quantities of hazardous wastes. It is assumed these wastes were properly stored and managed for offsite disposal (Dobbins ARB 2011f).

Site Alternative 4. No hazardous wastes or petroleum products were observed or have been known to be used at this site (Dobbins ARB 2011d).

Environmental Restoration Programs

The Defense Environmental Restoration Program (DERP) was formally established by Congress in 1986 to provide for the cleanup of DOD properties at active installations, BRAC installations, and formerly used defense sites (FUDS) throughout the United States and its territories. The three restoration programs under the DERP are the IRP, Military Munitions Response Program (MMRP), and Building Demolition/Debris Removal (BD/DR). The IRP requires each installation to identify, investigate, and clean up contaminated sites. The MMRP addresses nonoperational military ranges and other sites that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituents. BD/DR involves the demolition and removal of unsafe buildings and structures. Eligible

DERP sites include those contaminated by past defense activities that require cleanup under CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and certain corrective actions required by RCRA. Non-DERP sites are remediated under the Compliance-Related Cleanup Program (CRP).

Dobbins ARB has ten IRP sites, six of which are closed and are designated as No Further Action Planned to Industrial Levels. Of the remaining four sites, two lack State concurrence and two sites are in the beginning stages of the investigation process. Based on the information found within the EBSs, none of these ten IRP sites are within the boundaries of the four site alternatives. No MMRP or BD/DR sites occur at Dobbins ARB at the time of this study (Dobbins ARB 2011g).

AFP-6 has 75 SWMUs, IRPs, and other historical release sites. Eighteen of the 75 sites are closed and are designated as No Further Action required. The remaining sites are currently undergoing remedial investigation, are under further investigation, or require corrective action (Dobbins ARB 2011d).

Site Alternative 1. Two IRP sites are located on AFP-6 property adjacent to Site 1. SWMU 23, also known as the B-68 Drain Pipe Area, has a status of No Further Action. SWMU 62, also known at the B-70 Pit Under Railroad Tracks, also has a status of No Further Action. SWMUs 23 and 62 sites are located approximately 250 to 300 feet east and southeast of Site 1, respectively. The nearest IRP site, known as ST-08, is located approximately 0.5 miles southeast of Site 1. This site currently has a No Further Action required status.

In addition, an approximately 100-foot diameter TCE plume present in the surficial aquifer is present in the southeast corner of Site 1, based on a 2008 plume map generated for AFP-6 (Dobbins ARB 2011g).

Site Alternative 2. An EBS was not conducted for this site. The AFP-6 property is just north of Site Alternative 2. There is an environmental concern in an area with groundwater contamination found on the eastern boundary of Site Alternative 2 (Dobbins ARB 2010e). The plume originated from AFP-6. TCE concentrations exceeding maximum contaminant level of 5 micrograms per liter (µg/L) were found in the surficial aquifer. Other contaminants within the plume include VOCs, SVOCs, and metals. Further investigation of the extent of groundwater contamination is required and remedial actions to treat this groundwater plume are ongoing (Dobbins ARB 2011f). The depth to groundwater in the surrounding area is about 5.5 feet below ground surface (Dobbins ARB 2010e).

The nearest IRP site is SWMU 78, located approximately 250 feet north of Site 2 within the boundaries of AFP-6 (Dobbins ARB 2011d). SWMU 78 is a former sanitary sludge disposal area that is still under investigation,

Site Alternative 3. Six SWMUs associated with the AFP-6 property are found within Site 3 (SWMU 1, 3, 5, 29, 32, and 78).

- SWMU 1 is a site where an underground storage vault leaked laboratory wastes resulting in contaminated soil. The Georgia Environmental Protection Division has determined that No Further Action is required at this SWMU.
- SWMU 3 is a site where metal hydroxide sludge and other waste materials from Buildings B-90 and B-91 were landfilled. Site investigations identified soil and groundwater contamination, and a groundwater pump-and-treat system was installed as an interim corrective measure to prevent the migration of the groundwater plume. Further investigations and remedial action are required.
- SWMU 5 contains a septic tank leach field for a restroom in Building B-90 that likely received hazardous waste chemicals. While no known releases of any hazardous chemicals have been documented, this facility was formerly used for stripping radomes. Several chemicals such as

acetone, toluene, dimethylformamide, TCE, naphtha, and polyurethane paint thinner were formerly used at this facility and might have been disposed of through the field. Site investigations have identified soil and groundwater contamination emanating from the leach field. The site is currently undergoing remedial action.

- SWMU 29 is a former landfill that was in operation from 1951 to 1971 for the disposal of miscellaneous construction rubble. Moderate quantities of sealants, paints, and adhesives are suspected to have been disposed of in this area from 1970 to 1972. A determination of No Further Action required for SWMU 29 was made because of its proximity to SWMU 3 (USAF 1994). The monitoring wells used for SWMU 3 also monitor contaminants at SWMU 29; therefore, the two sites were consolidated to use the existing monitoring wells (Dobbins ARB 2010e). Due to the VOC-contaminated groundwater below SWMU 29, corrective action, including injection of emulsified oil substrate into the overburden coupled with monitored natural attenuation and land use controls is required under the Hazardous Waste Facility Permit (HW-034[D]) (GAEPD 2009).
- SWMU 32 contained a former UST fuel line that released diesel fuel in 1992. The investigation determined that soil and groundwater contamination was present. Annual groundwater monitoring has been completed to demonstrate that the natural attenuation of benzene, xylene, and polycyclic aromatic hydrocarbons (PAHs) is adequate to remediate the petroleum contaminants. Additional corrective actions for the VOC contamination included air spraying, soil vapor extraction, chemical injections, and land use controls. As a result of the 2009 annual groundwater monitoring report, a request of a No Further Action required status has been submitted to the Georgia Environmental Protection Division. Contamination was only found in 2 of 16 monitoring wells.
- SWMU 78 is a site where an aerobically digested sludge generated at the AFP-6 WWTP has been transported for ultimate disposal. Sludge disposal is currently managed through a state- and USEPA-approved plan required by AFP-6's NPDES permit (Dobbins ARB 2010e). Subsurface investigations have not identified constituent concentrations in soil or groundwater above regulatory thresholds; however, the SWMU remains an IRP site pending further consideration.

Two SWMUs (SWMU 14 and 89) are on an adjacent property approximately 80 feet to the north of this site.

- SWMU 14 (B-80 Fuel Oil Storage Tank Spill Area) is a former AST site where a release of approximately 20 gallons of fuel oil occurred in 1993 after a regulator valve on the AST failed resulting in soil contamination. The contamination was subsequently excavated and the area backfilled with clean material. Although a No Further Action status has not been issued, remedial action has occurred at this SWMU, and there is no evidence of environmental contamination remaining from this release.
- SWMU 89 (TCE Contamination at B-80 Fuel Spill Area), where, during the investigation of SWMU 14, elevated levels of TCE were detected in groundwater samples. The source of this TCE contamination is not known but was determined to be separate from the release addressed under SWMU 14. Further investigation and remedial action are required for this SWMU. It is noted that SWMU 89 is located within the 2008 mapped boundaries of the IRP-GWPLUM plume discussed as follows.

In addition, two plumes originating at AFP-6 extend beneath portions of this site.

- A large plume composed of several smaller, comingled plumes emanating from multiple contamination sources occurs in the AFP-6 Industrial Area and extends beneath the northern portion of Site 3. The plume exists in both the surficial aquifer and the bedrock aquifer. The primary contaminant of concern within the plume is TCE. Other contaminants within the plume include benzene and other VOCs, base neutral acids, and metals. TCE concentrations range from 5 µg/L to 10,000 µg/L within the plume. A plume isoconcentration map dated 2011 identifies TCE present in both the overburden and bedrock aquifers beneath the northern portion of Site 3 at concentrations ranging between 5 µg/L and 100 µg/L. The plume does not appear to extend beneath the southern portion of Site 3. Further investigation of the extent of groundwater contamination in the bedrock aquifer and the upgradient extent of contamination in the surficial aquifer are required. Remedial actions to treat this extensive groundwater plume are ongoing.

- A smaller TCE plume is present south of the Site 2 boundary and extends approximately 50 feet into the southern portion of the site. This plume is also present in the surficial and bedrock aquifers with concentrations likely in the 5 µg/L and 20 µg/L within the boundaries of the site (Dobbins ARB 2011f).

Site Alternative 4. No listed IRP, MMRP, or CRP sites are associated with Site Alternative 4. All of the eight IRP sites located at Dobbins ARB are at least 0.9 miles from this site and are not expected to impact it. None of the neighboring AFP-6 associated SWMUs are within the boundaries of this site. The nearest are SWMU-28 (B-58 Wingseal Facility Spill) and SWMU-14/89 B-80 Fuel Oil Storage Tank Spill Area and TCE Contamination at B-80 Fuel Spill Area, respectively), located approximately 260 feet to the west. These SWMUs contribute to an overall contaminated groundwater plume that has migrated from AFP-6 under this site. Remedial actions are currently underway. A plume is a concentration map based on plume-wide data collected in 2011 listed concentrations of TCE beneath the site in the 5 to 100 µg/L range (Dobbins ARB 2010e). Five monitoring wells are located on Site 4 property. The monitoring wells were installed in 1999 as part of the monitoring program for the plume migrating from the AFP-6 property (Dobbins ARB 2011d).

Asbestos-Containing Materials

According to the USEPA, asbestos is a mineral fiber that has been used commonly in a variety of building construction materials for insulation and as a fire-retardant. Asbestos is regulated by USEPA under CAA, TSCA, and CERCLA. USEPA has established that any material containing more than 1 percent asbestos by weight is considered an asbestos-containing material (ACM). Friable ACM is any material containing more than 1 percent asbestos, and that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Non-friable ACM is any ACM that does not meet the criteria for friable ACM.

USEPA and OSHA regulate the remediation of ACM. Emissions of asbestos fibers to ambient air are regulated by Section 112 of the CAA (42 U.S.C. 7401–7671g), as promulgated by 40 CFR 61, Subpart M (National Emissions Standards for Hazardous Air Pollutants).

AFI 32-1052, *Facilities Asbestos Management,* provides the direction for asbestos management at USAF installations. It requires installations to develop an asbestos management plan for the purposes of maintaining a permanent record of the status and condition of ACM in installation facilities, and documenting asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-related projects. The *Dobbins ARB Asbestos Operations and Management Plan* was last revised in September 2009 (Dobbins ARB 2009b).

Site Alternative 1. Non-friable ACM is present within the former USACE Laboratory within insulation and floor tiles. The ACM is in good condition and does not present a risk to health and safety if left undisturbed. Some of the underground piping and utility conduits that traverse Site Alternative 1 have the potential to contain ACM. Any potential asbestos unearthed during future development would be disposed of in accordance with established procedures prescribed in the installation's *Asbestos Operations and Management Plan,* and in accordance with local, state, and Federal regulations.

Site Alternative 2. No buildings or structures are present at this site. However, there is potential to encounter ACM in the underground utility infrastructure that could currently extend into Site 2 (Dobbins ARB 2010a, Dobbins ARB 2011f).

Site Alternative 3. ACM is present at Building B-64 within the chilled and hot water piping systems, insulation, ductwork, hot water fittings, roof fittings, and wallboard. Buildings B-63, B-90, and T-606 are assumed to contain ACM due to their age. Underground utility infrastructure at the Site 3 also has the potential to contain ACM based on the construction age (Dobbins ARB 2011f).

Site Alternative 4. There are no structures located on this site expect for picnic pavilions, which were not constructed with potential ACM (Dobbins ARB 2011d).

Lead-Based Paint

According to the USEPA, lead is a toxic metal that was used for many years in paint and other products. LBP was commonly used until banned in 1978 by the Federal government. Therefore, it is assumed that all structures constructed prior to 1978 could contain LBP.

USAF policy and guidance establishes LBP management at USAF facilities. The policy incorporates by reference the requirements of 29 CFR 1910.120, 29 CFR Part 1926, 40 CFR 50.12, 40 CFR Parts 240 through 280, the CAA, and other applicable Federal regulations. In addition, the policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards. The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X) regulates the use and disposal of LBP on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards. *Dobbins ARB Lead Based Paint Management Plan* is implemented on installation and describes procedures for managing any LBP identified at the installation (Dobbins ARB 2007c).

Site Alternative 1. Based on a 1997 survey, LBP is present at the former USACE Laboratory on some steel support columns, I-beams, doorframes, column edgings, and stair components, but is considered in good shape and does not require abatement if not disturbed (USACE 1997). The other buildings present within Site Alternative 1 are unlikely to contain LBP because no other buildings or trailers were constructed prior to 1978 (Dobbins ARB 2011g).

Site Alternative 2. There are no buildings or structures at Site Alternative 2. Therefore, LBP is not a concern.

Site Alternative 3. A LBP survey has not been conducted; however, the potential exists that LBP is present at Buildings B-63, B-64, B-90, and T-606 because these facilities were constructed prior to 1978 (Dobbins ARB 2011f).

Site Alternative 4. The only structures at Site 4 are picnic pavilions. No LBP survey has taken place at this site, but the pavilions did not appear to be painted, so LBP is unlikely to be a concern (Dobbins ARB 2011d).

Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are a group of chemical mixtures used as insulators in electrical equipment such as transformers and fluorescent light ballasts. Federal regulations govern items containing 50 to 499 ppm of PCBs. Chemicals classified as PCBs were widely manufactured and used in the United States throughout the 1950s and 1960s. PCB-containing oil is typically found in older electrical transformers and light fixtures (ballasts). Transformers containing greater than 500 ppm of PCBs, between 50 and 500 ppm of PCBs, and less than 50 ppm of PCBs are considered PCB, PCB-contaminated, and non-PCB, respectively.

Site Alternative 1. There is no evidence of PCB contamination at Site Alternative 1. There is potential for electrical equipment pre-dating 1985 at the former USACE Laboratory to contain PCBs. The 2003 EBS of the former USACE Laboratory stated that the older transformers of the facility were tested for PCBs and found to contain no detectable levels of PCBs. Transformers installed after 1992 were assumed to be non-PCB and were not tested (Dobbins ARB 2011g). Most electrical equipment at the former USACE Laboratory was not tested to determine if they contained PCBs. Therefore, a 2010 GAARNG memorandum recommended that the oils and fluids of all electrical equipment, except transformers, be tested for PCBs (USACE Savannah District 2003, GAARNG 2010).

Site Alternative 2. No electrical equipment is present at this site; therefore, no PCB contamination is expected to be present associated with Site Alternative 2 (Dobbins ARB 2010a).

Site Alternative 3. No known PCB-containing electrical equipment remains at Site 3. PCB-containing transformers and capacitors were previously present in an electronics laboratory of Building B-64, but were removed and disposed of. There is no evidence of PCB contamination at this site (Dobbins ARB 2011f).

Site Alternative 4. No electrical equipment or transformers are located at Site 4; therefore, no PCB contamination is expected to be present associated with Site Alternative 4 (Dobbins ARB 2011d).

Radon

Radon is a naturally occurring radioactive gas found in soils and rocks. It comes from the natural breakdown or decay of uranium. Radon has the tendency to accumulate in enclosed spaces that are usually below ground and poorly ventilated (e.g., basements). Radon is an odorless, colorless gas that has been determined to increase the risk of developing lung cancer. In general, the risk increases as the level of radon and length of exposure increase.

USEPA has established a guidance radon level of 4 picoCuries per liter (pCi/L) in indoor air for residences; however, there have been no standards established for commercial structures. Radon gas accumulations greater than 4 pCi/L are considered to represent a health risk to occupants. The USEPA-designated radon potential in Cobb County, Georgia, is Radon Zone 1, which has the highest potential for radon above 4 pCi/L (Dobbins ARB 2011g).

Dobbins ARB and AFP-6 have been surveyed for indoor radon. All radon samples taken during the surveys were below 4 pCi/L, so the surveys concluded that there is a low probability of indoor radon exceeding 4 pCi/L (Dobbins ARB 2011d, f, and g).

Pesticides

Pest management practices at Dobbins ARB are addressed in the installation's *Integrated Pest Management Plan* (Dobbins ARB 2010b). Dobbins ARB's pest management practices mainly focus on controlling mosquitoes, yellow jackets, wasps, honey bees, fire ants, cockroaches, spiders, ants, termites, nuisance weeds, Canada geese, mice, and rats. Chemicals used for pest management are stored and mixed in Building 509 of the installation's Civil Engineering complex. Dobbins ARB consider pesticides to be hazardous materials and, as such, they are subject to all regulations of hazardous materials (Dobbins ARB 2010b).

Site Alternative 1. Minimal amounts of pesticides are assumed to have been used at Site 1 to control nuisance pests. The former USACE Laboratory included a pesticides testing area, and all pesticides at the former USACE Laboratory are assumed to have been disposed of with other hazardous materials when the facility was closed. No known environmental contamination resulting from pesticide usage or storage has been identified (Dobbins ARB 2011g).

Site Alternative 2. It is assumed that minimal amounts of pesticides are used to control nuisance pests within Site Alternative 2 (Dobbins ARB 2011d).

Site Alternative 3. Minimal amounts of pesticides are assumed to be used at Site 3 to control nuisance pests. No storage or mixing of pesticides has been documented at the site. No known concerns with pesticide usage or storage have been identified (Dobbins ARB 2011f).

Site Alternative 4. The City of Marietta Parks Department reported that minimal amounts of pesticides are used at this site to control nuisance pests. No known issues with pesticide usage or storage have been identified (Dobbins ARB 2011d).

3.10 Safety

3.10.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety address (1) workers' health and safety during demolition activities and facilities construction, (2) public safety during demolition and construction activities and during subsequent operations of those facilities, and (3) aircraft and flight safety. Aircraft safety focuses on matters such as the potential for aircraft mishaps, airspace congestion, bird-aircraft strike hazards, munitions handling and use, flight obstructions, weather, and fire risks (Dobbins ARB 1999).

Construction site safety requires adherence to regulatory requirements imposed for the benefit of employees. It includes implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and military branch specific regulations designed to comply with standards issued by OSHA, USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment (PPE), administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

3.10.2 Affected Environment

Contractor Safety. Worker and public safety is a key issue at any construction site and military installation. All contractors performing construction activities at Dobbins ARB are responsible for following ground safety regulations and worker compensation programs and are required to conduct construction activities in a manner that does not pose any risk to its workers or installation personnel. An industrial hygiene program addresses exposure to hazardous materials, use of PPE, and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous material), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures (Dobbins ARB 1999).

Fire Hazards and Public Safety. The Dobbins Fire and Emergency Services provides fire, rescue, HAZMAT, and medical services at the installation in compliance with AFI 32-2001. In addition to Dobbins ARB Fire and Emergency services, private outside contractors could be called in to provide emergency services for HAZMAT spill-related incidents but only after the initial Dobbins ARB services' response. The 94th Security Forces Squadron handles security and police duties at the installation in accordance with AFI 31-201 and AFI 31-101. Other Federal agencies and local municipalities may assist the 94th Security Forces Squadron but only if needed. Individuals, supervisors, managers, and commanders are expected to give full support to safety efforts. Safety awareness and strict compliance with established safety standards are expected. In the event of a mishap, the installation will investigate the incident, document lessons learned, and take corrective action. The installation enforces strict security policies and enforcement procedures and is fully enclosed by a chain-link fence (Dobbins ARB 1999).

Site Alternative 4 is outside the boundaries of the Dobbins ARB and is owned by the City of Marietta. The City of Marietta, Marietta Fire Department, and the Marietta Police Department currently handle public safety at Site Alternative 4.

Explosives and Munitions Safety. Explosive safety zone/clearance zones must be established around facilities used for the storage, handling, or maintenance of munitions. Air Force Manual 91-201, *Explosives Safety Standards*, establishes the size of the clearance zones based on quantity-distance criteria or the category and weight of the explosives contained within the facility.

Explosive safety zones currently exist at Dobbins ARB. The largest safety zone is south of the runway at AFP-6. In addition, a 200-foot clear zone for Explosive Site 01 (Above Ground Magazine) at AFP-6 partially overlaps the Site Alternative 3 (Dobbins ARB 2011f). The Above Ground Magazine is a 28-foot-by-13-foot explosives storage container located on a parking lot at the north end of the Site Alternative 3 and used for the temporary storage of explosives, including those used in aircraft seat ejector systems, in support of inbound and outbound shipment activities. None of the other three proposed sites (Site Alternatives 1, 2, and 4) are located within explosive safety zones at Dobbins ARB (Dobbins ARB 2010a; Dobbins ARB 2011d, f, and g).

Protection of Children. Since children can suffer disproportionately (i.e., more so than adults due to physiological and behavioral differences) from environmental health risks and safety risks, EO 13045, Protection of Children from Environmental Health Risks and Safety Risks was signed by President Clinton in 1997. The intent of EO 13045 was to prioritize the identification and assessment of environmental health risks and safety risks that could affect children and to ensure that Federal agencies' policies, programs, activities, and standards address environmental health and safety risks to children.

Children live in the vicinity of Dobbins ARB. The facility has taken precautions to prevent children from unknowingly gaining access to the installation and to construction sites. There is no military family housing on the installation and therefore, no children reside on the installation. Children could be on the installation as visitors of family members and guests of Reservists and installation employees. Children must be under adult supervision while visiting Dobbins ARB. A small playground is located at the Big Lake Recreation Area for children's use.

3.11 Socioeconomics and Environmental Justice

3.11.1 Definition of the Resource

Socioeconomic Resources. Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these fundamental socioeconomic indicators typically result in changes to additional socioeconomic indicators, such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permit characterization of baseline conditions in the context of regional, state, and national trends.

Demographics, employment characteristics, and housing occupancy status data provide key insights into socioeconomic conditions that might be affected by a proposed action. Demographics identify the population levels and the changes in population levels of a region over time. Demographics data might also be obtained to identify a region's characteristics in terms of race, ethnicity, poverty status, educational attainment level, and other broad indicators. Data on employment characteristics identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region can be used to compare the "before" and "after" effects of any jobs created or lost as a result of a proposed action. Housing statistics provide baseline information about the local housing stock, the percentage of houses that are occupied, and the ratio of renters to homeowners. Housing statistics allow for baseline information to evaluate the impacts a proposed action might have upon housing in the region.

In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and influence in the job market.

Socioeconomic data shown in this section are presented at census tract, city, county, state, and national levels to characterize baseline socioeconomic conditions in the context of regional and state trends.

Environmental Justice. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies.

Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

3.11.2 Affected Environment

For the purposes of this socioeconomic analysis, five different spatial levels are used: (1) Region of Influence (ROI), defined as the census tracts including Dobbins ARB and those surrounding the four alternative site locations, which include tracts 304.12, 304.14, 308, 309.02, 310.01, and 311.13; (2) the City of Marietta; (3) Cobb County, the county within which Dobbins ARB is located; (4) Atlanta-Sandy Springs-Marietta 27 Metropolitan Statistical Area (MSA); and (5) the State of Georgia. **Figure 3-7** illustrates the area of the ROI.

The ROI best illustrates the socioeconomic characteristics for the areas adjacent to the alternative site locations and the geographic areas where most impacts from the Proposed Action would occur. The City of Marietta, Cobb County, and the Atlanta-Sandy Springs-Marietta MSA represent the areas where the users of the proposed commissary reside and could also be affected by the Proposed Action; therefore, they are included in the analysis. Data for the State of Georgia provide baseline comparisons for the spatial levels. Data for the United States are included to provide an additional baseline level for comparison.

Demographics. 2000 and 2010 population data for the five spatial levels are presented in **Table 3-6**. All of the spatial levels have population increase rates considerably higher than the United States baseline with the exception of the City of Marietta, which actually had a population decrease. Cobb County's population growth can be attributed to a tremendous growth in residential and commercial activity, direct access to four interstates (I-75, I-20, I-285, and I-575), and investments in educational facilities (Dobbins ARB 2010a).

Table 3-6. Population Data for 2000 and 2010

	2000	2010	Percent Change
ROI	N/A	22,696	N/A
The City of Marietta	58,748	56,579	-3.7%
Cobb County	607,751	688,078	13.2%
Atlanta-Sandy Springs-Marietta MSA	4,247,981	5,268,860	24.0%
Georgia	8,186,453	9,687,653	18.3%
United States	281,421,906	308,745,538	9.7%

Sources: U.S. Census Bureau 2010c, U.S. Census Bureau 2010d, U.S. Census Bureau 2010e, U.S. Census Bureau 2010f, Harvard 2010

Employment Characteristics. As of 2010, the percentage of persons employed in the armed forces was 0.8 percent in the ROI, 0.3 percent in the City of Marietta, 0.2 percent in Cobb County, 0.2 percent in the Atlanta-Sandy Springs-Marietta MSA, 0.8 percent in Georgia, and 0.5 percent in the United States. Interestingly, the percent of persons employed by the armed forces is the lowest in Cobb County despite the existence of Dobbins ARB. Construction is the most prevalent occupation in the ROI. For the City of Marietta, Cobb County, and the Atlanta-Sandy Springs-Marietta MSA, the most common occupations are professional, scientific, management, administrative, and waste management services. Retail sale is the most prevalent occupation in Georgia and the United States (U.S. Census Bureau 2010b). **Table 3-7** contains 2010 information regarding employment by industry.

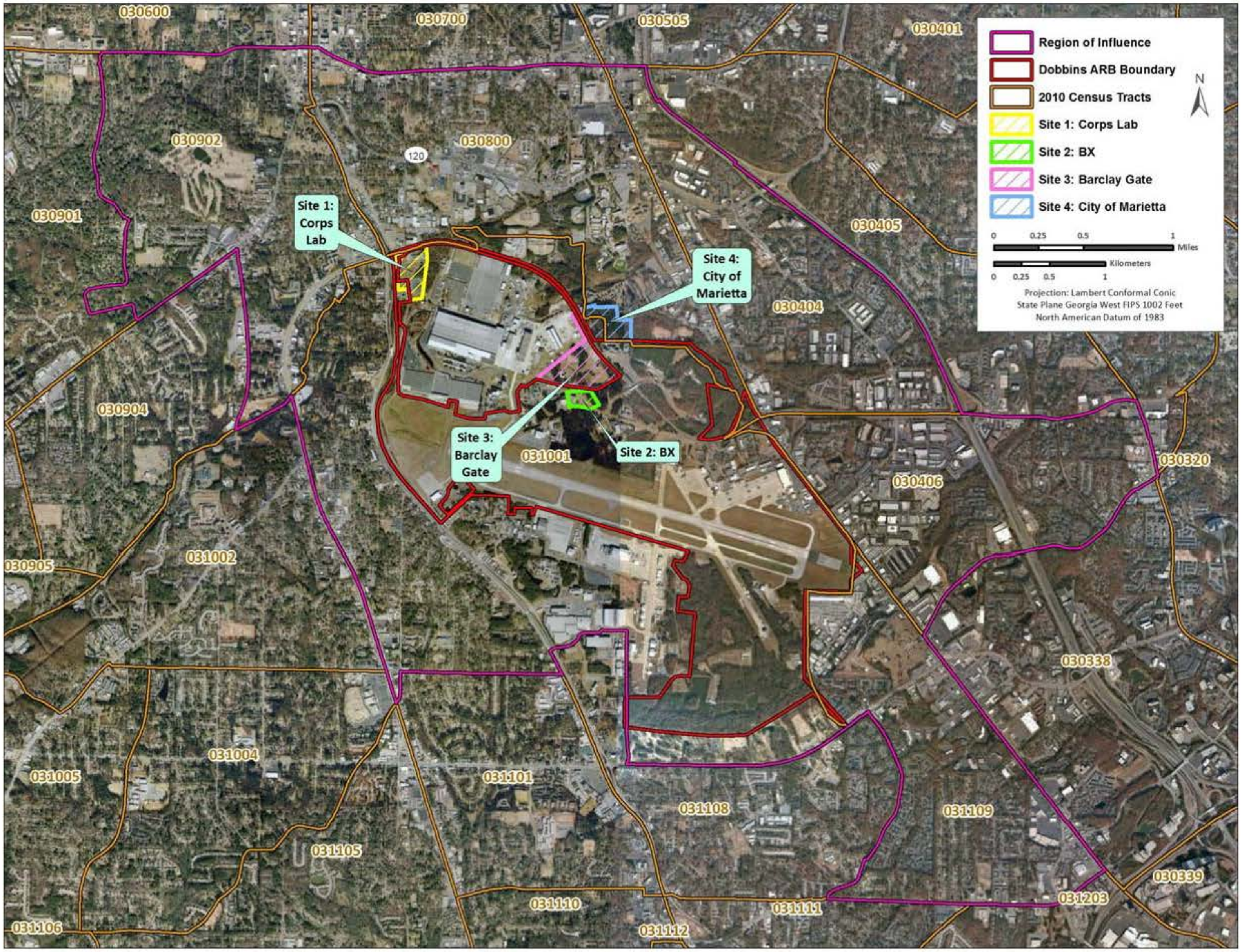


Figure 3-7. Socioeconomic and Environmental Justice Region of Influence for the Proposed Action

Table 3-7. Overview of Employment by Industry, 2010

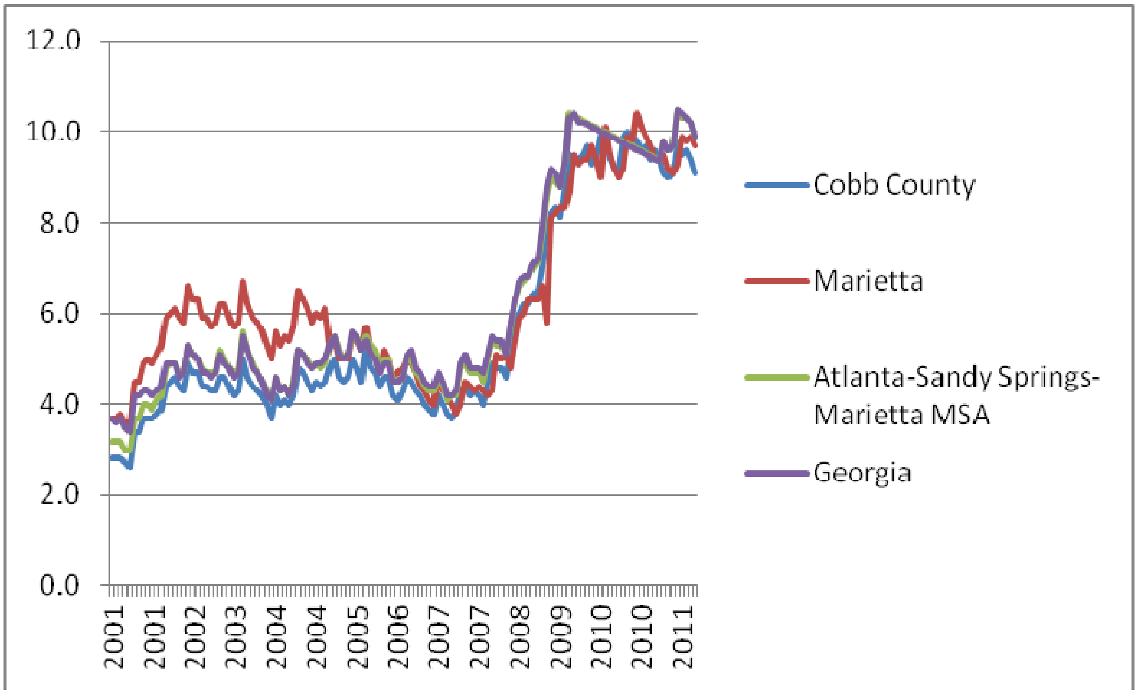
Employment Types	ROI	The City of Marietta	Cobb County	Atlanta-Sandy Springs-Marietta MSA	Georgia	United States
Percent of population 16 years and over in the labor force	75.2%	73.6%	72.8%	70.1%	65.5%	65%
Percent of population 16 years and over in labor force employed within the armed forces	0.8%	0.3%	0.2%	0.2%	0.8%	0.5%
Construction	16.5%	13.0%	7.9%	7.9%	7.9%	7.1%
Manufacturing	8.0%	8.0%	8.3%	9.0%	11.2%	11.0%
Wholesale trade	1.8%	2.4%	4.0%	3.9%	3.4%	3.1%
Retail trade	14.9%	12.6%	11.8%	11.8%	11.7%	11.5%
Transportation and warehousing, and utilities	3.9%	4.7%	5.4%	6.6%	6.1%	5.1%
Arts, entertainment, recreation, accommodation, and food services	9.1%	9.8%	8.0%	8.2%	8.3%	8.9%
Other services (except public administration)	5.0%	4.3%	4.7%	4.9%	4.9%	4.9%
Public administration	1.9%	4.0%	3.6%	4.5%	5.3%	4.8%
Agriculture, forestry, fishing and hunting, and mining	0.1%	0.3%	0.2%	0.3%	1.2%	1.9%
Manufacturing	7.95%	8.0%	8.3%	9.0%	11.2%	11.0%
Information	3.6%	2.8%	3.9%	3.6%	2.7%	2.4%
Finance, insurance, real estate, and rental and leasing	5.4%	7.2%	8.6%	7.8%	6.6%	7.0%
Professional, scientific, management, administrative, and waste management services	16.1%	14.0%	15.7%	13.3%	10.7%	10.4%

Source: U.S. Census Bureau 2010b

As of October 2010, Dobbins ARB has an estimated annual economic impact of $181,712,924 on the region. It has an average annual payroll of $93,841,157, annual expenditures of $39,403,533, and the estimated annual value of jobs created is $48,468,234. The installation is responsible for 2,547 direct and 878 indirect employees. Indirect jobs are estimated nonactive duty positions created by the installation (Dobbins ARB 2010f). Additionally, Dobbins ARB makes a considerable contribution to the local economy through direct employment and purchases from local businesses. In 2005, 88 percent of the total payroll was spent within a 50-mile radius of the installation (Dobbins ARB 2010a).

As of 2010, the average unemployment rate for the ROI was 7.33 percent (U.S. Census Bureau 2010b). The City of Marietta has had higher than baseline (i.e., Georgia) unemployment rates from 2001 to 2004. From 2004 to 2007, the City of Marietta had unemployment rates on par with the baseline, and from 2007 to 2011 their unemployment rates have been generally slightly lower than the baseline. The City of Marietta surpassed the 10 percent unemployment mark in February, September, and October 2010. Cobb

County has generally maintained unemployment rates slightly lower than the baseline for the past decade. Unemployment rates (not seasonally adjusted) in the Atlanta-Sandy Springs-Marietta MSA and Georgia have been tightly aligned for the past decade. The monthly unemployment rates for the Atlanta-Sandy Springs-Marietta MSA and Georgia have been intermittently higher than 10 percent since June 2009. However, the national seasonally adjusted unemployment rate has only risen above 10 percent one time in the past 10 years; in October 2009 it was 10.1 percent (Bureau of Labor Statistics 2011). **Figure 3-8** shows monthly unemployment rates for the region and state from 2001 through 2011.



Source: Bureau of Labor Statistics 2011

Figure 3-8. Unemployment Percentages, 2001 to 2011

Housing Characteristics. **Table 3-8** depicts the housing characteristics of the spatial levels. The housing occupancy rate in the ROI is relatively low and the owner occupancy rate is considerably low. Similarly, the City of Marietta also has a relatively low owner occupancy percentage and the second lowest occupancy percentage. The other spatial levels have occupancy percentages similar to the national average. It is worth noting that the Atlanta-Sandy Springs-Marietta MSA contains 53 percent of the housing units in Georgia (U.S. Census Bureau 2010b).

Environmental Justice. Minority population levels within the ROI are considerably higher than minority levels in all other spatial levels. The ROI's population reporting to be a race other than white was 58.9 percent, which is greater than the City of Marietta (47.3 percent), Cobb County (37.8 percent), the Atlanta-Sandy Springs-Marietta MSA (44.6 percent), Georgia (40.3 percent), and the United States (27.6 percent). The Hispanic or Latino population in the ROI was also considerably higher than all other spatial levels. Minority populations in all spatial levels are higher than for the United States (U.S. Census Bureau 2010b). The poverty status for individuals in the ROI is considerably higher than that of all other spatial levels. Likewise, the per capita income and median household income for the ROI is lower than in the other spatial levels. The ROI has a greater percentage of individuals under 5 years old than all other spatial levels (U.S. Census Bureau 2010b). **Table 3-9** shows the 2010 demographic data for the spatial levels.

Table 3-8. Housing Characteristics by Spatial Levels

	ROI	The City of Marietta	Cobb County	Atlanta-Sandy Springs-Marietta MSA	Georgia	USA
Total Housing Units	10,894	26,918	286,490	2,165,495	4,088,801	131,704,703
Occupancy Percentage	79.3%	85.7%	90.9%	89.5%	87.7%	88.6%
Owner Occupancy Percentage	21.3%	42.3%	66.9%	66.9%	65.7%	65.1%

Source: U.S. Census Bureau 2010b

Note: Owner occupancy percentage refers the percent of occupied houses that are occupied by the owner rather than rented.

Table 3-9. Minority, Low-Income, and Poverty Status, 2010

Demographic	ROI	The City of Marietta	Cobb County	Atlanta-Sandy Springs-Marietta MSA	Georgia	United States
Total Population	22,696	56,579	688,078	5,268,860	9,687,653	308,745,538
Percent Male	53.1%	48.9%	48.6%	48.7%	48.8%	49.2%
Percent Female	46.9%	51.1%	51.4%	51.3%	51.2%	50.8%
Percent Under 5 Years	9.4%	8.2%	7.0%	7.2%	7.1%	6.5%
Percent Over 65 Years	4.8%	10.1%	8.7%	9.0%	10.7%	13.0%
Percent White	41.1%	52.7%	62.2%	55.4%	59.7%	72.4%
Percent Black or African American	37.0%	31.5%	25.0%	32.4%	30.5%	12.6%
Percent American Indian, Alaska Native	1.0%	0.5%	0.3%	0.3%	0.3%	0.9%
Percent Asian	1.6%	3.0%	4.5%	4.8%	3.2%	4.8%
Percent Native Hawaiian and Other Pacific Islander	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
Percent Some Other Race	15.5%	9.1%	5.3%	4.5%	4.0%	6.2%
Percent Reporting 2 or more races	3.7%	3.3%	2.7%	2.4%	2.1%	2.9%
Percent Hispanic or Latino	34.3%	20.6%	12.3%	10.4%	8.8%	16.3%
Percent of Individuals Below Poverty	26.0%	18.5%	10.6%	12.6%	15.7%	13.8%
Per Capita Income	$18,696	$26,710	$33,110	$28,853	$25,134	$27,334
Median Household Income	$34,063	$45,233	$65,522	$57,550	$49,347	$51,914

Source: U.S. Census Bureau 2010b

4. Environmental Consequences

This section addresses the potential environmental consequences associated with the Proposed Action and No Action Alternative. The following discussion elaborates how environmental and socioeconomic resources impacts are categorized and described for the resource areas analyzed.

Short-term or long-term. These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term effects are those that would occur only with respect to a particular activity or for a finite period, such as during the time required for construction or installation activities. Short-term effects are more likely to be acute, whereas long-term effects are more likely to be persistent and chronic.

Direct or indirect. A direct effect is caused by and occurs contemporaneously at or near the location of the action. An indirect effect is caused by a proposed action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action. For example, a direct effect of erosion on a stream might include sediment-laden waters in the vicinity of the action, whereas an indirect impact of the same erosion might lead to lack of spawning and result in lowered reproduction rates of indigenous fish downstream.

Negligible, minor, moderate, or major. These relative terms are used to characterize the magnitude or intensity of an impact. Negligible effects are generally those that might be perceptible but are at the lower level of detection. A minor effect is slight, but easily detectable. A moderate effect is readily apparent. A major effect is one that is severely adverse or exceptionally beneficial.

Adverse or beneficial. An adverse effect is one having adverse, unfavorable, or undesirable outcomes on the man-made or natural environment. A beneficial effect is one having positive outcomes on the man-made or natural environment. A single act might result in adverse effects on one environmental resource and beneficial effects on another resource.

Significance. Significant effects are those that, in their context and due to their intensity (severity), meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27).

Context. The context of an effect can be localized or more widespread (e.g., regional).

Intensity. The intensity of an effect is determined through consideration of several factors, including whether an alternative might have an adverse impact on the unique characteristics of an area (e.g., historical resources, ecologically critical areas), public health or safety, or endangered or threatened species or designated critical habitat. Effects are also considered in terms of their potential for violation of Federal, state, or local environmental law; their controversial nature; the degree of uncertainty or unknown effects, or unique or unknown risks; if there are precedent-setting effects; and their cumulative effects (see **Section 5**).

4.1 Air Quality

4.1.1 Evaluation Criteria

The significance criteria are dependent on whether the Proposed Action is located in an attainment, nonattainment, or maintenance area for criteria pollutants. Other significance criteria include whether New Source Review (NSR) air quality construction permitting is triggered or Title V operating permitting is triggered. Major NSR air quality construction permitting is divided into Nonattainment Major NSR

(NANSR) for nonattainment pollutants and PSD permitting for attainment pollutants. All of these significance criteria are discussed in the following paragraphs.

Attainment Area Pollutants. The attainment area pollutants for the location of this Proposed Action are CO, NO_2, SO_2, Pb, and PM_{10}. The impact in NAAQS "attainment" areas would be considered significant if the net increases in these pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Exceed any Evaluation Criteria established by a SIP.

Impacts on ambient air quality were generally assessed by comparing the increase in emissions under the Proposed Action to the county or AQCR emissions inventory.

Nonattainment or Maintenance Area Pollutants. The nonattainment area pollutants for the location of this Proposed Action are $PM_{2.5}$ and O_3 (measured as NO_x and VOC). Effects on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in these project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP.

With respect to the General Conformity Rule, effects on air quality would be considered significant if the proposed Federal action emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been redesignated as a maintenance area. In addition, if a facility has a specific general conformity budget listed in the SIP, a proposed action that results in an exceedance of that budget would be considered a significant effect on air quality. Dobbins ARB is not specifically listed in the Georgia SIP as having a specific General Conformity budget.

Table 4-1 presents the General Conformity *de minimis* thresholds, by regulated pollutant. As shown in this table, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

Note that emissions sources subject to NANSR, PSD, or even Minor NSR air permitting are not required to be counted towards the General Conformity *de minimis* thresholds. The reasoning for this is they would already be required to go through an approval process with the appropriate Federal, state, or local air quality regulatory authority.

Nonattainment Major NSR Permits. The following factors were considered in determining the significance of air quality impacts with respect to NANSR permitting requirements:

- If the net increase in stationary source emissions qualify as a NANSR major source. This major source threshold varies from 10 tpy to 100 tpy for nonattainment pollutants depending on the severity of the nonattainment classification and the pollutant (40 CFR 51.165).

PSD and Title V Permits. The following factors were considered in determining the significance of air quality impacts with respect to PSD permitting requirements prior to construction:

Table 4-1. Conformity *de minimis* Emissions Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
Ozone (measured as NO_x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO_x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO_x) 100
Carbon Monoxide	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment	Serious Moderate No Special Classification	70 100 100
	Maintenance	All	100
$PM_{2.5}$ (measured directly, or as SO_2, or NO_x, or VOC as significant precursors)	Nonattainment/ maintenance	All	100
SO_2	Nonattainment/ maintenance	All	100
NO_x	Nonattainment/ maintenance	All	100
VOC	Nonattainment/ maintenance	All	100
Lead	Nonattainment/ maintenance	All	25

Source: 40 CFR 93.153, as of January 9, 2012

- If the net increase in stationary source emissions qualify as a PSD major source. This includes 250 tpy emissions per attainment pollutant (40 CFR 52.21(b)(1) and 40 CFR 52.21(a)(2), or 75,000 tpy emissions of GHGs.
- If the Proposed Action occurs within 10 kilometers of a Class I area and if it would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more (40 CFR 52.21[b][23][iii] and 40 CFR 52.21[a][2]).

The following factor was considered in determining the significance of air quality impacts with respect to Title V operating permit requirements (40 CFR 71.2 and 40 CFR 71.3):

- If the increase in stationary source emissions under the Proposed Action qualify as a Title V major source. This includes the potential to emit 100 tpy for criteria pollutants, or 10 tpy of any individual HAP, or 25 tpy of all HAPs combined, or 100,000 tpy of GHGs.

Only operational emissions increases were evaluated for PSD and Title V permitting impacts as construction activity emissions are typically not subject to the above significance criteria for these permit programs.

4.1.2 Proposed Action

The four site alternatives would generate essentially the same air quality impacts. Therefore, their air quality impacts discussion is consolidated into this one section for the Proposed Action. However, anomalies for certain alternatives that would cause some minor differences in air emissions are included in the detailed emissions calculations within **Appendix B** and in the tables below.

Construction Emissions Estimates. Short-term, adverse effects on air quality would be expected from the construction of the commissary; however, the effects would not be significant. The construction activities associated with the new facility would generate air pollutant emissions from site-disturbing activities such as grading, filling, compacting, trenching, and operation of construction equipment. Construction activities would also generate particulate emissions as fugitive dust from ground-disturbing activities and from the combustion of fuels in construction equipment and hauling of materials to the site. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the work phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of activity. Construction activities would incorporate best management practices (BMPs) and control measures (e.g., frequent use of water to suppress dust from dust-generating activities) to minimize fugitive particulate matter emissions. Additionally, the work vehicles are assumed to be well-maintained and could use diesel particle filters to reduce emissions. Construction workers commuting daily to and from the job site in their personal vehicles would also result in criteria pollutant air emissions. Based on the size of the new facility and the duration of the construction activities, it is not expected that emissions from construction activities would contribute to or affect local or regional attainment status with the NAAQS.

Emissions from construction activities would be produced only for the duration of work activities, which, for the purposes of this air quality analysis, is conservatively assumed to be 240 workdays (i.e., 5 days per week, 4 weeks per month, and 12 calendar months). Air emissions from construction activities are summarized in **Tables 4-2** through **4-5** for each of the four Site Alternatives. **Appendix B** contains detailed calculations and the assumptions used to estimate the air emissions. Note that all construction emissions are not stationary sources but are classified as mobile source emissions.

Operational Emissions Estimates. Long-term, adverse effects on air quality would be expected from the operations at the commissary; however, the effects would not be significant. The proposed facility would produce air emissions from the operation of the building's heating systems. Long-term emissions would be produced yearly, beginning with the year following the construction of the commissary. Further information on the sources of long-term air emissions are summarized in the following paragraphs.

It was assumed the proposed commissary would use a natural gas heating system. Although the design capacity of the heating system was not available, it was assumed the total heating capacity requirement would be approximately 6 million British Thermal Units per hour (BTU/hr) based on typical heating designs for military base buildings of similar size. Emissions from the building's heating systems were estimated using USEPA's emissions factor reference document, AP-42 (USEPA 2011e). Air emissions estimates from these operations are summarized in **Table 4-6**. **Appendix B** contains detailed calculations and the assumptions used to estimate the air emissions.

Table 4-2. Estimated Annual Air Emissions Resulting from Construction of the Proposed Action at Site Alternative 1

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Site 1 Alternative							
Combustion Emissions	6.090	0.673	2.641	0.403	0.424	0.411	703.199
Fugitive Dust Emissions	-	-	-	-	19.380	1.938	-
Haul Truck On-Road Emissions	0.570	0.412	1.674	0.045	0.677	0.176	144.189
Construction Commuter Emissions	0.176	0.175	1.586	0.002	0.017	0.011	210.371
Total Construction Emissions from Proposed Action – Site 1 Alternative	**6.836**	**1.261**	**5.901**	**0.450**	**20.498**	**2.536**	**1,057.759**
Percent of Cobb County Inventory	**0.03%**	**0.01%**	**0.005%**	**0.002%**	**0.1%**	**0.04%**	**See value and note below**
Percent of Metropolitan Atlanta AQCR Inventory	**0.004%**	**0.001%**	**0.001%**	**0.0003%**	**0.01%**	**0.01%**	**0.0005%***
General Conformity Applicability Thresholds	**100**	**100**	**NA**	**NA**	**NA**	**100**	**NA**

Notes: * Percent of Georgia's 2009 CO_2 emissions (DOE/EIA 2011). NA = Not Applicable

Table 4-3. Estimated Annual Air Emissions Resulting from Construction of the Proposed Action at Site Alternative 2

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Site 2 Alternative							
Combustion Emissions	5.391	0.633	2.356	0.389	0.381	0.370	616.710
Fugitive Dust Emissions	-	-	-	-	11.055	1.105	-
Haul Truck On-Road Emissions	0.425	0.307	1.249	0.033	0.506	0.131	107.638
Construction Commuter Emissions	0.176	0.175	1.586	0.002	0.017	0.011	210.371
Total Construction Emissions from Proposed Action – Site 2 Alternative	**5.992**	**1.116**	**5.192**	**0.425**	**11.958**	**1.617**	**934.719**
Percent of Cobb County Inventory	**0.03%**	**0.005%**	**0.004%**	**0.002%**	**0.1%**	**0.04%**	**See value and note below**
Percent of Metropolitan Atlanta AQCR Inventory	**0.004%**	**0.001%**	**0.001%**	**0.0002%**	**0.01%**	**0.005%**	**0.0005%***
General Conformity Applicability Thresholds	**100**	**100**	**NA**	**NA**	**NA**	**100**	**NA**

Notes: * Percent of Georgia's 2009 CO_2 emissions (DOE/EIA 2011). NA = Not Applicable

Table 4-4. Estimated Annual Air Emissions Resulting from Construction of the Proposed Action at Site Alternative 3

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Site 3 Alternative							
Combustion Emissions	5.682	0.650	2.474	0.395	0.399	0.387	652.583
Fugitive Dust Emissions	-	-	-	-	13.178	1.318	-
Haul Truck On-Road Emissions	0.482	0.349	1.417	0.038	0.573	0.149	122.074
Construction Commuter Emissions	0.176	0.175	1.586	0.002	0.017	0.011	210.371
Total Construction Emissions from Proposed Action – Site 3 Alternative	**6.341**	**1.174**	**5.477**	**0.435**	**14.167**	**1.864**	**985.028**
Percent of Cobb County Inventory	**0.03%**	**0.01%**	**0.004%**	**0.002%**	**0.1%**	**0.05%**	**See value and note below**
Percent of Metropolitan Atlanta AQCR Inventory	**0.004%**	**0.001%**	**0.001%**	**0.0002%**	**0.01%**	**0.01%**	**0.0005%***
General Conformity Applicability Thresholds	**100**	**100**	**NA**	**NA**	**NA**	**100**	**NA**

Notes: * Percent of Georgia's 2009 CO_2 emissions (DOE/EIA 2011). NA = Not Applicable

Table 4-5. Estimated Annual Air Emissions Resulting from Construction of the Proposed Action at Site Alternative 4

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Site 4 Alternative							
Combustion Emissions	6.090	0.673	2.641	0.403	0.424	0.411	703.199
Fugitive Dust Emissions	-	-	-	-	19.446	1.945	-
Haul Truck On-Road Emissions	0.576	0.417	1.693	0.045	0.685	0.178	145.874
Construction Commuter Emissions	0.176	0.175	1.586	0.002	0.017	0.011	210.371
Total Construction Emissions from Proposed Action – Site 4 Alternative	**6.843**	**1.265**	**5.921**	**0.450**	**20.572**	**2.544**	**1,059.444**
Percent of Cobb County Inventory	**0.03%**	**0.01%**	**0.005%**	**0.002%**	**0.1%**	**0.1%**	**See value and note below**
Percent of Metropolitan Atlanta AQCR Inventory	**0.004%**	**0.001%**	**0.001%**	**0.0003%**	**0.01%**	**0.01%**	**0.0006%***
General Conformity Applicability Thresholds	**100**	**100**	**NA**	**NA**	**NA**	**100**	**NA**

Notes: * Percent of Georgia's 2009 CO_2 emissions (DOE/EIA 2011). NA = Not Applicable

Table 4-6. Estimated Annual Air Emissions Resulting from Operation of the Proposed Action

Activity	NO_x tpy	VOC tpy	CO tpy	SO_2 tpy	PM_{10} tpy	$PM_{2.5}$ tpy	CO_2 tpy
Building Heating Systems Emissions	1.288	0.142	2.164	0.015	0.196	0.196	3,091.765
Worker and Patron Commuting Emissions	5.288	5.265	47.593	0.062	0.501	0.316	6,311.130
Total Operational Emissions from Proposed Action	**6.576**	**5.407**	**49.757**	**0.077**	**0.697**	**0.512**	**9,402.895**
Percent of Cobb County Inventory	**0.01%**	**0.008%**	**0.01%**	**0.0001%**	**0.002%**	**0.008%**	**See value and note below**
Percent of Metropolitan Atlanta AQCR Inventory	**0.002%**	**0.001%**	**0.002%**	**0.00002%**	**0.0002%**	**0.0009%**	**0.003%**[b]
PSD Permitting Thresholds	**250**	**250**	**250**	**250**	**250**	**250**	**75,000**[c]
NANSR Permitting Thresholds	**100**	**100**	**NA**	**NA**	**NA**	**100**	**NA**
Title V Permitting Thresholds	**100**	**100**	**100**	**100**	**100**	**100**	**100,000**[c]
General Conformity Applicability Thresholds	**100**	**100**	**NA**	**NA**	**NA**	**100**	**NA**

Notes:

a. There will be some emissions of NO_x from the process operations but they have not been fully quantified; however, the limited design information indicates the emissions will be negligible.

b. Percent of Georgia's 2009 CO_2 emissions (DOE/EIA 2011).

c. These thresholds include aggregating emissions of all GHGs; however, the overwhelming majority of GHGs emitted from the operational sources is CO_2.

NA = Not Applicable

Long-term air emissions would also be produced from the new workers commuting to the installation along with new patrons visiting the commissary. It is conservatively estimated that a total of 1,200 patrons and employees would commute to the installation daily based on estimated peak levels (DeCA 2012). It was assumed that the 1,200 vehicles would travel from outside the AQCR. Air emissions estimates from these personnel are summarized in **Table 4-6**. **Appendix B** contains detailed calculations and the assumptions used to estimate the air emissions. Note that the operational emissions are the same for each of the four site alternatives.

Based on the emissions calculations, operational emissions and construction emissions from the Proposed Action are not expected to (1) cause or contribute to a violation of any national or state ambient air quality standard, (2) increase the frequency or severity of a violation of any ambient air quality standard, (3) expose sensitive receptors to substantially increased pollutant concentrations, (4) exceed any Evaluation Criteria established by a SIP, or (5) delay the attainment of any standard or other milestone contained in the SIP. In addition, the operational emissions increases are not expected to trigger PSD, NANSR, or Title V permitting. Minor NSR permitting could be necessary for new heating systems or any other fossil-fueled combustion sources (e.g., emergency generator). The requirement for Minor NSR permitting should be determined once further design information is available.

General Conformity. The Proposed Action is located in a nonattainment area for $PM_{2.5}$ and O_3. Therefore, General Conformity applicability was evaluated based on the increase in $PM_{2.5}$ emissions and the pollutants that generate O_3, VOCs, and NO_x. The thresholds are 100 tpy for each of these pollutants. As shown above in **Tables 4-2** through **4-6**, the General Conformity thresholds are not expected to be exceeded for this Proposed Action, either during the construction activities or subsequent operational activities. Therefore, a General Conformity determination is not required.

Greenhouse Gas Emissions. Construction and operational activities would contribute directly to emissions of GHGs from the combustion of fossil fuels. Because CO_2 emissions account for approximately 92 percent of all GHG emissions in the United States, they are used to simplify the analyses of GHG emissions in this assessment.

The U.S. Department of Energy, Energy Information Administration estimates that in 2009 gross CO_2 emissions in Georgia were 164.2 million metric tons and were 5,814.4 million metric tons in the entire United States (DOE/EIA 2011). The Proposed Action would emit an estimated maximum of 960.9 metric tons from construction activities (Site Alternative 4) and 8,528.4 metric tons annually from operational activities. Construction GHG emissions would be temporary and occur for one year. GHG emissions from operational activities would be permanent beginning in the year following the completion of construction. The total maximum estimated annual CO_2 emissions from the Proposed Action would be 0.005 percent of Georgia's 2009 CO_2 emissions and 0.00015 percent of the entire United States' 2009 CO_2 emissions. Therefore, the Proposed Action would represent a negligible contribution towards statewide and national GHG inventories.

4.1.3 No Action Alternative

Under the No Action Alternative, Dobbins ARB would not implement the Proposed Action. Existing conditions would remain the same as described in **Section 3.1.2**. No effects on regional or local air quality would be expected.

4.2 Noise

4.2.1 Evaluation Criteria

Noise impact analyses typically evaluate potential changes to the existing noise environment that would result from implementation of a proposed action. Potential changes in the acoustical environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels or reduce the ambient sound level), negligible (i.e., if the total number of sensitive receptors to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased sound exposure to unacceptable noise levels or ultimately increase the ambient sound level). Projected noise effects were evaluated qualitatively for the alternatives considered.

4.2.2 Proposed Action

4.2.2.1 Site Alternative 1: Corps Lab Site

Construction Noise. The sources of noise at Site Alternative 1 that could impact populations include construction activities. These sources are addressed as follows.

The Proposed Action consists of constructing a permanent commissary for authorized patrons. Noise from construction activities varies depending on the type of equipment being used, the area that the action would occur in, and the distance from the noise source. To predict how construction activities would impact adjacent populations, noise from the probable equipment was estimated. For example, as shown in **Table 3-4**, construction usually involves several pieces of equipment (e.g., trucks and bulldozers) that can be used simultaneously. Under the Proposed Action, the cumulative noise from the construction equipment, during the busiest day, was estimated to determine the total impact of noise from construction activities at a given distance. Examples of expected cumulative construction noise during daytime hours at specified distances are shown in **Table 4-7**. These sound levels were predicted at 50, 100, 200, 400, 800, and 1,200 feet from the source of the noise.

Table 4-7. Predicted Noise Levels from Construction Activities

Distance from Noise Source	Predicted Noise Level
50 feet	89 dBA
100 feet	83 dBA
200 feet	77 dBA
400 feet	71 dBA
800 feet	65 dBA
1,200 feet	61 dBA

The noise from construction equipment would be localized, short-term, and intermittent during machinery operations. Heavy equipment would be used periodically during construction; therefore, noise levels from the equipment would fluctuate throughout the day.

Site Alternative 1 is within the installation boundary to the northwest; however it is bordered by off-installation land to the west and north. The closest off-installation noise-sensitive receptor (a residential area) is approximately 500 feet to the west. Persons approximately 500 feet from construction activities would like experience noise levels of approximately 68 dBA.

Construction activities under the Proposed Action would result in short-term, minor, adverse impacts on the noise environment in the vicinity of construction activities. However, noise generation would last only for the duration of construction activities and would diminish as they moved farther away from the receptor. Noise generation could be minimized by restricting construction to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.) and the use of measures such as equipment exhaust mufflers. It is not anticipated that the short-term increase in ambient noise levels from the Proposed Action at Site Alternative 1 would cause significant adverse effects on the surrounding populations.

Noise contours from aircraft operations at Dobbins ARB are directly south and west of Site Alternative 1. Since multiple single noise events create the cumulative DNL value, the actual sound levels that a person hears within the area of the DNL noise contours fluctuates throughout a 24-hour period. Consequently, populations within and adjacent to Site Alternative 1 are accustomed to fluctuations of noise levels. In addition, noise generation would last only for the duration of construction activities and would be isolated to normal working hours. Consequently, construction activities at Site Alternative 1 would not result in significant impacts on the noise environment.

Construction Vehicular Noise. Short-term, negligible to minor, adverse impacts on the ambient environment would be expected as a result of the increase in construction vehicular traffic under the Proposed Action. Construction traffic would use existing roadways as discussed in **Section 3.2.2** to access Site Alternative 1. The additional traffic resulting from construction vehicles would likely cause minor increases in noise levels on noise-sensitive populations adjacent to these roadways.

Operational Noise. Long-term, negligible to minor, adverse impacts on the ambient environment would be expected as a result of the increase in operational vehicular traffic under the Proposed Action. Persons would use Atlanta Road and a new or relocated controlled access point to access Site Alternative 1. Given that the increase in vehicles under the Proposed Action would likely be intermittent, that Atlanta Road is a primary roadway, and the gate and access road to the site improvements, long-term, minor increases in noise levels on noise-sensitive populations adjacent to these roadways would be expected. See **Section 4.8.2.1** for more information on the roadway improvements for Site Alternative 1.

No adverse impacts from operation of the proposed commissary would be expected. Operational noise would include mechanical ventilation, heat recovery systems, and air conditioning. These noise sources are standard for any shopping location, and would not be expected to be intrusive to commissary patrons. Therefore, operational noise at Site Alternative 1 would not result in significant impacts on the noise environment.

4.2.2.2 Site Alternative 2: BX Site

Construction Noise. Construction noise at Site Alternative 2 would be expected to be similar to Site Alternative 1. The proposed construction activities would be expected to result in noise levels comparable to those indicated in **Table 4-7**. Site Alternative 2 is not on the border of the installation, consequently there are no off-installation noise-sensitive land uses adjacent to it. Construction activities at Site Alternative 2 would result in short-term, direct, minor, adverse impacts on the noise environment in the vicinity of those activities.

Noise contours from aircraft operations at Dobbins ARB are directly south of Site Alternative 2. Consequently, populations within and adjacent to Site Alternative 2 are accustomed to fluctuations of noise levels. In addition, noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Consequently, construction activities at Site Alternative 2 would not result in significant impacts on the noise environment.

Construction Vehicular Noise. Vehicular noise from construction vehicles would be expected to be similar to those for Site Alternative 1. Construction traffic would use existing roadways as discussed in **Section 3.2.2** to access Dobbins ARB and existing roadways within the installation to access Site Alternative 2.

Operational Noise. Vehicular noise from commissary patrons would be expected to be similar to those for Site Alternative 1. Persons traveling to Site Alternative 2 would use existing roadways to access Site Alternative 2. However, as discussed in **Section 4.8.2.2**, a new entrance to the BX and commissary would likely be constructed off of Atlantic Avenue. If a large number of vehicles traveled to or from the commissary during peak hours, the installation roads and gates could become more congested, especially since Atlanta Avenue is one of the main roads on the installation and connects to the main gate. Consequently, long-term, minor increases in noise levels on noise-sensitive populations adjacent to these roadways would be expected.

Operational noise from the proposed commissary would be the same as under Site Alternative 1. Consequently, operational noise at Site Alternative 2 would not result in significant impacts on the noise environment.

4.2.2.3 Site Alternative 3: Barclay Gate Site

Construction Noise. Construction noise at Site Alternative 3 would be expected to be similar to Site Alternative 1. The proposed construction activities would be expected to result in noise levels comparable to those indicated in **Table 4-7**. Site Alternative 3 is not on the border of the installation, consequently there are no off-installation noise-sensitive land uses adjacent to it. Construction activities at Site Alternative 3 would result in short-term, direct, minor, adverse impacts on the noise environment in the vicinity of those activities.

Noise contours from aircraft operations at Dobbins ARB are approximately 500 feet south of Site Alternative 3. Consequently, populations within and adjacent to Site Alternative 3 are accustomed to fluctuations of noise levels. In addition, noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Consequently, construction activities at Site Alternative 3 would not result in significant impacts on the noise environment.

Construction Vehicular Noise. Vehicular noise from construction vehicles would be expected to be similar to those for Site Alternative 1. Construction traffic would use existing roadways as discussed in **Section 3.2.2** to access Dobbins ARB and Site Alternative 3.

Operational Noise. Vehicular noise from commissary patrons would be expected to be similar to those for Site Alternative 1. Persons traveling to Site Alternative 3 would use existing roadways outside and inside the installation. However, if Site 3 was chosen, an access road from Industrial Drive to the commissary would need to be constructed. Patrons and employees would arrive and depart at varying times. Similar to Site 2, if a large number of vehicles traveled to or from the commissary during peak hours, the installation roads and gates could become more congested. Consequently, long-term, minor increases in noise levels on noise-sensitive populations adjacent to these roadways would be expected. See **Section 4.8.2.3** for more information on the roadway improvements for Site Alternative 3.

Operational noise from the proposed commissary would be the same as under Site Alternative 1. Consequently, operational noise at Site Alternative 3 would not result in significant impacts on the noise environment.

4.2.2.4 Site Alternative 4: City of Marietta Site

Construction Noise. Construction noise at Site Alternative 4 would be expected to be similar to Site Alternative 1. The proposed construction activities would be expected to result in noise levels comparable to those indicated in **Table 4-7**. Site Alternative 4 is outside the installation boundary to the north; therefore, the site is bordered by potentially noise-sensitive land uses outside of the installation boundary. Site Alternative 4 is surrounded by public/semi-public land use to the west, north, and east, which includes two universities, their associated facilities, and a child-care center. Persons accessing these buildings would be expected to experience construction noise levels of up to 89 dBA, depending on their proximity to construction activities. Construction activities at Site Alternative 4 would result in short-term, direct, minor, adverse impacts on the noise environment in the vicinity of those activities.

Noise contours from aircraft operations at Dobbins ARB are approximately 2,000 feet south of Site Alternative 4. Consequently, populations within and adjacent to Site Alternative 4 are accustomed to fluctuations of noise levels. In addition, noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.). Consequently, construction activities at Site Alternative 4 would not result in significant impacts on the noise environment.

Construction Vehicular Noise. Vehicular noise from construction vehicles would be expected to be similar to those for Site Alternative 1. Construction traffic would use existing roadways as discussed in **Section 3.2.2** to access Dobbins ARB and Site Alternative 4.

Operational Noise. Persons traveling to Site Alternative 4 would travel on South Cobb Drive outside of the installation, enter the main gate, travel on Atlantic Avenue Southeast and take the Gym Road bridge. However, the road network in this region of the installation would require upgrading to accommodate the increases in traffic and commercial deliveries. In addition, a new road would need to be constructed to directly access the site. Similar to Sites 2 and 3, if a large number of vehicles traveled to or from the commissary during peak hours, the installation roads and gates could become more congested. Consequently, long-term, minor increases in noise levels on noise-sensitive populations adjacent to these roadways would be expected. See **Section 4.8.2.4** for more information on the roadway improvements for Site Alternative 4.

Operational noise from the proposed commissary would be the same as under Site Alternative 1. Consequently, operational noise at Site Alternative 4 would not result in significant impacts on the noise environment.

4.2.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented. There would not be an increase in construction activities, or vehicle operations; consequently, the ambient noise environment would not change from existing conditions as described in **Section 3.2.2**.

4.3 Land Use

4.3.1 Evaluation Criteria

An analysis of the effects of a proposed action on land use on an AFRC installation addresses the potential for impacts to occur on areas affected and the potential for buildings and other obstructions to intrude into controlled airspace. New construction should be compatible with current land use guidelines. Land use can remain compatible, become compatible, or become incompatible. Projected compatibility issues were measured both qualitatively and quantitatively. The level of potential land use effects is based on the degree of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use effect would be significant if it met any of the following criteria:

- Was inconsistent or in noncompliance with existing land use plans or policies
- Precluded the viability of existing land use
- Precluded continued use or occupation of an area
- Was incompatible with adjacent land use to the extent that public health or safety is threatened
- Conflicted with planning criteria established to ensure the safety and protection of human life and property.

4.3.2 Proposed Action

4.3.2.1 Site Alternative 1: Corps Lab Site

Long-term, minor to moderate, adverse impacts on land use would be expected at Site Alternative 1. As discussed in **Section 3.3.2**, the majority of Site Alternative 1 is part of AFP-6 and, as such, it is not addressed in the installation's 2010 General Plan. If the proposed commissary were built at this site, property owned by AFMC would be transferred to AFRC. Implementation of the Proposed Action within Site Alternative 1 would require the current land use designation to be changed from Lockheed Martin to commercial. However, Lockheed Martin is not currently using facilities on this property to produce aircraft or perform maintenance on them. There is a fitness trail that runs through the center of Site 1 that would likely have to be relocated under the Proposed Action, which would result in minor, adverse impacts. A change in the land use designation would be expected to have a less than significant impact on land use plans or policies.

The Aviation Wing of the Marietta Museum of History has sub-leased approximately 15 acres on Site Alternative 1. The museum, aircraft displays and several trailers are currently on the southern portion of this site. If the Proposed Action were constructed on Site 1, it is possible that these facilities would have to be relocated. This would result in impacts to the museum from relocation; in addition, the USAF might be required to cover the financial costs. However, since Site 1 includes 24.3 total acres, it is possible that the proposed commissary and supporting facilities could be built on the northern portion of the site with minor impacts to the property that the museum leases. Consequently, long-term, minor to moderate, adverse impacts on land use would be expected.

Implementation at Site Alternative 1 would not preclude the viability of existing land uses, or the continued use and occupation of areas surrounding it. Lockheed Martin personnel would continue to have access to the area south of the site, and the transfer of land to AFRC would not be expected to interfere with Lockheed Martin's use of the rest of the AFP-6 property. Therefore, it would result in no impacts on existing land use viability or continued land occupation.

Implementation at Site Alternative 1 would not violate local zoning ordinances and municipal zoning regulations do not apply to Federal property. Therefore, the Proposed Action would not result in any impacts on municipal land use plans or policies.

Construction at Site Alternative 1 would produce temporary, elevated noise levels that could be heard by populations in the surrounding area for the duration of those activities (see **Section 4.2.2.4**). Operation of the proposed commissary at Site Alternative 1 would not produce appreciable noise above ambient noise levels. Therefore, the proposed commissary would not result in impacts on land use compatibility from noise at Site Alternative 1.

4.3.2.2 Site Alternative 2: BX Site

No adverse impacts on land use would be expected at Site Alternative 2. Implementation at Site Alternative 2 would require the land use designation for most of the eastern half of the parcel to be changed from open space to commercial; however, this is consistent with the Dobbins ARB Future Land Use Plan (Dobbins ARB 2010a). Impacts on municipal land use plans and policies would be similar to those described for Site Alternative 1. The operation of the proposed commissary at Site Alternative 2 would not preclude the viability of existing land uses or the continued use and occupation of areas surrounding the proposed commissary. Therefore, the Proposed Action would result in no impacts on land use plans or policies, existing land use viability, or continued land occupation.

Construction and operational noise levels would be expected to be similar to those for Site Alternative 1. Therefore, less than significant impacts on land use compatibility would be expected from noise at Site 2.

4.3.2.3 Site Alternative 3: Barclay Gate Site

Long-term, minor, adverse impacts on land use would be expected at Site Alternative 3. As discussed in **Section 3.3.2**, Site Alternative 3 is part of AFP-6 and, as such, it is not addressed in the installation's 2010 General Plan. If the proposed commissary were built at this site, the property would be transferred to AFRC. Implementation of the Proposed Action at Site Alternative 3 would require the current land use designation to be changed from Lockheed Martin to commercial. However, the existing buildings on this site are used for storage or are vacant; no adverse impacts on Lockheed Martin operations would be expected from the transfer of this land to AFRC. Impacts on municipal land use plans and policies would be similar to those described for Site Alternative 1. Therefore, a change in the land use designation would be expected to have a less than significant impact on land use plans or policies and would not preclude the viability of existing land uses, or the continued use and occupation of areas surrounding it. Portions of this site were previously used as a landfill and would not be available for development. Consequently, an evaluation of the areas suitable for development would need to occur during the design phase of the Proposed Action.

Construction and operational noise levels would be expected to be similar to those for Site Alternative 1. Therefore, Site Alternative 3 would not result in impacts on land use compatibility from noise at Site 3.

4.3.2.4 Site Alternative 4: City of Marietta Site

Long-term, minor to moderate, adverse impacts on land use would be expected at Site Alternative 4. Site Alternative 4 is outside the installation boundary in the City of Marietta. The city has designated the existing and future use of this land as recreational. If the proposed commissary were built at this site, the property would be transferred to AFRC. Implementation of the Proposed Action at Site Alternative 4 would require the current land use designation to be changed from recreational to commercial. This would reduce the amount of recreational land within the City of Marietta by 9 percent (City of Marietta 2006a). The loss of park land would be expected to have a long-term, minor to moderate, adverse impact on park patrons. There are about 25 other parks in the City of Marietta, including the A.L. Burruss Nature Park, which is within 1 mile of the site (City of Marietta 2012). Therefore, there is ample park land available elsewhere in the City of Marietta. A change in the land use designation would be expected to have a less than significant impact on municipal land use plans or policies.

Persons would continue to be able to use Barclay Circle to access the universities and other facilities to the north and east of Site Alternative 3. Implementation of Site Alternative 3 would not preclude the continued use and occupation of areas surrounding it.

Construction and operational noise levels would be expected to be similar to those for Site Alternative 1. However, there are noise-sensitive land uses adjacent to Site Alternative 4 (see **Section 4.2.2**). Short-term, minor, adverse impacts on these noise-sensitive areas would be expected from construction noise. Operation of the proposed commissary at Site Alternative 4 would not produce appreciable noise above ambient noise levels. Therefore, Site Alternative 4 would not result in impacts on land use compatibility from noise during facility operations.

4.3.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be implemented and existing land use conditions would remain the same as under current conditions as described in **Section 3.3.2**. No impacts on land use would be expected.

4.4 Geological Resources

4.4.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating the potential impacts of a proposed action on geological resources. Generally adverse impacts can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development.

Impacts on geology and soils would be significant if they would substantially alter the geology that controls groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure, or function within the environment.

4.4.2 Proposed Action

4.4.2.1 Site Alternative 1: Corps Lab Site

Short- and long-term, minor, adverse impacts on geology and soils would be expected at Site Alternative 1. However, no significant adverse impacts would be expected, as construction would not substantially alter the geology of the site, and the soils present on site are largely disturbed, urban soil complexes. Construction would involve grading, paving, vegetation removal, and subsequent landscaping. Construction vehicles would compress soils, decreasing permeability and rates of stormwater runoff infiltration. The primary impacts on geology and soils from the Proposed Action at this site would be soil compact and erosion. Clearing of vegetation would increase erosion and sedimentation.

Because of potential soil contamination from the prior operations of the USACE Laboratory on this site, a site-specific soil contamination investigation should be conducted prior to implementing this alternative.

Long-term, minor, adverse impacts could occur from the increase in impervious surfaces in addition to the existing impervious surfaces on site. Increased impervious surfaces from construction of the commissary and its associated parking lot and access road could result in increased soil erosion and sedimentation. However, implementation of sustainable design techniques such as bioswales, green roofs, and retention ponds would offset the increase in erosion, sedimentation, and stormwater runoff resulting from the increase in impervious surfaces. By implementing sustainable design techniques, erosion and sedimentation rates should be expected to be maintained at current (pre-construction) levels.

As a result of implementing this alternative, soils would be compacted, and soil structure would be disturbed. Loss of soil structure due to excavation or compaction from foot and vehicle traffic could result in changes in drainage patterns. However, the majority of the soils at the Corps Lab Site have been previously disturbed and modified by development. Soil erosion-control, stormwater-control, and sediment-control measures would be included in site plans to minimize these impacts.

4.4.2.2 Site Alternative 2: BX Site

Impacts on geological resources would be similar to the impacts expected at Site Alternative 1. The land north of Industrial Drive within this site is largely undeveloped, with less disturbed soils of the Madison and Pacolet series. Additionally, underground water pipes and Industrial Drive would potentially be rerouted to accommodate construction of the commissary. Therefore, slightly more intensive short-term, adverse impacts on soils would be expected.

The primary impacts from the Proposed Action at this site would be soil compaction and erosion. Impacts from increases in impervious surfaces are expected to be similar to Site Alternative 1. Soil erosion-, sediment-, and stormwater-control measures would be implemented as described.

4.4.2.3 Site Alternative 3: Barclay Gate Site

Impacts on geological resources would be similar to the impacts expected from Site Alternative 1. However, there are two IRP sites within the area. The contaminants have been contained at both sites, and are currently in the long-term monitoring phase. Additionally, Site 3 is large enough to accommodate the proposed commissary without encroaching on the IRP sites. Therefore, potential contamination from the IRPs would not be expected to contribute to adverse impacts.

The primary impacts from the Proposed Action at this site would be soil compaction and erosion. Impacts from increases in impervious surfaces are expected to be similar to Site Alternative 1. Soil erosion-, sediment-, and stormwater-control measures would be implemented as described above.

4.4.2.4 Site Alternative 4: City of Marietta Site

Impacts on geological resources would be similar to, but more intense than, the impacts expected from Site Alternative 1. In addition to the construction activities described in Site Alternative 1, Site Alternative 4 would require upgrading to the road network, and construction of a new road to access the site directly. Fencing around the perimeter of the commissary would be required in order to secure the site, which is currently located outside installation boundaries.

The primary impacts from the Proposed Action at this site would be soil compact and erosion. Erosion potential would be greatest in the northern and eastern portions of the site, where the Madison clay loam has slopes of up to 25 percent.

Because of potential soil contamination from the groundwater plume from AFP-6, a site-specific soil contamination investigation should be conducted prior to implementation at this location.

Impacts from increases in impervious surfaces are expected to be similar to, but more intense than, Site Alternative 1. Soil erosion-, sediment-, and stormwater-control measures would be implemented as described above.

4.4.3 No Action Alternative

Under the No Action Alternative, the USAF would not construct a new commissary and associated infrastructure on Dobbins ARB. Conditions would remain as described in **Section 3.4.2**, and no impacts on geological resources would be expected.

4.5 Water Resources

4.5.1 Evaluation Criteria

Evaluation criteria for effects on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. A proposed action would have significant effects on water resources if it were to do one or more of the following:

- Substantially reduce water availability or supply to existing users
- Overdraft groundwater basins
- Exceed safe annual yield of water supply sources
- Substantially adversely affect water quality
- Endanger public health by creating or worsening health hazard conditions
- Threaten or damage unique hydrologic characteristics
- Violate established laws or regulations adopted to protect water resources.

The potential effect of flood hazards on a proposed action is important if such an action occurs in an area with a high probability of flooding.

Minimization of soil erosion is considered when evaluating potential effects of a proposed action on soil resources. Generally, adverse effects can be avoided or minimized if proper construction techniques, erosion-control measures, and structural engineering design are incorporated into project development. Effects on soils would be significant if they would alter the soil composition, structure, or function within the environment.

4.5.2 Proposed Action

4.5.2.1 Site Alternative 1: Corps Lab Site

Groundwater. Long-term, negligible, indirect adverse impacts on groundwater would be expected at Site Alternative 1. Groundwater at Dobbins ARB is not currently used for either potable or industrial purposes nor would it be used for such purposes at Alternative 1. Soil compaction and disturbance from vehicle traffic during project implementation could result in localized changes in drainage patterns, as compacted soil reduces infiltration and can inhibit growth of vegetation (USEPA 1999). Negligible effects on groundwater recharge would occur from the increase in impervious surfaces and related decrease in infiltration of precipitation into soils to recharge groundwater.

It is possible that construction equipment could leak or spills could occur during demolition and construction activities. In the event of a spill or leak of fuel or other contaminants, there could be adverse effects on groundwater because contaminants could seep through soils and into the underlying groundwater. All fuels and other potentially hazardous materials would be contained and stored appropriately. In the event of a spill, procedures identified in the installation's SPCC Plan would be followed to quickly contain and clean up a spill. Please see **Section 4.9** for a discussion on hazardous materials and wastes. There remains the possibility that a spill or leak could occur, but implementation of the BMPs identified in the SPCC Plan would minimize the potential for and extent of associated contamination.

Surface water. Construction of the commissary would result in long-term, minor, indirect, adverse effects on surface water as stormwater runoff volume and velocity would be expected to increase due to the increase in impervious surfaces. This increased runoff could affect the surface water quality of the receiving water bodies, such as Rottenwood Creek. Adherence to standard engineering practices, applicable codes and ordinances, and the Dobbins ARB SWPPP would typically reduce stormwater runoff-related impacts. Depending on where the commissary is constructed on Site 1, long-term, negligible or long-term, minor, adverse effects on vegetation could be expected due to permanent removal of vegetation, which could impact water quality and stormwater volume and velocity entering the drainage channel. However, by implementing sustainable design techniques, as described in **Section 3.5.1**, site hydrology would be expected to remain at current (pre-construction) levels.

As previously mentioned, it is possible that construction equipment could leak or spills could occur during demolition and construction activities as described in the groundwater section for Site 1. In the event of a spill or leak of fuel or other contaminants, there could be adverse effects on the receiving water bodies. All fuels and other potentially hazardous materials would be contained and stored appropriately. In the event of a spill, procedures identified in the installation's SPCC Plan would be followed to quickly contain and clean up a spill. There remains the possibility that a spill or leak could occur, but implementation of the BMPs identified in the SPCC Plan would minimize the potential for and extent of associated contamination.

Wetlands/Floodplains. Although no wetlands are on Site Alternative 1, long-term, negligible, indirect, adverse impacts on wetlands would be expected. Offsite wetlands could be impacted from stormwater runoff. The Proposed Action would increase impervious surfaces, causing a decrease in groundwater recharge and an increase in stormwater runoff. The installation and maintenance of erosion- and sediment-control barriers and the implementation of stormwater BMPs would reduce potential indirect impacts on wetlands from stormwater runoff, soil erosion, and sedimentation. No floodplains occur in the vicinity of Site 1; therefore, no impacts on floodplains would be expected.

4.5.2.2 Site Alternative 2: BX Site

Groundwater. Although a groundwater plume containing VOCs is adjacent to Site Alternative 2, impacts on groundwater would be expected to be similar to those described at Site 1. Soil compaction and vehicular disturbance would be similar to, but slightly greater than the conditions described at Site 1 due to an increase in vehicle congestion. Groundwater is currently not used for either potable or industrial purposes at Dobbins ARB nor would it be used for such purposes at Site 2. However, project planning should include the potential need for groundwater sampling prior to commencement of construction activities. The handling, storage, transportation, and disposal of hazardous substances would be conducted in accordance with applicable Federal, state, and local regulations; USAF regulations; and Dobbins ARB management procedures. BMPs would be implemented to minimize the potential for conveyance of pollutants associated with spills or stormwater runoff into the groundwater.

Surface water. Impacts on surface water at Site Alternative 2 would be expected to be similar to those described at Site Alternative 1. Even though Site 2 is closer to water bodies than Site 1, the commissary design remains unchanged, vegetation removal would be approximately comparable, and impacts on surface water as a result of the Industrial Drive reroute would be similar to those described for museum relocation at Site 1.

Wetlands/Floodplains. Long-term, minor, indirect, adverse impacts on wetlands would be expected to occur at Site Alternative 2, as described for Site Alternative 1. Site 2 is closer to wetlands than Site 1; however, this proximity would not be expected to increase impacts on wetlands and floodplains. Impacts on adjacent wetlands and other water resources would be avoided through design, siting, and proper implementation of erosion and sediment control and stormwater management practices along with other appropriate environmental protection measures and BMPs. Proper implementation of these measures and BMPs would ensure that no effects on surrounding wetlands or other waters of the United States would occur. Correspondence with regulatory and resource agencies prior to commencing any ground-breaking construction activities would be completed and permits would be obtained, as necessary.

No effects on floodplains or associated flood flows would be expected. Site 2 is approximately 0.4 miles from the nearest 100-year floodplain and implementation of stormwater BMPs during and following construction would ensure that runoff from the site would not impact downslope floodplains.

4.5.2.3 Site Alternative 3: Barclay Gate Site

Groundwater. Although a groundwater plume containing VOCs is underneath Site Alternative 3, impacts on groundwater would be expected to be similar to, but less than those described at Site Alternative 2. Vehicle congestion would not likely occur, no relocation of buildings or roads would be implemented, and IRP sites would be avoided resulting in long-term, negligible, indirect impacts on groundwater. BMPs as discussed at Sites 1 and 2 would be implemented to ensure potential for impacts on groundwater would be minimized.

Surface water. Impacts on surface water at Site Alternative 3 would be expected to be similar to, but less than those described at Site Alternative 1. The total impervious surfaces would generally remain the same; however, no building or road relocation would occur, resulting in long-term, negligible to minor, indirect, adverse impacts on surface water. Depending on where the commissary is constructed on Site 3, long-term, negligible or long-term, minor, adverse effects on vegetation could be expected due to permanent removal of vegetation, which could impact water quality and stormwater volume and velocity entering the unnamed stream on the site.

Wetlands/Floodplains. Effects on wetlands and floodplains would be similar to, but less than, those described at Site Alternative 2. An increase in impervious surfaces and vegetation removal would occur. No buildings or roads would be relocated and environmental protection measures and construction BMPs would be implemented to reduce the potential for impacts on wetlands. The nearest wetlands to the site are associated with Small Lake approximately 0.1 mile to the southeast. Effects on wetlands and floodplains would be reduced based on proper implementation of environmental protection measures and construction BMPs, resulting in long-term, negligible, indirect adverse impacts on wetlands. The nearest floodplains are 0.4 miles to the southeast. BMPs would keep runoff from reaching the floodplains. Therefore, no impacts on floodplains would be expected.

4.5.2.4 Site Alternative 4: City of Marietta Site

Groundwater. Long-term, negligible, indirect adverse impacts on groundwater would be expected at Site Alternative 4. Although a groundwater plume containing VOCs is underneath a portion of Site 4, impacts on groundwater would be expected to be similar to those described at Site 2. Road infrastructure would need to be upgraded to accommodate the increase in traffic and perimeter fencing would be installed resulting in impacts similar to, but greater than, the museum relocation described at Site 1 due to increased ground disturbance and associated potential effects on groundwater. BMPs as discussed at Sites 1 and 2 would be implemented to ensure potential for impacts on groundwater would be minimized.

Surface water. Impacts on surface water at Site Alternative 4 would be expected to be similar to, but greater than, those described at Site Alternative 1. An increase in vegetation removal would be expected at Site 4 resulting in long-term, minor, indirect, adverse impacts on surface water as discussed at Site 1. The increase in vegetation removal would lead to increased runoff compared to the other alternatives, resulting in a greater impact on water quality. The intermittent stream running through the site could be impacted depending on building placement. Prior to conducting any activities that could impact the intermittent stream, a current jurisdictional determination from USACE would be obtained. If the stream is a jurisdictional water of the United States then coordination with USACE would be conducted. Any impacts on the stream would be avoided and minimized to the maximum extent practicable and any necessary permits would be obtained prior to conducting any activities that could affect the stream.

Wetlands/Floodplains. Impacts on wetlands and floodplains would be similar to, but less than, those described at Site Alternative 2. An increase in vegetation removal would lead to increased runoff; however, the distance to adjacent wetlands would also increase, resulting in long-term, negligible, indirect, adverse impacts on wetlands. The nearest floodplains are 0.4 miles to the southeast. BMPs would keep runoff from reaching the floodplains. Therefore, no impacts on floodplains would be expected. .

4.5.3 No Action Alternative

Under the No Action Alternative, the proposed commissary would not be constructed and conditions of water resources described in **Section 3.5.2** would remain unchanged. Therefore, no impacts on water resources would be expected from the No Action Alternative.

4.6 Biological Resources

4.6.1 Evaluation Criteria

The level of impact on biological resources is based on (1) the importance (e.g., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications. Impacts on biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern. A habitat perspective is used to provide a framework for analysis of general classes of effects (i.e., removal of critical habitat, noise, human disturbance). Emphasis is placed on species with legal, commercial, recreational, ecological, or scientific importance.

4.6.2 Proposed Action

4.6.2.1 Site Alternative 1: Corps Lab Site

Vegetation. Short-term, negligible, direct, adverse impacts and long-term, negligible to moderate, direct, adverse impacts on vegetation would be expected at Site Alternative 1. The majority of vegetation within Site 1 is modified, landscaped, and mowed regularly. Short-term, negligible, adverse impacts on vegetation would be expected from temporary disturbances during construction activities (e.g., trampling and removal). This vegetation would be expected to regenerate or be replanted once construction activities have ceased. Depending on where the commissary is situated on Site 1, long-term, negligible or long-term, minor to moderate, adverse effects on vegetation could be expected from construction of the proposed commissary from the permanent removal of vegetation. Existing trees would likely be left in place to the greatest extent possible. The majority of vegetation within the project area has been planted and is not within a native and naturally occurring vegetation community; therefore, impacts on native vegetation as a result of direct removal within the open space and developed portions of Site 1 are anticipated to be negligible. If the proposed construction footprint overlaps a portion of the forested area in the eastern edge of Site 1, long-term, adverse impacts on vegetation would be minor to moderate from the permanent removal of native forest vegetation.

Any disturbances to the canopy or ground surface in the forested habitat in Site 1 as a result of the Proposed Action could allow opportunities for nonnative and invasive species to establish or spread within this forest stand, resulting in long-term, minor to moderate, adverse effects on vegetation. The following BMPs should be implemented during and following construction activities to prevent the establishment or spread of nonnative species:

- Inspect and clean construction equipment to remove soil, plants, and seeds
- Stage construction equipment in areas free of nonnative plant species
- Use weed-free materials (grass seed, mulch, gravel, sand)
- Promptly revegetate disturbed sites with native plant species
- Minimize soil disturbance and implement erosion-control practices.

Wildlife. Short-term and intermittent, direct, minor, adverse impacts on wildlife would be expected at Site Alternative 1 due to noise disturbances as a result of construction activities and heavy equipment use. High noise events could cause wildlife to engage in escape or avoidance behaviors, resulting in short-term, minor, adverse effects. Increases in ambient noise can reduce communication, inhibit predator detection, and increase energy expenditures in wildlife species. Noise can also distort or mask bird's communication signals (e.g., songs, warning calls, fledgling begging calls) and ability to find prey or detect predators (USEPA 1980). If noise persists in a particular area, animals could leave their habitat and avoid it permanently. Avoidance behavior by animals requires the expenditures of excess energy that is needed for survival (e.g., finding new food sources, water sources, and breeding and nesting habitats) (USEPA 1980). Most wildlife species in Site 1 would be expected to quickly recover once the construction activities have ceased for the day and after the construction period is complete. Construction noises would only be expected to affect individual animals within close proximity to the noise sources. Population-level impacts would not be expected to occur.

Depending on where the commissary is situated on Site 1, long-term, negligible to minor, adverse effects on wildlife could be expected from construction of the proposed commissary due to permanent removal of habitat and permanent disturbances due to increased human activity and traffic within the vicinity. The proposed construction footprint would likely occur within the open space and developed area within Site 1. Removal of this habitat type would result in long-term, negligible, adverse effects on wildlife. Wildlife species occurring within this habitat type are anticipated to be common, generalist species such as mourning doves, common grackles, gray squirrels, eastern cottontails, and nonnative species such as European starlings and house sparrows. Because these species are habitat generalists, it is anticipated that displaced individuals would be able to find other suitable habitats in the vicinity. It is also anticipated that species occurring within the open and developed areas of Site 1 would be adapted to human disturbances and could become habituated to long-term disturbances from the operation of the commissary.

If the proposed construction footprint overlaps a portion of the forested area in the eastern edge of Site 1, long-term, adverse impacts on wildlife would be minor to moderate due to the permanent removal of native forest habitat. Several wildlife species occurring within the forested habitat in the eastern portion of Site 1 are anticipated to be more specific in their habitat requirements and less accustomed to human disturbances. Therefore, impacts on wildlife from the removal of forested habitat are anticipated to be greater than impacts from the removal of maintained or disturbed habitats within Site 1.

Long-term, minor, direct, adverse impacts on wildlife could also be expected from mortality of smaller, less mobile wildlife species (e.g., reptiles, amphibians, rodents) that cannot avoid construction equipment or from wildlife species that nest or live within trees (e.g., squirrels, opossums) that are removed during construction activities. As discussed in the following section, vegetation-removal activities should occur outside of the migratory bird nesting season in order to avoid impacts on breeding birds and nests.

Protected and Sensitive Species. No federally listed threatened, endangered, or candidate species or Georgia DNR special concern species have been documented within Site Alternative 1. Therefore, no impacts on federally or state-listed species would be expected from the implementation of the Proposed Action at Site Alternative 1. If the construction footprint overlaps the forested portion of Site 1, a site-specific survey for pink ladyslipper populations should be conducted prior to any vegetation-removal activities. Although very unlikely, if a population of pink ladyslippers is discovered with more than 100 plants within the forested area of Site 1, a 50-foot buffer should be created to protect from disturbances around this population per the U.S. Forest Service and Georgia DNR recommendations. Any discovered occurrences of pink ladyslippers would be avoided to the greatest extent practicable.

The Migratory Bird Treaty Act and EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, require Federal agencies to minimize or avoid impacts on migratory birds listed in 50 CFR 10.13. Construction associated with the Proposed Action would be conducted in a manner to avoid adverse impacts on migratory birds to the greatest extent practicable and it is not anticipated that the Proposed Action would have any measureable negative impacts on migratory birds (e.g., direct mortality, decrease in population size, decrease in fitness, repetitive nest failure). However, impacts on migratory birds from temporary construction disturbances and long-term habitat removal and operational disturbances would be similar to those previously discussed for wildlife. BMPs, which are discussed as follows for migratory birds, are recommended for reduction or avoidance of impacts on migratory bird species within Site 1, particularly if trees or shrubs are to be removed by the Proposed Action.

Any construction or clearing activities requiring tree or shrub removal should be performed before migratory birds return to the project area or after all young have fledged to avoid incidental take (i.e., approximately mid-March through early August).

If construction or clearing activities are scheduled to start during the period when migratory birds are present, a site-specific survey for nesting migratory birds should be performed immediately prior to the activities. If nesting birds are found during the survey, buffer areas should be established around nests. Activities should be deferred in buffer areas until birds have left the nest.

Since no bald eagles are known to nest within the vicinity of Dobbins ARB and bald eagles are only transient visitors in the area, no impacts on bald eagles would be expected from the implementation of the Proposed Action within Site 1.

4.6.2.2 Site Alternative 2: BX Site

Vegetation. Impacts on vegetation from the implementation of the Proposed Action at Site Alternative 2 would be similar to those described for Site Alternative 1. Because the proposed commissary would be constructed adjacent to the existing BX facility, most of the vegetation that would be removed is anticipated to be regularly maintained, nonnative, lawns and landscaping. Therefore, short-term and long-term impacts on vegetation are anticipated to be negligible. If the forested area in the eastern portion of Site 2 were disturbed, impacts would be similar to those described for Site 1.

Wildlife. Impacts on wildlife from the implementation of the Proposed Action at Site Alternative 2 would be similar to those described under Site Alternative 1. Because the proposed commissary would be constructed adjacent to the existing BX facility, wildlife species that would be impacted from short-term disturbances and long-term habitat removal are anticipated to be habitat generalists that are adapted to frequent human disturbances. Furthermore, fewer less mobile species (e.g., reptiles, amphibians, rodents) that could be trampled by construction equipment would be expected to occur within Site 2. Therefore, short-term and long-term impacts on wildlife are anticipated to be negligible. If the forested habitat in the eastern portion of Site 2 were disturbed, impacts would be similar to those described for Site 1.

Protected and Sensitive Species. Impacts on protected and sensitive species from the implementation of the Proposed Action at Site Alternative 2 would be similar to those described for Site Alternative 1. No federally listed threatened, endangered, or candidate species or Georgia DNR special concern species have been documented within Site 2. Therefore, no impacts on federally or state-listed species would be expected from the implementation of the Proposed Action within Site 2. Impacts on potential migratory birds within Site 2 would be minimized from the implementation of BMPs described under Site Alternative 1. No impacts on bald eagles would be expected.

4.6.2.3 Site Alternative 3: Barclay Gate Site

Vegetation. Impacts on vegetation from the implementation of the Proposed Action at Site Alternative 3 would be similar to those described for Site Alternative 1. The construction footprint would likely occur within previously disturbed or regularly maintained and landscaped areas within Site 3. Therefore, short-term and long-term impacts on vegetation would be negligible. If the construction footprint overlaps the forested portions of Site 3, long-term, minor to moderate, adverse effects on vegetation would be expected due to the permanent removal of native forest vegetation.

Wildlife. Impacts on wildlife from the implementation of the Proposed Action within Site Alternative 3 would be similar to those described under Site Alternative 1. The construction footprint would likely occur within previously disturbed or regularly maintained and landscaped areas within Site 3; and fewer less mobile species (e.g., reptiles, amphibians, rodents) that could be trampled by construction equipment would be expected to occur within Site 3. Therefore, long-term impacts on wildlife from the removal of habitat and mortality from the operation of construction equipment would be negligible. If the construction footprint overlaps the forested portions of Site 3, long-term, minor, adverse effects on wildlife would be expected from the removal of native forest habitat and from wildlife mortality caused by the operation of construction equipment.

Protected and Sensitive Species. Impacts on protected and sensitive species from the implementation of the Proposed Action within Site Alternative 3 would be similar to those described for Site Alternative 1. No federally listed threatened, endangered, or candidate species or Georgia DNR special concern species have been documented within Site 3. Therefore, no impacts on federally or state-listed species would be expected from the implementation of the Proposed Action within Site 3. If the construction footprint overlaps the forested portions of Site 3, a site-specific survey for pink ladyslipper populations should be conducted prior to any vegetation-removal activities. Although unlikely, if a population of pink ladyslippers is discovered with more than 100 plants within the forested area of Site 3, a 50-foot buffer should be created to protect from disturbances around this population per the U.S. Forest Service and Georgia DNR recommendations. Any discovered occurrences of pink ladyslippers would be avoided to the greatest extent practicable.

Impacts on potential migratory birds within Site 3 would be minimized from the implementation of BMPs described under the Site Alternative 1. No impacts on bald eagles would be expected.

4.6.2.4 Site Alternative 4: City of Marietta Site

Vegetation. Short-term, minor, direct, adverse effects and long-term, moderate, direct, adverse effects on vegetation would be expected at Site Alternative 4. The majority of vegetation within Site 4 is native pine/pine hardwood forest. Short-term, minor, adverse effects on vegetation would be expected from temporary disturbances during construction activities (e.g., trampling and removal). This vegetation would be expected to regenerate or be replanted once construction activities have ceased. Long-term, moderate, adverse impacts on vegetation would be expected due to the permanent removal of native forest vegetation within Site 4. Because the forest in Site 4 adjoins stand DN-1 delineated on Dobbins ARB

(Dobbins ARB 2011a), it is assumed that it is a continuation of the same forest stand and thus would likely have excellent forest habitat quality. In addition, Site 4 is part of one of the largest contiguous forest stands in the vicinity of Dobbins ARB. Therefore, adverse impacts from the removal of this vegetation type would be greater than any of the other site alternatives for the Proposed Action.

Any disturbances to the canopy or ground surface in the forested habitat in Site 4 as a result of the Proposed Action could allow opportunities for nonnative and invasive species to establish or spread within this forest stand, resulting in long-term, minor to moderate, adverse effects on vegetation. BMPs discussed in Site Alternative 1 should be implemented to prevent the establishment or spread of nonnative plant species within Site 4.

Wildlife. Impacts on wildlife at Site Alternative 4 would be similar to, but greater than, those described for Site Alternative 1. Short-term and long-term, minor to moderate, adverse impacts on wildlife would be expected from the implementation of the Proposed Action in Site Alternative 4. Many wildlife species occurring within Site 4 are anticipated to be more specific in their habitat requirements and less accustomed to human disturbances. Furthermore, Site Alternative 4 contains more isolated and contiguous habitat than Site Alternatives 1 through 3. Therefore, short-term and long-term, adverse impacts from construction activities, permanent removal and fragmentation of habitat, mortality of less-mobile wildlife species from construction equipment, and commissary operational disturbances within Site 4 would be greater than any of the other site alternatives for the Proposed Action.

Protected and Sensitive Species. No known threatened or endangered species surveys have been conducted within Site Alternative 4. Therefore, it is not known if any federally listed threatened, endangered, or candidate species or Georgia DNR special concern species occur within Site 4. Due to the existing vegetation community type within Site 4, it is likely that pink ladyslipper colonies occur within the site. Site-specific surveys for threatened, endangered, candidate, or special concern species should be conducted prior to the selection of this site for the construction of a commissary. Any discovered protected or sensitive species would be avoided to the greatest extent practicable and any necessary correspondence/consultation with USFWS would be conducted. If a population of pink ladyslippers is discovered with more than 100 plants within Site 4, a 50-foot buffer should be created to protect from disturbances around this population per U.S. Forest Service and Georgia DNR recommendations. Any discovered occurrences of pink ladyslippers would be avoided to the greatest extent practicable. Impacts on potential migratory birds within Site 4 would be minimized from the implementation of BMPs described under Site Alternative 1. No impacts on bald eagles would be expected.

4.6.3 No Action Alternative

Under the No Action Alternative, the proposed commissary would not be constructed and conditions of biological resources would remain as described in **Section 3.6.2**. Therefore, no impacts on biological resources would be expected from the No Action Alternative.

4.7 Cultural Resources

4.7.1 Evaluation Criteria

Adverse impacts on cultural resources can include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or that alter its setting; general neglect of the resource to the extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of the agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

4.7.2 Proposed Action

Consultation with Section 106 of the NHPA will occur once a preferred site has been chosen. At this time, a preferred site has not been chosen.

4.7.2.1 Site Alternative 1: Corps Lab Site

No significant impacts on cultural resources would be expected at Site Alternative 1. Site 1 is within the viewshed of the western end of the Bell Bomber Plant Historic District. The westernmost building in the historic district is Building B-1, the Main Assembly Building. Given its scale, at more than 3,000,000 ft^2, and that of other adjacent non-historic buildings, the proposed commissary would have no adverse effect on the viewshed of the historic district.

The Aviation Wing of the Marietta Museum of History is located at Site 1, using a parking lot for static plane displays. It is housed in non-historic facilities outside of the boundaries of the Bell Bomber Plant Historic District within AFP-6. The museum and its displays might have to be relocated if the commissary where built on this site. Although it is a separate organization, the museum, in part, interprets the history of the Bell Bomber Plant and has a vested interested in remaining in close proximity to AFP-6.

This site is just north of the Sibley-Gardner House and its archaeological sensitivity zone. Given the level of disturbance at Site 1, there is little possibility that archaeological sites are present though additional testing might be needed depending on the proximity of the proposed commissary's site to the house. Should any discoveries be found during the process of design or construction, Section 4.2.4 of the Dobbins ARB Integrated Cultural Resources Management Plan (ICRMP) regarding Inadvertent Discoveries must be followed.

4.7.2.2 Site Alternative 2: BX Site

No significant impacts on cultural resources would be expected at Site Alternative 2. The eastern corner of Site 2 is in the vicinity of the Mount Sinai Cemetery, though not immediately adjacent to it. The rerouting of Industrial Drive required by selection of this site would have to be designed to avoid either direct or indirect effects on the cemetery. The viewshed of the NRHP-eligible Big Lake Dam, to the southeast of the BX site, could be blocked by vegetation, though it is already compromised by other buildings. Constructing the commissary at this location would have no adverse effect on any historic resources.

4.7.2.3 Site Alternative 3: Barclay Gate Site

No significant impacts on cultural resources would be expected at Site Alternative 3. This site is the easternmost portion of AFP-6. There are three small buildings within this site. Buildings B-90 and B-120 have previously been determined not eligible for listing in the NRHP. Building 64 of AFP-6, the Avionic Test Facility built in 1961, was last evaluated for NRHP eligibility in 1997 when it was found to not possess enough exceptional significance to meet Criteria Consideration G, for buildings less than 50 years old. It has now reached 50 years of age and should be reevaluated for NRHP eligibility if this site is chosen. Due to the size of the site and the surrounding buildings, it is likely that a proposed commissary could be located and designed in such a manner that it would have no adverse effect on Building B-64 if it is proven eligible.

Site 3 borders the eastern edge of the Bell Bomber Plant Historic District, and is adjacent to Buildings U-124 and U-145, the Water Pumping Station and Dehydrated Air Compressor Building, respectively, both of which are considered contributing to the district. Given the industrial nature of the district and the size of neighboring buildings, the proposed commissary would have no adverse effect on the viewshed of the district or Buildings U-124 and U-125.

Immediately outside of the western corner of the Site 3 is the NRHP-listed Bankston Rock House. It is surrounded by larger structures and is in the viewshed of the massive AFP-6 manufacturing buildings. If the commissary or its related parking facilities are not constructed adjacent to the Bankston Rock House in the western corner of this site, there would be no adverse effect on the historic structure.

The southeastern edge of this site is also in the vicinity of, though not immediately adjacent to, the Mount Sinai Cemetery, but the proposed commissary would have no effect on that resource.

4.7.2.4 Site Alternative 4: City of Marietta Site

No significant impacts on cultural resources would be expected at Site Alternative 4. Site 4 is located outside of current USAF property, just north of Dobbins ARB and east of AFP-6. The site is currently wooded and bordered by a highway and a contemporary apartment complex and school. There are no historic buildings adjacent to the site on USAF property. Site 4 includes two potentially historic small cemeteries and an adjacent house site, as noted **Section 3.7.2**. If this site is chosen, evaluation of the cemeteries for NRHP eligibility would be completed. As noted in the 2007 to 2011 ICRMP, any project that might affect the burials would have to follow the Georgia Annotated Code Relating to Burials and Cemeteries. The proposed commissary and associated facilities could likely be designed around the cemeteries. However, long-term, adverse impacts could occur from construction and increased visibility. The impacts from increased visibility could be lessened with proper planning.

4.7.3 No Action Alternative

Under the No Action Alternative, no new commissary would be constructed and there would be no affect on any historic properties at Dobbins ARB or AFP-6.

4.8 Infrastructure

4.8.1 Evaluation Criteria

Impacts on infrastructure are evaluated for their potential to disrupt or improve existing levels of service on the existing utilities that could occur from the increase in workforce and the changes to the Dobbins ARB as a result of the Proposed Action. An impact would be significant if implementation of the Proposed Action resulted in the following impacts on electrical power, natural gas, liquid fuels, central heating and cooling, potable water, sanitary sewer/wastewater, stormwater, communications, and solid waste systems:

- Exceed capacity of a utility
- A long-term interruption of the utility
- A violation of a permit condition
- A violation of an approved plan for that utility.

4.8.2 Proposed Action

4.8.2.1 Site Alternative 1: Corps Lab Site

Electrical System. No significant impacts on the existing electrical system would be expected at Site Alternative 1. Minor temporary impacts could occur on the electrical system as the aboveground and underground utilities are extended or rerouted during construction, causing temporary disruptions in service to existing buildings and facilities within the boundaries of, or adjacent to Site Alternative 1. These impacts/disruptions would be short in duration and would only occur during demolition (if needed) and construction.

Following the implementation of the Proposed Action, the overall electrical demand at Dobbins ARB would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, 38 percent of the existing electrical substation's capacity is in surplus during the peak periods over the high-demand summer months (Dobbins ARB 2010a). Therefore, the additional demand for electricity would be negligible in magnitude and would be accommodated by the existing capacity of the Dobbins ARB electrical system.

Natural Gas System. No significant impacts on the existing natural gas system would be expected at Site Alternative 1. Natural gas would be used to heat the proposed commissary. Natural gas infrastructure would have to be extended from the installation to this site, or obtained commercially. Gas South provides the City of Marietta with gas services. Natural gas service is available at the installation; however, according to the Natural Gas Distribution System map, the existing gas line extends only to the eastern boundary of the parcel of land that contains the Corps Laboratory Site (Dobbins ARB 2010a). Therefore, the existing natural gas line network would have to be extended to the northwestern corner of this parcel of land (approximately 3,500 to 6,000 feet) to provide service to the proposed commissary at Site Alternative 1. This is the longest gas line extension of all the proposed build alternatives if it is extended from the main gas line at Dobbins ARB. This extension of services could cause temporary disruptions in gas service to existing buildings and facilities within the boundaries of, or adjacent to, Site Alternative 1. The impacts/disruptions to service would be short in duration and would only occur during demolition (if needed) and construction. Natural gas lines to the site (via the USAF-owned lines or the city) would depend on the availability of the service, amount of work with respect to connecting the site, and the associated costs.

Following the implementation of the Proposed Action, the overall natural gas demand at Dobbins ARB would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. The Atlanta Gas Light Company can meet virtually any requirement for natural gas (Dobbins ARB 2010a). However, during periods of particularly cold weather the demand for natural gas is extremely high, which forces the Atlanta Gas Light Company to curtail supplies of natural gas to its industrial customers, including the facilities at Dobbins ARB that are provided interruptible services. At the time this EA was written, it was anticipated that the commissary would be on uninterrupted service; therefore, seasonal interruptions to this service are not anticipated. The increase in natural gas for the commissary would be negligible compared to the total natural gas demand at the installation.

Liquid Fuel. The Proposed Action would not alter the quantities of liquid fuels used at Dobbins ARB nor would it affect their handling or storage. There would be no impacts on liquid fuel as a result of the Proposed Action at Site Alternative 1.

Central Heating/Cooling. No significant impacts on central heating and cooling system would be expected. Dobbins ARB does not have a central heating/cooling plant. The majority of the facilities on Dobbins ARB are heated by natural gas and some by electricity. The proposed commissary would be heated by the natural gas network. Air conditioning would be installed in the sales areas and computer rooms of the proposed commissary, and reclamation of cold air from commissary display cases would be used in conjunction with the air conditioning system.

Water Supply System. No significant impacts on the existing water supply system would be expected at Site Alternative 1. Minor, temporary impacts could occur on the water supply system as the underground water lines are extended or rerouted during construction, causing temporary disruptions in service to existing buildings and facilities within the boundaries of, or adjacent to, Site Alternative 1. These impacts or disruptions would be short in duration and would only occur during demolition (if needed) and construction.

Following the implementation of the Proposed Action, the overall water supply demand at Dobbins ARB would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, the CCMWA current water supply storage capacity is 136 MGD with an average daily demand of 70 to 80 MGD (Dobbins ARB 2010a). Peak system demand occurs during the summer months and has been as high as 120 MGD. During peak periods, 12 percent of the system's treatment capacity remains in surplus. In addition, two potable water storage supply tanks are present at AFP-6 servicing Dobbins ARB with a total combined capacity of 4.5 million gallons. The peak demand at the military complex is 1.6 million gallons per month. Based on the storage supply at AFP-6 and the CCMWA, the Proposed Action would not significantly impact the existing water supply system.

Sanitary/Sewer Wastewater System. No significant impacts on the existing sanitary sewer/wastewater system would be expected at Site Alternative 1. Sanitary sewer/wastewater service interruptions could occur when the proposed commissary is connected to the tertiary sewage treatment plant. These impacts or disruptions would be short in duration and would only occur during demolition (if needed) and construction.

Following the implementation of the Proposed Action, the amount of wastewater generated at Dobbins ARB would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, any increase in the sanitary wastewater system would be negligible compared to the overall volume of wastewater generated at the installation. In addition, the tertiary sewage treatment plant has a maximum treatment capacity of 7 MGD of wastewater (Dobbins ARB 2010a). Historically, average daily flow is 1.1 MGD. Based on its treatment capacity, about 65 percent of the facility's capacity is surplus. Impacts on existing Dobbins ARB sanitary sewer/wastewater system are expected to be less than significant.

Stormwater/Sewer System. No significant impacts on the existing stormwater sewer system would be expected at Site Alternative 1. Construction of the Proposed Action would result in ground disturbance as heavy equipment would clear, grade, and contour land surfaces. These activities would temporarily disrupt natural and man-made stormwater drainage channels and increase the potential for stormwater runoff to erode soil during construction activities. Soil erosion and sediment production would be minimized during construction periods by following an erosion-and-sediment-control plan, and by using construction BMPs that would minimize ground surface disturbance and attempt to provide adequate temporary stormwater management techniques.

Site Alternative 1 is predominantly built-up with some landscaped areas and a trail intermixed. The construction of the proposed commissary and the associated sidewalks, parking lot, paved loading docks, and access road would add new impervious surface area and, therefore, an increase of sheet flow and runoff. However, because the site is already built-up, the increase in sheet flow and runoff as a result of additional impervious surface area is expected to be minimal. The proposed commissary construction plans include the installation of curbs and gutters, storm drainage systems, and landscaping that would help reduce potential sheet flow and runoff impacts. These new features would tie into the existing stormwater system. The existing system would continue to collect, convey, and treat runoff from the proposed site. The capabilities of the stormwater system are adequate to handle the potential increase in stormwater collection and disposal. Soil erosion and sediment control measures would be included in site plans to minimize long-term erosion and sediment runoff at the site. The site would be constructed with stormwater controls favoring methods that allow for stormwater to reenter the groundwater system rather than leaving the site as surface flow. With this method, the potential increase in runoff between pre- and post-development conditions would be managed, in accordance with EISA Section 438. Use of stormwater control measures that favor reinfiltration in this way would minimize the potential for erosion and sediment runoff as a result of future storm events. The Proposed Action would result in adverse impacts on stormwater systems (potential increase in stormwater); however, these impacts are expected to be less than significant.

Communications System. No significant impacts on the existing communications system would be expected at Site Alternative 1. Telephone and data service interruptions could occur to the communications system as the network is extended or rerouted during construction and when the Proposed Action is connected to the current communications system. This would cause temporary disruptions in service to existing buildings and facilities within the boundaries of, or adjacent to, Site Alternative 1. These impacts or disruptions would be short in duration and would only occur during construction.

Following the implementation of the Proposed Action, the overall telephone and data transmission demand at Dobbins ARB would increase due to the added infrastructure associated with the proposed commissary. The existing voice communications telephone switch has the capability of providing up to 10,000 phone lines with 4,800 presently in use (Dobbins ARB 2010a). Therefore, the current system can handle the increase of users as a result of the Proposed Action. In addition, with the implementation of the C4I system, increased data needs would also be satisfied.

Solid Waste Management System. No significant impacts on the existing solid waste management system at would be expected at Site Alternative 1. The proposed construction of the commissary and associated supporting areas would generate waste during construction. Receptacles would be provided for municipal solid waste generated by worker activity. Construction wastes would be separated from the solid waste stream and recycled. Nonhazardous construction waste would be transported to private transfer stations and disposed of in county landfills.

Following the implementation of the Proposed Action, the overall amount of solid waste generated at Dobbins ARB would increase due to the addition of the proposed commissary. However, any potential increase in solid waste generation would be negligible compared to the total volume of solid waste generated at Dobbins ARB and would be handled by current disposal practices. Therefore, the Proposed Action would result in an increase in solid waste generation; however, these impacts would be expected to be less than significant.

Transportation. Short- and long-term, minor to moderate, adverse impacts on the transportation system would be expected at Site Alternative 1. If the commissary were constructed at Site 1, patrons would access the site from Atlanta Road. The construction of a commissary would result in a slight increase in the amount of traffic at the site from equipment being delivered and contractors arriving to the work site. However, construction traffic would compose a small percentage of the total existing traffic on the existing roadways. Some of the heavy construction vehicles would be driven to the work sites and kept on-site for the duration of the activities, resulting in relatively few additional trips. The proposed construction activities would be spread over a period of several months, which would further reduce effects on traffic. Any potential increases in traffic volume associated with the proposed construction activities would be temporary. Consequently, short-term, negligible to minor, adverse impacts would be expected from construction activities.

Site 1 does not have a controlled access point, which means nonmilitary personnel can enter the site at any time. Controlled access points are required for commissaries that sell goods to military personnel. Currently, there are two entrances from Atlanta Road; a non-controlled entrance to Lockheed Martin and a separate controlled entrance to access Dobbins ARB. If the commissary were constructed on Site 1, the controlled access point would be relocated or a new entrance would be required, and accommodation for Lockheed Martin employees would continue. In addition, the access road to the site would be reconstructed. These changes would allow commissary patrons and employees to be separated, which should help alleviate congestion in the immediate area.

Under the Proposed Action, it is assumed that vehicles traveling to the commissary would arrive at varying times and come from different locations. In addition, delivery vehicles would travel to the commissary periodically. To access Site 1, traffic would use a new access route from Atlanta Road. In 2009, the average daily traffic count on Atlanta Road SE was 16,280 vehicles per day (GDOT 2009). Peak customer counts were estimated for a commissary, similar to one proposed at Dobbins ARB, at 1,200 per day (DeCA 2012). This would be an increase of approximately 7 percent of the daily total traffic on Atlanta Road. As discussed in **Section 3.8.2**, a traffic assessment in 2005 stated that vehicle speed and freedom of movement declined slightly due to increasing volume on the portion of Atlanta Road adjacent to the Site 1 (Cobb County 2008). Consequently, congestion on Atlanta Road could increase if the proposed commissary were built at this site. Given that the increase in vehicles under the Proposed Action would likely be intermittent, that Atlanta Road is a primary roadway, and the gate and access road improvements, long-term, minor to moderate, adverse impacts on the transportation system would be expected. However, if the proposed commissary is constructed at Dobbins ARB, a traffic study might need to be completed to further evaluate the traffic impacts from the proposed commissary.

Onsite Renewable Energy and Green Power. Dobbins ARB would consider the feasibility of incorporating renewable energy systems for the Commissary. This would include the installation of photovoltaic systems and solar hot water heaters on rooftops or over parking structures. It could also include the application of integrated solar photovoltaics on building façades. Incorporation of renewable energy on site would not only help to offset rising energy bills, it might present opportunities to test and advance new energy technologies and eventually provide energy independence for the facility. Dobbins ARB could conduct pilot projects for photovoltaic and wind alternatives to evaluate their effectiveness. Knowledge gained through pilot projects would provide insights into how these green technologies could be incorporated more broadly across the installation and in areas that are scheduled to be demolished.

In addition to onsite renewable energy generation, Dobbins ARB would consider entering into a power purchase agreement with the Georgia Power Company to supply power from renewable or sustainable sources in accordance with EO 13514 and its Strategic Sustainability Performance Plan.

4.8.2.2 Site Alternative 2: BX Site

Electrical System. Impacts on the electrical system and service disruptions would be similar to those described for Site Alternative 1.

Natural Gas System. Site Alternative 2 is closer in proximity to the existing natural gas infrastructure than Site Alternative 1. The natural gas system currently exists within the limits of Site Alternative 2. Depending on the location of the commissary within Site Alternative 2, the existing gas system would have to extend up to 1,500 feet. Impacts on the natural gas demand and disruptions would be similar to those described under Site Alternative 1.

Liquid Fuel. The Proposed Action would not alter the quantities of liquid fuels used at Dobbins ARB nor would it affect their handling or storage. Under Alternative 2, there would be no impacts on liquid fuel as a result of the Proposed Action.

Central Heating/Cooling. No significant impacts on central heating and cooling system would be expected. Dobbins ARB does not have a central heating/cooling plant. The majority of the facilities on Dobbins ARB are heated by natural gas, and some by electricity. The new commissary would be heated by the natural gas network. Air conditioning would be installed in the sales areas and computer rooms of the proposed commissary, and reclamation of cold air from commissary display cases would be used in conjunction with the air conditioning system.

Water Supply System. Impacts on the water supply system and service disruptions would be similar to those described for Site Alternative 1.

Sanitary/Sewer Wastewater System. Impacts on the sanitary sewer/wastewater system and service disruptions would be similar to those described for Site Alternative 1.

Stormwater/Sewer System. Site Alternative 2 is predominantly forested and undeveloped; therefore the increase in sheet flow and runoff as a result of new impervious surfaces from the implementation of the Proposed Action at this site is greater than that described in Site Alternative 1. However, the existing stormwater sewer system would be able to handle this additional flow and therefore the impacts on the stormwater sewer system would be similar to those described for Site Alternative 1. The site would be constructed with the stormwater controls that are described for Site Alternative 1.

Communication System. Impacts on the communications system and service disruptions would be similar to those described for Site Alternative 1.

Solid Waste Management System. Impacts on the solid waste management system would be similar to those described for Site Alternative 1.

Transportation. Short-term, negligible to minor, and long-term, minor to moderate, adverse effects on the transportation system would be expected at Site Alternative 2. The Proposed Action would result in a slight increase in the amount of traffic from equipment being delivered and contractors arriving to the work site. To access Site 2, vehicles would likely travel on South Cobb Drive outside of the installation, enter the main gate, and travel on Atlantic Avenue Southeast and Industrial Drive inside the installation. Construction vehicles would compose a small percentage of the total existing traffic on the existing roadways. However, since these vehicles would travel on secondary roads within the installation, there would be a greater potential for congestion than at Site 1. Any potential increases in traffic volume associated with the proposed construction activities would be temporary. Consequently, short-term, negligible to minor adverse impacts would be expected from construction activities.

If the existing BX and proposed commissary were collocated, there would be an increase in the amount of traffic on the adjacent roadways within the installation. The new patrons and employees (about 1,200 daily vehicles on peak days) would arrive and depart and varying times. However, the increase in vehicles, combined with the existing traffic to the BX, could cause congestion on Atlantic Avenue and into the BX access drive. This scenario is discussed in the *Dobbins Air Reserve Base General Plan* (Dobbins ARB 2010a). If Site 2 were chosen, recommendations in the General Plan state that Atlantic Avenue be realigned to the west of the traffic circle at Industrial Drive. Industrial Drive would be rerouted to the west of the existing BX. This would provide additional space for turning lanes in and out of the facilities, provide a greater distance between the existing BX and the road, and allow more space for parking. As a result, delivery trucks would be able to take the rerouted drive and access the BX and commissary from the north side. The new entrance to the BX and commissary would be from Atlantic Avenue. These measures would reduce long-term impacts on traffic within the installation. However, if a large number of vehicles traveled to or from the commissary during peak hours, the installation roads and gates could become more congested, especially since Atlantic Avenue is one of the main roads on the installation and connects to the main gate. Long-term, minor to moderate, adverse effects on the Dobbins ARB transportation system would be expected.

As previously mentioned, patrons would likely travel on South Cobb Drive or Delk Road outside of the installation to access Site 2. In 2010, the average daily traffic count on South Cobb Drive, adjacent to the installation, was 27,300 vehicles per day (GDOT 2010b). Peak customer counts were estimated at 1,200 per day (DeCA 2012), which would be an increase of approximately 4 percent of the daily traffic total on South Cobb Drive. In 2010, the average daily traffic count on Delk Road between the installation and I-75 was 3,970 vehicles per day (GDOT 2010a). This would be an increase of approximately 30 percent of the daily traffic total on Delk Road. Between I-75 and the installation, different segments of Delk Road have different levels of congestion. Traffic can move freely during peak hours on South Cobb Drive and some portions of Delk Road; however, vehicle speed and freedom of movement decline slightly due to increasing volume on other segments of Delk Road (Cobb County 2008). Consequently, congestion on Delk Road could increase if the proposed commissary were built at Site 2. Long-term, minor to moderate, adverse impacts on the transportation system outside the installation would be expected. If the proposed commissary is constructed at Dobbins ARB, a traffic study might need to be completed to evaluate the traffic impacts from the proposed commissary.

Onsite Renewable Energy and Green Power. Considerations for renewable energy and green power would be similar to those described for Site Alternative 1.

4.8.2.3 Site Alternative 3: Barclay Gate Site

Electrical System. Impacts on the electrical system and service disruptions would be similar to those described for Site Alternatives 1 and 2.

Natural Gas System. Site Alternative 3 is closer to existing natural gas infrastructure than Site Alternative 1, but is farther away from the infrastructure than Site Alternative 2. The natural gas system currently exists directly south of Site Alternative 3. Depending on the location of the commissary within Site Alternative 3, the existing piping network would have to be extended approximately 250 to 2,000 feet. Impacts on the natural gas demand and service disruptions would be similar to those described at Site Alternatives 1 and 2.

Liquid Fuel. The Proposed Action would not alter the quantities of liquid fuels used at Dobbins ARB nor would it affect their handling or storage. Under Site Alternative 3, existing ASTs would need be decommissioned and properly disposed of or moved to other temporary or permanent locations at the installation.

Central Heating/Cooling. No significant impacts on central heating and cooling system would be expected. Dobbins ARB does not have a central heating/cooling plant. The majority of the facilities on Dobbins ARB are heated by natural gas, and by some electricity. The proposed commissary would be heated by the natural gas network. Air conditioning would be installed in the sales areas and computer rooms of the proposed commissary, and reclamation of cold air from commissary display cases would be used in conjunction with the air conditioning system.

Water Supply System. Impacts on the water supply system and service disruptions would be similar to those described for Site Alternatives 1 and 2.

Sanitary/Sewer Wastewater System. Impacts on the sanitary sewer/wastewater system and service disruptions would be similar to those described for Site Alternatives 1 and 2.

Stormwater/Sewer System. Site Alternative 3 is similar to Site Alternative 4 in that the site is somewhat built-up; therefore, the increase in sheet flow and runoff as a result of new impervious surface area at the site is expected to be minimal. Impacts on the stormwater sewer system would be similar to those described for Site Alternatives 1 and 2. The site would be constructed with the stormwater controls that are described for Site Alternative 1.

Communications System. Impacts on the communications system and service disruptions would be similar to those described for Site Alternatives 1 and 2.

Solid Waste Management System. Impacts on the solid waste management system would be similar to those described for Site Alternatives 1 and 2.

Transportation. Short-term, negligible to minor, and long-term, minor to moderate, adverse effects on the transportation system would be expected at Site Alternative 3. Construction of a commissary would result in a slight increase in the amount of traffic from equipment being delivered and contractors arriving to the work site. Vehicles would likely access Site 3 using the same routes as they would to Site 2. Vehicles would travel on South Cobb Drive outside of the installation, enter the main gate, and travel on Atlantic Avenue Southeast and Industrial Drive inside the installation. Therefore, since these vehicles would travel on secondary roads within the installation, there would be a greater potential for congestion than at Site 1. Any potential increases in traffic volume associated with the proposed construction activities would be temporary. Consequently, short-term, negligible to minor, adverse impacts would be expected.

If Site 3 was chosen, an access road from Industrial Drive to the commissary would need to be constructed. Patrons and employees would arrive and depart at varying times. Similar to Site 2, if a large number of vehicles traveled to or from the commissary during peak hours, the installation roads and gates could become more congested. Consequently, long-term, minor to moderate, adverse effects on the Dobbins ARB transportation system would be expected.

Since Site 3 is adjacent to Site 2, vehicles would likely take the same routes to access both of these sites. Consequently, long-term, minor to moderate, adverse impacts on the transportation system outside the installation would be expected. If the proposed commissary is constructed at Dobbins ARB, a traffic study might need to be completed to evaluate the traffic impacts from the proposed commissary.

Onsite Renewable Energy and Green Power. Considerations for renewable energy and green power would be similar to those described for Site Alternatives 1 and 2.

4.8.2.4 Site Alternative 4: City of Marietta Site

Electrical System. No significant impacts on the existing electrical system would be expected at Site Alternative 4. Site Alternative 4 is owned by the City of Marietta. If Dobbins ARB purchased this property, electrical infrastructure would have to be extended from the installation or obtained commercially. Because electrical infrastructure is located within the vicinity of the City of Marietta Site, power to the site (via the USAF-owned lines or the city) would depend on the amount of work regarding connecting the site and the associated costs.

Following the implementation of the Proposed Action, the overall electrical demand at either Dobbins ARB or the City of Marietta would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, 38 percent of the existing electrical substation's capacity is in surplus during the peak periods over the high-demand summer months (Dobbins ARB 2010a). In addition, the increase in electrical demand compared to that of the general users in the City of Marietta would be negligible. Therefore, the additional demand for electricity would be less than significant and would be accommodated by either electrical system. Disruptions in electrical services during construction would be similar to those described for Site Alternatives 1, 2, and 3.

Natural Gas System. No significant impacts on the existing natural gas system would be expected at Site Alternative 4. Natural gas infrastructure would have to be extended from the installation to this site, or obtained commercially. Gas South provides the City of Marietta with gas services; however, no known pipelines are present within the immediate vicinity of the site (Dobbins ARB 2011d). The existing Dobbins ARB natural gas line is present directly south of the City of Marietta Site (Dobbins ARB 2010a). Depending on the location of the commissary within the site, if the lines were extended from the USAF-owned lines, the existing system would have to be extended approximately 250 to 2,000 feet. Natural gas lines to the site (via the USAF-owned lines or the city) would depend on the availability of the service, amount of work regarding connecting the site and the associated costs.

Following the implementation of the Proposed Action, the overall natural gas demand at Dobbins ARB or Gas South would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, the increase in demand would be accommodated by either service provider and would be negligible compared to the total natural gas demand at the installation or on Gas South. Service disruptions would be similar to those described under Site Alternatives 1, 2, and 3.

Liquid Fuel. No significant impacts on the liquid fuel would be expected at Site Alternative 4. The Proposed Action would not alter the quantities of liquid fuels used at Dobbins ARB nor would it affect their handling or storage.

Central Heating/Cooling. No significant impacts on central heating and cooling system would be expected. Dobbins ARB does not have a central heating/cooling plant. The majority of the facilities on Dobbins ARB are heated by natural gas, and some by electricity. The proposed commissary would be heated by the natural gas network. Air conditioning would be installed in the sales areas and computer rooms of the proposed commissary, and reclamation of cold air from commissary display cases would be used in conjunction with the air conditioning system.

Water Supply System. No significant impacts on the exiting water supply system would be expected at Site Alternative 4. Water supply infrastructure would have to be extended from the installation to this site, or obtained commercially. Portions of the Dobbins ARB water system are located directly south of the City of Marietta Site, and the CCMWA provides water to the City of Marietta including populous areas surrounding Site 4. Potable water to the site (via the USAF-owned lines or the CCMWA) would depend on the amount of work regarding connecting the site and the associated costs.

Following the implementation of the Proposed Action, the overall water supply would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, based on the storage supply at Dobbins ARB and the CCMWA, the Proposed Action would not significantly impact the existing water supply system. Potable water supply service disruptions would be similar to those described for Site Alternatives 1, 2, and 3.

Sanitary/Sewer Wastewater System. No significant impacts on the sanitary/sewer wastewater system would be expected at Site Alternative 4. Sewer/wastewater infrastructure would have to be extended from the installation to this site, or obtained commercially. Segments of the Dobbins ARB sanitary sewer/wastewater system are located directly south of the City of Marietta Site, and the CCMWA provides wastewater infrastructure to the City of Marietta. Sewer/wastewater services to the site (via the USAF-owned lines or the CCMWA) would depend on the amount of work regarding connecting the site and the associated costs.

Following the implementation of the Proposed Action, the amount of wastewater generated would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, any increase in the sanitary wastewater system would be negligible compared to the overall volume of wastewater generated at the installation or the City of Marietta. Therefore, impacts on existing Dobbins ARB sanitary sewer/wastewater system are expected to be less than significant. Sanitary sewer/wastewater system service disruptions would be similar to those described for Site Alternatives 1, 2, and 3.

Stormwater/Sewer System. No significant impacts on the stormwater/sewer system would be expected at Site Alternative 4. Site Alternative 4 is similar to Site Alternative 2 in that the area is predominantly forested; however, Site Alternative 4 is more heavily forested than Site Alternative 2. The increase in sheet flow and runoff as a result of new impervious surface areas is expected to be greater than that described in the other three site alternatives. The storm sewer system under this alternative would be constructed in such a way to handle the additional flow; therefore, the impacts on the stormwater sewer system would be similar to those described for Site Alternatives 1, 2, and 3. The site would be constructed with the stormwater controls that are described for Site Alternative 1.

The City of Marietta has a progressive stormwater management program implemented to eliminate nonpoint source pollution. Coordination with the City of Marietta upon design of the Proposed Action would be required to determine if its current systems or measures would need to be upgraded or if the current system can handle the potential increase in stormwater generated from the Proposed Action.

Communications System. No significant impacts on the communications system would be expected at Site Alternative 4. Following the implementation of the Proposed Action, the communications demands would increase due to the added infrastructure and the volume of users anticipated visiting the commissary. However, any increase in communication demands would be negligible compared to the overall demand generated at the installation or the City of Marietta. Therefore, impacts on existing Dobbins ARB communications network or any of the City of Marietta communications service providers would be negligible. Communications system service disruptions would be similar to those described for Site Alternatives 1, 2, and 3.

Solid Waste Management System. No significant impacts on the solid waste management system would be expected at Site Alternative 4. Following the implementation of the Proposed Action, the overall amount of solid waste generated would increase due to the addition of the proposed commissary. However, any potential increase in solid waste generation from the implementation of the Proposed Action would be negligible compared to the total volume of solid waste generated at Dobbins ARB or within the City of Marietta. The solid waste generated would be handled by current solid waste disposal practices. Therefore, the Proposed Action would result in an increase in solid waste generation; however, these impacts would be expected to be less than significant.

Transportation. Short-term, negligible to minor, and long-term, minor to moderate, adverse effects on the transportation system would be expected at Site Alternative 4. If this site were chosen, patrons would travel on South Cobb Drive outside of the installation, enter the main gate, travel on Atlantic Avenue Southeast and take Gym Road bridge, which crosses over South Cobb Drive, to Site 4. Similar to Sites 2 and 3, construction vehicles would travel on secondary roads within the installation and there would be a greater potential for congestion than at Site 1. Any potential increases in traffic volume associated with the proposed construction activities would be temporary.

By using the route through the installation and over Gym Road bridge, another controlled access point would not have to be constructed since vehicles could access the main gate. However, the road network in this region of the installation would require upgrading to accommodate the increases in traffic and commercial deliveries. In addition, a new road would need to be constructed to access the site directly. Similar to Sites 2 and 3, if a large number of vehicles traveled to or from the commissary during peak hours, the installation roads and gates could become more congested. Consequently, long-term, minor to moderate, adverse effects on the Dobbins ARB transportation system would be expected.

Vehicles would access Site 4 using the same off-installation routes as Site 2. Consequently, long-term, minor to moderate, adverse impacts on the transportation system outside the installation would be expected. If the proposed commissary is constructed at Dobbins ARB, a traffic study might need to be completed to evaluate the traffic impacts from the proposed commissary.

Onsite Renewable Energy and Green Power. Site Alternative 4 is owned by the City of Marietta. If Dobbins ARB purchased this property, electrical infrastructure would have to be extended from the installation or obtained commercially.

Following the implementation of the Proposed Action, the overall electrical demand at either Dobbins ARB or the City of Marietta would increase due to the added infrastructure and the volume of users anticipated to be visiting the commissary. The increase in electrical demand compared to that of the general users in the City of Marietta would be negligible. However, considerations for renewable energy and green power would be similar to those described for Site Alternatives 1, 2, and 3.

4.8.3 No Action Alternative

Under the No Action Alternative, the proposed commissary would not be constructed and infrastructure conditions would remain as described in **Section 3.8.2**. Therefore, no impacts on infrastructure would be expected from the No Action Alternative.

4.9 Hazardous Materials and Wastes

4.9.1 Evaluation Criteria

Impacts would be considered significant if a proposed action resulted in worker, resident, or visitor exposure to hazardous materials or wastes, or if the action generated quantities of these materials beyond the capability of current management procedures. Impacts on hazardous materials management would be considered significant if the Federal action resulted in noncompliance with applicable Federal and Georgia Environmental Protection Division regulations, or increased the amounts generated or procured beyond current Dobbins ARB waste management procedures and capacities. Impacts on the DERP would be considered significant if the Federal action disturbed (or created) contaminated sites resulting in adverse impacts on human health or the environment.

4.9.2 Proposed Action

The impacts discussed in this section apply to all four site alternatives. Therefore, these resources are not discussed further in **Sections 4.9.2.1** through **4.9.2.4**.

Hazardous Materials and Petroleum Products. No current storage or use of hazardous materials or petroleum products are identified at any of the four site alternatives. It is assumed that limited to moderate quantities of hazardous materials might have been used at Site Alternatives 1 and 3 resulting in historic releases that continue to potentially impact these sites as hazardous waste. In addition, previous management of hazardous materials at the nearby AFP-6 facility has resulted in contaminated groundwater that has migrated beneath each of the alternative sites. Impacts to each property associated with hazardous waste issues are discussed by site in subsequent sections.

No impacts on hazardous materials management during construction would be expected. Contractors would be responsible for the management of hazardous materials and petroleum product usage, which would be handled in accordance with Federal, state, and USAF regulations. Contractors must report the use of hazardous materials to the 94 MSG/CEVC to be input into the Hazardous Materials Management System (HMMS). If a material that is less hazardous can be used, the 94 MSG/CEVC should make these recommendations. Use of the HMMS system would also ensure that ozone-depleting substances are not available for use. Use of ozone-depleting substances in such products as refrigerants, aerosols, and fire-suppression systems is not permitted by the DOD without a formal request by waiver. There would be no new chemicals or toxic substances used or stored at the installation in conjunction with the Proposed Action.

The proposed commissary is not expected to use any hazardous materials other than refrigerants associated with the refrigerators, freezers, and HVAC systems or small quantities of cleaning materials. Under Title VI of the Clean Air Act, use of non-ozone depleting refrigerants is recommended. The EPA currently maintains a list of accepted alternatives to the ozone-depleting refrigerants historically used. In addition, new refrigerators and HVAC equipment are typically manufactured to be compatible with non-ozone depleting alternatives.

Prior to purchase of any chemical that would be used on-site, including refrigerants and cleaning products, a Hazardous Material Pharmacy (HAZMART) Control Number must be obtained from the HAZMART Manager. The operation of the commissary would not result in a significant increase in the type or quantity of hazardous materials or petroleum products. Therefore, no impacts on hazardous materials or petroleum product management would be expected.

Radon. Radon is not expected to be present in buildings above the USEPA guidance level of 4 pCi/L in indoor air at any of the sites, resulting in a negligible impact.

Pesticides. Pesticide contamination has not been identified at any of the four site alternatives. It is assumed that minimal amounts of pesticides were historically or are currently used at Site Alternatives 1, 3, and 4 to control nuisance pests, and that these pesticides were properly stored and used, resulting in a negligible impact.

The proposed commissary might use minor quantities of pesticides. Prior to purchase, a HAZMART Control Number must be obtained from the HAZMART Manager. The operation of the commissary would not result in a significant increase in the type or quantity of pesticides. Therefore, no impacts on hazardous materials or petroleum product management would be expected.

4.9.2.1 Site Alternative 1: Corps Lab Site

Hazardous and Petroleum Wastes. No significant impacts would be expected from the generation of hazardous wastes during construction activities. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible and thus less than significant impacts on the installation's hazardous waste management program would be expected. Contractors would be responsible for the temporary storage and disposal of hazardous wastes in accordance with Federal and state laws and regulations, and the *Hazardous Waste Management Plan for Dobbins ARB* (Dobbins ARB 2009c). BMPs, such as secondary containment, would be followed to ensure that contamination from a spill would not occur. In the event of a spill, the Dobbins Fire Department HAZMAT Response Team would respond to the spill. The operation and maintenance of the proposed commissary would not result in an increase in the type or quantity of hazardous and petroleum wastes; therefore, no impacts on hazardous and petroleum waste management would be expected.

Small quantities of hazardous wastes are present at the existing, onsite buildings at Site Alternative 1. It is assumed these materials are being properly managed for offsite disposal. A material identified as a sodium salt of an organic acid is present in Room E139 of the former USACE Laboratory, and requires characterization, profiling, and offsite disposal.

A former 180-day hazardous waste storage area was historically located in the loading dock area outside the USACE laboratory. Contamination associated with this site has been remediated and the site closed. Additional information is required to determine if the site was closed to residential standards or to commercial/industrial standards. If the latter, institutional controls could be present that would impact construction activities, resulting in a minor to moderate impact depending on the type of institutional controls that is in place.

A former acid neutralization pit was present on the exterior west side of the USACE Laboratory. The pit and surrounding soils were removed in 2002, but not all contaminated media was removed or remediated. Additional residual contamination at the USACE Laboratory includes contaminated surfaces inside the building associated with the HVAC system and two sumps containing contaminated sludge. If the proposed commissary were to be constructed on the site of the USACE Laboratory, contaminant sources should be properly remediated prior to initiating construction activities to reduce potential impact on construction workers.

Environmental Restoration Programs. No DERP sites are located within the boundaries of Site Alternative 1. The nearest DERP sites are SWMUs 23 and 62, which are located approximately 250 to 300 feet east and southeast of Site Alternative 1, respectively. Both of these SWMUs have a No Further Action status; therefore, no impacts are expected.

Asbestos-Containing Materials. ACMs are either known to be present or are suspected to be present in existing buildings at Site Alternate 1. If the proposed commissary is located within the footprint of these buildings which would require demolition, it is assumed that ACMs would be properly removed, managed, and transported off site for disposal in accordance with local, state, and Federal regulations prior to initiating construction, resulting in a minor impact. ACMs would not be used in the construction of the proposed commissary.

Lead-Based Paint. LBP is either known to be present or suspected to be present in existing buildings at Site Alternative 1. If the proposed commissary is located within the footprint of these buildings that would require demolition, it is assumed that LBP would be properly removed, managed, and transported off site for disposal in accordance with local, state, and Federal regulations prior to initiating construction. Therefore, minor, adverse impacts could be expected if demolition was required. LBP would not be used in the construction of the proposed commissary.

Polychlorinated Biphenyls. There is the potential for electrical equipment pre-dating 1985 at the former USACE Laboratory to contain PCBs for Site Alternative 1. If the proposed commissary is located within the footprint of this building which would require demolition, it is assumed that PCB-contaminated or PCB-containing equipment would be properly removed, managed, and transported off site for disposal in accordance with local, state, and Federal regulations prior to initiating construction. Therefore, minor, adverse impacts could be expected if demolition was required.

4.9.2.2 Site Alternative 2: BX Site

Hazardous and Petroleum Wastes. No hazardous wastes are currently identified at Site Alternative 2; therefore, no impacts are expected.

Environmental Restoration Programs. No DERP sites are located within the boundaries of Site Alternative 2. The nearest DERP site is SWMU 78, located approximately 250 feet north of Site Alternative 2 within the boundaries of AFP-6. SWMU 78 is a former sanitary sludge disposal area that is still under investigation, which suggests the boundaries of this site might not be delineated yet. If contamination associated with this SWMU extends into Site Alternative 2, minor to moderate impacts (depending on contaminant concentrations) on construction workers could be expected if the contamination is not remediated prior to initiating construction activities.

Asbestos-Containing Materials. No ACMs are currently identified at Site Alternative 2; therefore, no impacts are expected.

Lead-Based Paint. No LBP is currently identified at Site Alternative 2; therefore, no impacts are expected.

Polychlorinated Biphenyls. There is no known PCB contamination or PCB-containing equipment at Site Alternative 2; therefore, no impacts are expected.

4.9.2.3 Site Alternative 3: Barclay Gate Site

Hazardous and Petroleum Wastes. No hazardous wastes are currently identified at Site Alternative 3; therefore, no impacts are expected.

Environmental Restoration Programs. Seven DERP sites are located within the boundaries of Site Alternative 3.

SWMU 3 (B-64 LUST Site), SWMU 5 (B-90 Septic Tank Drain Field), SWMU 32 (B-90 old LUST), and SWMU 78 (Sanitary sludge disposal area) are each currently undergoing investigation. SWMU 29 (Past Landfill at Building 90) was consolidated into SWMU 3 and SWMU 29 listed as with a status of No Further Action. Depending on where the proposed commissary is cited, one or more of these SWMUs might be within the footprint of the building. Information relating to nature and extent of the contamination at these sites was not included in the EBS reports. Based on the depth to contamination and the contaminant concentrations levels, there could be a moderate, direct impact.

SWMU 1 (B-64 LUST Site) is listed as No Further Action. Additional information relating to implemented remedy, date of closure, regulatory program the site was closed under, and whether the site was closed under residential or commercial/industrial standards, was not provided in the EBS Report. If the site was closed under commercial/industrial standards, there is the potential for institutional controls to be associated with the site closure. If the site was closed under residential standards, there would be a negligible impact. If the site was closed under commercial/industrial standards, there could be moderate, direct impacts depending on the closure conditions and institutional controls, if any.

A large plume identified as IRP site IRP-GWPLUM is present in the northern portion of the Site Alternative 3 and a portion of a smaller plume located off site to the south extends approximately 50 feet into the southern portion of Site Alternative 3. Contamination in both plumes is present in both the overburden and bedrock aquifers. Depth to groundwater is approximately 5 to 6 feet below ground surface. If the commissary is cited outside the boundaries of either plume, there would be a negligible impact during construction activities. Since there is the potential for the plume boundaries to change with time, there is the potential for future indirect impacts associated with possible vapor intrusion to the building and contamination of drinking water. Drinking water contamination would depend on type of piping used to deliver potable water to the building. If the commissary is cited within the boundaries of either plume, major direct impacts associated with construction activities could occur. In addition, major indirect impacts associated with potential vapor intrusion to the building and potential contamination of drinking water (depending on type of piping used to deliver potable water to the building) could be expected.

Asbestos-Containing Materials. ACMs are either known to be present or are suspected to be present in existing buildings at Site Alternate 3. If the proposed commissary is located within the footprint of these buildings which would require demolition, it is assumed that ACMs would be properly removed, managed, and transported off site for disposal in accordance with local, state, and Federal regulations prior to initiating construction, resulting in a minor impact. ACMs would not be used in the construction of the proposed commissary.

Lead-Based Paint. LBP is either known to be present or suspected to be present in existing buildings at Site Alternative 3. If the proposed commissary is located within the footprint of these buildings which would require demolition, it is assumed that LBP would be properly removed, managed, and transported off site for disposal in accordance with local, state, and Federal regulations prior to initiating construction. Therefore, minor, adverse impacts could be expected if demolition was required. LBP would not be used in the construction of the proposed commissary.

Polychlorinated Biphenyls. There is no known PCB contamination or PCB-containing equipment at Site Alternative 3; therefore, no impacts are expected.

4.9.2.4 Site Alternative 4: City of Marietta Site

Hazardous and Petroleum Wastes. No hazardous wastes are currently identified at Site Alternative 4; therefore, no impacts are expected.

Environmental Restoration Programs. No DERP sites are located within the boundaries of Site Alternative 4. The nearest DERP sites are SWMU-28 (B-58 Wingseal Facility Spill) and SWMU-14/89 B-80 Fuel Oil Storage Tank Spill Area and TCE Contamination at B-80 Fuel Spill Area, respectively), which are located approximately 260 feet west of Site Alternative 4. Both sites are still under investigation, which suggests the boundaries of this site might not be delineated yet. If contamination associated with these SWMUs extends into Site 4, minor to moderate (depending on contaminant concentrations) impacts on construction workers could be expected if the contamination is not remediated prior to initiating construction activities.

The northwestern half of Site Alternative 4 is also underlain by the IRP-GWPLUM plume that originates from AFP-6, with contamination present in both the overburden and bedrock aquifers beneath the site. If the commissary is cited outside the boundaries of the plumes, there would be negligible impacts during construction activities. There is the potential for the plume boundaries to change with time. Consequently, moderate to major impacts associated with potential vapor intrusion to the building and potential contamination of drinking water (depending on type of piping used to deliver potable water to the building) could be expected. If the commissary is cited within the boundaries of the plume, major impacts associated with construction activities, future potential vapor intrusion to the building, and potential contamination of drinking water (depending on type of piping used to deliver potable water to the building) could be expected.

Asbestos-Containing Materials. No ACMs are currently identified at Site Alternative 4; therefore, no impacts are expected.

Lead-Based Paint. No LBP is currently identified at Site Alternative 4; therefore, no impacts are expected.

Polychlorinated Biphenyls. There is no known PCB contamination or PCB-containing equipment at Site Alternative 4; therefore, no impacts are expected.

4.9.3 No Action Alternative

Under the No Action Alternative, the proposed commissary would not be constructed and hazardous materials and waste conditions would remain as described in **Section 3.9.2**. Therefore, no impacts on hazardous materials and waste would be expected from the No Action Alternative.

4.10 Safety

4.10.1 Evaluation Criteria

Impacts on safety are evaluated for their potential to increase risks associated with the safety of construction personnel, contractors, military personnel, or the local community as a result of the Proposed Action. An impact would be considered significant if any of the following occurred:

- Increases the risks associated with the safety of construction personnel, contractors, military personnel, or the local community
- Hinders the ability to respond to an emergency
- Introduces a new health or safety risk for which the installation is not prepared or does not have adequate management and response plans.

The impacts on safety are discussed in the following subsections and include contractor safety, fire hazards and public safety, explosives and munitions safety, and protection of children.

4.10.2 Proposed Action

4.10.2.1 Site Alternative 1: Corps Lab Site

Contractor Safety. Short-term, minor, adverse impacts on contractor safety would be expected at Site Alternative 1. Implementation of the Proposed Action would slightly increase safety risks to contractors performing construction work at the site because of the increase in the level of construction activities. Contractors would be required to establish and maintain safety programs that their employees must follow. Implementation of proper safety plans and the use of PPE would decrease the risk to contractors. Although construction of the Proposed Action would result in increased risk to contractors, safety impacts would be less than significant due to the implementation of and adherence to effective health and safety plans.

Fire Hazards and Public Safety. No significant impacts regarding fire hazards or public safety would be expected at Site Alternative 1. As part of the proposed commissary, the project would include emergency building lighting and fire protection systems. These systems would aid the Dobbins Fire and Emergency Services (94 MSG/CEFO) and the 94th Security Forces (94 SFS/S3) in monitoring/patrolling the proposed commissary.

Site Alternative 1 does not have a controlled access point, which means nonmilitary personnel can enter this site at any time. Controlled access points are required for commissaries that sell goods to military personnel. Therefore, following implementation of the Proposed Action at Site Alternative 1, the controlled access point would need to be relocated or a new entrance would be required. If the new access point were constructed, additional security staffing at the gate would be needed.

Explosives and Munitions Safety. No explosives and munitions safety impacts would be expected at Site Alternative 1.

Protection of Children. Implementation of the Proposed Action would not result in increased health and safety risks to children. As previously mentioned, children do not reside on the installation. Children may be on installation as visitors, but their access to certain areas is restricted, and they must be under adult supervision. The installation takes precautions for children, including use of fencing and other limitations to prevent or restrict access to certain areas (such as construction sites).

Following implementation of the Proposed Action, there is a potential for increased visitation to the installation by children, but, as stated previously, children must be accompanied by an adult at all times while on installation. In addition, visitors to the commissary would not have access to restricted areas associated with the commissary.

4.10.2.2 Site Alternative 2: BX Site

Contractor Safety. Impacts on contractor safety would be similar to those described for Site Alternative 1.

Fire Hazards and Public Safety. No significant impacts regarding fire hazards or public safety would be expected at Site Alternative 2. As part of the proposed commissary, the project would include emergency building lighting and fire protection systems, which would aid the 94 MSG/CEFO and the 94 SFS/S3 in monitoring/patrolling the commissary.

Explosives and Munitions Safety. No explosives and munitions safety impacts would be expected at Site Alternative 2.

Protection of Children. Impacts on the protection of children would be similar to those described at Site Alternative 1.

4.10.2.3 Site Alternative 3: Barclay Gate Site

Contractor Safety. Impacts on contractor safety would be similar to those described for Site Alternatives 1 and 2.

Fire Hazards and Public Safety. Impacts on public safety would be similar to those described for Site Alternative 2.

Explosives and Munitions Safety. Although Site Alternative 3 is partially overlapped by the 200-foot clear zone for Explosive Site 01 (Above Ground Magazine), no conflicts or explosives and munitions safety concerns would occur at any of the sites (Dobbins ARB 2010d). A 200-foot clear zone would be maintained. Therefore, impacts on explosives and munitions safety would be similar to those described for Site Alternatives 1 and 2.

Protection of Children. Impacts on the protection of children would be similar to those described in Site Alternatives 1 and 2.

4.10.2.4 Site Alternative 4: City of Marietta Site

Contractor Safety. Impacts on contractor safety would be similar to those described for Site Alternatives 1, 2, and 3.

Fire Hazards and Public Safety. Impacts on public safety would be similar to those described for Site Alternative 1, including the need to construct a controlled access point and the need for security staffing at the gate.

Explosives and Munitions Safety. No explosives and munitions safety impacts are anticipated with the implementation of the Proposed Action at this site.

Protection of Children. Children live in the vicinity of Site Alternative 4. The site is currently a city-owned public park, Wildwood Park. Walking trails, a dog park, and picnic pavilions are located within this park. Children can freely use the park in its current existence. However, if this site was selected for the Proposed Action, policies regarding children at Dobbins ARB would be enforced at this location. Greater safety measures in the form of signage would be needed to inform the children and guardians that the park is no longer available for public use, thereby reducing potential for risks to children. Impacts on the protection of children would be similar to those described in Site Alternatives 1, 2, and 3.

4.10.3 No Action Alternative

Under the No Action Alternative, the proposed commissary would not be constructed and safety conditions would remain as described in **Section 3.10.2**. Therefore, no impacts on contractor safety, fire hazards, explosives and munitions safety, or protection of children would be expected from the No Action Alternative.

Long-term, minor, adverse impacts on public safety would be expected under the No Action Alternative. Under the No Action Alternative, a new facility would not be constructed resulting in the lack of a commissary in the Atlanta metropolitan area for patrons (retirees, active-duty and Reserve personnel, and their dependents). This would create adverse impacts on public safety as patrons would have to travel outside of the Atlanta metropolitan area to visit a commissary. The adverse impacts result from travel hazards from driving a distance of 2 hours to Robins AFB and Fort Benning, or 3 hours to Fort Gordon.

4.11 Socioeconomics and Environmental Justice

4.11.1 Evaluation Criteria

Socioeconomics. The significance of socioeconomic impacts is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., income, housing, and employment). The magnitude of potential impacts can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates 10 employment positions might be unnoticed in an urban area, but could have significant impacts in a rural community. If potential socioeconomic changes were to result in substantial shifts in population trends or regional spending and earning patterns, they would be considered significant.

Environmental Justice. Ethnicity and poverty data are examined for the ROI and compared to city, county, and state statistics to determine if a low-income or minority population could be disproportionately affected by the Proposed Action. This section also evaluates impacts from the Proposed Action on children's environmental health and safety risks.

4.11.2 Proposed Action

4.11.2.1 Site Alternative 1: Corps Lab Site

Short-term, minor, beneficial effects on the local economy from increases in employment and local business volume during construction would be expected at Site Alternative 1. As of 2010, approximately 16.5 percent of the ROI's workforce and 13 percent of the City of Marietta's workforce is employed in the construction industries. Therefore, there should be more than sufficient local workers available for the construction activities associated with Site Alternative 1. Short-term increases in local business volume within the local economy during construction would also be expected due to the provision of construction materials and supplies and other related services. Because Atlanta is a metropolitan area with access to the necessary construction materials and supplies, this benefit is likely to be felt locally. Short-term population increases during construction would not be expected to occur because construction workers are likely present in the community. No impacts on social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates due to population increases would be anticipated during construction activities and because the workers would likely be existing local residents.

The ROI has a considerably higher percent of residents of a racial minority and children under the age of 5 years old than the State of Georgia (58.9 percent versus 40.3 percent and 9.4 percent versus 7.1 percent, respectively). The ROI also has a considerably higher percentage of Hispanic or Latino and low-income residents than the State of Georgia (34.3 percent versus 8.8 percent and 26 percent versus 15.7 percent, respectively). Therefore, implementation at Site Alternative 1 could have short-term, negligible, adverse effects on minority and low-income populations from construction noise and traffic.

Dobbins ARB currently does not have a commissary. Therefore, Site Alternative 1 would result in a long-term, minor to moderate, beneficial effect on the local economy due to increase of employees and patrons at the commissary and regional (i.e., nonlocal) people shopping at nearby stores and restaurants. Sales at Fort McPherson, Fort Gillem, and the Navy Supply Corps School totaled $33.3 million in 2010. Patrons would no longer need to drive outside the Atlanta metro area to visit a commissary. Therefore, there would be an annual increase of approximately $33 million in revenue in the Atlanta metro area under the Proposed Action. It is anticipated that 50 employees would work at the commissary daily. These jobs would likely be a combination of full-time and part-time positions. Currently, there is not a controlled access point at Site Alternative 1, which would be required. If this site is selected, a controlled access point would be constructed and additional security staffing would be necessary.

Long-term, minor, adverse effects on minority and low-income populations from increased traffic would be expected at Site Alternative 1. As previously mentioned, the ROI has a disproportionally high minority and low-income population compared to the baseline. Therefore, the increase in traffic from the additional commissary patrons and employees would disproportionally affect minority and low-income populations. However, the effects would be minor since it is estimated that approximately 1,200 vehicles would visit the commissary at various times during the day. No impacts on social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates from population increases would be anticipated during operation of the proposed commissary since the employees would likely be local.

4.11.2.2 Site Alternative 2: BX Site

Short-term effects from implementation of the Proposed Action at Site Alternative 2 would be similar to those for Site Alternative 1. Additional short-term, beneficial effects on the local economy would result from the construction work necessary at Site 2. The road network in this region of the installation would require upgrading to accommodate increases in traffic and commercial deliveries.

Long-term effects from implementation of the Proposed Action at Site Alternative 2 would be similar to those for Site Alternative 1. As stated in **Section 2.3.2,** if the existing BX and proposed commissary were collocated, there would be an increase in the amount of traffic on the adjacent roadways. The new patrons and employees of the commissary could cause congestion in the immediate area.

4.11.2.3 Site Alternative 3: Barclay Gate Site

Short-term and long-term effects from implementation of the Proposed Action at Site Alternative 3 would be similar to those for Site Alternative 1.

4.11.2.4 Site Alternative 4: City of Marietta Site

Short-term effects from implementation of the Proposed Action at Site Alternative 4 would be similar to those for Site Alternative 1. However, short-term, beneficial effects on the local economy would result from the additional construction work necessary at Site Alternative 4. The access road would require upgrading to accommodate increases in traffic and commercial deliveries. In addition, fencing around the perimeter would need to be installed to ensure the entire site is secure. Long-term effects from implementation of the Proposed Action at Site Alternative 4 would be similar to those for Site Alternative 1.

4.11.3 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3.11.2** would continue. No construction would occur and there would continue to be no access to a commissary for the active-duty, Reserve, and retired military personnel in the Atlanta metropolitan area. Sales at Fort McPherson, Fort Gillem, and the Navy Supply Corps School totaled $33.3 million in 2010. Patrons would need to drive outside the Atlanta metro area to visit a commissary. Therefore, there would be an annual loss of approximately $33 million in revenue in the Atlanta metro area under the No Action Alternative, resulting in long-term, minor adverse socioeconomics. The No Action Alternative would not result in any environmental justice impacts.

THIS PAGE INTENTIONALLY LEFT BLANK

5. Cumulative and Other Potential Adverse Impacts

CEQ regulations stipulate that the cumulative effects analysis in an EA should consider the potential environmental effects resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR Part 1508.7). CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects that coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).

5.1 Projects Identified for Potential Cumulative Effects

The scope of the cumulative effects analysis involves both timeframe and geographic extent in which effects could be expected to occur, and a description of what resources could be cumulatively affected. For the purposes of this analysis, the geographic area for consideration of cumulative effects is Dobbins ARB and Cobb County, including the City of Marietta.

Construction of Marietta Trail System Multi-Use Trail. The City of Marietta has proposed to construct a multi-use trail within the University segment of the Marietta Trail System. The multi-use trail would travel along South Cobb Drive southeast into Southern Polytechnic State University and connect to an existing trail just north of Wildwood Park on Life University property. This trail then connects to A.L. Burruss Park to the south (City of Marietta 2010b).

The Operation of a Joint Forces Headquarters (JFHQ) at the General Lucius D. Clay National Guard Center, Cobb County, Georgia. The Georgia Air National Guard completed construction of the JFHQ in 2012. The JFHQ is an approximately 17-acre site in the northwestern portion of the General Lucius D. Clay National Guard Center in Cobb County, adjacent to the south of Dobbins ARB. The facility includes a 215,000-ft^2 multi-story building, onsite parking areas, sidewalks, an access road, exterior fire protection, lighting, a flagpole, and other ancillary facilities. The JFHQ accommodates the relocation of elements of the Headquarters, Headquarters Detachment of the Georgia State Area Command, the 124th Mobile Public Affairs Detachment, and the 118th Personnel Service Detachment of the Georgia Air National Guard; headquarters elements of the Georgia Air National Guard; and multiple departments of the Georgia DOD (Dobbins ARB 2009d).

Expansion of Lockheed Martin Aeronautics Material Recycling Facility. Lockheed Martin has proposed to expand and use an existing recycling facility that is at the central-southern edge of Site 3. The recycling facility is not currently operating and upgrades would need to be completed prior to its use. The design of the proposed facility has not been finalized, but the existing building would be expanded, a loading dock and asphalt parking lot/yard would be constructed, and an existing gravel road to the east and south of the proposed site would be widened and paved (Dobbins ARB 2011h).

Dobbins ARB General Plan Projects. The Dobbins ARB General Plan is intended to guide the installation's long-range development by providing an assessment of on-installation conditions, and recommendations for improvements and future development of the installation. The General Plan outlines future facility and infrastructure requirements that will enhance mission support capability (Dobbins ARB 2010a). These requirements are identified as a list of planned, programmed, and recommended projects in the General Plan's finding and recommendations. There are six major programmed projects identified in the General Plan. A summary of these projects is presented in **Table 5-1**.

Table 5-1. Summary of Dobbins ARB Projects in the Area of the Proposed Action

Project Title	Description	Status
Construction of New Fire Station/Security Forces Complex	A new fire station/security forces complex would be constructed immediately northeast of the existing Fire Station (Building 745). The proposed joint facility would combine the administration and the 24-hour operations of both services, and would provide a state-of-the-art facility for emergency response personnel. The facility would consist of a multi-story building with drive-through bays for fire engines, living quarters for firefighters, administrative offices and storage for the fire department and security forces, and a consolidated emergency dispatch center. Combination of the fire department and security forces allows Dobbins ARB to comply with AFI 10-2501, which requires integration of the emergency dispatch and Base Defense Operating Center functions. The existing Fire Station (Building 745) would be demolished immediately following completion and occupation of the new facility.	Programmed
Construction of New Fitness Center	A new fitness center would be constructed in the North Area to replace the existing outdated and undersized facility. The proposed facility would include men's and women's locker rooms with sauna, a cardiovascular and stretching area, a gymnasium with basketball/volleyball court and spectator seating area, racquetball courts, and a resistance and free weights training area. The facility would also include a lobby and administrative and support offices, a conference room, group exercise rooms, a laundry area, support storage, and equipment repair area. The existing fitness center would be demolished after construction of the new facility.	Programmed
Construction of AFRC Contingency Training Center	An AFRC Contingency Training Center would be constructed that could accommodate both Civil Engineering Expeditionary Combat Support Training – Certification Center and Force Support Combat Training, and a joint and interagency use. The AFRC Contingency Training Center would require a consolidated schoolhouse with contiguous functions and accessibility between housing, classrooms, and administration; troop billeting/student housing (open bay/hooch) and shower-and-shave facility; an open area for field training and field-training activities (field lodging; designated areas for specific field-training exercises; and pads for erecting field kitchens, tents, and billeting tents); runway minimum requirement (5,000-foot-long-by-75-foot-wide area); and Airfield Damage Repair pavement pads. The proposed site is the Army Reserve area southeast of the runway, and the alternate site is the Cobb County Legacy Golf Course adjacent to the southeast boundary of the installation.	Programmed

Project Title	Description	Status
Renovation of Wing Headquarters Building	Building 922 would be renovated to become the new Wing Headquarters. The renovation activities would include the removal of existing walls to provide an open office layout that will provide additional usable space, and other interior improvements, resurface parking lots, and relocate a fire hydrant. Wing Headquarters staff functions are currently in four geographically separated buildings, which result in reduced efficiency. Functions from Buildings 838, 727, 737, and 827 would be relocated to Building 922.	Programmed
Relocation of 700th Airlift Squadron	The 700th Airlift Squadron (700 AS) would be relocated to Bay 1 of Building 838 after Wing Headquarters functions have departed (see "Renovation of Wing Headquarters Building"). This relocation would consolidate 700 AS Operations into a single facility on the flightline and provide adequate space for operational activities associated with its new mobility mission. Some structural changes to Bay 1 might be required to accommodate this function.	Programmed
Recreation Area/Lodging Campus Projects	Several projects would be implemented on the North Area after the AFRC Contingency Training Center is relocated (see "Construction of AFRC Contingency Training Center and Alternative"). The recreational projects include relocation and expansion of the Family Campgrounds, construction of a frisbee golf course, relocation of the Rental Center, and construction of the new Fitness Center (see "Construction of New Fitness Center"). In addition to the recreation projects, a Lodging and Conference Facility would be constructed along Gym Road. The lodging facility would include space for 95 visitor rooms (each with a private bath), 5 distinguished visitor suites, lobby, vending, public restrooms, a front desk area, office/break area, storage areas, and a laundry room.	Programmed

Source: Dobbins ARB 2010a

5.2 Resource-Specific Cumulative Effects

5.2.1 Site Alternative 1: Corps Lab Site

Noise. All projects identified in **Section 5.1** would result in short-term, adverse impacts on the ambient noise environment in the northwestern corner of Dobbins ARB and nearby off-installation receptors, including residences, due to construction activities. Long-term, adverse impacts are likely to result from the combined vehicle traffic from these projects, except the Marietta multi-use trail. In addition, operation of the Lockheed Martin recycling facility and the AFRC Contingency Training Center would likely also result in long-term, adverse impacts on the noise environment due to activities that would occur at each site; however, the significance of these impacts is not known.

Implementation at Site Alternative 1 would result in short-term and long-term, negligible to minor, adverse impacts on the ambient noise environment from construction activities and vehicle traffic, and from operational vehicle traffic.

The projects identified in **Section 5.1** are more than 1.25 miles from Site 1, and it is unlikely that noise generated from the construction and operation of the Proposed Action would be heard at the other project sites. Therefore, when the noise impacts from Site Alternative 1 are combined with the noise impacts of projects identified in **Section 5.1**, no cumulative impacts would be expected.

Land Use. Most projects identified in **Section 5.1** would likely not result in land use impacts as the projects would be constructed on property with similar or compatible land uses. Projects sited on DOD property near an installation boundary (JFHQ, AFRC Contingency Training Center) or outside of DOD property (Marietta multi-use trail) could result in short-term, negligible impacts from generation of construction noise that could affect noise-sensitive land uses in the vicinity. Construction and operation of the AFRC Contingency Training Center has several constraints that would likely result in long-term, moderate, adverse impacts on land use. These constraints include overlap with an existing transitional surface, apron setbacks, an IRP site (LF-01), the explosive clear arc from Building 1043, and Explosive Safety-Quantity Distance arcs. An alternative to the proposed AFRC Contingency Training Center site is the Legacy Golf Course, which is directly adjacent to the south of the Dobbins ARB and is operated by Cobb County. If this alternative is implemented, there could be long-term, moderate, adverse impacts on land use due to the need to transfer land from Cobb County to AFRC, change land use categories, and upgrade security measures. Additionally, there would be a decrease in recreational land (i.e., golf course) in Cobb County.

Implementation of the Proposed Action at Site 1 would result in long-term, minor, adverse impacts on land use plans or policies because the proposed commissary would be constructed on property primarily outside of the Dobbins ARB boundary. The property at the proposed site that is owned by AFMC would need to be transferred to AFRC, and the land use designation would need to be changed from Lockheed Martin to commercial. Lockheed Martin is not currently using this property to produce aircraft or perform maintenance on them; therefore, land use impacts would be less than significant.

Implementation of the Proposed Action at Site 1 and the other projects identified in **Section 5.1** could result in short-term, minor, adverse cumulative impacts on noise-sensitive land uses, and long-term, minor to moderate, adverse cumulative impacts on land use plans and policies.

Air Quality. Past and current development and stationary and mobile sources at Dobbins ARB and in Cobb County have impacted regional and local air quality and future activities in these areas would continue to impact local and regional air quality. It is likely that the projects identified in **Section 5.1** would result in short-term, adverse impacts on air quality due to generation of particulate emissions as fugitive dust from ground-disturbing activities during construction, and generation of criteria pollutant air emissions from vehicular traffic of construction equipment and commuting construction workers. Emissions from construction activities would be produced only for the duration of work activities, and would likely not be significant. While the designs of these projects are not known, it is likely that operation of all projects except for the Marietta multi-use trail would result in long-term, adverse impacts on air quality due to emissions from operation of the building's heating systems or other operational equipment (e.g., specialized recycling equipment). Long-term impacts could also result from the vehicles of workers commuting to these proposed facilities.

As shown in **Tables 4-2** and **4-6**, construction and operation of the Proposed Action at Site Alternative 1 would contribute a minor amount of emissions to the local and regional air quality.

Implementation of the Proposed Action combined with other projects at Dobbins ARB and Cobb County that involve construction, stationary, and mobile source emissions would result in continuous long-term, minor, adverse cumulative impacts on air quality in the region.

Geological Resources. Past development activities at Dobbins ARB and the surrounding Cobb County have extensively modified geological resources, particularly soils, and current development activities continue to alter the soils. While several projects identified in **Section 5.1** would occur on fully or partially developed land or previously disturbed land, continued development on Dobbins ARB and within the City of Marietta would impact soils and topography locally. This could occur through ground-disturbing activities such as grading, excavation, and recontouring of the soils, which could result in increased soil compaction and erosion.

The Proposed Action would impact soils through site-disturbing construction activities and increases to impervious surfaces resulting in short-term and long-term, minor, adverse impacts resulting in compacted soils, increased erosion and sedimentation, and possible changes in drainage patterns. However, the majority of the soils at Site Alternative 1 have been previously disturbed and modified by development, and thus impacts from the Proposed Action would not be significant. In addition, soil erosion, stormwater, and sediment-control measures would be included in the site plan to minimize these impacts.

When combined with impacts from other projects, permanent but localized effects of the components of the Proposed Action would result in long-term, negligible, adverse, cumulative impacts on geological resources.

Water Resources. While several projects identified in **Section 5.1** would occur on fully or partially developed land, their implementation would further increase impervious surface area and, thereby, would have the potential to increase stormwater runoff and erosion and sedimentation into surface waters. Potential increases in sedimentation and other water resource degradation from development projects would be alleviated through the use of BMPs, and would likely be minimized through the use of design criteria and stormwater management controls designed to comply with NPDES permit requirements.

Implementation of the Proposed Action at Site Alternative 1 would result in long-term, negligible to minor, adverse impacts on water resources including groundwater, surface water, and wetlands. The Proposed Action would increase impervious surfaces and compact soil that could result in localized changes in drainage and infiltration patterns that could affect groundwater quality and recharge. The quality of surrounding surface water and wetlands could be affected by increased stormwater runoff and possible spills or leaks.

The Proposed Action would combine with other past and future development to produce long-term, minor, adverse, cumulative impacts on water resources.

Biological Resources. Existing development and operations on Dobbins ARB and in Cobb County currently impact vegetation and wildlife. Since several projects identified in **Section 5.1** would occur on fully or partially developed land or previously disturbed land. Development would eliminate some areas that are currently vegetated, while revegetation of disturbed areas with native species would replace some areas of nonnative vegetation schemes and weedy areas. Conversion of existing open space to facilities would reduce wildlife habitat; however, that habitat is of low quality on Dobbins ARB due to former use.

Implementation of the Proposed Action at Site Alternative 1 would result in short-term and long-term, negligible, adverse impacts on vegetation and wildlife due to removal of vegetation and wildlife habitat, and permanent disturbances due to increased human activity. If the proposed commissary is constructed in the forested portion of Site 1, the long-term impacts on vegetation and wildlife habitat could be minor to moderate due to permanent removal of native forest vegetation. In addition, construction activities could result in an adverse impact due to mortality of smaller, less mobile wildlife species. If the construction footprint overlaps the forested portion of Site 1, a site-specific survey for pink ladyslipper populations should be conducted prior to any vegetation-removal activities.

Past development at Dobbins ARB, in conjunction with the urban expansion and development in Cobb County, has degraded historic habitat of both sensitive and common species. The Proposed Action, in conjunction with past and future development both on and off the installation, would result in an overall long-term, minor, adverse, cumulative impact on biological resources. Cumulative actions are causing reduction in habitat and permanent loss of vegetation.

Cultural Resources. The potential impacts of the projects identified in **Section 5.1** on cultural resources are not known. Impacts on cultural resources resulting from projects at Dobbins ARB are likely to be minimal, if at all, due to the previously disturbed nature of the installation. Impacts could occur if new construction uncovered previously undetected prehistoric sites.

Implementation of the Proposed Action would have no adverse effect on viewshed of the NRHP-eligible Bell Bomber Plant Historic District and the Sibley-Gardner House. There is demonstrated concern that there might be archaeological resources related to the Sibley-Gardner house; however, given the level of disturbance at Site 1 there is little possibility that archaeological sites are present. Additional testing might be needed based on the proximity of the proposed commissary to the Sibley-Gardner House. In addition, the Aviation Wing of the Marietta Museum of History would need to be relocated.

Because the Proposed Action would have no adverse effects on any archaeological site or culturally significant buildings or structures, there would be no cumulative impacts on cultural resources.

Safety. Construction of the projects identified in **Section 5.1** could increase safety risk to contractors performing construction work; however, most of these projects would be required to develop and adhere to health and safety plans. Following implementation of the Proposed Action at Site Alternative 1, the controlled access point would need to be relocated or a new entrance would be required. Construction of the Fire Station/Security Forces Complex at Dobbins ARB would likely result in beneficial impacts on safety and emergency response capabilities.

Short-term, minor impacts on contractor safety would be expected under the Proposed Action. Contractors would use PPE and would be required to establish and maintain safety programs that their employees must follow, which would minimize their risk.

The Proposed Action would have a negligible, adverse cumulative effect on safety.

Socioeconomics and Environmental Justice. Construction of the projects in **Section 5.1** would result in short-term, negligible to minor, beneficial impacts on the local economy due to increases in employment and local business volume during construction activities. The ROI has higher percentages of minority, low-income, and Hispanic or Latino populations than the State of Georgia; therefore, the cumulative projects could result in impacts on these populations due to increased traffic. However, these impacts are not likely to be significant.

The Proposed Action would result in both short-term and long-term, beneficial effects on the local economy, but these impacts would not be significant. The Proposed Action would generate increased traffic that could negatively impact surrounding minority, low-income, and Hispanic or Latino populations; however, this impact would not be significant.

When combined with the impacts of other projects, the Proposed Action would result in beneficial cumulative impacts on the local economy, and possible cumulative adverse impacts on the local minority, low-income, and Hispanic or Latino populations. However, these impacts would not be significant.

Infrastructure. Impacts on infrastructure and utility systems due to implementation of projects identified in **Section 5.1** would include possible short-term interruptions of service and long-term increased demand of utility system services. It is likely that these impacts would not be significant as service interruptions would be short in duration and only occur during demolition and construction, and increased demand could be accommodated by the existing utility system capacity. Construction activities would likely result in short-term, adverse impacts on transportation systems in the vicinity of each project due to increased traffic from construction vehicles. This increased traffic would be intermittent and temporary; therefore, these impacts would be less than significant. It is unlikely that these projects would create significant long-term effects on transportations systems.

The Proposed Action would not significantly impact infrastructure or utilities. Short-term, minor, adverse impacts from temporary disruptions to the electrical system, natural gas system, water supply, sanitary sewer/wastewater system, stormwater drainage system, and the communications system at Dobbins ARB could result due to rerouting and connecting of utilities during construction. Additional solid waste would be generated during construction and demolition activities and adequate receptacles would be provided for waste disposal. During operation of the proposed commissary, long-term impacts on the electrical system, natural gas system, water supply, sanitary sewer/wastewater system, communications system, and solid waste management system at Dobbins ARB would result due to increased demand from additional infrastructure and the increased volume of users. There would be no impacts on liquid fuels and central heating and cooling systems. Short-term, negligible to minor and long-term, minor impacts would result from construction and operational traffic from implementation of the Proposed Action at Site 1.

Short-term, negligible to minor, cumulative impacts on infrastructure and utilities could result during construction and demolition activities from possible interruptions in service. Long-term, cumulative impacts on the electrical system, natural gas system, water supply, sanitary sewer/wastewater system, communications system, and solid waste management system at Dobbins ARB and regional providers would result from increased demand on these services. The other Dobbins ARB projects are on the eastern half of the installation, and, therefore, would likely use the main gate to access the project sites. The Marietta multi-use trail is also located east of Dobbins ARB and, thus, would primarily use South Cobb Drive to access the work site. Because the projects identified in **Section 5.1** are more than 1.25 miles from Site 1, it is unlikely that there would be any cumulative impacts on transportation systems.

Hazardous Materials and Hazardous Waste. Impacts from the use of hazardous materials for construction of the projects identified in **Section 5.1** would depend on the quantity and nature of the materials used, both of which are unknown. However, the use of BMPs and adherence to all applicable Federal, state, and local regulations would reduce the adverse effects from their use. Hazardous waste would likely be generated during operation of some of these projects, but these impacts would be minimized by properly disposing of all hazardous wastes. There is an environmental restoration program site within the proposed site of the AFRC Contingency Training Center, which is a constraint to development. The presence of ACMs, LBP, PCBs, radon, and pesticides at these sites is not known, although it is likely that some of these materials are present at the sites of these projects.

The Proposed Action would use hazardous materials during construction and operation, although no impacts are anticipated to occur due to implementation of proper storage and management regulations. A hazardous waste storage facility and acid neutralization pit associated with a former USACE laboratory facility are at Site 1. These areas should be tested prior to their demolition and removal, and, if necessary, the sites remediated prior to construction. Based on test results, impacts from hazardous wastes could be minor to major.

Construction activities at Site 1 could result in negligible impacts from historical pesticide use at the site, and minor impacts from historical use of ACMs, LBP, and PCBs at the site. ACMs and LBP would not be used to construct the proposed commissary. Radon is not expected to be present in buildings above the USEPA guidance level; therefore, negligible impacts would be expected.

The cumulative use of hazardous materials in projects on Dobbins ARB and surrounding areas would increase; the type and quantity is unknown. The proper use and disposal of these materials would reduce or eliminate any adverse effects from them. As stated previously, the USAF adheres to sustainable building practices. These practices generally use materials that are the least hazardous. For future construction projects, Dobbins ARB would implement fewer hazardous materials as replacement materials become available. Therefore, no cumulative impacts on hazardous materials would be expected.

Cumulative impacts from the generation of hazardous wastes account for wastes from on-installation activities in combination with off-installation activities. The amount of hazardous waste would be higher at times of construction. The potential exposure to hazardous wastes during construction of the Proposed Action could combine with similar exposures experienced during construction of other projects at Dobbins ARB and surrounding areas to result in cumulative minor to major impacts, although the type and quantity of wastes is unknown. Although no particular removal actions for the existing USACE laboratory facility are known, it is likely that hazardous wastes would be generated from any necessary remediation activities. Effects from remediation activities would be reduced through proper disposal and implementation of BMPs.

Based on the presence of ACMs, LBP, PCBs, and radon at the sites of other projects, there could be negligible to minor, cumulative impacts from exposure to these materials during construction.

5.2.2 Site Alternative 2: BX Site

Noise. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1; however, the Proposed Action would not occur near the installation boundary. Consequently, there are no off-installation, noise-sensitive land uses adjacent to Site Alternative 2. Noise impacts from the Proposed Action could combine with those of other cumulative projects to result in short-term and long-term, minor, adverse impacts.

Land Use. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. No adverse impacts on land use would be expected from implementation of the Proposed Action at Site 2. Therefore, no cumulative impacts on land use would result from Site Alternative 2.

Air Quality. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1. Emissions from construction and operation are shown in **Tables 4-3** and **4-6**. The cumulative impacts on air quality would be similar to those described under Site Alternative 1.

Geological Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1; however, underground water lines and Industrial Drive would potentially be rerouted to accommodate the proposed commissary. Therefore, slightly more intensive short-term, adverse impacts on soils would be expected. The cumulative impacts on geological resources would be similar to those described under Site Alternative 1.

Water Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1; however, soil compaction and, thus, associated potential effects on groundwater would be slightly greater under this alternative. The cumulative impacts on water resources would be similar to those described under Site Alternative 1.

Biological Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1; however, fewer less mobile species that could be trampled by construction equipment would be expected to occur within Site 2. Therefore, short-term and long-term impacts on wildlife are anticipated to be negligible. Similar to Site Alternative 1, if the construction footprint overlaps the forested portions of Site 3, a site-specific survey for pink ladyslipper populations should be conducted prior to any vegetation-removal activities. The cumulative impacts on biological resources would be similar to those described under Site Alternative 1.

Cultural Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 has some potential to impact the Mount Sinai Cemetery due to the realignment of Industrial Drive; therefore, it should be designed to avoid direct and indirect effects on the cemetery. Use of Site 2 would result in no adverse effect on historic resources. The cumulative impacts on cultural resources would be similar to those described under Site Alternative 1.

Safety. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1, although Site 2 would not require modification of the controlled access point as it is already within a secured area. The cumulative impacts on safety would be similar to those described under Site Alternative 1.

Socioeconomics and Environmental Justice. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 2 would result in impacts similar to those described under Site Alternative 1. The cumulative impacts on socioeconomics and minority, Hispanic or Latino, and low-income populations would be similar to those described under Site Alternative 1.

Infrastructure. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Site 2 is predominantly undeveloped forest land; therefore, implementation of the Proposed Action at this site would create new impervious surfaces resulting in increased sheet flow and runoff as compared to Site Alternative 1. However, the existing stormwater sewer system would be able to handle the additional flow. Implementation of Site Alternative 2 would result in short-term, negligible to minor impacts on the Dobbins ARB transportation system because construction vehicles would travel on secondary roads within the installation resulting in a greater potential for congestion than at Site 1. Long-term minor impacts on Dobbins ARB and off-installation transportation systems would result from increases in operational traffic. Traffic on Dobbins ARB would be further congested due to the collocation of the proposed commissary with the BX. Atlantic Avenue and Industrial Drive would be rerouted under Site Alternative 2, which would reduce some of the long-term impacts on installation traffic. The cumulative impacts on infrastructure and utility systems would be similar to those described under Site Alternative 1. The cumulative impacts on transportation systems would likely include short-term, minor impacts and long-term, minor to moderate impacts because many of the other Dobbins ARB projects are also on the eastern half of the installation and would be using the same off-installation and installation roads as the Proposed Action.

Hazardous Materials and Hazardous Waste. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. There is no known historical use of hazardous materials, or presence of hazardous wastes, ACMs, LBP, PCBs, radon, and pesticides at Site 2; therefore, negligible impacts would be anticipated from construction of the Proposed Action. The main environmental concern at Site 2 is the presence of a former sanitary sludge disposal area 250 feet north of the Site 2 boundary. This area is still under investigation; therefore, the boundaries of contamination associated with this area have not been defined. Based on the siting of the proposed commissary facility and the extent of the contamination, there could be minor to moderate impacts from construction activities. It is recommended that appropriate site investigations be performed prior to construction to determine the necessary actions to protect human health and the environment from the plume. However, it is anticipated that proper removal and disposal of hazardous wastes and materials at the site would be performed. Therefore, cumulative hazardous materials and hazardous waste impacts would be similar to those described under Site Alternative 1; however, the cumulative impacts from exposure to IRP sites during construction could be greater.

5.2.3 Site Alternative 3: Barclay Gate Site

Noise. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would result in impacts similar to those described under Site Alternative 1; however, there are no off-installation, noise-sensitive land uses adjacent to Site Alternative 3. Noise impacts from the Proposed Action could combine with those of other cumulative projects to result in short-term and long-term, minor, adverse impacts.

Land Use. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would result in impacts similar to those described under Site Alternative 1; however, the entire proposed site is within AFP-6. Therefore, all property at the proposed site would need to be transferred from AFMC to AFRC, and the land use designation would need to be changed from Lockheed Martin to commercial. The existing buildings on Site 3 are used for storage or are vacant. Implementation of the Proposed Action at Site 3 and the other projects identified in **Section 5.1** could result in short-term, minor, adverse impacts on noise-sensitive land uses, and long-term, minor, adverse impacts on land use plans and policies.

Air Quality. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would result in impacts similar to those described under Site Alternative 1. Emissions from construction and operation are shown in **Tables 4-4** and **4-6**. The cumulative impacts on air quality would be similar to those described under Site Alternative 1.

Geological Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would result in impacts similar to those described under Site Alternative 1. Two IRP sites are within Site 3; however, the contaminants at both IRP sites have been contained, and both sites are in the long-term monitoring phase. Additionally, Site 3 is large enough to accommodate the proposed commissary without encroaching on the IRP sites. The cumulative impacts on geological resources would be similar to those described under Site Alternative 1.

Water Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would result in impacts similar to those described under Site Alternative 1; however, impacts on groundwater and surface would be expected to be slightly less under this alternative. The cumulative impacts on water resources would be similar to those described under Site Alternative 1.

Biological Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would result in impacts similar to those described under Site Alternative 1; however, fewer less mobile species that could be trampled by construction equipment would be expected to occur within Site 3. Therefore, short-term and long-term impacts on wildlife are anticipated to be negligible. Similar to Site Alternative 1, if the construction footprint overlaps the forested portions of Site 3, a site-specific survey for pink ladyslipper populations should be conducted prior to any vegetation-removal activities. The cumulative impacts on biological resources would be similar to those described under Site Alternative 1.

Cultural Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 3 would have no adverse effect on the viewshed of the NRHP-eligible Bell Bomber Plant Historic District or Buildings U-124 and U-125, and could be designed to have no adverse effect on Building B-64 if it is proven eligible. If the proposed commissary is not constructed adjacent to the Bankston Rock House, there would be no adverse effect on the historic structure. The cumulative impacts on cultural resources would be similar to those described under Site Alternative 1.

Safety. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action would result in impacts similar to those described under Site Alternative 1; however, Site 3 is partially within the 200-foot clear zone for Explosive Site 01, an Above Ground Magazine. No conflicts or explosives and munitions safety concerns would occur if the Proposed Action is implemented at Site 3. A 200-foot clear zone would be maintained. In addition, Site 3 would not require modification of the controlled access point as it is already within a secured area. The cumulative impacts on safety would be similar to those described under Site Alternative 1.

Socioeconomics and Environmental Justice. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action would result in impacts similar to those described under Site Alternative 1. The cumulative impacts on socioeconomics and minority, Hispanic or Latino, and low-income populations would be similar to those described under Site Alternative 1.

Infrastructure. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action would result in impacts similar to those described under Site Alternative 1. Existing ASTs at Site 3 would need be decommissioned and properly disposed of or moved to other locations on the Lockheed Martin plant. Implementation of Site Alternative 3 would result in short-term, negligible to minor impacts on the Dobbins ARB transportation system because construction vehicles would travel on secondary roads within the installation resulting in a greater potential for congestion than at Site 1. Long-term, minor to moderate impacts on Dobbins ARB transportation systems would result from the need to construct an access road from Industrial Drive to the commissary and from increases in operational traffic. Long-term, minor, adverse impacts on the transportation system outside the installation would be expected. The cumulative impacts on infrastructure and utility systems would be similar to those described under Site Alternative 1. The cumulative impacts on transportation systems would likely include short-term, minor impacts and long-term, minor to moderate impacts because many of the other Dobbins ARB projects are also on the eastern half of the installation and would be using the same off-installation and installation roads as the Proposed Action. Long-term, cumulative impacts on the Dobbins ARB transportation system would also be expected due to combination of traffic from the proposed commissary and the Lockheed Martin recycling facility that is also on Site 3.

Hazardous Materials and Hazardous Waste. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action would result in impacts similar to those described under Site Alternative 1, except there could be moderate to major impacts from exposure to onsite IRP sites during construction. There are several IRP and SWMU sites within Site 3; however, Site 3 is large enough to accommodate the proposed commissary without encroaching upon these sites.

In addition, there is no known PCB contamination or hazardous wastes at Site 3; therefore, impacts from potential presence of these materials are negligible. Therefore, cumulative hazardous materials and hazardous waste impacts would be similar to those described under Site Alternative 1, except there could also be minor to moderate, cumulative impacts from presence of IRP sites or similarly contaminated sites.

5.2.4 Site Alternative 4: City of Marietta Site

Noise. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in impacts similar to those described under Site Alternative 1; however, the Proposed Action would occur at an off-installation site that is bordered by potentially noise-sensitive land uses, including a university and a childcare center. Persons accessing these buildings would be expected to experience construction noise levels of up to 89 dBA, depending on their proximity to construction activities. Noise impacts from the Proposed Action could combine with those of other cumulative projects, particularly the construction of the Marietta multi-use trail that is in the same area as Site 4, to result in short-term and long-term, minor, adverse impacts.

Land Use. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in short-term, minor, adverse and long-term, minor to moderate, adverse impacts on land use. Short-term impacts on noise-sensitive areas surrounding the proposed site would be expected from construction noise. The proposed site is outside of Dobbins ARB on City of Marietta-owned land whose existing and future use has been designated as recreational. The property at Site 4 would need to be transferred to AFRC, and the land use designation would need to be changed from recreational to commercial. This would reduce the amount of recreational land within the City of Marietta resulting in a long-term, adverse impact on park patrons. However, there is ample park land available elsewhere in the City of Marietta; therefore, this impact would be less than significant. Therefore, implementation of the Proposed Action at Site 4 and the other projects identified in **Section 5.1** could result in short-term, minor, adverse impacts on noise-sensitive land uses, and long-term, minor to moderate, adverse impacts on land use plans and policies, including the cumulative removal of recreational opportunities for Cobb County residents.

Air Quality. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in impacts similar to those described under Site Alternative 1. Emissions from construction and operation are shown in **Tables 4-5** and **4-6**. The cumulative impacts on air quality would be similar to those described under Site Alternative 1.

Geological Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in impacts similar to those described under Site Alternative 1; however, more ground would be disturbed due to the need to upgrade the existing road network and construction of a new access road. In addition, due to potential soil contamination from the onsite TCE groundwater plume, a site-specific soil contamination investigation should be conducted prior to implementing this alternative. The cumulative impacts on geological resources would be similar to those described under Site Alternative 1.

Water Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in impacts similar to those described under Site Alternative 1; however, there would be greater impacts on groundwater and surface water due to increased ground-disturbing activities and vegetation removal leading to increased runoff, sedimentation, and erosion. In addition, the intermittent stream running through the site could be impacted depending on building placement. Prior to conducting any activities that could impact the intermittent stream, a current jurisdictional determination from USACE would be obtained. The cumulative impacts on water resources would be similar to those described under Site Alternative 1.

Biological Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in impacts similar to those described under Site Alternative 1; however, implementation of the Proposed Action at Site 4 would result in long-term, moderate, adverse impacts on vegetation and wildlife. Adverse impacts on vegetation would be expected due to the permanent removal of native forest vegetation that makes up a majority of Site 4. This forest stand in Site 4 is one of the largest contiguous forest stands in the vicinity of Dobbins ARB, and likely has excellent forest habitat quality. Due to the existing vegetation community type within Site 4, it is likely that pink ladyslipper colonies occur within the site. Site-specific surveys for threatened, endangered, candidate, or special concern species should be conducted prior to the selection of this site for the construction of a commissary. BMPs discussed in Site Alternative 1 should be implemented to prevent the establishment or spread of nonnative plant species within Site 4. Wildlife occurring within Site 4 are anticipated to be more specific in their habitat requirements and less accustomed to human disturbances; therefore, adverse impacts from construction activities, permanent removal and fragmentation of habitat, mortality of less mobile wildlife species, and operational disturbances within Site 4 would be greater than at any of the other site alternatives. The cumulative impacts on biological resources would be short-term and long-term, moderate, and adverse.

Cultural Resources. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 could have an adverse impact on the two cemeteries and other settlements on Site 4. While the proposed commissary could likely be designed around the cemeteries, there could be long-term, adverse impacts on them due to construction and increased visibility, or they could need more protection than is currently provided. If the Proposed Action is implemented at Site 4, additional extensive archaeological investigations, and careful site design and management planning would be required to control long-term impacts. Implementation of Site Alternative 4 could result in long-term, adverse cumulative impacts on cultural resources.

Safety. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action would result in impacts similar to those described under Site Alternative 1, although Site 4 would require expansion of the boundary fence protecting the North Area to include all newly acquired Air Force property. The cumulative impacts on safety would be similar to those described under Site Alternative 1.

Socioeconomics and Environmental Justice. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action would result in impacts similar to those described under Site Alternative 1; however, additional short-term, beneficial effects on the local economy would result from the additional construction work necessary to upgrade the road network in the vicinity of Site 4. The cumulative impacts on socioeconomics and minority, Hispanic or Latino, and low-income populations would be similar to those described under Site Alternative 1.

Infrastructure. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. Implementation of the Proposed Action at Site 4 would result in impacts similar to those described under Site Alternative 1. Because Site 4 is off-installation on City of Marietta-owned property, most utilities would need to be extended from Dobbins ARB or obtained commercially. The utility provider would be based on the amount of work required to connect the site and the associated costs. Site 4 is predominantly forested and would create more new impervious surfaces than Site Alternatives 1, 2, and 3. Therefore, implementation of the Proposed Action at this site would result in greater sheet flow and runoff as compared to the other alternatives. The existing stormwater system at Dobbins ARB would be able to handle this additional flow. Implementation of Site Alternative 4 would result in short-term, negligible to minor impacts on the Dobbins ARB transportation system because construction vehicles would travel on secondary roads within the installation resulting in a greater potential for congestion than at Site 1. Long-term, minor to moderate impacts on Dobbins ARB transportation systems would result from the need to construct an access road to the commissary, they need to upgrade the installation road network in the vicinity of Site 4, and increases in operational traffic. Long-term, minor, adverse impacts on the transportation system outside the installation would be expected. The short-term and long-term, cumulative impacts on infrastructure would be similar to those described under Site Alternative 1. The cumulative impacts on transportation systems would likely include short-term, minor impacts and long-term, minor to moderate impacts because many of the other Dobbins ARB projects are also on the eastern half of the installation and would be using the same off-installation and installation roads as the Proposed Action.

Hazardous Materials and Hazardous Waste. Impacts from other cumulative projects would be the same as described in **Section 5.2.1**. There is no known historical use of hazardous materials, or presence of hazardous wastes, ACMs, LBP, PCBs, radon, and pesticides at Site 4; therefore, negligible impacts would be anticipated from construction of the Proposed Action. The main environmental concerns at Site 4 are the presence of a Wingseal Facility spill, and a fuel oil spill and associated TCE-contaminated groundwater plume 260 feet west of the Site 4 boundary. These areas are still under investigation; therefore, the boundaries of contamination associated with these areas have not been defined. Based on the siting of the proposed commissary facility and the extent of the contamination, there could be minor to moderate impacts from construction activities. It is recommended that appropriate site investigations be performed prior to construction to determine the necessary actions to protect human health and the environment from the plume. However, it is anticipated that proper removal and disposal of hazardous wastes and materials at the site would be performed. Therefore, cumulative hazardous materials and hazardous waste impacts would be similar to those described under Site Alternative 1; however, the cumulative impacts from exposure to IRP sites during construction could be greater.

5.2.5 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur, and the existing conditions discussed in **Section 3** would continue. There would be no commissary in the Atlanta metropolitan area and commissary patrons would need to drive outside the metropolitan area to visit a commissary. The No Action Alternative would not result in any cumulative impacts.

5.3 Unavoidable Adverse Effects

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

Air Quality. Implementation of the Proposed Action would result in temporary particulate emissions due to construction and possibly demolition activities. The operation of the proposed commissary would also result in long-term, adverse impacts on air quality due to emissions from the building's heating systems and from vehicular traffic of commuting workers. Although unavoidable, the results of the impact analysis indicate impacts would not be significant.

Geological Resources. Under the Proposed Action, construction activities, such as grading and excavating of the ground, would result in some minor soil disturbance. Implementation of BMPs during construction would limit environmental consequences resulting from construction and demolition activities. Standard erosion-control measures would also reduce potential environmental impacts related to these characteristics. Although unavoidable, impacts on soils would not be considered significant.

Infrastructure. Solid waste would be generated as a result of construction and demolition activities. This is an unavoidable, but minor, adverse impact that can be mitigated to a certain extent by possible recycling opportunities.

Minor, adverse traffic impacts would be expected as a result of the Proposed Action. These impacts would be the unavoidable consequences of implementing the Proposed Action, but are not considered significant.

Hazardous Materials and Wastes. The use of hazardous materials and the generation of hazardous wastes would be unavoidable conditions associated with the Proposed Action. Products containing hazardous materials would be procured and used during the proposed commissary construction project. It is anticipated that the quantity of products containing hazardous materials used during the construction activities would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal and state regulations. Contractors must report use of hazardous materials. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations, and the Dobbins ARB Hazardous Waste Management Plan. The potential for accidents or spills due to improper fuel handling during construction or demolition activities is an unavoidable risk associated with the Proposed Action.

Energy Resources. Energy supplies would be committed to the Proposed Action. The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The construction and demolition activities associated with the Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Relatively small amounts of energy resources would be committed to the Proposed Action and are not considered significant.

5.4 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

The proposed construction activities would not result in any significant or incompatible land use changes on or off the installation. Implementation of the Proposed Action would require the change of land use categories under Site Alternatives 1, 3, and 4. After completion of these changes, construction activities would not be in conflict with installation or City of Marietta land use policies or objectives. The Proposed Action would not directly conflict with any applicable off-installation land use ordinances or designated clear zones.

5.5 Relationship between the Short-term Use of the Environment and Long-term Productivity

Short-term uses of the biophysical components of the human environment include direct, construction-related disturbances and direct impacts associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those effects occurring over a period of more than 5 years, including permanent resource loss.

This EA identifies potential short-term, adverse effects on the natural environment as a result of construction activities. These potential adverse effects include noise emissions, air emissions, soil erosion, stormwater runoff into surface water, and increased traffic. Proposed construction activities would be expected to increase the long-term productivity of Dobbins ARB by providing the only commissary in the Atlanta metropolitan area.

The Proposed Action would not result in significant intensifications of land use at Dobbins ARB or the surrounding areas.

5.6 Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the loss of biological habitat and consumption of material resources used for construction, energy resources, land, landfill space, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources irretrievably used for the Proposed Action include steel, concrete, and other building materials. Such materials are not in short supply and would not be expected to limit other unrelated construction activities. The irretrievable use of material resources would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel fuel would be used for the operation of construction vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant impacts would be expected.

Landfill Space. The generation of construction and possibly demolition debris and subsequent disposal of that debris in a landfill would be an irretrievable adverse impact.

Biological Habitat. The Proposed Action would result in minimal, irreversible loss of vegetation and wildlife habitat. The loss would be minimal and not considered significant on a regional basis.

Human Resources. The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

6. List of Preparer’s

This EA has been prepared by HDR and Stell Environmental Enterprises under the direction of AFRC and the 94th Airlift Wing at Dobbins ARB. The individuals who contributed to the preparation of this document are listed below.

Amy Altimare
Stell Environmental Enterprises
M.E.M. Masters of Environmental Management
B.S. Environmental Science
Years of Experience: 15

Louise Baxter
M.P.A. Public Administration
B.S. Political Science
Years of Experience: 20

Cynthia Cash, PG
Stell Environmental Enterprises
B.S. Geology
Years of Experience: 22

Ryan Delaney
M.S. Environmental Science
B.A. International Relations, English Literature
Years of Experience: 1

Elaine Dubin
B.S. Earth Science
Years of Experience: 5

Nicolas Frederick
M.S. Biology
B.S. Psychology
Years of Experience: 2

Stuart Gottlieb
B.A. Geography
GIS Professional Certificate
Years of Experience: 9

Leigh Hagan
MESM Environmental Science and Management
B.S. Biology
Years of Experience: 7

Deborah Haines
Stell Environmental Enterprises
B.S. Environmental Science
B.S. Meteorology
Years of Experience: 3

Christopher Holdridge
M.S. Environmental Assessment
B.S. Environmental Science/Chemistry
Years of Experience: 15

Cheryl Myers
A.A.S. Nursing
Years of Experience: 21

Steven Peluso, CHMM, CPEA
B.S. Chemical Engineering
Years of Experience: 24

Tanya Perry
B.S. Environmental Science
B.A. Communications
Years of Experience: 11

Max Pinnola
M.S. Sustainable Development
B.A. Environmental Policy and Science
Years of Experience: 1

Bruce Ramo
B.A. Urban Planning
Years of Experience: 35

Audrey Stuller
M.S. Environmental Science and Policy
B.S. Wildlife Science
Years of Experience: 5

Timothy Swavely
Stell Environmental Enterprises
B.S. Marine Science
Years of Experience: 4

Jeffrey Weiler
M.S. Resource Economics/Environmental Management
B.A. Political Science
Years of Experience: 36

Melissa Wiedenfeld, Ph.D.
Ph.D. History
M.A. History
B.A. History
Years of Experience: 25

Caroline Wright
M.A. Architecture
B.A. Architecture
Years of Experience: 1

7. References

Bureau of Labor Statistics 2011	Bureau of Labor Statistics. 2011. “ Local Area Unemployment Statistics.” Available online: <*http://www.bls.gov/lau/#tables*>. Accessed 22 December 2011.
CEQ 1997	Council on Environmental Quality (CEQ). 1997. *Considering Cumulative Effects Under the National Environmental Policy Act*. January 1997.
City of Marietta 2006a	City of Marietta. 2006. *City of Marietta, Georgia Comprehensive Plan 2006-2030.*
City of Marietta 2006b	City of Marietta, Georgia. 2006. “Marietta Power.” Available online: <*http://www.mariettaga.gov/departments/utilities/power/default.aspx*>. Accessed 3 January 2012
City of Marietta 2006c	City of Marietta, Georgia. 2006. “Marietta Water.” Available online: <*http://www.mariettaga.gov/departments/utilities/water/ collection.aspx*>. Accessed 3 January 2012.
City of Marietta 2009	City of Marietta, Georgia. 2009. “Marietta, Georgia Code of Ordinances, Part 10, Chapter 10-6, NOISE.” 11 March 2009. Available online: <*http://library. municode.com/showDocument.aspx?clientID=12224&docID=0*>. Accessed 19 January 2012.
City of Marietta 2010a	City of Marietta, Georgia. 2010. *Marietta, Georgia Official Future Land Use Map*. 1 October 2010.
City of Marietta 2010b	City of Marietta, Georgia. 2010. Draft Trail Map. September 2010.
City of Marietta 2012	City of Marietta, Georgia. 2012. Parks, Recreation, & Facilities. Available online: <*http://www.mariettaga.gov/departments/parks_rec/parks/default.aspx*>. Accessed 1 February 2012.
Cobb County 2008	Cobb County, Georgia. 2008. *Cobb County 2030 Comprehensive Transportation Plan Final Report*. 27 February 2008.
Cobb County 2010	Cobb County, Georgia. 2010. “Cobb County, Georgia Code of Ordinances, Chapter 50, Article VII, NOISE.” 23 February 2010. Available online: <*http://library. municode.com/showDocument.aspx?clientID=10572&docID=0*>. Accessed 19 December 2012.
Cobb County 2011	Cobb County, Georgia. 2011. Correspondence between HDR, Inc. and Cobb County regarding historic-age cemeteries in Wildwood Park. 31 August 2011.
DeCA 2012	Defense Commissary Agency (DeCA). 2012. Email correspondence from Mr. Noel A. Harris, DeCA, Planning Division, Logistic and Engineering Group. 24 April 2012.

Dobbins ARB 1999	Dobbins Air Reserve Base (ARB). 1999. *Final EA/FONSI for the Environmental Assessment of the Conversion of the 700th Airlift Squadron at Dobbins Air Reserve Base, Georgia*. September 1999.
Dobbins ARB 2004	Dobbins ARB. 2004. *Final Environmental Assessment for New Joint Armed Forces Readiness Headquarters Facility, Dobbins Air Reserve Base, Cobb County, Georgia*. 11 September 2004.
Dobbins ARB 2007a	Dobbins ARB. 2007. *Final Integrated Natural Resources Management Plan (INRMP)/Environmental Assessment (EA) for Dobbins ARB, Georgia*. Prepared for Dobbins ARB and AFCEE. Prepared by e2M. AFCEE Contract Number: F41624-03-D-8599. Task Order: 0073. June 2007.
Dobbins ARB 2007b	Dobbins ARB. 2007. *Threatened and Endangered Species Survey Report – 2007 Update for Dobbins Air Reserve Base, Georgia*. Prepared for Dobbins ARB and AFCEE. Prepared by e2M. AFCEE Contract Number: F41624-03-D-8599. Task Order: 0123. November 2007.
Dobbins ARB 2007c	Dobbins ARB. 2007. *Integrated Cultural Resource Management Plan, Fiscal Years 2007-2011*. Prepared by engineering-environmental Management, Inc. 10 May 2007.
Dobbins ARB 2007d	Dobbins ARB. 2007. *Final Hazardous Material Emergency Planning and Response Plan (HAZMAT Plan) For Dobbins Air Reserve Base*. Prepared for Headquarters Air Force Reserve Command, Robins AFB, Georgia. Prepared by e2M, Apex, North Carolina. Contract Number: F41624-03-D-8599, Task Number: 0093. November 2007,
Dobbins ARB 2009a	Dobbins ARB. 2009. *Wetland Delineation and Stream Evaluation Report.* September 2009.
Dobbins ARB 2009b	Dobbins ARB. 2009. *Dobbins Air Reserve Base Asbestos Operations and Management Plan*. September 2009.
Dobbins ARB 2009c	Dobbins ARB. 2009. *Hazardous Waste Management Plan for Dobbins Air Reserve Base*. October 2009.
Dobbins ARB 2009d	Dobbins ARB. 2009. *ARNG Environmental Checklist for the Proposed Construction and Operation of a Joint Forces Headquarters (JFHQ) at the Former Naval Air Station (NAS) Atlanta, Cobb County, Georgia.* 20 March 2009.
Dobbins ARB 2010a	Dobbins ARB. 2010. *Final General Plan.* HQ AFCEE Contract No. FA8903-08-D-8769, Task Order 0180. Prepared by CH2MHILL, Atlanta, Georgia. June 2010.
Dobbins ARB 2010b	Dobbins ARB. 2010. *Integrated Pest Management Plan*. October 2010.
Dobbins ARB 2010c	Dobbins ARB. 2010. *Spill Prevention, Control, and Countermeasure (SPCC) Plan*. Last revised July 2010.

Dobbins ARB 2010d	Dobbins ARB. 2010. *Dobbins Air Reserve Base Stormwater Pollution Prevention Plan for Municipal and Industrial Activities*. November 2010.
Dobbins ARB 2010e	Dobbins ARB. 2010. *Environmental Baseline Survey Update for Air Force Plant 6, Marietta, Georgia.* May 2010.
Dobbins ARB 2010f	Dobbins ARB. 2010. *Economic Impact Analysis for the 94th Airlift Wing at Dobbins ARB.* 10 November 2010.
Dobbins ARB 2011a	Dobbins ARB. 2011. *Forest Management Plan, FY 2007 – FY 2011 for Dobbins Air Reserve Base, Georgia*. Prepared for: 94th Combat Support Group, Environmental Flight, 94 SPTG/CEV, Dobbins ARB, GA and Headquarters Air Force Reserve Command, Environmental Division, AFRC/CEV, Robins AFB, GA. Prepared by: H. Warner Spence, District Forester Forest Resources Office, CESAS-RE-RT, Savannah, GA.
Dobbins ARB 2011b	Dobbins ARB. 2011. *2011 Air Installation Compatible Use Zone (AICUZ) Study at Dobbins Air Reserve Base, Georgia*. October 2011.
Dobbins ARB 2011c	Dobbins ARB. 2011. *2009 Final Air Emission Inventory Report*. Contract #GS10F0073L. Delivery Order #FA8903-10-F0005. 29 January 2011.
Dobbins ARB 2011d	Dobbins ARB. 2011. *Final Environmental Baseline Survey for the City Of Marietta Site Proposed For A Commissary at Dobbins Air Reserve Base, Georgia*. Prepared for Dobbins Air Reserve Base and Air Force Reserve Command. December 2011.
Dobbins ARB 2011e	Dobbins Air Reserve Base (ARB). 2011. Correspondence between Thomas Vaughan and Heather Yates regarding Explosive Site Plans. 3 August 2011.
Dobbins ARB 2011f	Dobbins ARB. 2011. *Draft Environmental Baseline Survey for the Barclay Gate Site Proposed For A Commissary at Dobbins Air Reserve Base, Georgia*. Prepared for Dobbins Air Reserve Base and Air Force Reserve Command. December 2011.
Dobbins ARB 2011g	Dobbins ARB. 2011. *Final Environmental Baseline Survey for the Corps Lab Site Proposed For A Commissary at Dobbins Air Reserve Base, Georgia*. Prepared for Dobbins Air Reserve Base and Air Force Reserve Command. November 2011.
Dobbins ARB 2011h	Dobbins ARB. 2011. *Lockheed Martin Aeronautics Material Recycling Facility: Option 1, Facility Layout*. 3 August 2011.
DOD 2010a	Department of Defense (DOD). 2010. Memorandum from Dorothy Robyn (Office of the Under Secretary of Defense) regarding DOD Implementation of Stormwater Requirements under Section 438 of the Energy Independence and Security Act. 19 January 2010.
DOD 2010b	DOD. 2010. *Unified Facilities Criteria (UFC): Low Impact Development*. 6 April 2010.

DOE/EIA 2011	U.S. Department of Energy, Energy Information Administration (DOE/EIA). 2011. “Table 1. State Emissions by Year (Million Metric Tons of Carbon Dioxide).” Available online <*http://www.eia.gov/environment/emissions/state/state_emissions.cfm*>. Data Released October 2011. Data accessed 6 January 2012.
FEMA 1986	Federal Emergency Management Agency (FEMA). 1986. *A Unified National Program for Floodplain Management*. March 1986.
FEMA 2008	FEMA. 2008. “Current FEMA Issued Flood Maps.” Flood Insurance Rate Map (FIRM) 13067C0117G. 16 December 2008. Available online: <*http://www.msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1*>. Accessed 26 September 2011.
FICON 1992	Federal Interagency Committee on Noise (FICON). 1992. *Federal Agency Review of Selected Airport Noise Analysis Issues*. August 1992.
GAARNG 2010	Georgia Army National Guard (GAARNG). 2010. *Executive Summary, USACE South Atlantic Division Laboratory*. Prepared by GAARNG Facilities Management Office-Environmental Programs Section (CFMO-ENV). 16 April 2010.
GADNR 2011	Georgia Department of Natural Resources (GADNR). 2011. “Georgia Department of Natural Resources, Ambient Air Quality Standards, Chapter 391-3-1-.02(4) - Ambient Air Standards.” Effective September 13, 2011. Available online: <*http://www.air.dnr.state.ga.us/airpermit/downloads/aqrules/airrules091311.pdf*> Accessed 6 January 2012.
GAEPD 2009	Georgia Environmental Protection Division (GAEPD). 2009. *Hazardous Waste Facility Permit No. HW-034(D) for Air Force Plant 6*. 14 October 2009.
Georgia DNR 2011a	Georgia Department of Natural Resources (DNR). 2011. “Special Concern Animal Species in Georgia.” Georgia DNR Wildlife Resources Division. 26 July 2011. Available online: <*http://georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/text/htht/et_lists/span.html*>. Accessed 28 December 2011.
Georgia DNR 2011b	Georgia DNR. 2011. “Special Concern Plant Species in Georgia.” Georgia DNR Wildlife Resources Division. 21 July 2011. Available online: <*http://georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/text/htht/et_lists/sppl.html*>. Accessed 28 December 2011.
GDOT 2009	Georgia Department of Transportation (GDOT). 2009. GASTARS Traffic Counters – 2043. Available online: <*http://www.dot.state.ga.us/statistics/stars/Pages/CobbTraffic.aspx*>. Accessed 19 April 2012.
GDOT 2010a	GDO. 2009. GASTARS Traffic Counters – R052. Available online: <*http://www.dot.state.ga.us/statistics/stars/Pages/CobbTraffic.aspx*>. Accessed 25 April 2012.

GDOT 2010b	GDO. 2009. GASTARS Traffic Counters – 2623. Available online: <*http://www.dot.state.ga.us/statistics/stars/Pages/CobbTraffic.aspx*>. Accessed 26 April 2012.
Harvard 2010	Harvard University. 2010. “Diversity Data - Atlanta-Sandy Springs-Marietta, GA.” Available online: <*http://diversitydata.sph.harvard.edu/Data/Profiles/Show.aspx?loc=124*>. Accessed 22 December 2011.
MicroCorp 2011	MicroCorp. 2011. “About Us.” Available online: <*http://www.microcorp.com/index.aspx*>. Accessed 3 January 2012.
State of Georgia 2011	State of Georgia. 2011. “Official Code of Georgia.” Available online: <*http://www.lexisnexis.com/hottopics/gacode*/>. Accessed 25 January 2012.
U.S. Census Bureau 2010a	U.S. Census Bureau. 2010. “State and County QuickFacts, Fulton County, Georgia.” Available online: <*http://quickfacts.census.gov/qfd/states/13/13121.html*>. Accessed 26 September 2011.
U.S. Census Bureau 2010b	U.S. Census Bureau. 2010. “American FactFinder.” Available online: <*http://factfinder2.census.gov/main.html* >. Accessed 22 December 2011.
U.S. Census Bureau 2010c	U.S. Census Bureau. 2010. “Cobb County, Georgia QuickFacts.” Available online: <*http://quickfacts.census.gov/qfd/states/13/13067.html*>. Accessed 22 December 2011.
U.S. Census Bureau 2010d	U.S. Census Bureau. 2010. “Marietta (City), Georgia) QuickFacts.” Available online: < *http://quickfacts.census.gov/qfd/states/13/1349756.html*>. Accessed 22 December 2011.
U.S. Census Bureau 2010e	U.S. Census Bureau. 2010. “Georgia QuickFacts.” Available online: <*http://quickfacts.census.gov/qfd/states/13000.html*>. Accessed 22 December 2011.
U.S. Census Bureau 2010f	U.S. Census Bureau. 2010. “USA QuickFacts.” Available online: <*http://quickfacts.census.gov/qfd/states/00000.htm*>. Accessed 22 December 2011.
USACE 1997	U.S. Army Corps of Engineers (USACE). 1997. *Lead-based Paint Survey Report, South Atlantic Division Laboratory Building, Marietta, Georgia*. 22 September 1997.
USACE Savannah District 2003	USACE Savannah District. 2003. *Revised Environmental Baseline Survey for the Transfer of the South Atlantic Division Laboratory Marietta, Georgia*. Prepared by USACE Savannah District Environmental Resources Branch. May 2003.
USAF 1994	U.S. Air Force (USAF). 1994. *Final, U.S. Air Force, Management Action Plan (MAP), Air Force Plant 6, Marietta, Georgia*. Prepared by Ecology and Environment, Inc. 1 December 1994.

USAF 2005	USAF. 2005. *Integrated Cultural Resources Management Plan, Air Force Plant 6, Marietta, Georgia 2006-2010*. United States Air Force, Aeronautical Systems Center, Wright Patterson Air Force Base, Ohio and Air Force Plant 6, Marietta, Georgia. Prepared by Geo-Marine, Inc., San Antonio, Texas. September 2005.
USAF 2010	USAF. 2010. *Environmental Baseline Survey Update for Air Force Plant 6, Marietta, Georgia*. Prepared by AECOM for the USAF. May 2010.
USEPA 1971	U.S. Environmental Protection Agency (USEPA). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*. 31 December 1971.
USEPA 1974	USEPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Prepared by: USEPA Office of Noise Abatement and Control. March 1974.
USEPA 1980	USEPA. 1980. *Effects of Noise on Wildlife and Other Animals*. Review of Research Since 1971. EPA 550/9-BO-100. July 1980.
USEPA 1981a	USEPA. 1981. "Noise and its Measurement." January 1981. Available online: <*http://nonoise.org/epa/Roll19/roll19doc49.pdf*>. Accessed 3 March 2010.
USEPA 1981b	USEPA. 1981. "Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise." Office of Noise Abatement and Control. October 1979, Revised July 1981. Available online: <*http://nonoise.org/epa/Roll7/roll7doc27.pdf*>. Accessed 3 March 2010.
USEPA 1999	USEPA. 1999. "Stormwater Technology Fact Sheet: Vegetated Swales." Available online <*http://www.epa.gov/owm/mtb/vegswale.pdf*>. Accessed 30 November 2011.
USEPA 2008	USEPA. 2008. "National Emissions Inventory, NEI Browser Search by State and County." Available online <*http://neibrowser.epa.gov/eis-public-web/geo/search.html*>. Accessed 4 January 2012.
USEPA 2009	USEPA. 2009. *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*. December 2009.
USEPA 2011a	USEPA. 2010. "National Ambient Air Quality Standards." Last updated on 04 August 2011. Available online <*http://www.epa.gov/air/criteria.html*>. Accessed 6 January 2012.
USEPA 2011b	USEPA. 2011. "40 CFR Part 81 – Designation of Areas for Air Quality Planning Purposes, Subpart B – Designation of Air Quality Control Regions, Sec. 81.45 Metropolitan Atlanta Air Quality Control Region." Available online <*http://edocket.access.gpo.gov/cfr_2002/julqtr/40cfr81.45.htm*>. Accessed on 6 January 2012.

USEPA 2011c	USEPA. 2011. "40 CFR Part 81 – Designation of Areas for Air Quality Planning Purposes, Subpart C – Section 107 Attainment Status Designations, Sec. 81.311 Georgia, Cobb County." Available online < *http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=6a9e1aaa6783730fa7f12026b7511806&rgn=div8&view=text&node=40:17.0.1.1.1.3.1.12&idno=40*>. Accessed on 6 January 2012.
USEPA 2011d	USEPA. 2011. "Mandatory Class I Areas." Available online <*http://www.epa.gov/ttn/oarpg/t1/fr_notices/classimp.gif*>. Accessed 6 January 2012.
USEPA 2011e	USEPA. 2011. "AP-42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Chapter 1.4 – Natural Gas Combustion." Available online: <*http://www.epa.gov/ttn/chief/ap42/ch01/final/c01s04.pdf* >. Accessed 6 January 2012.
USFWS 2011a	U.S. Fish and Wildlife Service (USFWS). 2011. "Listings and occurrences for Georgia." Species Reports, Environmental Conservation Online System. Last updated 28 December 2011. Available online: <*http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=GG&s8fid=112761032792&s8fid=112762573902*>. Accessed 28 December 2011.
USFWS 2011b	USFWS. 2011. "Candidate Species for Listing. Species Reports, Environmental Conservation Online System." Last updated 28 December 2011. Available online: <*http://ecos.fws.gov/tess_public/pub/SpeciesReport.do?listingType=C&mapstatma=1*>. Accessed 28 December 2011.
USGS 2011a	U.S. Geological Survey (USGS). 2011. "Geologic Unit: Powers Ferry." Available online <*http://ngmdb.usgs.gov/Geolex/NewRefsmry/sumry_3402.html.*>. Accessed 22 December 2011.
USGS 2011b	USGS. 2011. "Earthquake Hazards Program: Georgia Seismic Hazard Map." Available online <*http://earthquake.usgs.gov/earthquakes/states/georgia/hazards.php*>. Accessed 27 December 2011.
USGS 2011c	USGS. 2011. "USGS Store: Map Locater and Downloader." Available online: <*http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areaDetails&xcm=r3standardpitrex_prd&carea=%24ROOT&layout=6_1_61_48&uiarea=2)/.do*>. Accessed 9 January 2012.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING AND PUBLIC INVOLVEMENT CORRESPONDENCE

DEPARTMENT OF THE AIR FORCE
AIR FORCE RESERVE

13 December 2011

MEMORANDUM FOR DISTRIBUTION

FROM: 94 MSG/CE
884 Industrial Drive
Dobbins ARB, Georgia 30069

SUBJECT: Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) for an Environmental Assessment Addressing a Proposed Commissary at Dobbins Air Reserve Base, Georgia.

1. The Air Force Reserve Command (AFRC) is proposing to construct a new commissary at Dobbins Air Reserve Base (ARB). Dobbins ARB is in Cobb County in northwestern Georgia, about 16 miles northwest of the City of Atlanta. At this time, the installation does not have a commissary. A commissary would be built to provide service to patrons in the Atlanta area and would consist of a facility that would be approximately 70,972 square feet in size. The commissary would include general sales, a Grab N Go area, electronic checkout registers, receiving area, loading dock, meat and produce preparation areas, cold and freezer storage, and other supporting facilities. A parking lot consisting of approximately 350 patron parking spaces, 50 employee spaces, and shopping cart corrals would be constructed. To accommodate deliveries, a paved parking area and loading docks would be built in the rear of the commissary. In addition, an access road that could accommodate the delivery trucks traveling to the back of the commissary would be constructed.

2. The purpose of the Proposed Action is to construct a permanent commissary for authorized patrons. The need for the Proposed Action is to provide a commissary in the Atlanta metropolitan area, which is necessitated by the closing of other commissaries in the area due to Department of Defense Base Realignment and Closure (BRAC) actions. Four alternative site locations will be evaluated in the Environmental Assessment (EA), as shown in **Figure 1**. Site Alternative 1, Corps Lab Site, is in the northwestern corner of the installation near a former U.S. Army Corps of Engineers Laboratory. This site consists of 24.3 acres and includes property owned by the Georgia Department of Defense, Air Force Materiel Command, and Air Force Reserve Command. Site Alternative 2 is the Base Exchange (BX) Site in the central portion of the installation, where the proposed commissary would be built adjacent to the existing BX. This property is near the intersection of Industrial Drive and Atlantic Avenue and includes 9.0 acres on Air Force Reserve Command property. Site Alternative 3 is the Barclay Gate Site. This site is owned by Air Force Materiel Command, includes 45.7 acres north of Alternative Site 2, and is southwest of South Cobb Drive. Site Alternative 4, the City of Marietta Site, is the location of Wildwood Park, which is east of South Cobb Drive and northeast of Alternative Site 3. This property is owned by the City of Marietta and consists of 23.2 acres.

3. Under the No Action Alternative, Dobbins ARB would not construct the proposed commissary. As a result, there would not be a commissary in the Atlanta metropolitan area for patrons, which include retirees, active-duty and Reserve personnel, and their dependents.

4. The EA will be prepared to evaluate the Proposed Action at four alternative site locations and the No Action Alternative. Resources that will be considered in the impacts analysis are noise, land use, air quality, geological resources, water resources, biological resources, cultural resources, socioeconomic resources and environmental justice, infrastructure, hazardous materials and waste management, and safety.

5. The environmental impact analysis process for the Proposed Action and appropriate alternatives is being conducted by Headquarters Air Force Reserve Command in accordance with the Council on Environmental Quality's guidelines pursuant to the requirements of the National Environmental Policy Act (NEPA). The U.S. Air Force's implementing regulation for NEPA is its *Environmental Impact Analysis Process* that is detailed in 32 Code of Federal Regulations Part 989, as amended.

6. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing this letter and solicit your comments concerning the proposal and any potential environmental issues of concern to you. We request that you send comments or information you would like considered during preparation of the Draft EA directly to the undersigned at 901 Industrial Drive, Dobbins ARB, Georgia, 30069 within 30 days from the date of this letter. In addition, please indicate if you are interested in receiving a copy of the Draft EA, once it is available, or if someone else within your organization other than you should receive the Draft EA. Attachment 2 of this letter provides a list of other contacted stakeholders. Your prompt attention to this request would be greatly appreciated. If members of your staff have any questions, please contact my POC, Mr. Mark Floyd at (678) 655-3549.

KENNETH W. WILLIAMS
Base Civil Engineer

Attachments:
1. Alternative Site Location Map
2. Distribution List

Attachment 1

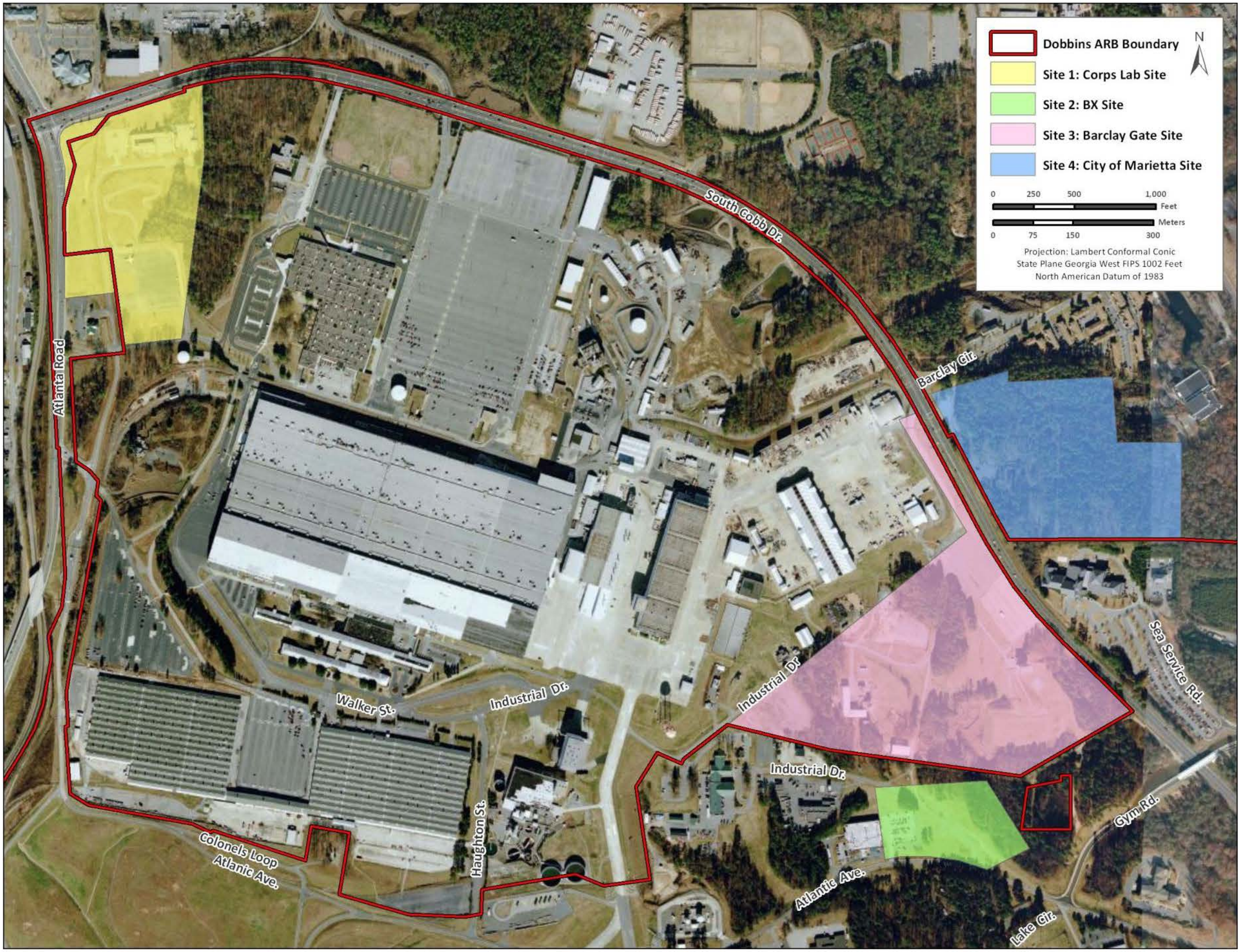


Figure 1. Alternative Site Location Map

IICEP Distribution List:

Ms. Gwendolyn Keyes Fleming
U.S. Environmental Protection Agency,
Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303

U.S. Fish and Wildlife Service
Southeast Region, Region 4
1875 Century Blvd., Suite 400
Atlanta, GA 30345

U.S. Army Engineer Division, South Atlantic
60 Forsyth Street S.W., Room 9M15
Atlanta, Georgia 30303-8801

Georgia Environmental Protection Division
Georgia Department of Natural Resources
2 Martin Luther King Jr. Drive
Suite 1152, East Tower
Atlanta, GA 30334

Georgia State Parks and Historic Sites
Georgia Department of Natural Resources
2 Martin Luther King Jr. Drive
Suite 1352, East Tower
Atlanta, GA 30334

Historic Preservation Division
Georgia Department of Natural Resources
254 Washington Street, SW; Ground Level
Atlanta, GA 30334

Mr. Dana Johnson
Cobb County Community Development
Department
100 Cherokee Street, Suite 556
Marietta, GA 30090-9674

Cobb Chamber of Commerce
P. O. Box 671868
Marietta, GA 30006-0032

Cobb County Soil and Water Conservation
District
678 South Cobb Drive, Suite 150
Marietta, GA 30060

Cobb County Board of Commissioners
100 Cherokee Street
Marietta, GA 30090

Cobb County Department of Transportation
1890 County Services Pkwy
Marietta, GA 30008

Mr. Rusty Roth
City of Marietta Department of Planning and
Zoning
205 Lawrence Street
Marietta, GA 30060

Mr. William Bruton, Jr.
Marietta City Manager
205 Lawrence Street
Marietta, GA 30060

Mr. Rich Buss
Marietta City Hall, Parks and Recreation
P.O. Box 609
Marietta, GA 30061-0609

City of Smyrna
P.O. Box 1226
Smyrna, Georgia 30081

Atlanta Regional Commission
40 Courtland Street, NE
Atlanta, GA 30303-2538

Attachment 2

Alabama-Quassarte Tribal Town
117 North Main
Wetumka, OK 74883

Catawba Indian Nation
611 East Main Street
Rock Hill, SC 29730

Cherokee Nation
PO Box 948
Tahlequah, OK 74465

Eastern Band of Cherokee Indians
PO Box 455
Cherokee, NC 28719

Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, AL 36502

PARKS, RECREATION AND FACILITIES
RECREATION DIVISION
205 Lawrence Street
P.O. Box 609
Marietta, GA 30061-0609
(770) 794-5601
Fax (770) 794-5635

Kenneth W. Williams
Base Civil Engineer
901 Industrial Drive
Dobbins ARB, GA 30069

January 10, 2012

RE: Proposed Commissary Site at Wildwood Park

Dear Mr. Williams:

This letter is a response to your request for comments regarding the proposal and any environmental issues of concern related to the potential location of a commissary in Wildwood Park.

There are three areas of note regarding the property that I shall share: 1) Regulations on transfer of the property, 2) Ground Water Monitoring Wells on the property, and 3) the existence of know gravesites. I am unaware of any other issues or environmental conditions.

Wildwood Park was acquired in the Federal Land to Parks initiative. The development of the park was done in part with Land and Water Conservation Fund (LWCF) monies appropriated by the Department of Interior through the National Park Service. Use of the property for anything other than outdoor recreation requires a "conversion" of the property according to LWCF guidelines. Chapter 675.9 of the LWCF Grants Manual details the requirements. I can supply a copy if you find it necessary. In summary, the property would have to be replaced.

There are two ground water monitoring wells on the property testing runoff from the Lockheed Martin facility.

Two separate locations have identified gravesites. The interred are unknown. We have conducted an archaeological study and believe these to be the only sites. There was a graduate paper done by a Georgia State University student done hypothesizing that a much larger graveyard is present. Our study did not corroborate with that document.

A complete package with all of the available documents for each of these items was submitted to Stell Environmental, and from what I understand they were forwarded to Mark Floyd over the holidays.

Let me know if you need any additional information.

Sincerely:

Rich

Rich

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION

MARK WILLIAMS
COMMISSIONER

DR. DAVID CRASS
DIVISION DIRECTOR

January 12, 2012

Kenneth Williams
Base Civil Engineer
Department of the Air Force
Air Force Reserve Command
94 MSG/CE
884 Industrial Drive
Dobbins ARB, Georgia 30069
Attn: Mark Floyd, mark.floyd@dobbins.af.mil

RE: Dobbins ARB: Construct 70, 972 Square Foot Commissary Building
Cobb County, Georgia
HP-111215-002

Dear Mr. Williams:

The Historic Preservation Division (HPD) has received initial information as part of the Interagency and Intergovernmental Coordination for Environmental Planning for an Environmental Assessment addressing the above referenced project. Our comments are offered to assist federal agencies and their applicants in complying with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA).

Thank you for contacting HPD concerning this potential undertaking. We look forward to receiving Section 106 compliance documentation from you when it becomes available. Please note that if the federal agency involved intends to use National Environmental Policy Act (NEPA) documentation and procedures to comply with Section 106 of the NHPA in lieu of the procedures set forth in 36 CFR Part 800.3 through 800.6, the federal agency must notify HPD and the Advisory Council on Historic Preservation (ACHP) in advance, pursuant to 36 CFR Part 800.8(c).

For information pertaining to historic properties in the subject area of potential effect (APE) for the completion of NEPA documentation or for environmental planning purposes, please see our website under "Historic Resources" for information concerning the multiple file sources available for research in our office. Unfortunately, we cannot provide this service for you. If we may be of further assistance, please do not hesitate to contact me at (404) 463-6687, or Erin Parr, Environmental Review Specialist, at (404) 651-6546.

Sincerely,

Elizabeth Shirk

Elizabeth Shirk
Environmental Review Coordinator

The Atlanta
Journal-
Constitution

PUBLISHER'S AFFIDAVIT

ACCOUNT NAME **HDR ENVIRONMENTAL**

ACCOUNT NO. **069133514**

LEVERN MUHAMMAD personally appeared before me, the undersigned Notary Public, who states that she is an ACCOUNT EXECUTIVE for **THE ATLANTA JOURNAL AND CONSTITUTION** newspaper, a newspaper of general circulation published in the City of Atlanta, Georgia, and who further states under oath that the advertisement attached hereto and made part of this affidavit appeared in The Atlanta Journal-Constitution on the following date(s): JULY 30, 2012.

Levern Muhammad, Legal Clerk

SWORN TO AND SUBSCRIBED BEFORE ME,

THIS 1 DAY OF AUGUST, 2012

(NOTARY SIGNATURE)

LYNSUE CHUKURA
NOTARY PUBLIC
COBB COUNTY, GEORGIA
MY COMMISSION EXPIRES NOVEMBER 2, 2014

PolitiFact

from B1

, even in cases of
incest.
aim is almost
to one made
ma ad that ran
st week of Ju-
olleagues at
k.org said
sted Romney's
At the time, the
ampaign backed
by pointing to a
oate when Rom-
he would sign a
banned all abor-
t there was no
bill and no specif-
ge.
bama campaign
d a new ad, but it
sted on YouTube.
d it on a Washing-
site that tracks
n ads using data
ntar Media. The
ges the claim to
Romney support-
l" rather than a

me, the Obama
n referred us to
al material. In
d 2008, the Re-
n Party platform
he "human life
nent," which as-
t legal person-
gins at concep-
nd with that
ll constitution-
tions. In 2007,
said on ABC's
Morning Ameri-
u know, I do sup-
Republican plat-
d I support that
rt of the Republi-
form and I'm pro-

e Obama cam-
s a problem in
ating Romney's
from that com-
pport for the
nent does not nec-
equate to oppos-
tion when preg-
due to rape or in-

ational Com-
or a Human Life
nent, a Wash-
based advocacy
as compiled the
sional bills in fa-
n amendment dat-
to 1973. Some of
lls have no excep-
rape and incest.

Facebook and search for PolitiFact Georgia. Once our page appears, hit the "Like" button. And let the commenting commence.

However, the most recent versions do.

In 2003, Rep. Jo Ann Emerson, R-Mo., introduced H.J. Res 9, which held that "no unborn person shall be deprived of life." However, the bill adds "nothing in this article shall prohibit a law permitting only those medical procedures required to prevent the death of the mother of an unborn person: Provided further, that nothing in this article shall limit the liberty of a mother with respect to the unborn offspring of the mother conceived as a result of rape or incest."

We asked Michael Taylor, executive director of the National Committee for a Human Life Amendment, what that bill means.

"I'm not a lawyer," Taylor said, "but the way I read it, there's an exception for the life of the mother and for cases of rape and incest."

Taylor's site lists another occasion in 1989 when the Senate Judiciary Committee's subcommittee on the Constitution approved amendment language proposed by Sen. Mitch McConnell, R-Ky., that also included exceptions for rape and incest.

These versions predate the Republican Party platforms of 2004 and 2008 that endorse the "human life amendment." Emerson introduced the same amendment with the exception for rape and incest in 2005, so the main versions when Romney made his 2007 remark included the exception.

More recently, Romney has made clear that he supports the exception for rape and incest. In 2011, Romney explained his position on abortion in an op-ed in the National Review. It begins with "I am pro-life and believe

campaign said Romney "backed a bill that outlaws all abortions, even in cases of rape and incest."

The Obama campaign provides virtually nothing to back that up, however. It has no evidence that Romney explicitly opposed the exception for rape and incest. While he supported the "human

supports those exceptions.

In its effort to appeal to women, the Obama campaign has twisted Romney's position to a ridiculous degree. We rate the claim Pants on Fire.

For a list of sources for this article, go to www.politifact.com.

Legal Notices

INVITATION FOR BIDS

METROPOLITAN ATLANTA RAPID TRANSIT AUTHORITY (MARTA) will accept Bids as follows:

CP B26516 Procurement of Door Interlock Kits for Rail Vehicles. Bid Opening August 8, 2012 at 2:00 p.m. For more information call Elvis Gibbs at 404-848-3235.

CP B21350 Hamilton Bus Facility Expansion. Bid Opening August 15, 2012 at 2:00 p.m. For more information call DeValory Donahue at 404-848-4159.

RFP P24674 Solicitation of Proposals for Automated Teller Machines in MARTA Rail Stations and Facilities. Proposal Deadline August 15, 2012 at 2:00 p.m. For more information call Diane Graham at 404-848-4123.

CP B26769 AC Traction Overhaul and Repair Services. Bid Opening August 16, 2012 at 2:00 p.m. For more information call DeValory Donahue at 404-848-4159.

RFI P26495 MARTA Concessions Program Enhancements through Partnerships. Proposal Information Deadline August 20, 2012 at 2:00 p.m. For more information call Darlene West at 404-848-5194.

To obtain a Bid document or CD, contact MARTA's Contract Control Branch at 404-848-5580. You may also use a major credit card to purchase Bid documents or CDs. Bids should be received at 2424 Piedmont Road, N.E., Lobby Floor, Atlanta, GA 30324 by the aforementioned date and local time. Envelopes containing bids MUST BE marked with Bid Number and returned to the Contract Control Branch. Contracts are subject to Federal Grant Regulations and to MARTA's Resolution on Equal Opportunity prohibiting discrimination based on race, color, sex, religion or national origin.

View MARTA's Home Page
About MARTA
http://www.itsmarta.com

NOTICE OF INTENT TO AWARD

Notice is hereby given that not sooner than five (5) days after the publication hereof, the Metropolitan Atlanta Rapid Transit Authority (MARTA) intends to award the following contract:

RFP P22221 Design Build Brady Mobility Facility. Archer Western Contractors, Ltd. - $38,206,066.00. Federal Funds.

CP B22614 Chassis Dynamometer Upgrades. M.C. Headley Properties, LLC - $293,942.00. Federal/Local Capital Funds.

A summary of the terms of the contract is available at the Office of Contracts & Procurement and Material, MARTA 2424 Piedmont Road, N. E. Atlanta, GA 30324.

Beverly A. Scott, Ph.D.
General Manager/CEO
View MARTA'S
VENDOR OPPORTUNITIES
http://www.itsmarta.com

PUBLIC NOTICE

The City of Atlanta License Review Board's (LRB) meeting of Tuesday, July 24, 2012, was not held as scheduled. Accordingly, that meeting has been rescheduled, and it will be held at 5:00 p.m. on Tuesday, July 31, 2012. The meeting location will be in the City of Atlanta Council Chamber on the 2nd Floor, 55 Trinity Avenue, Atlanta, Georgia 30303.

GIVEN UNDER MY HAND AND SEAL OF THIS OFFICE ON THIS 26th day of July, 2012

Rhonda Dauphin Johnson
Municipal Clerk, CMC

For more information on Legal Guidelines, Contact your County Newspaper.

PUBLIC NOTICE
Air Force Reserve Command

Notice of Availability
Draft Environmental Assessment Addressing a Proposed Commissary at Dobbins Air Reserve Base, Georgia

The Air Force Reserve Command (AFRC), in conjunction with Dobbins Air Reserve Base (ARB), has completed a Draft Environmental Assessment (EA) that evaluates the potential effects of a proposed commissary at Dobbins ARB, Georgia.

The analysis considered in detail the potential environmental effects of the Proposed Action and the No Action Alternative. Four alternative site locations were evaluated. The commissary would be approximately 70,972 ft^2 in size and include general sales, a parking lot, and an access road. The results, as found in the EA, show that the Proposed Action would not have a significant impact on the environment, indicating that a Finding of No Significant Impact (FONSI) would be appropriate. An Environmental Impact Statement is not considered necessary to implement the Proposed Action. Copies of the Draft EA presenting the analysis are available for review at the following libraries:

Cobb County Central Library
266 Roswell Street
Marietta, GA 30060

Smyrna Public Library
100 Village Green Circle
Smyrna, Georgia 30080-3478

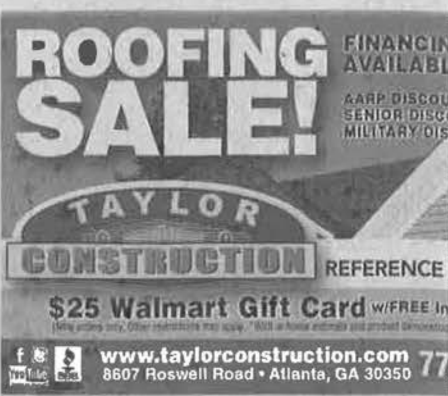
The document is also available at:

http://www.dobbins.afrc.af.mil/shared/media/document/AFD-120615-055.pdf

Written comments on the Draft EA are invited and will be accepted for 30 days from the publication of this notice. Comments for consideration by the AFRC on this document should be provided in writing to:

94th Airlift Wing Public Affairs Office
1430 First Street
94AW/PA
Dobbins ARB, GA 30069
Phone: 678-655-5055
Email: 94AW.PA@us.af.mil

Website: http://www.dobbins.afrc.af.mil/un[illegible]pa/index.asp



MARIETTA DAILY JOURNAL www.mdjonline.com
CHEROKEE TRIBUNE www.cherokeetribune.com
NEIGHBOR NEWSPAPERS www.neighbornewspapers.com

Wade Stephens
Vice President of Sales & Marketing
wstephens@mdjonline.com

Main Office
580 Fairground Street
Post Office Box 449
Marietta, Georgia 30061
Phone: 770.428.9411
Fax: 770.428.5375

Cobb County
Marietta Daily Journal
Cobb Life Magazine
East Cobb Neighbor
North Cobb Neighbor
South Cobb Neighbor
Smyrna Neighbor
Vinings Neighbor

Cherokee County
Cherokee Tribune
Cherokee Life Magazine
Cherokee Tribune Plus

Bartow County
Bartow Neighbor

Douglas County
Douglas Neighbor

Paulding County
Paulding Neighbor

Fulton County
Northside Neighbor
Sandy Springs Neighbor
Sandy Springs Life Magazine
Roswell Neighbor
Johns Creek Neighbor
Milton Neighbor
Alpharetta Neighbor
South Fulton Neighbor

Fayette County
Fayette Neighbor

Henry County
Henry Neighbor

Clayton County
Clayton Neighbor

DeKalb County
Dunwoody Neighbor
Dunwoody Life Magazine
North DeKalb Neighbor
Mid DeKalb Neighbor

Proudly Serving
Suburban Atlanta
Ten Counties
Over 400,000
Audited Circulation

AFFIDAVIT OF PUBLICATION

I, **Wade Stephens** do solemnly swear that I am

Vice President of the Marietta Daily Journal,

Cherokee Tribune, and Neighbor Newspapers, printed

and published at Marietta in the State of Georgia and that

from my own personal knowledge and reference to the files

Of said publication, the advertisements for:

Public Notice –
Air Force Reserve Command Notice of Availability for:
"Draft Environmental Assessment Addressing a Proposed Commissary at Dobbins Air Force Base, Georgia",

Was published in the: **MARIETTA DAILY JOURNAL,**

On: **Monday, July 30, 2012, page 5B;**

Subscribed and sworn to before 6th day of August, 2012.

Notary Public

Aug 11, 2015
Expiration Date

TARA M GUEST
NOTARY PUBLIC
AUGUST 11, 2015

Investigators, in a police report, listed a knife or some other sharp object as the weapon used to kill the couple. Davis said detectives hadn't determined a motive for the slayings.

PUBLIC NOTICE

Air Force Reserve Command
Notice of Availability

Draft Environmental Assessment

Addressing a Proposed Commissary at
Dobbins Air Reserve Base, Georgia

The Air Force Reserve Command (AFRC), in conjunction with Dobbins Air Reserve Base (ARB), has completed a Draft Environmental Assessment (EA) that evaluates the potential effects of a proposed commissary at Dobbins ARB, Georgia.

The analysis considered in detail the potential environmental effects of the Proposed Action and the No Action Alternative. Four alternative site locations were evaluated. The commissary would be approximately 70,972 ft^2 in size and include general sales, a parking lot, and an access road. The results, as found in the EA, show that the Proposed Action would not have a significant impact on the environment, indicating that a Finding of No Significant Impact (FONSI) would be appropriate. An Environmental Impact Statement is not considered necessary to implement the Proposed Action. Copies of the Draft EA presenting the analysis are available for review at the following libraries:

Cobb County Central Library
266 Roswell Street
Marietta, GA 30060

Smyrna Public Library
100 Village Green Circle
Smyrna, Georgia 30080-3478

The document is also available at:
http://www.dobbins.afrc.af.mil/shared/media/document/AFD-120615-055.pdf

Written comments on the Draft EA are invited and will be accepted for 30 days from the publication of this notice. Comments for consideration by the AFRC on this document should be provided in writing to:

94th Airlift Wing Public Affairs Office
1430 First Street
94AW/PA
Dobbins ARB, GA 30069
Phone: 678-655-5055
Email: 94AW.PA@us.af.mil

Website: http://www.dobbins.afrc.af.mil/units/pa/index.asp

APPENDIX B

AIR QUALITY CALCULATIONS

Site Alternative 1

Summary	Summarizes total emissions by calendar year for the Proposed Action
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill and construction materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
AQCR Tier Report	Summarizes total emissions for the Metropolitan Atlanta Intrastate Air Quality Control Region Tier report for 2008, to be used to compare the Proposed Action to regional emissions.

Air Quality Emissions from the Proposed Action

Construction Activities	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	6.090	0.673	2.641	0.403	0.424	0.411	703.199
Fugitive Dust	-	-	-	-	19.380	1.938	-
Haul Truck On-Road	0.570	0.412	1.674	0.045	0.677	0.176	144.189
Commuter	0.176	0.175	1.586	0.002	0.017	0.011	210.371
TOTAL Construction Activities	***6.836***	***1.261***	***5.901***	***0.450***	***20.498***	***2.536***	***1,057.759***

Operational Activities	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Building Heating Systems	***1.288***	***0.142***	***2.164***	***0.015***	***0.196***	***0.196***	***3,091.765***
Worker Commuting and Commissary Patron Trips	***5.288***	***5.265***	***47.593***	***0.062***	***0.501***	***0.316***	***6,311.130***
TOTAL Operational Activities	***6.576***	***5.407***	***49.757***	***0.077***	***0.697***	***0.512***	***9,402.895***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

	Construction Activities	**Operational Activities**
CO_2 emissions converted to metric tons =	***959.39***	***8528.43***
State of Georgia CO_2 emissions (metric tons) =	***164,200,000***	
Percent of Georgia CO_2 emissions =	***0.0006%***	***0.005%***
United States' CO_2 emissions (metric tons) =	***5,814,400,000***	
Percent of USA's CO_2 emissions =	***0.00002%***	***0.00015%***

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2011. *State CO_2 Emissions by Year 1980-2009 (Million Metric Tons of Carbon Dioxide).*
Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 09 January 2012.
Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory.
Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan Atlanta Air Quality Control Region and Cobb County

		All Sources					
	Year	**NO_x (tpy)**	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Metro Atlanta AQCR	2008	161,849	150,101	890,752	178,961	165,459	34,875
Cobb County	2008	20,872	22,492	129,676	25,972	17,573	3,892

Source: USEPA - AirData National Emissions Inventory Data by State and County; Site Accessed on January 4, 2012.
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=15&inventoryYear=2008
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=51&inventoryYear=2008

Air Emissions from the Construction and Operation of the Dobbins ARB Commissary

	(tpy)	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**
Proposed Construction Emissions	6.836	1.261	5.901	0.450	20.498	2.536
Proposed Operational Emissions	6.576	5.407	49.757	0.077	0.697	0.512
% of Regional Emissions (Construction only)	**0.004%**	**0.001%**	**0.001%**	**0.0003%**	**0.01%**	**0.01%**
% of Regional Emissions (Operational only)	**0.004%**	**0.004%**	**0.006%**	**0.00004%**	**0.0004%**	**0.0015%**
% of Cobb County Emissions (Construction only)	**0.03%**	**0.01%**	**0.005%**	**0.002%**	**0.1%**	**0.1%**
% of Cobb County Emissions (Operational only)	**0.03%**	**0.024%**	**0.04%**	**0.0003%**	**0.004%**	**0.013%**

Site Alternative 2

Summary	Summarizes total emissions by calendar year for the Proposed Action
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill and construction materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
AQCR Tier Report	Summarizes total emissions for the Metropolitan Atlanta Intrastate Air Quality Control Region Tier report for 2008, to be used to compare the Proposed Action to regional emissions.

Air Quality Emissions from the Proposed Action

Construction Activities	**NO_x (ton)**	**VOC (ton)**	**CO (ton)**	**SO_2 (ton)**	**PM_{10} (ton)**	**$PM_{2.5}$ (ton)**	**CO_2 (ton)**
Combustion	5.391	0.633	2.356	0.389	0.381	0.370	616.710
Fugitive Dust	-	-	-	-	11.055	1.105	-
Haul Truck On-Road	0.425	0.307	1.249	0.033	0.506	0.131	107.638
Commuter	0.176	0.175	1.586	0.002	0.017	0.011	210.371
TOTAL Construction Activities	***5.992***	***1.116***	***5.192***	***0.425***	***11.958***	***1.617***	***934.719***

Operational Activities	**NO_x (ton)**	**VOC (ton)**	**CO (ton)**	**SO_2 (ton)**	**PM_{10} (ton)**	**$PM_{2.5}$ (ton)**	**CO_2 (ton)**
Building Heating Systems	***1.288***	***0.142***	***2.164***	***0.015***	***0.196***	***0.196***	***3,091.765***
Worker Commuting and Commissary Patron Trips	***5.288***	***5.265***	***47.593***	***0.062***	***0.501***	***0.316***	***6,311.130***
TOTAL Operational Activities	***6.576***	***5.407***	***49.757***	***0.077***	***0.697***	***0.512***	***9,402.895***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

	Construction Activities	**Operational Activities**
CO_2 emissions converted to metric tons =	***847.79***	***8528.43***
State of Georgia CO_2 emissions (metric tons) =	***164,200,000***	
Percent of Georgia CO_2 emissions =	***0.0005%***	***0.005%***
United States' CO_2 emissions (metric tons) =	***5,814,400,000***	
Percent of USA's CO_2 emissions =	***0.000015%***	***0.00015%***

<u>Source</u>: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2011. *State CO_2 Emissions by Year 1980-2009 (Million Metric Tons of Carbon Dioxide).*
Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 09 January 2012.
Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory.
Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan Atlanta Air Quality Control Region and Cobb County

		All Sources					
	Year	**NO_x (tpy)**	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Metro Atlanta AQCR	2008	161,849	150,101	890,752	178,961	165,459	34,875
Cobb County	2008	20,872	22,492	129,676	25,972	17,573	3,892

Source: USEPA - AirData National Emissions Inventory Data by State and County; Site Accessed on January 4, 2012.
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=15&inventoryYear=2008
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=51&inventoryYear=2008

Air Emissions from the Construction and Operation of the Dobbins ARB Commissary

	(tpy)	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**
Proposed Construction Emissions	5.992	1.116	5.192	0.425	11.958	1.617
Proposed Operational Emissions	6.576	5.407	49.757	0.077	0.697	0.512
% of Regional Emissions (Construction only)	**0.004%**	**0.001%**	**0.001%**	**0.0002%**	**0.01%**	**0.005%**
% of Regional Emissions (Operational only)	**0.004%**	**0.004%**	**0.006%**	**0.00004%**	**0.0004%**	**0.0015%**
% of Cobb County Emissions (Construction only)	**0.03%**	**0.005%**	**0.004%**	**0.002%**	**0.1%**	**0.04%**
% of Cobb County Emissions (Operational only)	**0.03%**	**0.024%**	**0.04%**	**0.0003%**	**0.004%**	**0.013%**

Site Alternative 3

Summary	Summarizes total emissions by calendar year for the Proposed Action
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill and construction materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
AQCR Tier Report	Summarizes total emissions for the Metropolitan Atlanta Intrastate Air Quality Control Region Tier report for 2008, to be used to compare the Proposed Action to regional emissions.

Air Quality Emissions from the Proposed Action

Construction Activities	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Combustion	5.682	0.650	2.474	0.395	0.399	0.387	652.583
Fugitive Dust	-	-	-	-	13.178	1.318	-
Haul Truck On-Road	0.482	0.349	1.417	0.038	0.573	0.149	122.074
Commuter	0.176	0.175	1.586	0.002	0.017	0.011	210.371
TOTAL Construction Activities	***6.341***	***1.174***	***5.477***	***0.435***	***14.167***	***1.864***	***985.028***

Operational Activities	NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)	$PM_{2.5}$ (ton)	CO_2 (ton)
Building Heating Systems	***1.288***	***0.142***	***2.164***	***0.015***	***0.196***	***0.196***	***3,091.765***
Worker Commuting and Commissary Patron Trips	***5.288***	***5.265***	***47.593***	***0.062***	***0.501***	***0.316***	***6,311.130***
TOTAL Operational Activities	***6.576***	***5.407***	***49.757***	***0.077***	***0.697***	***0.512***	***9,402.895***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

	Construction Activities	**Operational Activities**
CO_2 emissions converted to metric tons =	***893.42***	***8528.43***
State of Georgia CO_2 emissions (metric tons) =	***164,200,000***	
Percent of Georgia CO_2 emissions =	***0.0005%***	***0.005%***
United States' CO_2 emissions (metric tons) =	***5,814,400,000***	
Percent of USA's CO_2 emissions =	***0.000015%***	***0.00015%***

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2011. *State CO_2 Emissions by Year 1980-2009 (Million Metric Tons of Carbon Dioxide).*
Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 09 January 2012.
Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory.
Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan Atlanta Air Quality Control Region and Cobb County

		All Sources					
	Year	**NO_x (tpy)**	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Metro Atlanta AQCR	2008	161,849	150,101	890,752	178,961	165,459	34,875
Cobb County	2008	20,872	22,492	129,676	25,972	17,573	3,892

Source: USEPA - AirData National Emissions Inventory Data by State and County; Site Accessed on January 4, 2012.
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=15&inventoryYear=2008
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=51&inventoryYear=2008

Air Emissions from the Construction and Operation of the Dobbins ARB Commissary

	(tpy)	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**
Proposed Construction Emissions	6.341	1.174	5.477	0.435	14.167	1.864
Proposed Operational Emissions	6.576	5.407	49.757	0.077	0.697	0.512
% of Regional Emissions (Construction only)	**0.004%**	**0.001%**	**0.001%**	**0.0002%**	**0.01%**	**0.01%**
% of Regional Emissions (Operational only)	**0.004%**	**0.004%**	**0.006%**	**0.00004%**	**0.0004%**	**0.0015%**
% of Cobb County Emissions (Construction only)	**0.03%**	**0.01%**	**0.004%**	**0.002%**	**0.1%**	**0.05%**
% of Cobb County Emissions (Operational only)	**0.03%**	**0.024%**	**0.04%**	**0.0003%**	**0.004%**	**0.013%**

Site Alternative 4

Summary	Summarizes total emissions by calendar year for the Proposed Action
Combustion	Estimates emissions from non-road equipment exhaust.
Fugitive	Estimates particulate emissions from construction and demolition activities including earthmoving, vehicle traffic, and windblown dust.
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions.
Haul Truck On-Road	Estimates emissions from haul trucks hauling fill and construction materials to the job site.
Construction Commuter	Estimates emissions for construction workers commuting to the site.
AQCR Tier Report	Summarizes total emissions for the Metropolitan Atlanta Intrastate Air Quality Control Region Tier report for 2008, to be used to compare the Proposed Action to regional emissions.

Air Quality Emissions from the Proposed Action

Construction Activities	**NO_x (ton)**	**VOC (ton)**	**CO (ton)**	**SO_2 (ton)**	**PM_{10} (ton)**	**$PM_{2.5}$ (ton)**	**CO_2 (ton)**
Combustion	6.090	0.673	2.641	0.403	0.424	0.411	703.199
Fugitive Dust	-	-	-	-	19.446	1.945	-
Haul Truck On-Road	0.576	0.417	1.693	0.045	0.685	0.178	145.874
Commuter	0.176	0.175	1.586	0.002	0.017	0.011	210.371
TOTAL Construction Activities	***6.843***	***1.265***	***5.921***	***0.450***	***20.572***	***2.544***	***1,059.444***

Operational Activities	**NO_x (ton)**	**VOC (ton)**	**CO (ton)**	**SO_2 (ton)**	**PM_{10} (ton)**	**$PM_{2.5}$ (ton)**	**CO_2 (ton)**
Building Heating Systems	***1.288***	***0.142***	***2.164***	***0.015***	***0.196***	***0.196***	***3,091.765***
Worker Commuting and Commissary Patron Trips	***5.288***	***5.265***	***47.593***	***0.062***	***0.501***	***0.316***	***6,311.130***
TOTAL Operational Activities	***6.576***	***5.407***	***49.757***	***0.077***	***0.697***	***0.512***	***9,402.895***

Note: Total $PM_{10}/_{2.5}$ fugitive dust emissions are assuming USEPA 50% control efficiencies.

	Construction Activities	**Operational Activities**
CO_2 emissions converted to metric tons =	***960.92***	***8528.43***
State of Georgia CO_2 emissions (metric tons) =	***164,200,000***	
Percent of Georgia CO_2 emissions =	***0.0006%***	***0.005%***
United States' CO_2 emissions (metric tons) =	***5,814,400,000***	
Percent of USA's CO_2 emissions =	***0.000017%***	***0.00015%***

Source: U.S. Department of Energy, Energy Information Administration (U.S. DOE/EIA). 2011. *State CO_2 Emissions by Year 1980-2009 (Million Metric Tons of Carbon Dioxide).* Available online <http://www.eia.gov/environment/emissions/state/state_emissions.cfm>. Data released October 2011. Data accessed 09 January 2012.
Since future year budgets were not readily available, actual 2008 air emissions inventories for the counties were used as an approximation of the regional inventory.
Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan Atlanta Air Quality Control Region and Cobb County

		All Sources					
	Year	**NO_x (tpy)**	**VOC (tpy)**	**CO (tpy)**	**SO_2 (tpy)**	**PM_{10} (tpy)**	**$PM_{2.5}$ (tpy)**
Metro Atlanta AQCR	2008	161,849	150,101	890,752	178,961	165,459	34,875
Cobb County	2008	20,872	22,492	129,676	25,972	17,573	3,892

Source: USEPA - AirData National Emissions Inventory Data by State and County; Site Accessed on January 4, 2012.
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=15&inventoryYear=2008
http://neibrowser.epa.gov/eis-public-web/geo/county-emissions.html?stateJurisdictionId=51&inventoryYear=2008

Air Emissions from the Construction and Operation of the Dobbins ARB Commissary

	(tpy)	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**	**(tpy)**
Proposed Construction Emissions	6.843	1.265	5.921	0.450	20.572	2.544
Proposed Operational Emissions	6.576	5.407	49.757	0.077	0.697	0.512
% of Regional Emissions (Construction only)	**0.004%**	**0.001%**	**0.001%**	**0.0003%**	**0.01%**	**0.01%**
% of Regional Emissions (Operational only)	**0.004%**	**0.004%**	**0.006%**	**0.00004%**	**0.0004%**	**0.0015%**
% of Cobb County Emissions (Construction only)	**0.03%**	**0.01%**	**0.005%**	**0.002%**	**0.1%**	**0.1%**
% of Cobb County Emissions (Operational only)	**0.03%**	**0.024%**	**0.04%**	**0.0003%**	**0.004%**	**0.013%**

FIGURE 1. CLAY FACILITY AERIAL MAP (based on GIS data provided by CNGC)

KEY

12 Digit Hydrologic Unit 🟧

Facility Boundary 🟩

North

FIGURE 2. CLAY FACILITY DRAINAGE MAP (based on GIS data provided by CNGC)

KEY

Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple

Facility Boundary 🟩 12 Digit Hydrologic Unit 🟧

North

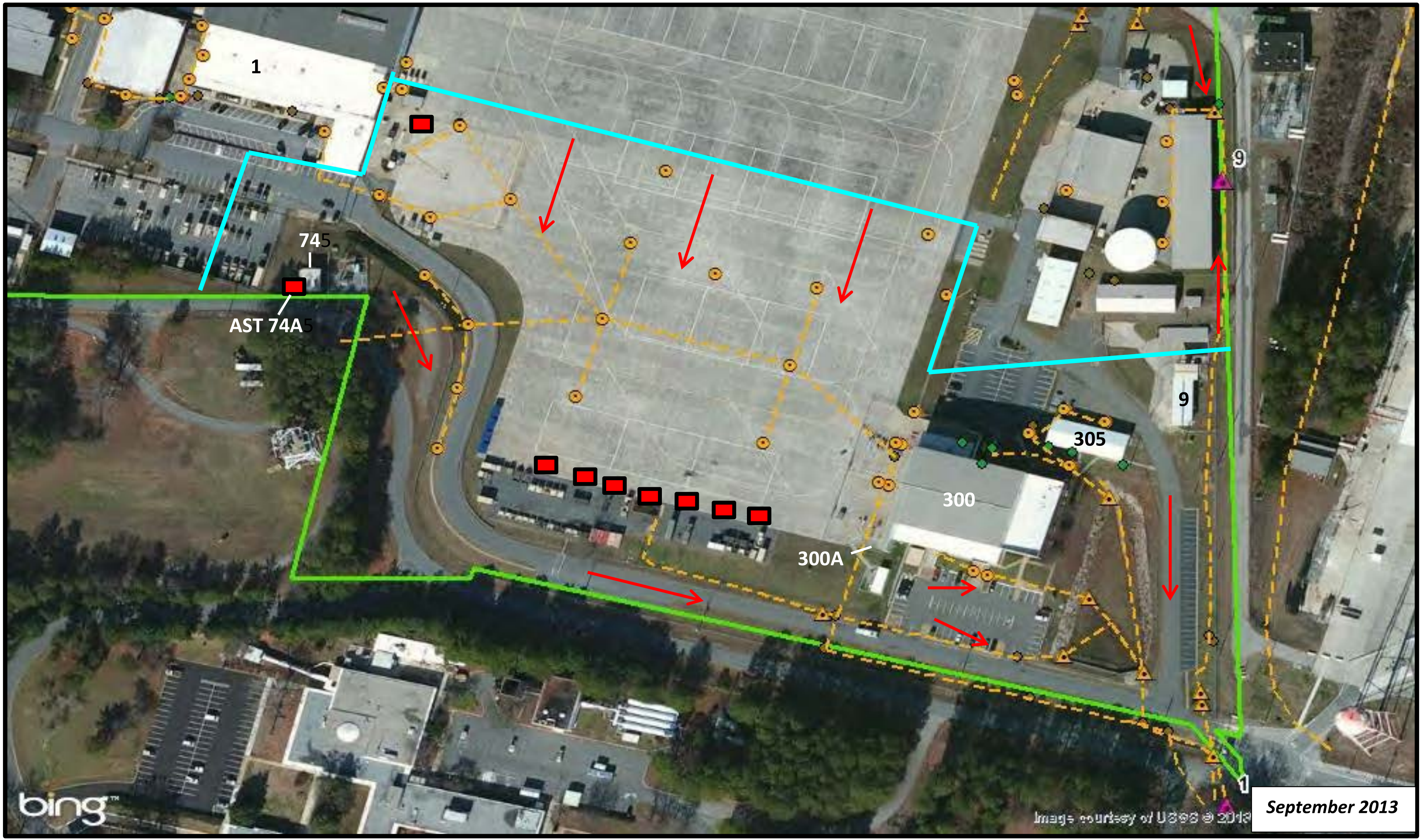


FIGURE 3. CLAY FACILITY DRAINAGE BASIN 1 MAP (based on GIS data provided by CNGC)

North

KEY

Drainage Basin ━

Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple

Facility Boundary ━

Potential Pollutant Source (see Appendix C) 🟥

Drainage Pattern →

Note: Multiple pad-mounted transformers adjacent to Building 1

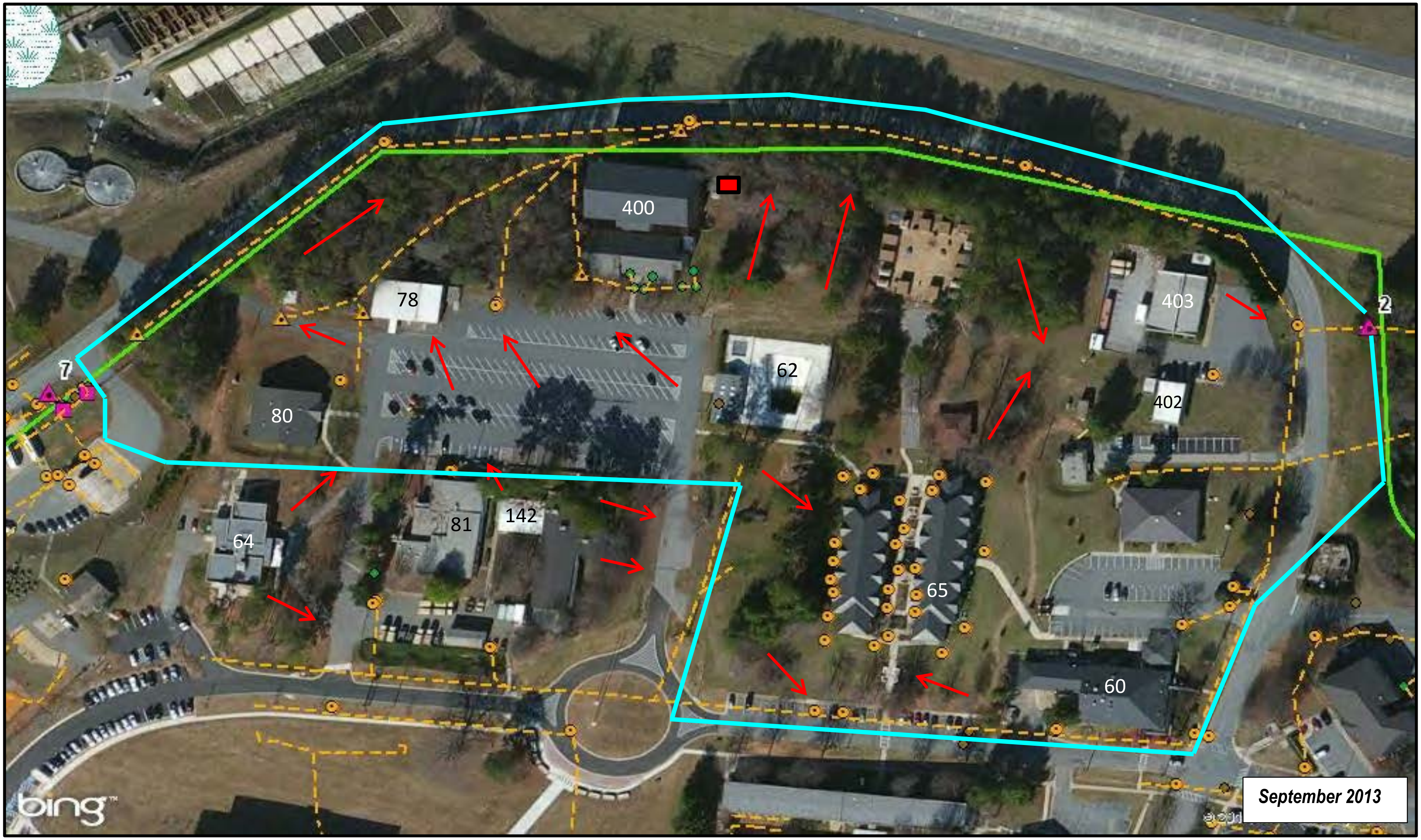


FIGURE 4. CLAY DRAINAGE BASIN 2 MAP (based on GIS data provided by CNGC)

KEY

Drainage Basin	—	Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple		
Facility Boundary	—	Potential Pollutant Source (see Appendix C) 🟥	Drainage Pattern	→

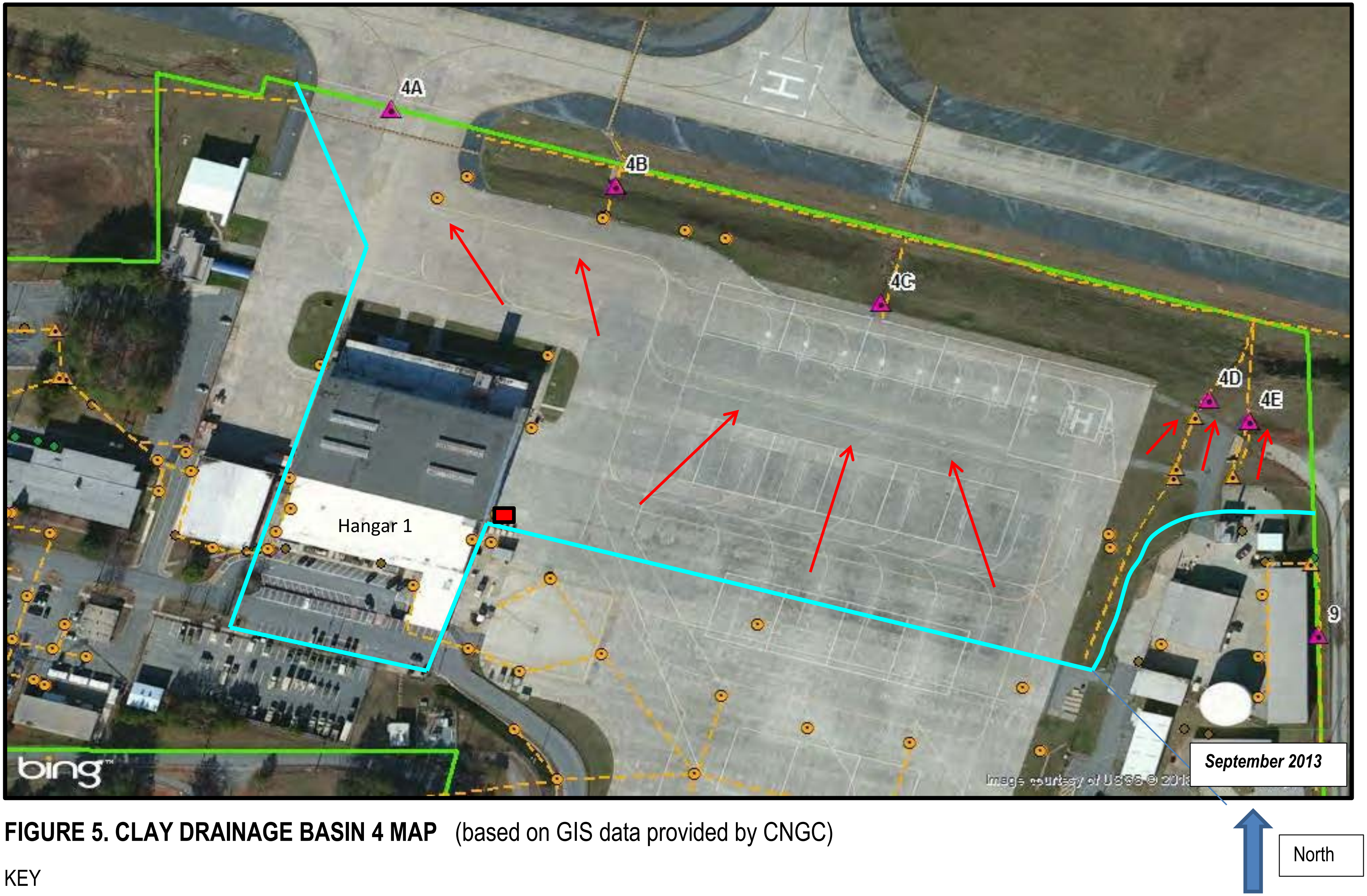
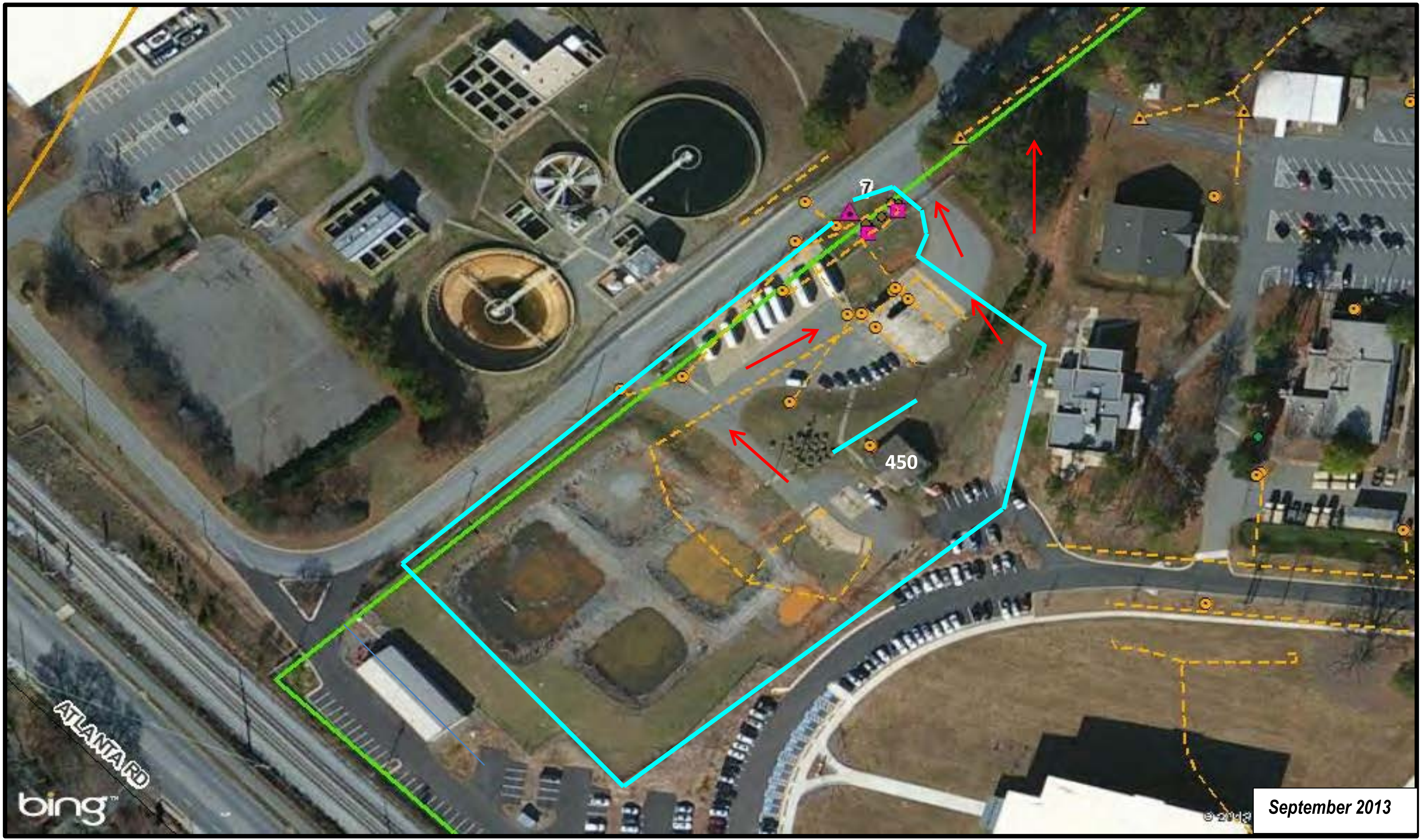


FIGURE 5. CLAY DRAINAGE BASIN 4 MAP (based on GIS data provided by CNGC)

KEY

Drainage Basin	▬	Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple	
Facility Boundary	▬	Potential Pollutant Source (see Appendix C) 🟥	Drainage Pattern →



North

FIGURE 6. CLAY DRAINAGE BASIN 7 MAP (based on GIS data provided by CNGC)

KEY

12 Digit Hydrologic Unit ━━

Drainage Basin ━━

Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple

Facility Boundary ━━

Potential Pollutant Source (see Appendix C) 🟥

Drainage Pattern →

FIGURE 7. CLAY DRAINAGE BASIN 8 MAP (based on GIS data provided by CNGC)

North

KEY

12 Digit Hydrologic Unit ━

Drainage Basin ━

Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple

Facility Boundary ━

Potential Pollutant Source (see Appendix C) 🟥

Drainage Pattern →

FIGURE 8. CLAY DRAINAGE BASIN 9 MAP (based on GIS data provided by CNGC)

KEY

Drainage Basin	🟦	Drains, Catch Basins, Curb Inlets, Pipes, Headwalls and Ditches are identified in yellow; Outfalls in purple	
Facility Boundary	🟩	Potential Pollutant Source (see Appendix C) 🟥	Drainage Pattern →

North

Final
Site Inspections Report of Fire Fighting Foam Usage at Air Force Plant 6 Cobb County, Georgia

October 2018

Submitted to:

Air Force Civil Engineer Center
3515 General McMullen Suite 155
San Antonio, Texas 78226-2018

Submitted by:

U.S. Army Corps of Engineers
Savannah District
100 W. Oglethorpe Avenue
Savannah, Georgia 31401-3640

Prepared by:

Aerostar SES LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830-8022
under
Contract No. W912HN-15-C-0022

Final
Site Inspections Report
of
Fire Fighting Foam Usage
at
Air Force Plant 6
Cobb County, Georgia

October 2018

Submitted to:
Air Force Civil Engineer Center
3515 General McMullen Suite 155
San Antonio, Texas 78226-2018

Submitted by:
U.S. Army Corps of Engineers
Savannah District
100 West Oglethorpe Avenue
Savannah, Georgia 31401-3640

Prepared by:
Aerostar SES LLC
1006 Floyd Culler Court
Oak Ridge, Tennessee 37830
under
Contract No. W912HN-15-C-0022

Table of Contents

List of Tables

Appendix A – Area-Specific Figures

Acronyms and Abbreviations

µg/kg	micrograms per kilogram
µg/L	micrograms per liter
AFP	Air Force Plant
AFFF	aqueous film forming foam
amsl	above mean sea level
ASL	Aerostar SES LLC
bgs	below ground surface
btoc	below top of casing
CAS	Chemical Abstracts Service
CCMWA	Cobb County-Marietta Water Authority
CSM	conceptual site model
DARB	Dobbins Air Reserve Base
DPT	direct push technology
EC	emerging contaminants
EPA	U.S. Environmental Protection Agency
ERP	Environmental Restoration Program
FTA	Fire Training Area
ft/min	feet per minute
HA	health advisory
ID	identification
IDW	investigation-derived waste
IWTP	industrial wastewater treatment plant
J	estimated value
mg/kg	milligrams per kilogram
NA	not applicable
ND	not detected at the method detection limit
NL	not listed
NPDES	National Pollutant Discharge Elimination System
PA	Preliminary Assessment
PFAS	per- and polyfluorinated alkyl substance
PFBS	perfluorobutane sulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
pH	potential of hydrogen
QAPP	quality assurance project plan
RSL	Regional Screening Level
SI	Site Inspection
SWMU	Solid Waste Management Unit
TOC	total organic carbon
U	analyte not detected
UCMR3	EPA Third Unregulated Contaminant Monitoring Rule
USCS	Unified Soil Classification System
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
WWTP	wastewater treatment plant

1.0 INTRODUCTION

Aerostar SES LLC (ASL) under contract to the U.S. Army Corps of Engineers (USACE) Savannah District (Contract No. W912HN-15-C-0022) conducted screening-level site inspections (SIs) at thirteen areas at Air Force Plant (AFP) 6 in Cobb County, Georgia (Figure 1, Appendix A). The purpose of the SI is to determine the presence or absence of perfluorobutane sulfonate (PFBS), perfluorooctanoic acid (PFOA), and perfluorooctane sulfonate (PFOS) in the environment at these areas. The SI was conducted in accordance with contract requirements (USACE, July 2015), the quality assurance project plan (QAPP) (ASL, January 2016), and the AFP6 site-specific addendum to the QAPP (ASL, November 2017). The QAPP and QAPP addendum were prepared in accordance with U.S. Environmental Protection Agency (EPA) guidance (EPA, March 2012) and Air Force Civil Engineer Center requirements.

PFBS, PFOA, and PFOS are in a class of synthetic fluorinated chemicals used in industrial and consumer products, including defense-related applications. This class of compounds is also referred to as per- and polyfluorinated alkyl substances (PFAS). In 1970, the U.S. Air Force (USAF) began using aqueous film forming foam (AFFF) firefighting agents containing PFOA and PFOS to extinguish petroleum fires. Releases of AFFF to the environment routinely occur during fire training, equipment maintenance, storage, and use. Although manufacturers have reformulated AFFF to eliminate PFOS, the USAF maintains a significant inventory of PFOS-based AFFF. As of this report, the USAF is actively removing PFOS-based AFFF from its inventory and replacing it with formulations based on shorter carbon chains, which may be less persistent and bioaccumulative in the environment.

The objectives of the SIs were to

- determine if a confirmed release of PFBS, PFOS, or PFOA has occurred at the area selected for inspection,
- determine if PFOS and PFOA are present in groundwater or surface water at the inspection area at concentrations exceeding the EPA lifetime health advisory (HA) for drinking water,
- determine if PFOA and PFOS are present in soil or sediment at the inspection area at concentrations exceeding calculated Regional Screening Levels (RSLs), and
- identify potential receptor pathways with immediate impacts to human health (immediate impact to human health is considered consumption of drinking water with PFOS/PFOA above the HA or PFBS above the RSL).

This report does not include assessment of ecological exposure pathways, receptors, or risk from PFAS impacts to the environment. Confirmed releases may require further investigation to fully delineate the extent of contamination and perform a complete risk assessment that includes ecological receptors.

The QAPP included calculations, using the EPA RSL calculator, for PFOS and PFOA screening levels in resident soil and sediment, using a target hazard quotient of 1.0. As presented herein, screening levels for PFOA and PFOS have been revised based on RSL calculations, using a target hazard quotient of 0.1. Appendix B presents the RSL calculations for soil and sediment based on a Tier 3 toxicity value reference dose of 0.00002 mg/kg per day derived by EPA in their drinking water HAs for both PFOS and PFOA (EPA, May 2016a and 2016b). Screening levels for PFOS and PFOA in groundwater and surface water are based on EPA lifetime drinking water HAs for PFOS (EPA, May 2016a) and PFOA (EPA, May 2016b). A release will be considered confirmed when exceedances of the following concentrations are identified:

PFOS:

- 0.07 micrograms per liter (µg/L) in groundwater/surface water (combined with PFOA value).
- 126 micrograms per kilogram (µg/kg) in soil/sediment (calculated RSL).

PFOA:

- 0.07 µg/L in groundwater/surface water (combined with PFOS value).
- 126 µg/kg in soil/sediment (calculated RSL).

Although PFOS and PFOA are the focus of the HA and provide specific targets for the USAF to address in this SI, EPA has also derived RSLs for PFBS, for which there is a Tier 2 toxicity value (Provisional Peer Reviewed Toxicity Value) for resident soil (EPA, July 2014). The USAF also considers a release to be confirmed when exceedances of the following concentrations are identified:

PFBS:

- 40 µg/L in groundwater/surface water.
- 130,000 µg/kg in soil/sediment.

Although PFAS refers to a group of synthetic compounds, only PFBS, PFOA, and PFOS have published screening levels. To better facilitate reporting and discussion of the investigation, sampling, and analysis of PFOA, PFOS, and PFBS in this report, these three compounds are hereafter referred to collectively as PFAS.

Table 1 presents the screening values used for comparing the analytical results for each of the PFAS compounds.

Table 1 Regulatory Screening Values

Parameter	Chemical Abstracts Number	Residential Soil [a] (µg/kg)	Tap Water [a] (µg/L)	Soil and Sediment [b] (µg/kg)	Surface Water and Groundwater [c] (µg/L)
Perfluorobutane sulfonate (PFBS)	375-73-5	130,000	40	NL	NL
Perfluorooctanoic acid (PFOA)	335-67-1	NL	NL	126	0.07[d]
Perfluorooctane sulfonate (PFOS)	1763-23-1	NL	NL	126	

[a] EPA Regional Screening Levels (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA RSL calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

[c] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*; EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*.

[d] When both PFOA and PFOS were present, the combined concentrations of PFOA and PFOS were compared with the 0.07 µg/L health advisory level.

µg/kg = micrograms per kilogram

EPA = Environmental Protection Agency

µg/L = micrograms per liter

NL = not listed

AFFF areas were selected for further inspection through the SI process at AFP6 during the preliminary assessment (PA) phase and documented in the PA report (ASL, February 2017). The PA recommended thirteen areas for an SI. The rationale for completing an SI for the thirteen AFFF areas are listed in Table

2, and the AFFF areas are shown on Figure 2 (Appendix A). Media evaluated included surface soil (0 to 6 inches in depth), subsurface soil (collected in the vadose zone immediately above the water saturated-unsaturated soil interface), groundwater, and surface water and sediment (as applicable).

Table 2 AFFF Areas and Selection Rationale for Site Inspection at Air Force Plant 6

AFFF Area	AFFF Inspection Area	Associated Existing ERP Site	Area Selection Rationale
1	Structural Fire Training Area (B-64)	TU-016	• The FTA was constructed between March 2003 and April 2004 and uses liquid propane gas as a fuel source. • Training exercises use 2–3 gallons of AFFF.
2	AFFF Spray Test Area	N/A	• The area is used for annual testing of AFFF equipment/vehicles. • Typically, the AFFF equipment tanks are emptied during testing. • Approximately 2,200 gallons of AFFF have been released during each test.
3	Corporate Hangar (T-728)	N/A	• The hangar is used to store 55-gallon drums of AFFF. • The facility has a confirmed release of AFFF.
4	Fire Station #1 (B-4)	ID-031	• The facility is an active fire station that houses AFFF equipment/vehicles. • Leaking equipment has resulted in a confirmed AFFF release inside the fire hall.
5	Fire Station #2 (B-69)	N/A	• The facility is an active fire station that houses AFFF equipment/vehicles. • Leaking equipment has resulted in a confirmed AFFF release inside the fire hall.
6	C-5 Engine Fire	N/A	• AFFF was used to extinguish an engine fire that occurred on a concrete apron, releasing an unknown volume of AFFF.
7	C-5 Fuel System Test Facility (B-96)	SS-723	• The facility has an AFFF fire suppression system and has a confirmed AFFF release. • AFFF leaked out the back of the facility.
8	Fire Prevention Headquarters (B-102)	CG-705	• The facility was originally a manufacturing facility and includes an AFFF fire suppression system. • A ruptured pipe released an unknown volume of AFFF.
9	Industrial Wastewater Treatment Plant (IWTP)	WP-006	• The IWTP is a collection point for manufacturing wastewater treatment and has a confirmed AFFF release at the former IWTP aeration pond. • IWTP effluent discharges to the WWTP.
10	Sanitary Wastewater Treatment Plant (WWTP)	N/A	• The WWTP is a collection point for all sanitary sewage systems and ITWP effluent. • The WWTP effluent discharges into Nickajack Creek in an off-base residential area.
11	Outfall 1	AOC-9	• Outfall 1 is the surface water collection and Nation Pollutant Discharge Elimination System (NPDES) discharge point for Drainage Basin 1. • Known AFFF releases have occurred within drainage basin. • The volume of AFFF released is unknown.
12	Outfall 2	SD-005	• The area is the surface water collection and NPDES discharge point for Drainage Basin 2. • Known AFFF releases have occurred within the drainage basin. • The volume of AFFF released is unknown.
13	Outfall 5	N/A	• The area is the surface water collection and NPDES discharge point for Drainage Basin 5. • Known AFFF releases have occurred within the drainage basin. • The volume of AFFF released is unknown.

AFFF = aqueous film forming foam
ERP = Environmental Restoration Program
IWTP = Industrial Wastewater Treatment Plant
NPDES = National Pollutant Discharge Elimination System
FTA = Fire Training Area
N/A = not applicable
WWTP = Sanitary Wastewater Treatment Plant

2.0 AFFF AREA DESCRIPTIONS

AFP6 is on approximately 720 acres in Cobb County, Georgia, adjacent to the cities of Marietta and Smyrna, approximately 15 miles northwest of Atlanta. AFP6 is part of a 3336-acre military complex that includes Dobbins Air Reserve Base (DARB), the Atlanta Naval Air Station, the United States Army Reserve, and the Georgia Air National Guard. AFP6 is primarily comprised of two areas referred to as the North and South Campuses. Generally, the North Campus is an industrial area north of the west end of the airfield, and the South Campus is an industrial area that lies south of the central part of the airfield.

AFP6 was constructed in 1942 and supported the production of B-29 aircraft until 1946, when plant operations were suspended. In 1951, the Air Force reopened AFP6 to modify B-29 aircraft for the Korean War. Since 1951, plant operations have included production and modification of the B-47, C-130, JetStar, C-141, and C-3 aircraft.

Land use within AFP6 is primarily industrial and supports the manufacturing of military aircraft. Land use surrounding AFP6 includes residential, recreational, commercial, and industrial areas of DARB. Most of the area between the North Campus and South Campus is occupied by airfield facilities and runways of DARB. Private residential areas and commercial developments border AFP6 to the north (Marietta, Georgia), and to the south (Smyrna, Georgia).

2.1 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

The Structural Fire Training Area (B-64) is in the eastern part of the North Campus (Figure 3 of Appendix A). The surrounding areas to the north, south, and east are flat and grass covered. A forested area is west of the site. The training area includes a steel storage container on a gravel-covered pad (approximately 60 feet by 60 feet) and uses propane as a fuel source. Based on historical aerial imagery, the site was constructed between February 2003 and March 2004, and the gravel area was originally much smaller, extending approximately 10 feet beyond the storage container. The training facility does not have a containment system.

Although records did not indicate AFFF was used at the Structural Fire Training Area, fire prevention personnel indicated training exercises used approximately 2 to 3 gallons of AFFF to extinguish fires. Fire prevention personnel estimate the facility has been used approximately five times, for a maximum estimated total of 15 gallons of AFFF released.

2.2 AFFF SPRAY TEST AREA (AFFF AREA 2)

The AFFF Spray Test Area is in the southern area of the South Campus. The area is a 2-acre, grass-covered field near the south end of Taxiway G (Figure 4, Appendix A). Firefighting trucks were tested annually by energizing the AFFF tanks and spraying AFFF onto the ground. According to fire protection personnel, the spray testing continues until each AFFF tank is empty, releasing approximately 2,200 gallons of AFFF annually.

2.3 CORPORATE HANGAR (T-728) (AFFF AREA 3)

The corporate hangar is a single-plane hangar on a concrete apron in the southeastern part of the North Campus (Figure 5, Appendix A). The hangar does not have floor drains, trench drains, or a fire suppression system. Historically, the building has been used to store drums of AFFF concentrate and an AFFF foam trailer. At the time of the SI site visit, fifteen 55-gallon plastic drums of AFFF were stored inside the hangar, without secondary containment. Most AFFF drums were on wooden shipping pallets, while others were sitting directly on the concrete floor. Fire prevention personnel confirm that AFFF has been released inside the hangar and subsequently washed into the grass area south of the hangar. The quantity of AFFF released into the environment is unknown.

2.4 FIRE STATION #1 (B-4) (AFFF AREA 4)

Fire Station #1 is an active fire station on the north end of building B-4 (Figure 6, Appendix A). The surrounding area is covered with asphalt pavement. Fire-prevention personnel report that routine maintenance of truck and trailer-mounted AFFF equipment is performed at Fire Station #1. Occasional equipment leaks have resulted in AFFF releases inside the fire station. On some occasions, AFFF was washed from inside the fire station onto the surrounding pavement, which drains into nearby stormwater inlets. The quantity of AFFF released into the environment at Fire Station #1 is unknown.

2.5 FIRE STATION #2 (B-69) (AFFF AREA 5)

Fire Station #2 is an active fire station on the west side of Hangar B-24, on the South Campus (Figure 7, Appendix A). Hangar B-24 is surrounded by pavement. Fire prevention personnel report that routine maintenance of truck- and trailer-mounted AFFF equipment is performed at Fire Station #2. Occasional equipment leaks have resulted in AFFF releases inside the fire station. On some occasions, AFFF was washed from inside the fire station onto the surrounding pavement, which drain into nearby stormwater inlets. The quantity of AFFF released into the environment at Fire Station #2 is unknown.

2.6 C-5 ENGINE FIRE (AFFF AREA 6)

The C-5 Engine Fire area is near the intersection of Taxiway E and Taxiway G, on the South Campus (Figure 8, Appendix A). During routine maintenance, the engine of a C-5 caught fire while parked on the concrete apron. A large portion of the area is covered in pavement, surrounded by relatively flat ground covered with grass. Fire-prevention personnel extinguished the fire with AFFF, releasing an unknown volume of AFFF into the environment.

2.7 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

The C-5 Fuel System Test Facility is in the northeast area of the North Campus, east of Gibbs Street and near South Cobb Drive (Figure 9, Appendix A). The building is primarily surrounded by pavement and gravel covered areas, but land northeast of the building slopes down dramatically and is covered by dense vegetation. The sloped area contains a small detention basin that collects surface drainage from the building and drains into the Outfall 1 detention basin (AFFF Area 11). The facility is used to test wing-based fuel systems and includes an AFFF fire prevention system that has discharged on at least one occasion. The AFFF foam migrated through an opening beneath the northeast exterior wall, across a drainage ditch, and down the paved embankment. An unknown volume of AFFF was released into the environment.

2.8 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

The Fire Prevention Headquarters is near the intersection of Industrial Drive and Taxiway M, on the North Campus (Figure 5, Appendix A). The building is surrounded by a combination of pavement and vegetated areas. The building was originally constructed as a manufacturing facility and includes an

AFFF system. Fire-prevention staff confirmed an AFFF release occurred when an AFFF pipe froze and ruptured. Some of the AFFF migrated into the grass areas southeast of the building and some was washed across Taxiway M into the grass covered area.

2.9 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

The Industrial Wastewater Treatment Plant (IWTP) is south of Building B-102, west of Taxiway M, on the North Campus (Figure 5, Appendix A). The IWTP is a multi-phase treatment system that treats manufacturing wastewater generated from operations within the North Campus. The IWTP is surrounded by pavement that is bordered by vegetated areas. IWTP effluent discharges into the sanitary sewer system that drains to the WWTP (AFFF Area 10). AFFF releases have occurred within some of the buildings that drain to the IWTP. As originally constructed, the plant included an aeration pond. On at least one occasion, the aeration pond was inundated with AFFF foam, causing foam to settle along the pond perimeter. The former aeration pond was excavated, filled, and capped in 1989.

2.10 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

The WWTP is adjacent to Taxiways L and E on the west end of the South Campus (Figure 10, Appendix A). The surrounding areas are a combination of pavement and well vegetated areas. The WWTP treats sanitary sewage for all of DARB and AFP6, including effluent from the IWTP. AFFF releases have occurred inside some of the buildings that drain to the IWTP, so it is possible that AFFF reached the Sanitary WWTP through the IWTP. Likewise, several buildings that had AFFF releases have floor drains that are connected to the sanitary WWTP.

2.11 OUTFALL 1 (AFFF AREA 11)

Outfall 1 is along the USAF property boundary of the North Campus, adjacent to South Cobb Drive (Figure 9, Appendix A). The outfall is the NPDES-permitted stormwater outfall for Drainage Area 1. Surface water is impounded in an unlined pond above the outfall structure, which discharges into an unnamed tributary of Rottenwood Creek. The surrounding areas are well vegetated. No known AFFF releases have occurred at the outfall location. However, AFFF releases within Drainage Area 1 may have resulted in an AFFF release from the outfall.

2.12 OUTFALL 2 (AFFF AREA 12)

Outfall 2 is along the Air Force property boundary of the North Campus, adjacent to South Cobb Drive (Figure 9, Appendix A). The area is the NPDES-permitted stormwater outfall for Drainage Area 2. Surface water is impounded in a lined pond above the outfall structure, which discharges into an unnamed tributary of Rottenwood Creek. The surrounding areas are well vegetated. No known AFFF releases have occurred at the outfall location. However, AFFF releases within Drainage Area 2 may have resulted in an AFFF release from the outfall.

2.13 OUTFALL 5 (AFFF AREA 13)

Outfall 5 is on Poor House Creek, near the intersection of 1st Street and Atkins Road Southeast, within the South Campus (Figure 11, Appendix A). The area is the NPDES-permitted stormwater outfall for Drainage Area 5. The surrounding areas are well vegetated. No known AFFF releases have occurred at the outfall location. However, AFFF releases within Drainage Area 5 may have resulted in an AFFF release from the outfall.

3.0 FIELD ACTIVITIES

A readiness review was conducted for all field personnel prior to mobilizing to the site. The completed readiness review forms for field personnel are presented in Appendix C. The readiness review covered anticipated hazards, types and proper use of equipment needed for the field activities, sampling procedures, PFAS cross-contamination avoidance procedures, and installation-specific schedule and work area restrictions. Detailed PFAS cross-contamination avoidance procedures are presented in Section 3.2.

3.1 FIELD ACTIVITIES AND SAMPLING PROCEDURES

ASL personnel mobilized to AFP6 on Monday, November 13, 2017, to perform SI sampling activities for the thirteen AFFF Areas. Field activities for the SI included collecting groundwater samples from existing monitoring wells and temporary direct push technology (DPT) wells, collecting surface and subsurface soil samples from DPT soil borings, and collecting surface water and sediment samples. In accordance with the QAPP (ASL, January 2016), ASL used a targeted sampling design to collect samples in locations most likely to have detectable concentrations of the target compounds as a result of an AFFF release. Field forms generated during the sampling activities are in Appendix C. All field activities were completed by Tuesday, November 21, 2017 except for AFFF Area 6. Due to airfield security requirements, field sampling at AFFF Area 6 was completed between December 4, 2017 and December 13, 2017.

Samples were submitted via overnight courier to Maxxam Analytics International Corporation of Mississauga, Ontario, Canada, under chain of custody procedures. The samples were analyzed for eighteen PFAS compounds, using modified EPA Method 537. The following three, of the eighteen compounds, are the only compounds that have health-based screening levels.

Analyte	***CAS Number**
• Perfluorobutane sulfonate (PFBS)	29420-43-3
• Perfluorooctanoic acid (PFOA)	335-67-1
• Perfluorooctane sulfonate (PFOS)	1763-23-1

*CAS = Chemical Abstracts Service

Field duplicate samples were collected at a frequency of one for every 10 samples for each sample media. Matrix spike/ matrix spike duplicate samples were collected at a frequency of one per every 20 samples for each media. Third-party Stage 2B validation was completed on 100% of the analytical data and Stage 4 validation was completed on 10% of the results. Data validation qualifiers were applied as needed to the data. All the results were evaluated as usable and no determinations for the AFFF Areas were changed as a result of quality control qualified data. The data validation report and laboratory data sheets are presented in Appendix D.

Field activities were conducted in accordance with the QAPP (ASL, January 2016) and the AFP6 site-specific addendum to the QAPP (ASL, November 2017). Soil borings were advanced with a track-mounted DPT system. Borings logs are presented in Appendix C. Surface soil samples were collected to 6 inches below ground surface (bgs) using a combination of stainless steel hand augers and stainless steel spoons. Subsurface soil samples were collected immediately above the water saturated/ unsaturated soil interface using a DPT macro-core sampler with acetate liners. Groundwater samples were collected from existing monitoring wells and newly installed temporary monitoring wells using a peristaltic pumps and disposable polyvinyl tubing. Groundwater samples collected from newly installed temporary wells used either a ¾-inch diameter prepacked screen or hydropunch samplers installed in the DPT borings. Sediment samples were collected using a combination of dip samplers and stainless steel spoons. Surface water samples were collected directly from surface water bodies into the sample containers. For each site where new soil borings were completed, a representative composite soil sample was collected for each PFAS soil sample depth. The composite soil samples were submitted to CT Laboratories of Baraboo, Wisconsin, for physiochemical analyses. The physiochemical analyses include soil potential of hydrogen (pH) (EPA Method 9045D), particle size analysis (American Society for Testing and Materials [ASTM] D422), and total organic carbon content in soil (EPA Lloyd Kahn Method). The physiochemical laboratory data sheets and a data summary table are presented in Appendix E. In accordance with the QAPP (ASL, January 2016), all temporary wells were abandoned by removing the temporary riser and pre-packed screen, then filling the bore hole with bentonite chips.

Wellston Associates Land Surveyors (Warner Robbins, Georgia) recorded the coordinates and surface elevations of the soil borings and temporary wells, providing an accuracy of within one-hundredth of a foot (horizontal and vertical). Northing and easting coordinates were recorded in U.S. survey feet using the Georgia State Plane West coordinate system. Elevations were recorded referenced to the North American Vertical Datum 1988. Surface water and sediment sample locations were recorded by ASL, using a Trimble® Geo 7X handheld global positioning system (GPS) unit. Post-processed horizontal data collected with the Trimble® Geo 7X is accurate to sub-meter intervals.

Synoptic groundwater elevation measurements, from existing and temporary groundwater monitoring wells, across the thirteen AFFF Areas, except AFFF Area 6, were recorded on November 21, 2017. Due to airfield access restrictions, water levels at AFFF Area 6 were recorded on December 13, 2017.

Sample locations, area-specific soil descriptions, groundwater flow direction, analytical results, and conclusions are presented in Sections 3.3 through 3.15.

3.2 PFAS CROSS-CONTAMINATION AVOIDANCE PROCEDURES

Field personnel complied with PFAS cross-contamination avoidance procedures and considerations, which are included in ASL Standard Operating Procedure 028 "Field Sampling Protocols to Avoid Cross-Contamination at Perfluorinated Compounds (PFCs) Sites:"

3.2.1 Field Equipment

- Teflon®-containing materials (Teflon® tubing, bailers, tape, plumbing paste, or other Teflon® materials) were not used because Teflon® contains fluorinated compounds.
- High-density polyethylene (HDPE) and silicon materials are acceptable.
- Peristaltic pumps were used to sample groundwater at depths of 25 feet or shallower. Monsoon pumps were used to sample groundwater at depths greater than 25 feet, as applicable. These pumps are stainless steel and minimize cross-contamination of PFAS. Pumps with Teflon® impellers, such as Grundfos RediFlo pumps, were not used. Field notes were recorded in a bound logbook that did not have waterproof paper. All personnel changed gloves between recording and sampling activities to prevent cross-contamination.
- Post-It Notes® were not allowed on site.
- Only Sharpie® brand markers were used. Pens were used to document field activities in the logbooks and on field forms, to label sample containers, and to prepare the chains of custody.

- Chemical (blue) ice packs were not used to store samples, food, or drinks.

3.2.2 Field Clothing and Personal Protective Equipment

- The sampling personnel wore field clothing made of synthetic and natural fibers (preferably cotton). The clothing had to have been laundered at least six times without using a fabric softener since it was purchased. New clothing was not allowed because it could contain PFAS-related treatments.
- Only rain gear made from polyurethane and wax-coated materials was allowed.
- Clothing or boots containing Gore-Tex™ was not allowed because it consists of a PFAS membrane.
- Tyvek® clothing was not allowed on site because it contains fluorinated compounds.
- Disposable nitrile gloves were worn at all times when field activities were being conducted, and a new pair was donned prior to the following activities at each sample location:
  - Decontamination of reusable sampling equipment;
  - Contact with sample bottles or water containers;
  - Insertion of anything into the well (HDPE tubing, HydraSleeve® bailer, etc.);
  - Insertion of silicon tubing into the peristaltic pump;
  - Completion of monitor well purging;
  - Sample collection; and
  - Handling of any quality assurance/QC samples, including field blanks and equipment blanks.
- A new pair of nitrile gloves was worn after handling any non-dedicated sampling equipment, after contact with surfaces that had not been decontaminated, or when field personnel thought it was necessary.

3.2.3 Sample Containers

- All samples were collected in polypropylene or HDPE bottles with screw caps made of the same materials. The liners of lined screw caps were not made of Teflon® and did not contain PFAS.
- Glass sample containers were not used.
- Container labels were completed using a Sharpie® pen after the caps had been placed on each bottle.

3.2.4 Wet Weather

- Field personnel who were sampling during wet weather (such as rainfall or snowfall) wore appropriate clothing that did not pose a risk of cross-contamination. Sampling personnel avoided synthetic gear treated with water-repellant finishes containing PFAS. Only rain gear made from polyurethane and wax-coated materials was allowed.
- Field personnel wore gloves when erecting or moving a gazebo tent overtop used for protection from rain at sampling locations because the canopy material may have been treated with a PFAS-based coating. Gloves were changed immediately after handling the tent, and any further contact with the tent was avoided until all sampling activities were finished and the team was ready to move on to the next sample location.

3.2.5 Equipment Decontamination

Field sampling equipment, including oil-water interface meters and water level indicators, were decontaminated using Alconox® or Liquinox® soap. Decon 90® was not used during decontamination activities. Laboratory-certified PFAS-free water was used for the final decontamination rinse of sampling equipment. Larger equipment, such as drill rigs, was decontaminated using potable water and a high-pressure washer and then rinsed with potable water.

3.2.6 Personnel Hygiene

- Field personnel did not use cosmetics, moisturizers, hand cream, or other related products as part of their personal hygiene routine before a sampling event because these products may contain surfactants and be a potential source of PFAS.
- Because many manufactured sunblock and insect repellants contain PFAS, only sunblock and insect repellants that contain 100% natural ingredients were allowed.
- For restroom breaks, field personnel left the exclusion zone (EZ) before removing PPE. Before returning to the EZ, field personnel washed as normal, allowing extra time to rinse with water after using soap. Field personnel used a mechanical dryer to avoid using paper towels if possible.

3.2.7 Food Considerations

Field personnel did not eat or drink inside the EZ.

3.2.8 Visitors

Site visitors remained outside the EZ during all sampling activities.

3.3 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

Media potentially impacted by an AFFF release at AFFF Area 1 include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.3.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), three DPT borings were completed at AFFF Area 1. Surface soil and subsurface soil samples were collected from DPT borings AFP0601-001, AFP0601-002, and AFP0601-003. All three soil borings hit refusal before encountering groundwater, so groundwater samples were not collected. DPT boring AFP0601-001 was completed near the northwest corner of the gravel pad. DPT boring AFP0601-002 was completed southeast of the storage container. DPT boring AFP0601-00003 was completed in the gravel pad, south of the storage container.

Paired surface water and sediment samples were to be collected from the north end of two ditches that drain the training area. However, at the time of the field sampling, surface water was not present at either of the two sample locations (AFP0601-004 and AFP0601-005). In accordance with the QAPP (ASL, November 2017), the sediment samples were collected as surface soil samples. Sample location AFP0601-004 was at the north end of the western ditch. Sample location AFP0601-005 was at the north end of the eastern ditch. Figure 3 of Appendix A shows the AFFF Area 1 sample locations.

3.3.2 Soil Description

Three DPT soil borings were completed to depths ranging from 20 feet to 26 feet bgs. The primary soil types and classifications include silty sand (SM) and lean clay (CL). Detailed boring logs are presented in Appendix C.

3.3.3 Groundwater Flow

All three DPT borings encountered refusal before groundwater, so the depth to water level measurements were not collected at this area. In the absence of depth to water level measurements, the hydraulic gradient direction was not calculated. Based on the PA, the presumed groundwater flow direction at AFFF Area 1 is southeast.

3.3.4 Analytical Results

Six surface soil samples (five primary and one field duplicate) and three subsurface soil samples from AFFF Area 1 were submitted to the project laboratory for analyses.

Surface Soil
PFBS was not detected in the surface soil samples. PFOA and PFOS were detected in one or more of the surface soil samples, but did not exceed the screening levels for soil. Table 3 presents the analytical results of the surface soil samples. Figure 12 (Appendix A) shows the analytical results for the surface soil samples from AFFF Area 1.

Subsurface Soil
None of the target analytes were detected in any of the subsurface soil samples. Table 4 presents the analytical results of the subsurface soil samples. Figure 12 (Appendix A) shows the analytical results for the subsurface soil samples from AFFF Area 1.

Table 3 Structural Fire Training Area (B-64) (AFFF Area 1) Surface Soil Analytical Results

Analyte	Sample ID	AFP0601-001-SS-001	AFP0601-002-SS-001	AFP0601-003-SS-001	AFP0601-004-SS-001	AFP0601-004-SS-901 (duplicate)	AFP0601-005-SS-001
	Depth (ft)	0–0.5	0–0.5	0–0.5	0–0.5	0–0.5	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.65 U	0.60 U	0.60 U	0.60 U	0.55 U	0.65 U
Perfluorooctanoic acid (PFOA)	126[b]	**3.3**	**1.0 J**	0.96 U	0.96 U	**0.57 J**	**0.86 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**5.8**	**5.4**	0.96 U	**1.4**	**1.9**	**9.3**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 4 Structural Fire Training Area (B-64) (AFFF Area 1) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0601-001-SO-019	AFP0601-002-SO-025	AFP0601-003-SO-019
	Depth (ft)	19–20	25–26	19–20
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.55 U	0.60 U	0.50 U
Perfluorooctanoic acid (PFOA)	126[b]	0.88 U	0.96 U	0.80 U
Perfluorooctane sulfonate (PFOS)	126[b]	0.88 U	0.96 U	0.80 U

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

A composite surface soil sample and composite subsurface soil sample from AFFF Area 2 were submitted for physiochemical analyses. The composite surface soil sample (AFP0601-006-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0601-006-SO-021) was composed of aliquots of the subsurface soil from just above bedrock refusal. The physiochemical sample results are presented in Appendix E.

3.3.5 Conclusions

Fire training exercises conducted at Structural Fire Training Area starting in early 2003 used AFFF to extinguish training fires fueled by propane. As a result, AFFF was discharged into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. Since the DPT borings encountered refusal without encountering groundwater, the hydraulic characteristics of shallow groundwater in this area are unknown. The analyses of the surface soil and subsurface soil samples indicate that the target compounds do not remain in the soil at concentrations above the screening levels. Based on the soil analytical results, a release of AFFF has occurred. Because groundwater was not encountered during the SI, additional groundwater investigation is warranted.

3.4 AFFF SPRAY TEST AREA (AFFF AREA 2)

Media potentially impacted by an AFFF release at AFFF Area 2 include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.4.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), three DPT borings were completed at AFFF Area 2. Surface soil, subsurface soil, and groundwater samples were collected from the DPT borings. Boring AFP0602-001 was completed southeast of the stormwater drop inlet where AFFF would have drained. Boring AFP0602-002 was completed in the south end of the spray test area, the furthest point where AFFF was sprayed. Boring AFP0602-003 was completed along the east edge of Taxiway G where AFFF may have drained to a stormwater inlet.

Paired surface water and sediment samples were to be collected from a stormwater inlet within the Spray Test Area. However, at the time of the field sampling, surface water was not present at the sample location AFP0602-004. In accordance with the QAPP, the sediment sample was collected as a surface soil sample. Paired surface water and sediment samples were collected from the stormwater discharge pipe south of the area. Figure 4 of Appendix A shows the AFFF Area 2 sample locations.

3.4.2 Soil Description

Three DPT soil borings were completed at depths ranging from 20 to 35 feet bgs. The primary soil types and classifications include clayey gravel (GC), silty sand (SM), and lean clay (CL). Detailed boring logs are presented in Appendix C.

3.4.3 Groundwater Flow

Depth to groundwater measurements were recorded in temporary wells installed in borings AFP0602-001, AFP0602-002, and AFP0602-003. Static groundwater elevations were calculated based on North American Vertical Datum of 1988 (NAVD88). Groundwater elevations ranged from 998.99 feet (23.18 feet btoc at AFP0602-002) to 1009.87 feet (13.56 feet btoc at AFP0602-003). The groundwater elevation measurements are presented in Appendix F. Figure 4 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 2 was to the south-southwest.

3.4.4 Analytical Results

Four surface soil samples, three subsurface soil samples, three groundwater samples, one surface water sample, and one sediment sample from AFFF Area 2 were submitted to the project laboratory for analyses.

Surface Soil
PFBS was not detected in the surface soil samples. PFOA and PFOS were detected in all four surface soil samples from AFFF Area 2. The detected concentrations of PFOA did not exceed the screening levels for soil. However, PFOS concentrations did exceed the screening levels in two surface soil samples (AFP0602-001-SS-001 and AFP0602-002-SS-001). Table 5 presents the analytical results of the surface soil samples. Figure 13 (Appendix A) shows the surface soil sample analytical results for AFFF Area 2.

Subsurface Soil
PFBS, PFOA, and PFOS were detected in one or more of the subsurface soil samples, but none of the detected concentrations exceeded the screening levels for soil. Table 6 presents the analytical results of

the subsurface soil samples. Figure 13 (Appendix A) shows the surface soil analytical results for AFFF Area 2.

Groundwater

PFBS, PFOA, and PFOS were detected in one or more of the groundwater samples. PFBS concentrations did not exceed the screening value in the three samples. PFOA concentrations exceeded the screening level in all three groundwater samples and ranged from 8.7 µg/L (AFP0602-003-GW-015) to 57 µg/L (AFP0602-001-GW-020). PFOS concentrations exceeded the screening levels in two of the samples (AFP0602-001-GW-020 at 41 µg/L and AFP0602-002-GW-025 at 6.1 µg/L). The combined concentrations of PFOA and PFOS exceeded the screening levels in all three groundwater samples and ranged from 8.7 µg/L (AFP0602-003-GW-015) to 98 µg/L (AFP0602-001-GW-020). Table 7 presents analytical results of the groundwater samples. Figure 14 (Appendix A) shows the groundwater analytical results for AFFF Area 2.

Surface Water

All three target analytes were detected in the surface water sample, but the PFBS concentration did not exceed the screening level. The PFOA concentration exceeded the screening level at 2.1 µg/L. The PFOS concentration exceeded the screening level at 1.9 µg/L. Likewise, the combined PFOA and PFOS concentrations exceeded the screening level at 4.0 µg/L. Table 8 presents the analytical results of the surface water sample. Figure 14 (Appendix A) shows the surface water analytical results for AFFF Area 2.

Sediment

PFBS was not detected in the sediment sample. PFOA and PFOS were detected in the sediment sample, but the concentrations did not exceed the screening levels. Table 9 presents the analytical results of the sediment sample. Figure 13 (Appendix A) shows the sediment analytical results for AFFF Area 2.

Table 5 AFFF Spray Test Area (AFFF Area 2) Surface Soil Analytical Results

Analyte	**Sample ID**	**AFP0602-001-SS-001**	**AFP0602-002-SS-001**	**AFP0602-003-SS-001**	**AFP0602-004-SS-001**
	Depth (ft)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	5.5 U	0.55 U	0.60 U	6.4 U
Perfluorooctanoic acid (PFOA)	126[b]	**27**	**3.8**	**1.9**	**5.8 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**2,800**	**240**	**67**	**35**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 6 AFFF Spray Test Area (AFFF Area 2) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0602-001-SO-020	AFP0602-002-SO-029	AFP0602-003-SO-014
	Depth (ft)	20–21	29–30	14–15
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	**1.9**	0.60 U	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	**13**	**2.5**	**4.3**
Perfluorooctane sulfonate (PFOS)	126[b]	**7.3**	0.96 U	0.96 U

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 7 AFFF Spray Test Area (AFFF Area 2) Groundwater Analytical Results

Analyte	Station	AFP0602-001	AFP0602-002	AFP0602-003
	Sample ID	AFP0602-001-GW-020	AFP0602-002-GW-025	AFP0602-003-GW-015
	Depth (ft)	15.07–25.07	19.79–29.79	10.08–20.08
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**23**	**7.1**	**0.31**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**57**	**10**	**8.7**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**41**	**6.1**	0.075 U
Combined PFOA+PFOS	0.07[b]	**98**	**16.1**	**8.7**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*. Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 8 AFFF Spray Test Area (AFFF Area 2) Surface Water Analytical Results

Analyte	Sample ID	AFP0602-005-SW-001
	Depth (ft)	0–0.5
	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.88**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**2.1**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**1.9**
Combined PFOA+PFOS	0.07[b]	**4.0**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://www.semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).*
Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification

Table 9 AFFF Spray Test Area (AFFF Area 2) Sediment Analytical Results

Analyte	Sample ID	AFP0602-005-SD-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	**0.60 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**1.0 J**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

A composite surface soil sample and composite subsurface soil sample from AFFF Area 2 were submitted for physiochemical analyses. The composite surface soil sample (AFP0602-006-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0602-006-SO-029) was composed of aliquots of the subsurface soil from above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.4.5 Conclusions

Annual testing of AFFF spray equipment results in approximately 2,200 gallons of AFFF being released into the environment each year. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results of the subsurface soil and sediment samples indicate that target analyte concentrations do not remain in the subsurface soil or sediment in excess of the screening levels. However, the analytical results indicate that PFOS concentrations in surface soil exceeded the screening levels. Likewise, the analytical results indicate the individual and the combined PFOA and PFOS concentrations in groundwater and surface water exceeded the screening levels. Based on the analytical results, a release of AFFF is confirmed that has impacted surface soil, shallow groundwater, and surface water at AFFF Area 2.

3.5 CORPORATE HANGAR (T-728) (AFFF AREA 3)

Media potentially impacted by an AFFF release at AFFF Area 3 include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.5.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), one DPT boring was completed at AFFF Area 3. Surface soil, subsurface soil, and groundwater samples were collected from DPT boring AFP0603-001, located along the southern edge of the concrete apron. An additional groundwater sample was collected from existing groundwater monitoring well PMW10 located on the concrete apron south of the hangar. Depth to groundwater was measured in the temporary wells installed in the DPT soil borings, and from existing monitoring wells B04539 and B04540. Surface water from the hangar area enters the stormwater drainage system through a number of drop inlets along the east edge of the apron and is conveyed through a series of pipes that discharge north of building S-501. A paired surface water and sediment sample was collected from the stormwater pipe discharge. Figure 5 of Appendix A shows the AFFF Area 3 sample locations.

3.5.2 Soil Description

One DPT soil boring was completed to 60 feet bgs. The primary soil types and classifications include clayey silt (CL) and trace amounts of sandy clay (SC). The detailed boring log is presented in Appendix C.

3.5.3 Groundwater Flow

Depth to groundwater measurements were recorded in temporary wells installed in boring AFP0603-001 and existing monitoring wells PMW10, B04540, and B04539. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations range from 1065.36 feet (41.67 feet btoc at PMW10) to 1077.81 feet (30.94 feet btoc at B04539). The groundwater elevation measurements are presented in Appendix F. Figure 5 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 3 was to the south-southwest.

3.5.4 Analytical Results

One surface soil sample, one subsurface soil sample, two groundwater samples, one surface water sample, and one sediment sample from AFFF Area 3 were submitted to the project laboratory for analyses.

Surface Soil
PFBS was not detected in the surface soil sample. PFOA and PFOS were detected in the surface soil sample, but the concentrations did not exceed the screening levels. Table 10 presents the analytical results of the surface soil samples. Figure 15 (Appendix A) shows the surface soil analytical results for AFFF Area 3.

Subsurface Soil
None of the target analytes were detected in the subsurface soil sample. Table 11 presents the analytical results of the subsurface soil samples. Figure 15 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 3.

Groundwater
All three target analytes were detected in both groundwater samples. PFBS and PFOS concentrations did not exceed the screening levels. PFOA concentrations exceed the screening level in both groundwater samples (AFP0603-001-GW-045 at 0.20 µg/L and AFP0603-PMW10-GW-074 at 0.32 µg/L). The combined PFOA and PFOS concentrations exceeded the screening levels in both groundwater samples (AFP0603-001-GW-045 at 0.238 µg/L and AFP0603-PMW10-GW-074 at 0.345 µg/L). Table 12 presents the analytical results of the groundwater samples. Figure 16 (Appendix A) shows the groundwater analytical results for AFFF Area 3.

Surface Water
All three target analytes were detected in the surface water sample, but none of the detected concentrations exceeded the screening levels. Table 13 presents the analytical results of the surface water sample. Figure 16 (Appendix A) shows the surface water analytical results for AFFF Area 3.

Sediment
Neither PFBS nor PFOA were detected in the sediment sample. PFOS was detected in the sediment sample, but the concentrations did not exceed the screening level. Table 14 presents the analytical results of the sediment sample. Figure 15 (Appendix A) shows the sediment analytical results for AFFF Area 3.

Table 10 Corporate Hangar (T-728) (AFFF Area 3) Surface Soil Analytical Results

Analyte	Sample ID	AFP0603-001-SS-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.55 U
Perfluorooctanoic acid (PFOA)	126[b]	**3.2**
Perfluorooctane sulfonate (PFOS)	126[b]	**6.1**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 11 Corporate Hangar (T-728) (AFFF Area 3) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0603-001-SO-047
	Depth (ft)	47–48
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.70 U
Perfluorooctanoic acid (PFOA)	126[b]	1.1 U
Perfluorooctane sulfonate (PFOS)	126[b]	1.1 U

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 12 Corporate Hangar (T-728) (AFFF Area 3) Groundwater Analytical Results

Analyte	Station	AFP0603-001	PMW10
	Sample ID	AFP0603-001-GW-045	AFP0603-PMW10-GW-074
	Depth (ft)	35.4–50.4	66–81
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.040**	**0.061**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.20**	**0.32**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.038**	**0.025**
Combined PFOA+PFOS	0.07[b]	**0.238**	**0.345**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://www.semspub.epa/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

Table 13 Corporate Hangar (T-728) (AFFF Area 3) Surface Water Analytical Results

Analyte	Sample ID	AFP0603-002-SW-001
	Depth (ft)	0–0.5
	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.034**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.030**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.011 J**
Combined PFOA+PFOS	0.07[b]	**0.041 J**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://www.semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*.
Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification

Table 14 Corporate Hangar (T-728) (AFFF Area 3) Sediment Analytical Results

Analyte	Sample ID	AFP0603-002-SD-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.55 U
Perfluorooctanoic acid (PFOA)	126[b]	0.88 U
Perfluorooctane sulfonate (PFOS)	126[b]	**0.69 J**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram dup = duplicate
ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

A composite surface soil sample and composite subsurface soil sample from AFFF Area 3 were submitted for physiochemical analyses. The composite surface soil sample (AFP0603-003-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0603-003-SO-047) was composed of aliquots of the subsurface soil from above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.5.5 Conclusions

Ongoing storage of AFFF concentrate at the Corporate Hangar has resulted in the release of an unknown volume of AFFF into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results of the surface soil, subsurface soil, surface water, and sediment samples indicate that the target analyte concentrations do not remain in the soil, surface water, or sediment in excess of the screening levels. However, the individual PFOA and combined PFOA and PFOS concentrations exceeded the screening levels in groundwater samples. Based on the analytical results, a release of AFFF is confirmed that has impacted shallow groundwater at AFFF Area 3.

3.6 FIRE STATION #1 (B-4) (AFFF AREA 4)

Although the surrounding area is covered by asphalt pavement, considering the potential for AFFF to migrate through pavement seams, the media potentially impacted by an AFFF release at AFFF Area 4 include surface soil, subsurface soil, and groundwater. Surface water in the area drains into the stormwater drainage system and is conveyed north into the Outfall 2 pond (AFFF Area 12). Because the area does not have concentrated surface water bodies, neither surface water nor sediment samples were collected at AFFF Area 4.

3.6.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), three DPT borings were completed at AFFF Area 4. Surface soil, subsurface soil, and groundwater samples were collected from two DPT borings near the fire station door (AFP0604-001 and AFP0604-002) and a third DPT boring (AFP0604-003) across the street from the fire station door. Depth to groundwater was measured in the temporary wells installed in the DPT soil borings and from existing monitoring wells MW6 and B4MWV. Figure 6 of Appendix A shows the AFFF Area 4 sample locations.

3.6.2 Soil Description

Three DPT soil borings were completed to depths ranging from 35 feet to 40 feet bgs. The primary soil types and classifications include clayey sand (SC), silty sand (SM), and lean clay (CL). Detailed boring logs are presented in Appendix C.

3.6.3 Groundwater Flow

During the SI, depth to groundwater measurements were recorded in temporary wells installed in borings AFP0604-001, AFP0604-002, and AFP0604-003 and existing wells MW6 and B4MWV. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations ranged from 1,057.16 feet (51.48 feet btoc at MW6) to 1,083.16 feet (24.98 feet btoc at AFP0604-002). The groundwater elevation measurements are presented in Appendix F. Figure 6 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 4 varied from north-northwest to southeast.

3.6.4 Analytical Results

Four surface samples (three primary and one field duplicate), four subsurface soil samples (three primary and one field duplicate), and four groundwater samples (three primary and one field duplicate) from AFFF Area 4 were submitted to the project laboratory for analyses.

Surface Soil

PFBS, PFOA, and PFOS were detected in one or more surface soil samples, but none of the detected concentrations exceeded the screening levels. Table 15 presents the analytical results of the surface soil samples. Figure 17 (Appendix A) shows the surface soil analytical results for AFFF Area 4.

Subsurface Soil

PFOA was not detected in the subsurface soil samples. PFBS and PFOS was detected in one or more subsurface soil samples, but none of the detected concentrations exceeded the screening levels. Table 16 presents the analytical results of the subsurface soil samples. Figure 17 (Appendix A) shows the subsurface soil analytical results for AFFF Area 4.

Groundwater

PFBS, PFOA, and PFOS were detected in all four groundwater samples. PFBS concentrations did not exceed the screening value in any of the samples. PFOA concentrations exceeded the screening level and ranged from 0.12 µg/L (AFP0604-001-GW-035) to 1.5 µg/L (AFP0604-002-GW-030). PFOS concentrations exceeded the screening level and ranged from 0.25 µg/L (AFP0604-002-GW-030) to 1.1 µg/L (AFP0604-003-GW-035). The combined PFOA and PFOS concentrations exceeded the screening levels in all four samples and ranged from 0.47 µg/L (AFP0604-001-GW-035) to 1.75 µg/L (AFP0604-002-GW-030). Table 17 presents the analytical results of the groundwater samples. Figure 18 (Appendix A) shows the groundwater analytical results for AFFF Area 4.

Table 15 Fire Station #1 (B-4) (AFFF Area 4) Surface Soil Analytical Results

Analyte	**Sample ID**	**AFP0604-001-SS-001**	**AFP0604-002-SS-001**	**AFP0604-002-SS-901 (duplicate)**	**AFP0604-003-SS-001**
	Depth (ft)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.70 U	**1.4**	**1.7**	0.55 U
Perfluorooctanoic acid (PFOA)	126[b]	**7.2**	**22**	**24**	**2.1**
Perfluorooctane sulfonate (PFOS)	126[b]	**42**	**55 J**	**91 J**	**100**

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 16 Fire Station #1 (B-4) (AFFF Area 4) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0604-001-SO-036	AFP0604-002-SO-029	AFP0604-002-SO-929 (duplicate)	AFP0604-003-SO-036
	Depth (ft)	**36–37**	**29–30**	**29–30**	**36–37**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.60 U	**0.86 J**	**1.6**	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	0.96 U	0.96 U	1.0 U	0.96 U
Perfluorooctane sulfonate (PFOS)	126[b]	0.96 U	0.96 U	1.0 U	**0.74 J**

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 17 Fire Station #1 (B-4) (AFFF Area 4) Groundwater Analytical Results

Analyte	Station	AFP0604-001	AFP0604-002	AFP0604-002	AFP0604-003
	Sample ID	**AFP0604-001-GW-035**	**AFP0604-002-GW-030**	**AFP0604-002-GW-930 (duplicate)**	**AFP0604-003-GW-035**
	Depth (ft)	**28.91–38.91**	**25.08–35.08**	**25.08–35.08**	**29.7–39.7**
	Screening Level (µg/L)	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.0077 J**	**1.7**	**1.7**	**0.015 J**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.12**	**1.5**	**1.5**	**0.21**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.35**	**0.25**	**0.25**	**1.1**
Combined PFOA+PFOS	0.07[b]	**0.47**	**1.75**	**1.75**	**1.31**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://www.semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Physiochemical Sample
A composite surface soil sample and composite subsurface soil sample from AFFF Area 4 were submitted for physiochemical analyses. The composite surface soil sample (AFP0604-004-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0604-004-SO-036) was composed of aliquots of the subsurface soil from above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.6.5 Conclusions

Occasionally, fire-fighting equipment and vehicles parked at Fire Station #1 leaked AFFF, releasing an unknown quantity into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results indicate that target analyte concentrations in the surface soil and subsurface soil samples did not exceed the screening levels. However, individual and combined PFOA and PFOS concentrations exceeded the screening levels in groundwater samples. Based on the analytical results, a release of AFFF is confirmed that has impacted shallow groundwater at AFFF Area 4.

3.7 FIRE STATION #2 (B-69) (AFFF AREA 5)

Since the area surrounding the fire station is paved with no open seams, surface soil, subsurface soil, and groundwater are not media of concern and were not sampled under this SI. Media potentially impacted by an AFFF release at AFFF Area 5 are limited to surface water and sediment.

3.7.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), paired surface water and sediment samples were collected from the drainage ditch near the southeast edge of the south apron. Figure 7 of Appendix A shows the AFFF Area 5 sample locations.

3.7.2 Soil Description

Soil borings were not completed at AFFF Area 5 because soil is not a media of concern.

3.7.3 Groundwater Flow

Because groundwater is not a media of concern at AFFF Area 5, depth to groundwater measurements were not recorded. Based on the PA, the presumed groundwater flow direction at AFFF Areas 5 is to the southeast.

3.7.4 Analytical Results

One surface water sample and one sediment sample from AFFF Area 5 were submitted to the project laboratory for analyses.

Surface Water
Neither PFOA nor PFOS were detected in the surface water sample from AFFF Area 5. PFBS was detected in the sample, but the concentration did not exceed the screening level. Table 18 presents the

analytical results of the surface water sample. Figure 20 (Appendix A) shows the surface water analytical results for AFFF Area 5.

Sediment

The target analytes were not detected in the sediment sample from AFFF Area 5. Table 19 presents the analytical results of the sediment sample. Figure 19 (Appendix A) shows the sediment analytical results for AFFF Area 5.

Table 18 Fire Station #2 (B-69) (AFFF Area 5) Surface Water Analytical Results

Analyte	Sample ID	AFP0605-001-SW-001
	Depth (ft)	0–0.5
	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.0081 J**
Perfluorooctanoic Acid (PFOA)	0.07[b]	0.010 U
Perfluorooctane sulfonate (PFOS)	0.07[b]	0.015 U
Combined PFOA+PFOS	0.07[b]	ND

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://www.semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).*
Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 19 Fire Station #2 (B-69) (AFFF Area 5) Sediment Analytical Results

Analyte	Sample ID	AFP0605-001-SD-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.65 U
Perfluorooctanoic acid (PFOA)	126[b]	1.0 U
Perfluorooctane sulfonate (PFOS)	126[b]	1.0 U

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https:/.epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

In accordance with the QAPP addendum, physicochemical samples were not collected from AFFF Area 5.

3.7.5 Conclusions

Occasionally, firefighting equipment and vehicles parked at Fire Station #2 leaked AFFF, releasing an unknown quantity into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns. The analytical results of the sediment samples indicate that the target analytes were not detected in sediment. The analytical results of the surface water sample indicate that PFBS was detected in the surface water, but the concentration did not exceed the screening level. Based on the analytical results, an AFFF release at AFFF Area 5 is not confirmed.

3.8 C-5 ENGINE FIRE (AFFF AREA 6)

Media potentially impacted by an AFFF release at AFFF Area 6 include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.8.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), three DPT borings were completed at AFFF Area 6. Surface soil, subsurface soil, and groundwater samples were collected from DPT borings AFP0606-001, AFP0606-002, and AFP0606-003. Boring AFP0606-001 was completed north of the apron. Borings AFP0606-002 and AFP0606-003 were completed south of the apron. Paired surface water and sediment samples were collected from the stormwater pipe discharge east of the paved taxiway. Figure 8 of Appendix A shows the AFFF Area 6 sample locations.

3.8.2 Soil Description

Three DPT soil borings were completed to depths ranging from 28 feet to 31 feet bgs. The primary soil types and classifications include silt (ML) and lean clay (CL). Detailed boring logs are presented in Appendix C.

3.8.3 Groundwater Flow

Due to site-access restrictions at this area, depth to groundwater measurements were recorded in temporary wells installed in borings AFP0606-001, AFP0606-002, and AFP0606-003 on December 13, 2017. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations ranged from 985.90 feet (28.15 feet btoc at AFP0606-002) to 996.39 feet (21.74 feet btoc at AFP0606-001). The groundwater elevation measurements are presented in Appendix F. Figure 8 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 6 was to the east-southeast.

3.8.4 Analytical Results

Four surface soil samples (three primary and one field duplicate), four subsurface soil samples (three primary and one field duplicate), four groundwater samples (three primary and one field duplicate), two surface water samples (one primary and one field duplicate), and two sediment samples (one primary and one field duplicate) from AFFF Area 6 were submitted to the project laboratory for analyses.

Surface Soil

PFBS was not detected in any of the surface soil samples. PFOA and PFOS were detected in one or more surface soil samples, but the concentrations did not exceed the screening levels. Table 20 presents the analytical results of the surface soil samples. Figure 21 (Appendix A) shows the surface soil analytical results for AFFF Area 6.

Subsurface Soil

Neither PFBS nor PFOS were detected in any of the subsurface soil samples. PFOA was detected in two subsurface soil samples (AFP0606-002-SO-024 and AFP0606-003-SO-027), but the concentrations did not exceed the screening levels. Table 21 presents the analytical results of the subsurface soil samples. Figure 21 (Appendix A) shows the subsurface soil analytical results for AFFF Area 6.

Groundwater

All three target analytes were detected in one or more groundwater samples. PFBS and PFOS concentrations did not exceed the screening levels. PFOA concentrations exceeded the screening levels in two groundwater samples (AFP0606-002-GW-029 at 0.11 µg/L and AFP0606-003-GW-026 at 1.9 µg/L). The combined PFOA and PFOS concentrations exceeded the screening levels in two samples (AFP0606-002-GW-029 at 0.11 µg/L and AFP0606-003-GW-026 at an estimated 1.9094 µg/L). Table 22 presents the concentrations of PFBS, PFOA, and PFOS detected in the groundwater samples. Figure 22 (Appendix A) shows the sample locations and detected concentrations in groundwater at AFFF Area 6.

Surface Water

PFBS was not detected in the surface water sample. PFOS and PFOA were both detected in the surface water sample, but the PFOS concentrations did not exceed the screening level. The PFOA concentration exceeded the screening level at 0.19 µg/L. The combined PFOA and PFOS concentrations exceeded the screening level at an estimated 0.1982 µg/L (AFP0606-004-SW-001). Table 23 presents the analytical results of the surface water samples. Figure 22 (Appendix A) shows the surface water analytical results for AFFF Area 6.

Sediment

Neither PFBS nor PFOS was detected in the sediment sample. PFOA was detected in the sediment sample, but the concentrations did not exceed the screening levels. Table 24 presents the analytical results of the sediment sample. Figure 21 (Appendix A) shows the sediment analytical results for AFFF Area 6.

Table 20 C-5 Engine Fire (AFFF Area 6) Surface Soil Analytical Results

Analyte	**Sample ID**	**AFP0606-001-SS-001**	**AFP0606-001-SS-901 (duplicate)**	**AFP0606-002-SS-001**	**AFP0606-003-SS-001**
	Depth (ft)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.55 U	0.55 U	0.48 U	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	**0.35 J**	0.88 U	**0.51 J**	**0.52 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**2.3 J**	**1.6 J**	**7.0**	**23**

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 21 C-5 Engine Fire (AFFF Area 6) Subsurface Soil Analytical Results

Analyte	**Sample ID**	**AFP0606-001-SO-020**	**AFP0606-001-SO-920 (duplicate)**	**AFP0606-002-SO-024**	**AFP0606-003-SO-027**
	Depth (ft)	**20–21**	**20–21**	**24–25**	**27–28**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.60 U	5.0 U	0.50 U	0.44 U
Perfluorooctanoic acid (PFOA)	126[b]	0.96 U	0.80 U	**0.80 J**	**0.84 J**
Perfluorooctane sulfonate (PFOS)	126[b]	0.96 U	0.80 U	0.80 U	0.70 U

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram dup = duplicate

ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 22 C-5 Engine Fire (AFFF Area 6) Groundwater Analytical Results

Analyte	Station	AFP0606-001	AFP0606-001	AFP0606-002	AFP0606-003
	Sample ID	AFP0606-001-GW-026	AFP0606-001-GW-926 (duplicate)	AFP0606-002-GW-029	AFP0606-003-GW-026
	Depth (ft)	21–31	21–31	20.07–30.07	17.83–27.83
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	0.015 U	**0.0054 J**	**0.021**	**0.028**
Perfluorooctanoic Acid (PFOA)	0.07[b]	0.010 U	0.010 U	**0.11**	**1.9**
Perfluorooctane sulfonate (PFOS)	0.07[b]	0.015 U	0.015 U	0.015 U	**0.0094 J**
Combined PFOA+PFOS	0.07[b]	ND	ND	**0.11**	**1.9094 J**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*. Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 23 C-5 Engine Fire (AFFF Area 6) Surface Water Analytical Results

Analyte	Sample ID	AFP0606-004-SW-001	AFP0606-004-SW-901 (duplicate)
	Depth (ft)	0–0.5	0–0.5
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	0.015 U	0.015 U
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.19**	**0.22**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.0082 J**	0.015 U
Combined PFOA+PFOS	0.07[b]	**0.1982 J**	**0.22**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*. Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification

Table 24 C-5 Engine Fire (AFFF Area 6) Sediment Analytical Results

Analyte	Sample ID	AFP0606-004-SD-001	AFP0606-004-SD-901 (duplicate)
	Depth (ft)	**0–0.5**	**0–0.5**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.50 U	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	**0.42 J**	**0.45 J**
Perfluorooctane sulfonate (PFOS)	126[b]	0.80 U	0.96 U

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

Physiochemical Sample

A composite surface soil sample and composite subsurface soil sample from AFFF Area 6 were submitted for physiochemical analyses. The composite surface soil sample (AFP0606-005-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0606-005-SO-027) was composed of aliquots of the subsurface soil from above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.8.5 Conclusions

Fire-fighting activities resulted in the release of an unknown volume of AFFF into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results of the surface soil, subsurface soil, and sediment samples indicate that target analyte concentrations did not exceed the screening levels. However, individual PFOA and combined PFOA and PFOS concentrations exceed the screening levels in groundwater and surface water samples. Based on the analytical results, a release of AFFF is confirmed that has impacted shallow groundwater and surface water at AFFF Area 6.

3.9 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

Media potentially impacted by an AFFF release at AFFF Area 7 include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.9.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), three DPT borings were completed at AFFF Area 7. Surface soil, subsurface soil, and groundwater samples was collected from DPT borings AFP0607-001, AFP0607-002, and AFP0607-003. Depth to groundwater was measured in the temporary monitoring wells installed in the DPT borings, and existing monitoring well OB208B. Borings AFP0607-001 and AFP0607-002 were completed along the dirt road, between the building and the Outfall 1 (AFFF Area 11) pond. Boring AFP0607-003 was completed near the abandoned above-ground fuel tank containment structure behind the building. Paired surface water and sediment samples were collected from the small retention pond behind the building. Figure 9 of Appendix A shows the AFFF Area 7 sample locations.

3.9.2 Soil Description

Three DPT soil borings were completed to depths ranging from 15 feet to 50 feet bgs. The primary soil types and classifications include silty gravel (GM), silty sand (SM), lean clay (CL), and organic silt (OL). Detailed boring logs are presented in Appendix C.

3.9.3 Groundwater Flow

During the SI, depth to groundwater measurements were recorded in temporary wells installed in borings AFP0607-001, AFP0607-002, and AFP0607-003 and existing well OB2088. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations ranged from 1,025.90 feet (12.55 feet btoc at OB2088) to 1,036.05 feet (38.40 feet btoc at AFP0607-003). The groundwater elevation measurements are presented in Appendix F. Figure 9 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 7 was to the northeast.

3.9.4 Analytical Results

Three surface soil samples, three subsurface soil samples, three groundwater samples, one surface water sample, and one sediment sample from AFFF Area 7 were submitted to the project laboratory for analyses.

Surface Soil
PFBS was not detected in the surface soil samples. PFOA and PFOS were detected in one or more surface soil samples, but the concentrations did not exceed the screening levels for soil. Table 25 presents the analytical results of the surface soil samples. Figure 23 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 7.

Subsurface Soil
PFBS, PFOA, and PFOS were detected in one of the three subsurface soil samples, but only the PFOS concentration exceeded the screening levels. Table 26 presents the analytical results of the subsurface soil samples. Figure 23 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 7.

Groundwater
PFBS was not detected in the groundwater samples. The PFOS concentration in sample AFP0607-001-GW-011 exceeded the screening level. PFOA and the combined PFOA and PFOS concentrations exceeded the screening levels in all three groundwater samples. Combined PFOA and PFOS concentrations ranged from 0.15 µg/L (AFP0607-003-GW-046) to 0.362 µg/L (AFP0607-002-GW-020). Table 27 presents the analytical results of the groundwater samples. Figure 24 (Appendix A) shows the sample locations and detected concentrations in groundwater at AFFF Area 7.

Surface Water
PFBS was not detected in the surface water sample. PFOA and PFOS were detected in the surface water sample, but the concentrations did not exceed the screening level. Table 28 presents the analytical results of the surface water sample and the screening values. Figure 24 (Appendix A) shows the sample locations and detected concentrations in surface water at AFFF Area 7.

Sediment
PFBS was not detected in the sediment sample. PFOA and PFOS were detected in the sediment sample, but the concentrations did not exceed the screening levels. Table 29 presents the analytical results of the sediment sample. Figure 23 (Appendix A) shows the sample locations and detected concentrations in sediment at AFFF Area 7.

Table 25 C-5 Fuel System Test Facility (B-96) (AFFF Area 7) Surface Soil Analytical Results

Analyte	Sample ID	AFP0607-001-SS-001	AFP0607-002-SS-001	AFP0607-003-SS-001
	Depth (ft)	0–0.5	0–0.5	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.50 U	0.50 U	0.49 U
Perfluorooctanoic acid (PFOA)	126[b]	**7.4**	**0.93 J**	0.78 U
Perfluorooctane sulfonate (PFOS)	126[b]	**10**	**15**	0.78 U

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 26 C-5 Fuel System Test Facility (B-96) (AFFF Area 7) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0607-001-SO-007	AFP0607-002-SO-010	AFP0607-003-SO-047
	Depth (ft)	7–8	10–11	47–48
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.50 U	**1.7**	0.44 U
Perfluorooctanoic acid (PFOA)	126[b]	0.80 U	**38**	0.70 U
Perfluorooctane sulfonate (PFOS)	126[b]	0.80 U	**570**	0.70 U

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 27 C-5 Fuel System Test Facility (B-96) (AFFF Area 7) Groundwater Analytical Results

Analyte	Station	AFP0607-001	AFP0607-002	AFP0607-003
	Sample ID	AFP0607-001-GW-011	AFP0607-002-GW-020	AFP0607-003-GW-046
	Depth (ft)	5.14–15.14	13.9–23.9	40.03–50.03
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	0.015 U	0.017 U	0.015 U
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.11**	**0.31**	**0.15**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.077**	**0.052**	0.015 U
Combined PFOA+PFOS	0.07[b]	**0.187**	**0.362**	**0.15**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).*
Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 28 C-5 Fuel System Test Facility (B-96) (AFFF Area 7) Surface Water Analytical Results

Analyte	**Sample ID**	**AFP0607-004-SW-001**
	Depth (ft)	**0–0.5**
	Screening Level (µg/L)	**Result (µg/L)**
Perfluorobutane Sulfonate (PFBS)	40[a]	0.015 U
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.048**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.011 J**
Combined PFOA+PFOS	0.07[b]	**0.059 J**

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).*

Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 29 C-5 Fuel System Test Facility (B-96) (AFFF Area 7) Sediment Analytical Results

Analyte	**Sample ID**	**AFP0607-004-SD-001**
	Depth (ft)	**0–0.5**
	Screening Level (µg/kg)	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	1.3 U
Perfluorooctanoic acid (PFOA)	126[b]	**3.6**
Perfluorooctane sulfonate (PFOS)	126[b]	**9.8**

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram dup = duplicate

ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

A composite surface soil sample and composite subsurface soil sample from AFFF Area 7 were submitted for physiochemical analyses. The composite surface soil sample (AFP0607-005-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0607-005-SO-047) was composed of aliquots of the subsurface soil above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.9.5 Conclusions

The AFFF fire suppression system released an unknown volume of AFFF into the environment at AFFF Area 7. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results of the surface soil, surface water, and sediment samples indicate that concentrations of the target compounds do not remain in the surface soil, surface water, or sediment in excess of the screening levels. However, PFOS concentrations in subsurface soil exceeded the screening level, indicating subsurface soil has been impacted by an AFFF release. Likewise, the combined PFOA and PFOS concentrations exceeded the screening levels in groundwater samples. Based on the analytical results, a release of AFFF is confirmed that has impacted subsurface soil and shallow groundwater at AFFF Area 7.

3.10 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

Media potentially impacted by an AFFF release at AFFF Area 8 include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.10.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), three DPT borings were completed at AFFF Area 8. Surface soil, subsurface soil, and groundwater samples were collected from two DPT borings completed between the building and Taxiway M (AFP0608-001 and AFP0608-003) and one DPT boring (AFP0604-002) on the east side of Taxiway M. Paired surface water and sediment samples were to be collected from the ditch along the east side of Taxiway M. However, at the time of the field sampling, surface water was not present at the sample location, so the sediment sample was collected as a surface soil sample. Figure 5 of Appendix A shows the AFFF Area 8 sample locations.

3.10.2 Soil Description

Three DPT soil borings were completed to depths ranging from 40 feet to approximately 45 feet bgs. The primary soil types and classifications include micaceous silt (MH), silty sand (SM), and lean clay (CL). Detailed boring logs are presented in Appendix C.

3.10.3 Groundwater Flow

During the SI, depth to groundwater measurements were recorded in temporary wells installed in borings AFP0608-001, AFP0608-002, and AFP0608-003 and existing well B102MW-2. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations ranged from 1,064.81 feet (30.51 feet btoc at B102MW-2) to 1,065.62 feet (39.52 feet btoc at AFP0608-001). The groundwater elevation measurements are presented in Appendix F. Figure 5 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 8 was to the south.

3.10.4 Analytical Results

Four surface soil samples, three subsurface soil samples, and three groundwater samples from AFFF Area 8 were submitted to the project laboratory for analyses.

Surface Soil

PFBS was not detected in the surface soil samples. PFOA and PFOS were detected in all four surface soil samples. PFOA concentrations did not exceed the screening level. However, PFOS exceeded the screening in one surface soil sample (420 µg/kg at AFP0608-003-SS-001). Table 30 presents the analytical results of the surface soil samples. Figure 15 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 8.

Subsurface Soil

The target analytes were not detected in subsurface soil at AFFF Area 8. Table 31 presents the analytical results of the subsurface soil samples. Figure 15 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 8.

Groundwater

All three target compounds were detected in the three groundwater samples. PFBS concentrations did not exceed the screening levels. However, PFOA concentrations exceeded the screening level in two groundwater samples (AFP0608-002-GW-035 at 0.18 µg/L and AFP0608-003-GW-040 0.67 µg/L). PFOS concentrations exceeded the screening level in all three groundwater samples with concentrations ranging from 0.084 µg/L (AFP0608-001-GW-042) to 1.8 µg/L (AFP0608-003-GW-040). The combined PFOA and PFOS concentrations exceeded the screening levels in all three groundwater samples and ranged from 0.129 (AFP0608-001-GW-042) to 2.47 µg/L AFP0608-003-GW-040). Table 32 presents the analytical results of the groundwater samples. Figure 16 (Appendix A) shows the sample locations and detected concentrations in groundwater at AFFF Area 8.

Table 30 Fire Prevention Headquarters (B-102) (AFFF Area 8) Surface Soil Analytical Results

Analyte	**Sample ID**	**AFP0608-001-SS-001**	**AFP0608-002-SS-001**	**AFP0608-003-SS-001**	**AFP0608-004-SS-001**
	Depth (ft)	**0–0.5**	**0–0.5**	**0–0.5**	**0–0.5**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.60 U	0.55 U	0.48 U	0.55 U
Perfluorooctanoic acid (PFOA)	126[b]	**2.6**	**0.73 J**	**4.3**	**5.8**
Perfluorooctane sulfonate (PFOS)	126[b]	**63**	**24**	**420**	**92**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 31 Fire Prevention Headquarters (B-102) (AFFF Area 8) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0608-001-SO-035	AFP0608-002-SO-032	AFP0608-003-SO-040
	Depth (ft)	35–36	32–33	40–41
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.50 U	6.5 U	0.55 U
Perfluorooctanoic acid (PFOA)	126[b]	0.80 U	10 U	0.88 U
Perfluorooctane sulfonate (PFOS)	126[b]	0.80 U	10 U	0.88 U

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 32 Fire Prevention Headquarters (B-102) (AFFF Area 8) Groundwater Analytical Results

Analyte	Station	AFP0608-001	AFP0608-002	AFP0608-003
	Sample ID	AFP0608-001-GW-042	AFP0608-002-GW-035	AFP0608-003-GW-040
	Depth (ft)	35.05–45.05	30.19–40.19	34.9–44.9
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.13**	**0.027**	**0.17**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.045**	**0.18**	**0.67**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.084**	**0.13**	**1.8**
Combined PFOA+PFOS	0.07[b]	**0.129**	**0.31**	**2.47**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

Physiochemical Sample
A composite surface soil sample and composite subsurface soil sample from AFFF Area 8 were submitted for physiochemical analyses. The composite surface soil sample (AFP0608-005-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0608-005-SO-032) was composed of aliquots of the subsurface soil from above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.10.5 Conclusions

Freezing temperatures caused an AFFF fire suppression system pipe to rupture, releasing an unknown volume of AFFF into the environment at AFFF Area 8. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results for the subsurface soil samples indicate that concentrations of the target compounds do not remain in the subsurface soil above the screening levels. However, the analytical results for surface soil indicate PFOS concentrations remain in surface soil. Similarly, the combined PFOA and PFOS concentrations exceeded the screening levels in all three groundwater samples. Based on the analytical results, a release of AFFF is confirmed that has impacted surface soil and shallow groundwater at AFFF Area 8.

3.11 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

Because the former IWTP aeration pond was excavated and regraded with soil, the media potentially impacted by an AFFF release at the IWTP are limited to groundwater, surface water, and sediment.

3.11.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), groundwater samples were collected from three existing monitoring wells (MW23, MW24, and MW25). Paired surface water sample and sediment samples were collected from the drainage ditch north of the former aeration pond area, and from the stormwater discharge pipe east of Taxiway M. Figure 5 of Appendix A shows the AFFF Area 9 sample locations.

3.11.2 Soil Description

Since soil borings were not completed at AFFF Area 9, the soil classifications in this area are unknown.

3.11.3 Groundwater Flow

During the SI, depth to groundwater measurements were recorded in existing monitoring wells MW23, MW24, and MW25. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations ranged from 1,058.53 feet (32.12 feet btoc at MW24) to 1,061.58 feet (22.23 feet btoc at MW23). The groundwater elevation measurements are presented in Appendix F. Figure 5 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 9 was to the southeast.

3.11.4 Analytical Results

Three groundwater samples, two surface water samples, and two sediment samples from AFFF Area 9 were submitted to the project laboratory for analyses.

Groundwater
All three target compounds were detected in the three groundwater samples. PFBS concentrations did not exceed the screening level. PFOA concentrations exceeded the screening level in all three groundwater samples and ranged from 0.26 µg/L (AFP0609-MW25-GW-038) to 0.80 µg/L (AFP0609-MW23-GW-027). PFOS concentrations exceeded the screening level in all three groundwater samples and ranged from 0.076 µg/L (AFP0609-MW23-GW-027) to 2.4 µg/L (AFP0609-MW24-GW-43.5). The combined PFOA and PFOS concentrations exceeded the screening levels in all three groundwater samples and ranged from 0.349 µg/L (AFP0609-MW25-GW-038) to 3.12 µg/L (AFP0609-MW24-GW-43.5). Table 33 presents the analytical results of the groundwater samples. Figure 16 (Appendix A) shows the sample locations and detected concentrations in groundwater at AFFF Area 9.

Surface Water
All three target compounds were detected in both surface water samples. PFBS concentrations did not exceed the screening level. The PFOA concentration in sample AFP0609-002-SW-001 exceeded the screening level at 0.21 µg/L. The PFOS concentration in sample AFP0609-001-SW-001 exceeded the screening level at 0.084 µg/L. Likewise, the combined PFOA and PFOS concentrations exceeded the screening level in both surface water samples and ranged from 0.106 µg/L (AFP0609-001-SW-001) to 0.255 µg/L (AFP0609-002-SW-001). Table 34 presents the analytical results of the surface water sample. Figure 16 (Appendix A) shows the sample locations and detected concentrations in surface water at AFFF Area 9.

Sediment
The target analytes were not detected in sediment sample AFP0609-002-SD-001. All three target compounds were detected in sediment sample AFP0609-001-SD-001, but did not exceed the screening levels. Table 35 presents the analytical results of the sediment sample. Figure 15 (Appendix A) shows the sample locations and detected concentrations in sediment at AFFF Area 9.

Table 33 Industrial Wastewater Treatment Plant (AFFF Area 9) Groundwater Analytical Results

Analyte	Station	MW23	MW24	MW25
	Sample ID	AFP0609-MW23-GW-027	AFP0609-MW24-GW-43.5	AFP0609-MW25-GW-038
	Depth (ft)	35–40	39.8–44.8	32–37
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.019 J**	**0.066**	**0.30**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.80**	**0.72**	**0.26**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.076**	**2.4**	**0.089**
Combined PFOA+PFOS	0.07[b]	**0.876**	**3.12**	**0.349**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 34 Industrial Wastewater Treatment Plant (AFFF Area 9) Surface Water Analytical Results

Analyte	Sample ID	AFP0609-001-SW-001	AFP0609-002-SW-001
	Depth (ft)	0–0.5	0–0.5
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.042**	**0.084**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.022**	**0.21**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.084**	**0.045**
Combined PFOA+PFOS	0.07[b]	**0.106**	**0.255**

Bold values indicate analyte detected at concentration indicated.

Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

Table 35 Industrial Wastewater Treatment Plant (AFFF Area 9) Sediment Analytical Results

Analyte	Sample ID	AFP0609-001-SD-001	AFP0609-002-SD-001
	Depth (ft)	0–0.5	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	**0.83 J**	0.55 U
Perfluorooctanoic acid (PFOA)	126[b]	**0.93 J**	0.88 U
Perfluorooctane sulfonate (PFOS)	126[b]	**9.9**	0.88 U

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

In accordance with the QAPP addendum, physiochemical samples were not collected from AFFF Area 9.

3.11.5 Conclusions

AFFF releases that occurred inside buildings with floor drains that flow to the IWTP have resulted in the release of an unknown volume of AFFF into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results of the sediment samples indicate that concentrations of the target compounds do not remain in the sediment in excess of the screening levels. However, individual and combined PFOA and PFOS concentrations exceeded the screening levels in groundwater and surface water samples. Based on the analytical results, a release of AFFF is confirmed that has impacted shallow groundwater and surface water at AFFF Area 9.

3.12 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

Media potentially impacted by an AFFF release at the sanitary WWTP include surface soil, subsurface soil, groundwater, surface water, and sediment.

3.12.1 Sample Locations

In accordance with the QAPP (ASL, November 2017), four DPT borings were completed at AFFF Area 10. Surface soil, subsurface soil, and groundwater samples were collected from the four DPT borings completed around the perimeter of the WWTP sludge drying beds. Two DPT borings (AFP0610-001 and AFP0610-003) were completed along the north side of the sludge drying beds and two DPT borings (AFP0610-002 and AFP0610-004) were completed along the south side of the sludge drying beds. Paired surface water and sediment samples were collected from the WWTP discharge, at the confluence of Nickajack Creek and an unnamed tributary near Wakita Drive. Figure 10 of Appendix A shows the AFFF Area 10 sample locations.

3.12.2 Soil Description

Four DPT soil borings were completed to depths ranging from 20 feet to 25 feet bgs. The primary soil types and classifications include silty sand (SM), clayey sand (SC), and lean clay (CL). Detailed boring logs are presented in Appendix C.

3.12.3 Groundwater Flow

During the SI, depth to groundwater measurements were recorded in temporary wells installed in borings AFP0610-001, AFP0610-002, AFP0610-003, and AFP0610-004. Static groundwater elevations were calculated based on NAVD88. Groundwater elevations ranged from 1,048.96 feet (13.05 feet btoc at AFP0610-003) to 1,049.60 feet (12.02 feet btoc at AFP0610-002). The groundwater elevation measurements are presented in Appendix F. Figure 10 (Appendix A) shows the potentiometric surface contours developed from the groundwater elevation measurements. The contours indicate that, at the time of the measurements, the shallow groundwater flow direction at AFFF Area 10 varied from north-northeast to east-northeast.

3.12.4 Analytical Results

Five surface soil samples (four primary and one field duplicate), five subsurface soil samples (four primary and one field duplicate), five groundwater samples (four primary and one field duplicate), two surface water samples (one primary and one field duplicate), and two sediment samples (one primary and one field duplicate) from AFFF Area 10 were submitted to the project laboratory for analyses.

Surface Soil
All three target compounds were detected in one or more surface soil samples. Neither PFBS nor PFOA concentrations exceeded the screening levels. PFOS concentrations exceeded the screening levels in two samples (AFP0610-002-SS-001 at 130 µg/kg and AFP0610-003-SS-001 at an estimated 160 µg/kg). Table 36 presents the analytical results of the subsurface soil samples. Figure 25 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 10.

Subsurface Soil
Neither PFBS nor PFOA were detected in the subsurface soil samples. PFOS was detected in one or more subsurface soil samples, but the concentrations did not exceed the screening level. Table 37 presents the analytical results of the subsurface soil samples. Figure 25 (Appendix A) shows the sample locations and detected concentrations in soil at AFFF Area 10.

Groundwater
All three target compounds were detected in the five groundwater samples. PFBS concentrations did not exceed the screening value. PFOA concentrations exceeded the screening level in the four groundwater samples and ranged from 0.15 µg/L (AFP0610-003-GW-014) to 0.40 µg/L (AFP0610-002-GW-014). PFOS concentrations exceeded the screening level in the four groundwater samples and ranged from 0.23 µg/L (AFP0610-004-GW-014) to 2.1 µg/L (AFP0610-003-GW-014). The combined PFOA and PFOS concentrations exceeded the screening levels in all four groundwater samples and ranged from 0.52 µg/L

(AFP0610-004-GW-014) to 2.25 µg/L (AFP0610-003-GW-014). Table 38 presents the analytical results of the groundwater samples. Figure 26 (Appendix A) shows the sample locations and detected concentrations in groundwater at AFFF Area 10.

Surface Water

All three target compounds were detected in the surface water sample. PFBS and PFOA concentrations did not exceed the screening value. PFOS concentrations exceeded the screening level in the surface water sample at an estimated 0.18 µg/L. The combined PFOA and PFOS concentrations exceeded the screening level in the surface water sample at 0.235 µg/L. Table 39 presents the analytical results of the surface water sample. Figure 26 (Appendix A) shows the sample locations and detected concentrations in surface water at AFFF Area 10.

Sediment

Neither PFBS nor PFOA were detected in the sediment sample. PFOS was detected in the sediment sample, but the concentration did not exceed the screening level. Table 40 presents the analytical results of the sediment sample. Figure 25 (Appendix A) shows the sample locations and detected concentrations in sediment at AFFF Area 10.

Table 36 Sanitary Wastewater Treatment Plant (AFFF Area 10) Surface Soil Analytical Results

Analyte	Sample ID	AFP0610-001-SS-001	AFP0610-002-SS-001	AFP0610-003-SS-001	AFP0610-003-SS-901 (duplicate)	AFP0610-004-SS-001
	Depth (ft)	0–0.5	0–0.5	0–0.5	0–0.5	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.46 U	**0.39 J**	0.60 U	0.47 U	0.41 U
Perfluorooctanoic acid (PFOA)	126[b]	**0.39 J**	**3.7**	**1.8 J**	**1.0 J**	**0.36 J**
Perfluorooctane sulfonate (PFOS)	126[b]	**0.44 J**	**130**	**160 J**	**77 J**	**15**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 37 Sanitary Wastewater Treatment Plant (AFFF Area 10) Subsurface Soil Analytical Results

Analyte	Sample ID	AFP0610-001-SO-014	AFP0610-002-SO-015	AFP0610-003-SO-015	AFP0610-003-SO-915 (duplicate)	AFP0610-004-SO-016
	Depth (ft)	**14–15**	**15–16**	**15–16**	**15–16**	**16–17**
	Screening Level (µg/kg)	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**	**Result (µg/kg)**
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.55 U	0.55 U	0.60 U	0.65 U	0.50 U
Perfluorooctanoic acid (PFOA)	126[b]	0.88 U	0.88 U	0.96 U	1.0 U	0.80 U
Perfluorooctane sulfonate (PFOS)	126[b]	**10**	**0.83 J**	**4.0 J**	**1.1 J**	0.80 U

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram dup = duplicate
ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 38 Sanitary Wastewater Treatment Plant (AFFF Area 10) Groundwater Analytical Results

Analyte	Station	AFP0610-001	AFP0610-002	AFP0610-003	AFP0610-003	AFP0610-004
	Sample ID	**AFP0610-001-GW-014**	**AFP0610-002-GW-014**	**AFP0610-003-GW-014**	**AFP0610-003-GW-914 (duplicate)**	**AFP0610-004-GW-014**
	Depth (ft)	**9.08–19.08**	**9.42–19.42**	**8.83–18.83**	**8.83–18.83**	**9.44–19.44**
	Screening Level (µg/L)	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**	**Result (µg/L)**
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.035**	**0.25**	**0.044**	**0.051**	**0.080**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.25**	**0.40**	**0.15**	**0.15**	**0.29**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**1.5**	**0.94**	**2.1**	**1.9**	**0.23**
Combined PFOA+PFOS	0.07[b]	**1.75**	**1.34**	**2.25**	**2.05**	**0.52**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

Table 39 Sanitary Wastewater Treatment Plant (AFFF Area 10) Surface Water Analytical Results

Analyte	Sample ID	AFP0610-005-SW-001	AFP0610-005-SW-901 (duplicate)
	Depth (ft)	0–0.5	0–0.5
	Screening Level (µg/L)	Result (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.028**	**0.016 J**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.055**	**0.044**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.18 J**	**0.086 J**
Combined PFOA+PFOS	0.07[b]	**0.235 J**	**0.130 J**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 40 Sanitary Wastewater Treatment Plant (AFFF Area 10) Sediment Analytical Results

Analyte	Sample ID	AFP0610-005-SD-001	AFP0610-005-SD-901 (duplicate)
	Depth (ft)	0–0.5	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.55 U	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	0.88 U	0.96 U
Perfluorooctane sulfonate (PFOS)	126[b]	**0.99 J**	**0.78 J**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

A composite surface soil sample and composite subsurface soil sample from AFFF Area 10 were submitted for physiochemical analyses. The composite surface soil sample (AFP0610-006-SS-001) was composed of aliquots of the surface soil (0–6 inches bgs). Similarly, the subsurface soil sample (AFP0610-006-SO-015) was composed of aliquots of the subsurface soil from above the water saturated-unsaturated soil interface. The physiochemical sample results are presented in Appendix E.

3.12.5 Conclusions

AFFF releases have occurred inside some buildings with floor drains that flow to the IWTP, which discharges into the WWTP. Based on the analytical results presented in Section 3.10.4, an unknown volume of AFFF has been released into the environment. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns and the groundwater flow direction. The analytical results of the subsurface soil and sediment samples indicate that concentrations of the target compounds do not remain in the subsurface soil or sediment in excess of the screening levels. However, the analytical results of the surface soil samples indicate that PFOS concentrations exceeded the screening level. Likewise, the combined PFOA and PFOS concentrations exceeded the screening levels in groundwater and surface water samples. Based on the analytical results, a release of AFFF is confirmed that has impacted surface soil, shallow groundwater, and surface water at AFFF Area 10.

3.13 OUTFALL 1 (AFFF AREA 11)

AFFF Area 11 is a stormwater impoundment and outfall. The media potentially impacted by an AFFF release at Outfall 1 include surface water and sediment.

3.13.1 Sample Locations

Paired surface water and sediment samples were collected from the Outfall 1 discharge area. Figure 9 of Appendix A shows the AFFF Area 11 sample location.

3.13.2 Soil Description

Since soil borings were not completed at AFFF Area 11, the soil classifications in this area are unknown.

3.13.3 Groundwater Flow

Because groundwater is not a media of concern at AFFF Area 11, depth to groundwater measurements were not recorded. Based on the groundwater measurements collected from AFFF Area 7 and historical groundwater flow direction in the area, the groundwater flow direction at AFFF Areas 11 is presumed to be to the northeast.

3.13.4 Analytical Results

One surface soil sample and one subsurface soil sample from AFFF Area 11 were submitted to the project laboratory for analyses.

Surface Water

PFBS was not detected in the surface water sample. PFOA and PFOS were detected in the surface water sample, but the combined concentration did not exceed the screening level. Table 41 presents the analytical results of the surface water sample. Figure 24 (Appendix A) shows the sample locations and detected concentrations in surface water at AFFF Area 11.

Sediment

The target analytes were not detected in the sediment sample. Table 42 presents the analytical results of the sediment sample. Figure 23 (Appendix A) shows the sample locations and detected concentrations in sediment at AFFF Area 11.

Table 41 Outfall 1 (AFFF Area 11) Surface Water Analytical Results

Analyte	Sample ID	AFP0611-001-SW-001
	Depth (ft)	0–0.5
	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	0.015 U
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.014 J**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.0062 J**
Combined PFOA+PFOS	0.07[b]	**0.0202 J**

Bold values indicate analyte detected at concentration indicated.

[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*. Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.

µg/L = micrograms per liter ft = foot or feet ID = identification

J =The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Table 42 Outfall 1 (AFFF Area 11) Sediment Analytical Results

Analyte	Sample ID	AFP0611-001-SD-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.60 U
Perfluorooctanoic acid (PFOA)	126[b]	0.96 U
Perfluorooctane sulfonate (PFOS)	126[b]	0.96 U

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).

[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

µg/kg = micrograms per kilogram dup = duplicate

ft = foot or feet ID = identification

U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample
In accordance with the QAPP addendum, physicochemical samples were not collected from AFFF Area 11.

3.13.5 Conclusions

AFFF releases within Drainage Area 1 have resulted in the release of an unknown volume of AFFF into the environment through Outfall 1. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns. The analytical results of the surface water and sediment samples indicate that concentrations of the target compounds do not remain in surface water or sediment in excess of the screening levels. Based on the analytical results, a release of AFFF at AFFF Area 11 is not confirmed.

3.14 OUTFALL 2 (AFFF AREA 12)

AFFF Area 12 is a stormwater impoundment and outfall. The media potentially impacted by an AFFF release at Outfall 2 include surface water and sediment.

3.14.1 Sample Locations

Paired surface water and sediment samples were collected from the Outfall 2 discharge area. Figure 9 of Appendix A shows the AFFF Area 12 sample location.

3.14.2 Soil Description

Since soil borings were not completed at AFFF Area 12, the soil classifications in this area are unknown.

3.14.3 Groundwater Flow

Because groundwater is not a media of concern at AFFF Area 12, depth to groundwater measurements were not recorded. Based on the groundwater measurements collected from AFFF Area 7 and historical groundwater flow direction in the area, the groundwater flow direction at AFFF Areas 12 is presumed to be to the northeast.

3.14.4 Analytical Results

One surface water sample and one sediment sample from AFFF Area 12 were submitted to the project laboratory for analyses.

Surface Water
All three target compounds were detected in the surface water sample. The PFBS concentration did not exceed the screening level. The PFOA concentration exceeded the screening level at 0.67 µg/L. The PFOS concentration exceeded the screening level at 0.49 µg/L. The combined PFOA and PFOS concentrations exceeded the screening level at 1.16 µg/L. Table 43 presents the analytical results of the surface water sample. Figure 24 (Appendix A) shows the sample locations and detected concentrations in surface water at AFFF Area 12.

Sediment

Neither PFBS nor PFOA were detected in the sediment sample. PFOS was detected in the sediment sample, but the concentration did not exceed the screening level. Table 44 presents the analytical results of the sediment sample. Figure 23 (Appendix A) shows the sample locations and detected concentrations in sediment at AFFF Area 12.

Table 43 Outfall 2 (AFFF Area 12) Surface Water Analytical Results

Analyte	Sample ID	AFP0612-001-SW-001
	Depth (ft)	0–0.5
	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.087**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.67**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.49**
Combined PFOA+PFOS	0.07[b]	**1.16**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification

Table 44 Outfall 2 (AFFF Area 12) Sediment Analytical Results

Analyte	Sample ID	AFP0612-001-SD-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.70 U
Perfluorooctanoic acid (PFOA)	126[b]	1.1 U
Perfluorooctane sulfonate (PFOS)	126[b]	**3.6**

Bold values indicate analyte detected at concentration indicated.
[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram ft = foot or feet ID = identification
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

In accordance with the QAPP addendum, physicochemical samples were not collected from AFFF Area 12.

3.14.5 Conclusions

AFFF releases within Drainage Area 2 have resulted in the release of an unknown volume of AFFF into the environment through Outfall 2. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns. The analytical results of the sediment sample indicate that concentrations of the target compounds do not remain in the sediment in excess of the screening levels. However, the combined PFOA and PFOS concentration exceeded the screening level in surface water. Based on the analytical results, a release of AFFF is confirmed that has impacted surface water at AFFF Area 12.

3.15 OUTFALL 5 (AFFF AREA 13)

AFFF Area 13 is a stormwater outfall on Poorhouse Creek. The media potentially impacted by an AFFF release at Outfall 5 include surface water and sediment.

3.15.1 Sample Locations

Paired surface water and sediment samples were collected from Poorhouse Creek, upstream of the Atkins Road Southeast Bridge. Figure 11 of Appendix A shows the AFFF Area 13 sample location.

3.15.2 Soil Description

Since soil borings were not completed at AFFF Area 13, the soil classifications in this area are unknown.

3.15.3 Groundwater Flow

Because groundwater is not a media of concern at AFFF Area 13, depth to groundwater measurements were not recorded. Historically, the groundwater flow direction at AFFF Area 13 is to the northeast, following the hydraulic gradient of Poorhouse Creek.

3.15.4 Analytical Results

One surface water sample and one sediment sample from AFFF Area 13 were submitted to the project laboratory for analyses.

Surface Water
All three target compounds were detected in the surface water sample. The PFBS concentration did not exceed the screening level. The PFOA concentration exceeded the screening level at 0.24 µg/L. The PFOS concentration exceeded the screening level at 0.15 µg/L. The combined PFOA and PFOS concentration exceeded the screening level at 0.39 µg/L. Table 45 presents the analytical results of the surface water sample. Figure 28 (Appendix A) shows the sample locations and detected concentrations in surface water at AFFF Area 13.

Sediment
The target analytes were not detected in the sediment sample. Table 46 presents the analytical results of the sediment sample. Figure 27 (Appendix A) shows the sample locations and detected concentrations in sediment at AFFF Area 13.

Table 45 Outfall 5 (AFFF Area 13) Surface Water Analytical Results

Analyte	Sample ID	AFP0613-001-SW-001
	Depth (ft)	0–0.5
	Screening Level (µg/L)	Result (µg/L)
Perfluorobutane Sulfonate (PFBS)	40[a]	**0.095**
Perfluorooctanoic Acid (PFOA)	0.07[b]	**0.24**
Perfluorooctane sulfonate (PFOS)	0.07[b]	**0.15**
Combined PFOA+PFOS	0.07[b]	**0.39**

Bold values indicate analyte detected at concentration indicated.
Shaded cells indicate analyte detected above screening level.
[a] EPA Regional Screening Levels for Tapwater (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] EPA, May 2016a, *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)* and EPA, May 2016b, *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*. Note: When PFOA and PFOS are both present, the combined detected concentrations of the compounds are compared with the 0.07 µg/L Health Advisory value.
µg/L = micrograms per liter ft = foot or feet ID = identification

Table 46 Outfall 5 (AFFF Area 13) Sediment Analytical Results

Analyte	Sample ID	AFP0613-001-SD-001
	Depth (ft)	0–0.5
	Screening Level (µg/kg)	Result (µg/kg)
Perfluorobutane sulfonate (PFBS)	130,000[a]	0.65 U
Perfluorooctanoic acid (PFOA)	126[b]	1.0 U
Perfluorooctane sulfonate (PFOS)	126[b]	1.0 U

[a] EPA Regional Screening Levels for Resident Soil (May 2018) (https://semspub.epa.gov/work/HQ/197235.pdf).
[b] Screening levels for residential soil and sediment were calculated using the EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).
µg/kg = micrograms per kilogram dup = duplicate
ft = foot or feet ID = identification
U = The analyte was analyzed for but was not detected above the reported sample quantification limit.

Physiochemical Sample

In accordance with the QAPP addendum, physicochemical samples were not collected from AFFF Area 13.

3.15.5 Conclusions

AFFF releases within Drainage Area 5 have resulted in the release of an unknown volume of AFFF into the environment through Outfall 5. Samples were collected where the target compounds would most likely be detected based on surface drainage patterns. The analytical results of the sediment sample indicate that concentrations of the target compounds do not remain in the sediment in excess of the screening levels. However, the combined PFOA and PFOS concentration exceeded the screening levels in surface water. Based on the analytical results, a release of AFFF is confirmed that has impacted surface water at AFFF Area 13.

3.16 INVESTIGATION-DERIVED WASTE

The QAPP addendum (ASL, 2017) included prescribed work procedures for the handling and chemical analysis of investigation-derived waste (IDW) generated during the SI. After the QAPP addendum was approved, the Air Force provided revised guidance for IDW disposal to minimize waste generation. In accordance with this guidance, the minimal soil and water generated was placed on the ground adjacent to, and downgradient from, each sampling location. General waste, such as paper, plastic, trash, and personal protective equipment was placed in plastic garbage bags and placed in an on-site dumpster for disposal.

4.0 GROUNDWATER PATHWAY

The following hydrogeologic setting information was taken from the PA (CH2M Hill, October 2015) unless otherwise noted.

Groundwater in the northern Piedmont Physiographic Province, where AFP6 lies, occurs predominantly in joints and fractures of the bedrock and in the pore spaces of the overlying residual soil. Recharge is principally from rainfall that either seeps downward through the residuum or flows into openings in exposed rock.

Unweathered and unfractured bedrock in the northern Piedmont reportedly has very low porosity and permeability. The quantity of water that the rock can store depends on the occurrence and distribution of the joints and openings. The quantity of water that can flow through these openings is largely dependent on the extent to which these rock openings are interconnected. Fracturing in rock in the northern Piedmont generally decreases with depth. The upper weathered and fractured zones can transmit significant quantities of water.

The aquifer beneath the AFP6 industrial area is unconfined and is characterized by three zones of hydraulic conductivities paralleling the three geologic strata: the residual soil or residuum, the underlying fractured bedrock, and the competent bedrock. The upper two zones, the residuum and the fractured bedrock, provide the dominant pathway for groundwater flow, exhibiting average hydraulic conductivities between 5×10^{-5} and 2×10^{-5} feet per minute (ft/min). The reported geometric mean hydraulic conductivity of the residuum strata for the industrial area ranges between 4×10^{-4} and 5×10^{-5} ft/min, and the geometric mean hydraulic conductivity of the fractured bedrock strata in the industrial area ranges between 2×10^{-3} and 4×10^{-4} ft/min. The hydraulic conductivity for the competent bedrock averages less than 5×10^{-8} ft/min, reducing its significance as a groundwater pathway.

Depth to groundwater ranges from approximately 10 feet near the C-5 Fuel System Test Facility (B-96) to approximately 51 feet near Fire Station #1. Generally, groundwater in the AFP6 area flows southeasterly, toward the Chattahoochee River. Figure 29 (Appendix A) presents a conceptual geologic cross-section of the AFP6 area.

The EDR GeoCheck® Report for Dobbins Air Reserve Base (EDR, 2015), identified numerous wells within 4 miles of AFP6; however, none of the identified wells are used for drinking water. The EDR report identified one public water supply (PWS) well (EDR record 119) within 4 miles of AFP6. However, additional research concluded record 119 (PWS ID GA2950055) was incorrectly shown in the EDR report to be 1.5 miles northwest of AFP6. Based on the EDR record, PWS ID GA2950055 is in Dalton, Georgia, but the former registered PWS operator (American Containment Services, Inc.) is in Marietta, Georgia. Groundwater is not a drinking water source for AFP6.

4.1 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

As presented in Section 3.3, the three DPT soil borings hit refusal at depths ranging from 20 feet to 26 feet bgs and did not encounter groundwater. Considering DPT technology limitations and the presence of groundwater in nearby wells, shallow groundwater is likely present at greater depths than were attained during the SI fieldwork. In the absence of groundwater sample analysis, additional field investigation to determine target analyte concentrations in shallow groundwater is warranted. Although groundwater was not sampled, in the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.2 AFFF SPRAY TEST AREA (AFFF AREA 2)

As presented in Section 3.4 and Table 7, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening level. These results indicate that the shallow groundwater at AFFF Area 2 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 5, at the time of the SI, shallow groundwater flow direction at AFFF Area 2 was to the south-southwest. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.3 CORPORATE HANGAR (T-728) (AFFF AREA 3)

As presented in Section 3.5 and Table 12, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening level. These results indicate that the shallow groundwater at AFFF Area 3 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 8, at the time of the SI, shallow groundwater flow direction at AFFF Area 3 was to the south-southwest. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.4 FIRE STATION #1 (B-4) (AFFF AREA 4)

As presented in Section 3.6 and Table 17, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening levels. These results indicate that the shallow groundwater at AFFF Area 4 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 11 at the time of the SI, shallow groundwater flow direction at AFFF Area 4 varied from north-northwest to southeast. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete, based on the current drinking water receptors.

4.5 FIRE STATION #2 (B-69) (AFFF AREA 5)

As discussed in Section 3.7, because the area is surrounded by pavement, groundwater is not a media of concern at AFFF Area 5 and was not sampled.

4.6 C-5 ENGINE FIRE (AFFF AREA 6)

As presented in Section 3.8 and Table 22, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening level. These results indicate that the shallow groundwater at AFFF Area 6 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 17 at the time of the SI, shallow groundwater flow direction at AFFF Area 6 was to the east-southeast. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.7 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

As presented in Section 3.9 and Table 27, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening levels. These results indicate that the shallow groundwater at AFFF Area 7 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 20, at the time of the SI, shallow groundwater flow direction at AFFF Area 7 was to the northeast. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.8 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

As presented in Section 3.10 and Table 32, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening level. These results indicate that the shallow groundwater at AFFF Area 8 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 8 at the time of the SI, shallow groundwater flow direction at AFFF Area 8 was to the south. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.9 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

As presented in Section 3.11 and Table 33, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening level. These results indicate that the shallow groundwater at AFFF Area 9 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 8 at the time of the SI, shallow groundwater flow direction at AFFF Area 9 was to the southeast. In the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.10 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

As presented in Section 3.12 and Table 38, the analytical results for one or more groundwater samples had combined PFOA and PFOS concentrations exceeding the screening level. These results indicate that the shallow groundwater at AFFF Area 10 has been impacted by the release of AFFF. Based on the static groundwater levels presented on Figure 23 at the time of the SI, shallow groundwater flow direction at AFFF Area 10 varied from north-northeast to east-northeast. In the absence of drinking water wells within

4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

4.11 OUTFALL 1 (AFFF AREA 11)

As discussed in Section 3.13, because the area is a surface water outfall, groundwater is not a media of concern at AFFF Area 11 and was not sampled.

4.12 OUTFALL 2 (AFFF AREA 12)

As discussed in Section 3.14, because the area is a surface water outfall, groundwater is not a media of concern at AFFF Area 12 and was not sampled.

4.13 OUTFALL 5 (AFFF AREA 13)

As discussed in Section 3.15, because the area is a surface water outfall, groundwater is not a media of concern at AFFF Area 13 and was not sampled.

5.0 SURFACE WATER PATHWAY

The following hydrologic setting information was taken from the PA (CH2M Hill, October 2015) unless otherwise noted.

AFP6 lies within the Chattahoochee River drainage basin. Surface water within the military complex includes two manmade lakes (Big Lake and Little Lake), two stormwater outfall ponds (Outfall 1 pond [AFFF Area 11] and Outfall 2 pond [AFFF Area 12]), and several unnamed intermittent drainage features. Generally, surface waters drain west-to-east through culverts, ditches, and intermittent streams. Several intermittent streams originate from manufactured ditches that divert accumulated runoff from paved areas.

Surface waters within the North Campus generally drain either north through Outfall 1 (AFFF Area 1) or Outfall 2 (AFFF Area 2); or east into Big Lake or Little Lake and through Outfall 3 on DARB. Surface waters on the South Campus generally drain south into Poorhouse Creek, which flows east into Rottenwood Creek. Poorhouse Creek flows east along the southern boundary of the South Campus toward Rottenwood Creek. Rottenwood Creek is north of the Base, and generally flows southeast into the Chattahoochee River.

Approximately 3.8 miles downstream from where Rottenwood Creek drains into the Chattahoochee River, the City of Atlanta Department of Watershed Management Bureau of Drinking Water operates a raw water intake (Atlanta Water Intake) on the Chattahoochee River that is routed to the Chattahoochee and Hemphill Water Plants to provide drinking water to Fulton County, Georgia.

In accordance with the EPA Third Unregulated Contaminant Monitoring Rule (UCMR3), finished drinking water from the Chattahoochee and Hemphill Water Plants was analyzed for PFBS, PFOA, and PFOS in 2013 and 2014. According the UCMR3 data results, PFAS was not detected in the finished drinking water from either water plant (EPA, April 2018).

The EDR GeoCheck® Report for Dobbins Air Reserve Base (EDR, 2015) identified five PWS systems (EDR cluster G114-G118), sourced from surface water, within 15 miles of AFP6. EDR cluster G represents the following five customers of the Cobb County-Marietta Water Authority (CCMWA) (PWS GA0670002), a wholesale drinking water provider:

- Record G114 (PWS GA0670001), City of Austell Water Division;
- Record G115 (PWS GA0670005), City of Marietta/Marietta Power and Water;
- Record G116 (PWS GA0670007), City of Smyrna Utility Services; and
- Record G117 (PWS GA0670004), Kennesaw Water System.
- Record G118 (PWS GA0670003), Cobb County Water

In addition to the five water utility districts listed above, CCMWA also provides drinking water to AFP6/GARB and several other utility districts within Cobb County. CCMWA operates two water treatment plants, the Wyckoff and Quarles Water Plants. The Wyckoff Water Plant draws raw water from Lake Allatoona, approximately 12 miles northwest of AFP6, on the Etowah River. The Quarrels Water Plant draws raw water from the Chattahoochee River, approximately 6.3 miles upstream from where Rottenwood Creek drains into the Chattahoochee River.

5.1 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

As discussed in Section 3.3, surface water is a media of concern at AFFF Area 1. However, at the time of the field sampling, surface water was not present in the sample locations. Surface water drainage from the Structural Fire Training Area is concentrated into two drainage ditches, which flow north for a short distance before merging with a larger ditch that generally flows southeasterly. Approximately ½ mile downstream for the Structural Fire Training Area, surface water flows into Big Lake, the first of two impoundments on DARB property. Overflow from Big Lake continues ½ mile in an unnamed tributary before encountering the second impoundment (Little Lake) and Outfall 3. After leaving Outfall 3, surface drainage continues ½ mile before flowing into Rottenwood Creek. Continuing downstream an additional seven miles, Rottenwood Creek flows into the Chattahoochee River, approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 12.1 miles downstream from AFFF Area 1. Although surface water from AFFF Area 1 was not sampled, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

5.2 AFFF SPRAY TEST AREA (AFFF AREA 2)

As presented in Section 3.4 and Table 8, individual and combined PFOA and PFOS concentrations in surface water exceeded the screening levels, indicating that surface water at AFFF Area 6 has been impacted by an AFFF release. Surface water drains from the spray test area either by sheet flow to the south or into a stormwater drop inlet near the middle of the field. Both drainage paths flow through Outfall 5 before leaving Air Force property. Surface water drainage flows into the headwaters of Poor House Creek, approximately 1 mile upstream from Outfall 5. Once in Poor House Creek, surface waters travel approximately 3 miles downstream into Rottenwood Creek. Continuing downstream an additional 4.3 miles, Rottenwood Creek flows into the Chattahoochee River approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 11.1 miles downstream from AFFF Area 2. Although surface water from AFFF Area 2 has been impacted by an

AFFF release, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

5.3 CORPORATE HANGAR (T-728) (AFFF AREA 3)

As presented in Section 3.5 and Table 13, the target analytes were not detected in surface water above the screening levels, indicating that surface water at AFFF Area 6 has not been impacted by an AFFF release. In the absence of PFAS concentrations above the screening levels, the human health exposure pathway for ingestion of surface water is incomplete.

5.4 FIRE STATION #1 (B-4) (AFFF AREA 4)

As discussed in Section 3.6, surface water is not a media of concern at AFFF Area 4.

5.5 FIRE STATION #2 (B-69) (AFFF AREA 5)

As presented in Section 3.7 and Table 18, the target analytes were not detected in the surface water above the screening levels, indicating that surface water at AFFF Area 6 has not been impacted by an AFFF release. In the absence of PFAS concentrations above the screening levels, the human health exposure pathway for ingestion of surface water is incomplete.

5.6 C-5 ENGINE FIRE (AFFF AREA 6)

As presented in Section 3.8 and Table 23, PFOA and the combined PFOA and PFOS concentrations in surface water samples exceeded the screening levels, indicating that surface water at AFFF Area 6 has been impacted by an AFFF release. Currently, surface water from the C-5 Engine Fire area drains into stormwater inlets that are connected to a fuel-water separator. At the time of the AFFF release, the apron did not have stormwater inlets or a fuel-water separator, so the area drained south on the paved apron to the surrounding ground. Once on the ground surface, stormwater would have continued south into Poor House Creek, approximately 1 mile upstream from Outfall 5. Once in Poor House Creek, contaminants travel approximately 3 miles downstream and join Rottenwood Creek. Continuing downstream an additional 4.3 miles, Rottenwood Creek flows into the Chattahoochee River, approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 11.1 miles downstream from AFFF Area 6. Although surface water from AFFF Area 6 has been impacted by an AFFF release, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

5.7 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

As presented in Section 3.9 and Table 28, the target analytes were not detected in surface water sample above the screening levels, indicating that surface water at AFFF Area 7 has not been impacted by an AFFF release. In the absence of PFAS concentrations above the screening levels, the human health exposure pathway for ingestion of surface water is incomplete.

5.8 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

As discussed in Section 3.10, surface water is a media of concern at AFFF Area 8. However, at the time of the field sampling, surface water was not present in the sample locations. Surface water at the Fire Prevention Headquarters flows southeast toward Atlantic Avenue. Beyond Atlantic Avenue, surface waters flow into Big Lake, the first of two impoundments on DARB property. Overflow from Big Lake continues ½ mile in an unnamed tributary before encountering the second impoundment (Little Lake) and Outfall 3. After leaving Outfall 3, surface drainage continues ½ mile before flowing into Rottenwood Creek. Continuing downstream an additional seven miles, Rottenwood Creek flows into the Chattahoochee River, approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 12.1 miles downstream from AFFF Area 3. Although surface water from AFFF Area 8 has not been sampled, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

5.9 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

As presented in Section 3.11 and Table 34, the individual and combined PFOA and PFOS concentrations in surface water samples exceeded the screening levels, indicating that surface water at AFFF Area 9 has been impacted by an AFFF release. Surface water from the IWTP is routed into the stormwater collection inlet on the north side of the former IWTP surface impoundment where it travels beneath Taxiway M and flows through ditches into Big Lake, the first of two impoundments on DARB property. Overflow from Big Lake continues ½ mile in an unnamed tributary before encountering the second impoundment (Little Lake) and Outfall 3. After leaving Outfall 3, surface drainage continues ½ mile before flowing into Rottenwood Creek. Continuing downstream an additional seven miles, Rottenwood Creek flows into the Chattahoochee River, approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 12.1 miles downstream from AFFF Area 9. Although surface water from AFFF Area 9 has been impacted by an AFFF release, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

5.10 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

As presented in Section 3.12 and Table 39, PFOS and the combined PFOA and PFOS concentrations in surface water samples exceeded the screening levels, indicating that surface water at AFFF Area 10 has been impacted by an AFFF release. The sanitary WWTP effluent discharges to Nickajack Creek in a residential area approximately 1½ miles beyond the USAF property boundary. Once in Nickajack Creek, surface water continues downstream, approximately 13.7 miles, before entering the Chattahoochee River, 5.1 miles downstream of the Atlanta Water Intake. In the absence of a downstream surface water intake within 15 miles of AFFF Area 10, the human health exposure pathway for ingestion of surface water is incomplete.

5.11 OUTFALL 1 (AFFF AREA 11)

As presented in Section 3.13 and Table 41, the target analytes were not detected in surface water sample above the screening levels, indicating that surface water at AFFF Area 11 has not been impacted by an AFFF release. In the absence of PFAS concentrations above the screening levels, the human health exposure pathway for ingestion of surface water is incomplete.

5.12 OUTFALL 2 (AFFF AREA 12)

As presented in Section 3.14 and Table 43, individual and combined PFOA and PFOS concentrations in the surface water sample exceeded the screening levels, indicating that surface water at AFFF Area 12 has been impacted by an AFFF release. Outfall 2 is a conduit for surface water in Drainage Area 2 to drain into Rottenwood Creek. Surface water discharging through Outfall 2 leaves Air Force property in an unnamed tributary that flows into Rottenwood Creek approximately ½ mile downstream. Once in Rottenwood Creek, surface waters travel approximately 8 miles downstream before reaching the Chattahoochee River, approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 12.3 miles downstream from AFFF Area 12. Although surface water from AFFF Area 12 has been impacted by an AFFF release, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

5.13 OUTFALL 5 (AFFF AREA 13)

As presented in Section 3.15 and Table 45, individual and combined PFOA and PFOS concentrations in the surface water sample exceeded the screening levels, indicating that surface water at AFFF Area 13 has been impacted by an AFFF release. Outfall 5 is a conduit for surface water in Drainage Area 5 to drain into Poor House Creek. Surface water discharging through Outfall 5 leaves USAF property in Poor House Creek and travels approximately 1.7 miles downstream before reaching Rottenwood Creek. Once in Rottenwood Creek, surface waters continue another 4 miles downstream before reaching the Chattahoochee River, approximately 3.8 miles upstream of the Atlanta Water Intake. The Atlanta Water Intake on the Chattahoochee River is approximately 9.5 miles downstream from AFFF Area 13. Although surface water from AFFF Area 13 has been impacted by an AFFF release, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

6.0 SOIL, SEDIMENT, AND AIR PATHWAYS

The objective of soil and sediment sampling was to determine if soil and/or sediment in the individual areas has been impacted by the release of AFFF and whether target analyte concentrations remain in the soil or sediment at concentrations above the screening levels.

6.1 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

As discussed in Section 3.3, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 1. However, at the time of the field sampling, surface water was not present in the sediment sampling locations. In accordance with the QAPP, surface soil samples (AFP0601-004-SS-001 and AFP0601-005-SS-001) were collected in lieu of sediment samples. As presented in Table 4, the target analytes were not detected in subsurface soil samples. As shown in Table 3, PFOA and PFOS were detected in surface soil, but none of the detections exceeded the screening levels. Based on the analytical results, surface soil and subsurface soil at AFFF Area 1 have not been impacted by an AFFF release.

The area is surrounded by mature grass that is mowed regularly between March and October. Currently, the area is used for fire training exercises and the land use is unlikely to change. The nearest residential area is approximately 5,300 feet to the west. The nearest schools are Fair Oaks Elementary School and Oakwood High School, each approximately 7,400 feet to the southwest.

6.2 AFFF SPRAY TEST AREA (AFFF AREA 2)

As discussed in Section 3.4, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 2. As shown in Tables 6 and 9, target analyte concentrations in subsurface soil and sediment did not exceed the screening levels. However, as presented in Table 5, PFOS concentrations in surface soil exceeded the screening levels, indicating surface soil at AFFF Area 2 has been impacted by an AFFF release and may be a continuing source of contamination to shallow groundwater in the area.

6.3 CORPORATE HANGAR (T-728) (AFFF AREA 3)

As discussed in Section 3.5, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 3. As shown in Tables 10, 11, and 14, target analyte concentrations in soil and sediment did not exceed the screening levels, indicating that soil and sediment at AFFF Area 3 have not been impacted by an AFFF release.

6.4 FIRE STATION #1 (B-4) (AFFF AREA 4)

As discussed in Section 3.6, surface soil and subsurface soil are media of concern at AFFF Area 4. As shown in Table 15, 16, and 19, target analyte concentrations in the surface soil and subsurface soil samples did not exceed the screening levels, indicating that soil at AFFF Area 4 has not been impacted by an AFFF release.

6.5 FIRE STATION #2 (B-69) (AFFF AREA 5)

As discussed in Section 3.7, sediment are a media of concern at AFFF Area 5. As shown in Table 19, target analytes were not detected in the sediment sample, indicating sediment at AFFF Area 5 has not been impacted by a release of AFFF.

The area surrounding the active fire station is paved. Current land use is unlikely to create a human health exposure, and future land use is likely to remain unchanged. The nearest residential area is approximately 2,500 feet to the west. The nearest school is Smyrna Elementary School, approximately 4,500 feet south in a residential area.

6.6 C-5 ENGINE FIRE (AFFF AREA 6)

As discussed in Section 3.8, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 6. As show in Tables 20, 21, and 24, target analyte concentrations did not exceed the screening levels in the surface soil, subsurface soil, and sediment samples, indicating soil and sediment at AFFF Area 6 have not been impacted by an AFFF release.

6.7 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

As discussed in Section 3.9, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 7. As shown in Tables 25 and 29, the target analyte concentrations were below screening levels in the surface soil and sediment samples. However, as shown in Table 26, PFOS concentrations in the subsurface soil exceeded the screening level, indicating subsurface soil at AFFF Area 7 has been impacted by an AFFF release.

Currently, the site is an active fuel system test facility and is surrounded by pavement and gravel. Current land use is unlikely to create a human health exposure, and future land use is likely to remain unchanged. Workers are present at the facility eight hours a day. However, the nature of their work does not include soil excavation or other exposure routes to contaminated soil. Although current land use is unlikely to involve any human health exposures, utility or construction workers could be exposed to PFAS impacted soil during excavations or other ground disturbing activities. Human ingestion of PFAS impacted soils during these activities is unlikely. The nearest residential area is approximately 3,000 feet to the north. The nearest school is Fair Oaks Elementary School, approximately 7,900 feet to the southwest in a residential area.

6.8 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

As discussed in Section 3.10, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 8. However, at the time of the field sampling, surface water was not present in the sediment sampling location. In accordance with the QAPP, surface soil samples (AFP0608-004-SS-001) were collected in lieu of a sediment sample. As shown in Table 31, target analytes were not detected in subsurface soil samples, indicating that subsurface soil at AFFF Area 8 has not been impacted by an AFFF release. However, as shown in Table 30, the PFOS concentration in one surface soil sample (AFP0608-003-SS-001) exceeded the screening level, indicating surface soil at AFFF Area 8 has been impacted by an AFFF release and may be a continuing source of contamination to groundwater.

The site is an inactive aircraft assembly hangar, currently used as an office and warehouse for Fire Prevention Headquarter Personnel. The area is surrounded by mature grass that is mowed regularly between March and October. Current land use is unlikely to create a human health exposure, and future land use is likely to remain unchanged. Workers are present at the site 24 hours a day. However, the nature of their work is unlikely to expose them to contaminated soil. Although current land use does not involve any human health exposures, workers could be exposed to PFAS-impacted surface soil during excavations or other ground disturbing activities. The nearest residential area is approximately 3,600 feet to the west. The nearest schools are Fair Oaks Elementary School and Oakwood High School, both approximately 5,800 feet to the southwest in a residential area.

6.9 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

As discussed in Section 3.11, sediment is a media of concern at AFFF Area 9. As shown in Table 34, target analyte concentrations in the sediment sample did not exceed the screening levels, indicating sediment at AFFF Area 9 has not been impacted by an AFFF release.

6.10 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

As discussed in Section 3.12, surface soil, subsurface soil, and sediment are media of concern at AFFF Area 10. As shown in Tables 37 and 40, target analyte concentrations in subsurface soil and sediment did not exceed the screening levels, indicating that surface soil and sediment have not been impacted by an AFF release. However, as shown in Table 36, PFOS concentrations in surface soil exceeded the screening level, indicating that surface soil at AFFF Area 10 has been impacted by an AFFF release.

The site is an active sanitary wastewater treatment plant, surrounded by mature grass that is mowed regularly between March and October. Current land use is unlikely to create a human health exposure, and future land use is likely to remain unchanged. Workers are present at the site 24 hours a day. However, the nature of their work is unlikely to expose them to contaminated soil at the site. Although current land use does not involve any human health exposures, workers could be exposed to PFAS-impacted media during excavations or other ground-disturbing activities. The nearest residential area is approximately 950 feet to the southwest. The nearest school is Oakwood High School, approximately 2,600 feet west of the site in a residential area.

6.11 OUTFALL 1 (AFFF AREA 11)

As discussed in Section 3.13, sediment are a media of concern at AFFF Area 11. As shown in Table 42, target analyte concentrations in sediment were below the screening level, indicating that sediment at AFFF Area 11 has not been impacted by an AFFF release.

6.12 OUTFALL 2 (AFFF AREA 12)

As discussed in Section 3.14, sediment are a media of concern at AFFF Area 12. As shown in Table 44, target analyte concentrations in sediment were below the screening level, indicating that sediment at AFFF Area 12 has not been impacted by an AFFF release.

6.13 OUTFALL 5 (AFFF AREA 13)

As discussed in Section 3.15, sediment are a media of concern at AFFF Area 13. As shown in Table 46, the target analytes were not detected in sediment, indicating that sediment at AFFF Area 13 has not been impacted by an AFFF release.

7.0 UPDATE TO CONCEPTUAL SITE MODELS

The following sections summarize updated conceptual site models (CSM) based on the human health exposure pathways presented in Sections 4, 5 and 6.

7.1 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

The CSM for the Structural Fire Training Area presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, surface water, and sediment as media of concern at AFFF Area 1. In accordance with the QAPP, since surface water was not present at the sample location, the sediment sample was collected as a surface soil sample. As such, the surface soil sample analytical results are discussed as they relate to sediment. The QAPP addendum identified construction workers and Base personnel exposed to impacted groundwater, surface water, or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.1, groundwater was not sampled during the SI. In the absence of groundwater sample analysis, additional field investigation to determine target analyte concentrations in shallow groundwater is warranted. However, in the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

Based on the discussion of human health exposure pathways for surface water presented in Section 5.1, surface water was not sampled during the SI. The Atlanta Water Intake on the Chattahoochee River is approximately 12.1 miles downstream from AFFF Area 1. Although surface water from AFFF Area 1 was not sampled, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.1, target analyte concentrations in surface soil and subsurface soil are not present above the screening levels.

7.2 AFFF SPRAY TEST AREA (AFFF AREA 2)

The CSM for the AFFF Spray Test Area presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, surface water, and sediment as media of concern at AFFF Area 2. The QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, groundwater, surface water, or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.2, individual and combined PFOA and PFOS concentrations in shallow groundwater exceeded the screening levels. However, in the absence of downgradient drinking water wells within 4 miles of the area, the groundwater pathway is incomplete.

Based on the discussion of human health exposure pathways for surface water presented in Section 5.2, individual and combined PFOA and PFOS concentrations in surface water exceeded the screening levels. The Atlanta Water Intake is approximately 11.1 miles downstream from AFFF Area 2. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.2, PFAS concentrations in surface soil exceeded the screening levels and may be a continuing source of contamination to shallow groundwater in the area.

7.3 CORPORATE HANGAR (T-728) (AFFF AREA 3)

The CSM for the Corporate Hangar presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, surface water, and sediment as media of concern at AFFF Area 3. The QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, groundwater, surface water, or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.3, PFOA and the combined PFOA and PFOS concentrations in shallow groundwater exceeded the screening levels. However, in the absence of downgradient drinking water wells within 4 miles of the area, the groundwater pathway is incomplete.

Based on the discussion of human health exposure pathways for surface water presented in Section 5.3, target analyte concentrations in surface water are not present above the screening levels. Therefore, the human exposure pathway for surface water is incomplete.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.3, target analyte concentrations in surface soil, subsurface soil, and sediment are not present above the screening levels.

7.4 FIRE STATION #1 (B-4) (AFFF AREA 4)

The CSM for Fire Station #1 presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, and groundwater as media of concern at AFFF Area 4. Neither surface water nor sediment are media of concern because surface water bodies are not present in the area and surface drainage from the area drains through Outfall 2 (AFFF Area 12). The QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, or groundwater as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.4, individual and combined PFOA and PFOS concentrations in shallow groundwater exceed the screening levels. However, in the absence of downgradient drinking water wells within 4 miles of the area, the groundwater pathway is incomplete.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.4, target analyte concentrations in surface soil and subsurface soil are not present above the screening levels.

7.5 FIRE STATION #2 (B-69) (AFFF AREA 5)

The CSM for Fire Station #2 presented in the QAPP addendum (ASL, November 2017) identified surface water and sediment as media of concern at AFFF Area 5. Soil and groundwater are not media of concern because a large concrete apron surrounds the facility. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface water or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.5, target analyte concentrations in sediment are not present above the screening levels.

Based on the discussion of human health exposure pathways for surface water presented in Section 5.5, target analyte concentrations in surface water are not present above the screening levels. Therefore, the human exposure pathway for surface water is incomplete.

7.6 C-5 ENGINE FIRE (AFFF AREA 6)

The CSM for the C-5 Engine Fire presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, surface water, and sediment as media of concern at AFFF Area 6. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, groundwater, or surface water and sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.6, PFOA and the combined PFOA and PFOS concentrations in shallow groundwater exceeded the screening levels. However, in the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete, based on the current drinking water receptors.

Based on the discussion of human health exposure pathways for surface water in Section 5.6, PFOA and the combined PFOA and PFOS concentrations in surface water exceed the screening levels. The Atlanta Water Intake is approximately 11.1 miles downstream from AFFF Area 6. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.6, target analyte concentrations in surface soil, subsurface soil, and sediment did not exceed the screening levels.

7.7 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

The CSM for the C-5 Fuel Test Facility presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, surface water, and sediment as media of concern at AFFF Area 7. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, groundwater, surface water, or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.7, individual and combined PFOA and PFOS concentrations in shallow groundwater exceed the screening levels. However, in the absence of a downgradient drinking water well within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

Based on the discussion of human health exposure pathways for surface water in Section 5.7, target analyte concentrations in surface water are not present above the screening levels. Therefore, the human exposure pathway for surface water is incomplete.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.7, target analyte concentrations in surface soil and sediment are not present above the screening levels. However, PFOS concentrations in subsurface soil exceeded the screening levels.

7.8 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

The CSM for the Fire Prevention Headquarters presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, surface water, and sediment as media of concern at AFFF Area 8. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, groundwater, or surface water and sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.8, individual and combined PFOA and PFOS concentrations in shallow groundwater exceed the screening levels. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete.

Based on the discussion of human health exposure pathways for surface water in Section 5.8, surface water is a media of concern at AFFF Area 8. However, at the time of the field sampling, surface water was not present in the sample locations. The Atlanta Water Intake on the Chattahoochee River is approximately 12.1 miles downstream from AFFF Area 1. Although surface water from AFFF Area 1 was not sampled, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.8, target analyte concentrations in subsurface soil are not present above the screening levels. However, PFOS concentrations in the surface soil exceeded the screening levels, indicating the surface soil has been impacted by an AFFF release.

7.9 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

The CSM for the IWTP presented in the QAPP addendum (ASL, November 2017) identified groundwater, surface water, and sediment as media of concern at AFFF Area 9. Soil is not a media of concern because the area was excavated during closure of the aeration pond. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted groundwater, surface water, or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.9, individual and combined PFOA and PFOS concentrations in shallow groundwater exceed the screening levels. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete.

Based on the discussion of human health exposure pathways for surface water in Section 5.9, individual and combined PFOA and PFOS concentrations in surface water exceeded the screening levels. The Atlanta Water Intake is approximately 12.1 miles downstream from AFFF Area 9. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.9, target analyte concentrations in surface soil and subsurface soil are not present above the screening levels.

7.10 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

The CSM for the WWTP presented in the QAPP addendum (ASL, November 2017) identified surface soil, subsurface soil, groundwater, sediment, and surface water as media of concern at AFFF Area 10. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface soil, subsurface soil, groundwater, or surface water and sediment as potential human receptors.

Based on the discussion of human health exposure pathways for groundwater in Section 4.10, individual and combined PFOA and PFOS concentrations in shallow groundwater exceed the screening levels. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete.

Based on the discussion of human health exposure pathways for surface water in Section 5.10, PFOA and the combined PFOA and PFOS concentrations in surface water exceeded the screening levels. However, in the absence of a downstream surface water intake within 15 miles of AFFF Area 10, the human health exposure pathway for ingestion of surface water is incomplete.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.10, target analyte concentrations in surface soil and sediment did not exceed the screening levels. However, PFOS concentrations in surface soil exceeded the screening level, indicating surface soil at AFFF Area 10 has been impacted by an AFFF release and may be a continuing source of contamination to groundwater. Although current land use does not involve any human health exposures, workers could be exposed to AFFF-impacted surface soil during excavations or other ground disturbing activities.

7.11 OUTFALL 1 (AFFF AREA 11)

The CSM for Outfall 1 presented in the QAPP addendum (ASL, November 2017) identified surface water and sediment as media of concern at AFFF Area 11. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface water or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for surface water in Section 5.11, target analyte concentrations in surface water are not present above the screening levels. Therefore, the human exposure pathway for surface water is incomplete.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.11, target analyte concentrations in sediment are not present above the screening levels.

7.12 OUTFALL 2 (AFFF AREA 12)

The CSM for Outfall 2 presented in the QAPP addendum (ASL, November 2017) identified surface water and sediment as media of concern at AFFF Area 12. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface water or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for surface water in Section 5.12, individual and combined PFOA and PFOS concentrations in surface water exceed the screening levels. The Atlanta Water Intake is approximately 11.1 miles downstream from AFFF Area 12. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.12, target analyte concentrations in sediment are not present above the screening levels.

7.13 OUTFALL 5 (AFFF AREA 13)

The CSM for Outfall 5 presented in the QAPP addendum (ASL, November 2017) identified surface water and sediment as media of concern at AFFF Area 13. The CSM in the QAPP addendum identified construction workers and Base personnel exposed to impacted surface water or sediment as potential human receptors.

Based on the discussion of human health exposure pathways for surface water in Section 5.13, individual and combined PFOA and PFOS concentrations in surface water exceeded the screening levels. The Atlanta Water Intake is approximately 9.5 miles downstream from AFFF Area 13. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating there is no potential receptor pathway with immediate impacts to human health via consumption of drinking water, and surface water is not impacting drinking water at these two water plants.

Based on the discussion of human health exposure pathways for soil, sediment, and air presented in Section 6.13, target analyte concentrations in sediment are not present above the screening levels.

8.0 SUMMARY AND CONCLUSIONS

ASL completed SIs at thirteen known or suspected AFFF release areas at AFP6 as detailed in the site-specific QAPP addendum (ASL, November 2017). The areas inspected included the following.

- Structural Fire Training Area (B-64) (AFFF Area 1)
- AFFF Spray Test Area (AFFF Area 2)
- Corporate Hangar (T-728) (AFFF Area 3)
- Fire Station #1 (B-4) (AFFF Area 4)
- Fire Station #2 (B-69) (AFFF Area 5)
- C-5 Engine Fire (AFFF Area 6)
- C-5 Fuel System Test Facility (B-96) (AFFF Area 7)
- Fire Prevention Headquarters (B-102) (AFFF Area 8)
- Industrial Wastewater Treatment Plant (AFFF Area 9)
- Sanitary Wastewater Treatment Plant (AFFF Area 10)
- Outfall 1 (AFFF Area 11)
- Outfall 2 (AFFF Area 12)
- Outfall 5 (AFFF Area 13)

Selected sample media varied across the thirteen sites but included surface soil, subsurface soil, groundwater, sediment, and surface water. Sampling was primarily limited to the immediate areas of known or suspected AFFF releases and biased toward locations most likely to have been impacted by the releases.

All samples were analyzed for PFBS, PFOA, and PFOS using modified EPA Method 537. Analytical results for PFBS in soil and sediment were compared to published EPA RSLs (130,000 µg/kg). Analytical results for PFOA and PFOS in soil and sediment were compared to calculated RSLs (126 µg/kg for both PFOA and PFOS). Analytical results for PFBS in groundwater and surface water were compared to the published EPA RSL (40 µg/L). Analytical results for PFOA and PFOS in groundwater and surface water were compared to the EPA HA of 0.07 µg/L (for the combined concentrations of PFOA and PFOS).

Although AFFF use at AFP6 has resulted in PFAS concentrations above screening levels in all environmental media except sediment, no potential receptor pathways with immediate impacts to human health were identified. Table 47 summarizes detected concentrations of PFBS, PFOA, and PFOS for each media sampled at each area. Brief summaries of key findings and conclusions for each site (focusing on PFOA and PFOS exceedances) are included in Sections 8.1 through 8.13 below.

8.1 STRUCTURAL FIRE TRAINING AREA (B-64) (AFFF AREA 1)

Fire training operations using AFFF have been conducted approximately five times since the facility was constructed. An estimated maximum of 15 gallons of AFFF were used during training exercises. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. The DPT borings completed during the SI hit refusal and did not encounter groundwater. Surface soil and subsurface soil samples from AFFF Area 1 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 1.

As discussed in Section 4.1, although groundwater was not sampled during the SI, in the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors.

As discussed in Section 5.1, although surface water was not sampled, UCMR3 data for the Chattahoochee and Hemphill Water Plants indicate PFBS, PFOA, and PFOS are not present in the treated drinking water, indicating the human health exposure pathway for ingestion of surface water is incomplete.

As discussed in Section 6.1, the surface soil and subsurface soil analytical results indicate that concentrations of the target analytes were below the screening levels.

In the absence of groundwater analytical data, AFFF Area 1 is recommended for a Remedial Investigation to determine target analyte concentrations in groundwater.

8.2 AFFF SPRAY TEST AREA (AFFF AREA 2)

Annual testing of firefighting equipment has been conducted in this area for years. Typically, each AFFF tank is emptied during testing, totaling an estimated annual release volume of 2,200 gallons. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Surface soil, subsurface soil, groundwater, surface water, and sediment samples from AFFF Area 2 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 2.

As discussed in Section 4.2, individual and combined PFOA and PFOS concentrations detected in groundwater samples exceeded the screening level. Based on the analytical results, a release of AFFF has been confirmed at AFFF Area 2 that has impacted shallow groundwater. However, in the absence of downgradient drinking wells within 4 miles of the area, the groundwater pathway is incomplete and not an immediate threat to human health.

As discussed in Section 5.2, individual and combined PFOA and PFOS concentrations detected in the surface water sample exceeded the screening level. Based on the analytical results, a release of AFFF has been confirmed at AFFF Area 2 that has impacted the surface water. The Atlanta Water Intake is approximately 11.1 miles downstream from AFFF Area 2; however, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating the human exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.2, the subsurface soil and sediment sample analytical results indicate that concentrations of the target analytes are below the screening levels. However, the analytical results indicate surface soil has been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 2 is recommended for a remedial investigation.

8.3 CORPORATE HANGAR (T-728) (AFFF AREA 3)

An AFFF foam trailer and drummed AFFF concentrate is stored inside the Corporate Hangar. On at least one occasion, AFFF was spilled inside the hangar and was washed outside of the building and into nearby soil. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Surface soil, subsurface soil, groundwater, surface water, and sediment samples were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 3.

As discussed in Section 4.3, PFOA and combined PFOA and PFOS concentrations detected in one or more groundwater samples exceeded the screening level. Based on the analytical results, a release of AFFF has been confirmed at AFFF Area 3 that has impacted shallow groundwater. However, in the absence of downgradient drinking wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Section 5.3, the surface water results indicate that concentrations of the target analytes were below the screening levels. Based on the analytical results, surface water has not been impacted by an AFFF release. Therefore, the human exposure pathway for surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.3, the surface soil, subsurface soil, and sediment analytical results indicate that concentrations of the target analytes were below the screening levels. Based on the analytical results, surface soil, subsurface soil, and sediment have not been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 3 is recommended for a remedial investigation.

8.4 FIRE STATION #1 (B-4) (AFFF AREA 4)

Fire Station #1 is an active facility, and routine AFFF equipment maintenance has been conducted outside of the building. Occasional AFFF releases have occurred as a result of maintenance activities. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Because there are no surface water bodies in the area and surface water drains through Outfall 2 (AFFF Area 12), surface water and sediment are not media of concern. Surface soil, subsurface soil, and groundwater samples from AFFF Area 4 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 4.

As discussed in Section 4.4, individual and combined PFOA and PFOS concentrations in the groundwater samples exceeded the screening level. Based on the analytical results, a release of AFFF has been confirmed at AFFF Area 4 that has impacted shallow groundwater. However, in the absence of downgradient drinking wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Section 5.4, because there are no concentrated surface water conveyances at AFFF Area 4, surface water was not sampled. However, surface drainage from AFFF Area 4 is conveyed through the Outfall 2 pond (AFFF Area 12).

As discussed in Section 6.4, the surface soil and subsurface soil sample analytical results indicate that concentrations of the target analytes were below the screening levels. Based on the analytical results, surface soil and subsurface soil have not been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 4 is recommended for a remedial investigation.

8.5 FIRE STATION #2 (B-69) (AFFF AREA 5)

Fire Station #2 is an active facility and routine AFFF equipment maintenance has been conducted outside of the building. Occasional AFFF releases have occurred as a result of maintenance activities. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Because the area is surrounded by pavement, soil and groundwater are not media of concern. Surface water and sediment samples from AFFF Area 5 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 5.

As discussed in Section 4.5, groundwater is not a media of concern at AFFF Area 5 because the area is surrounded by pavement.

As discussed in Sections 5.5 and 6.5 respectively, the surface water and sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating that AFFF Area 5 has not been impacted by an AFFF release. Therefore, the human exposure pathway for surface water is incomplete and not an immediate threat to human health.

Based on the analytical results and potential exposure pathways, AFFF Area 5 is recommended for No Further Response Action Planned.

8.6 C-5 ENGINE FIRE (AFFF AREA 6)

The engine on a C-5 caught fire while it was parked on the concrete apron. The fire was extinguished using an unknown volume of AFFF. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Surface soil, subsurface soil, groundwater, surface water, and sediment samples from AFFF Area 6 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 6.

As discussed in Section 4.6, PFOA and combined PFOA and PFOS concentrations exceeded the screening levels in groundwater. Based on the analytical results, a release of AFFF at AFFF Area 6 is confirmed that has impacted shallow groundwater and surface water. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Section 5.6, PFOA and combined PFOA and PFOS concentrations exceeded the screening levels in surface water. Based on the analytical results, a release of AFFF at AFFF Area 6 is confirmed that has impacted surface water. The Atlanta Water Intake is approximately 11.1 miles downstream from AFFF Area 2. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating the human exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.6, the surface soil, subsurface soil, and sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels. Based on the analytical results, surface soil, subsurface soil, and sediment at AFFF Area 6 have not been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 6 is recommended for a remedial investigation.

8.7 C-5 FUEL SYSTEM TEST FACILITY (B-96) (AFFF AREA 7)

The C-5 Fuel Test Facility is used to test wing-based fuel systems and includes an AFFF fire prevention system that discharged on at least one occasion, releasing an unknown volume of AFFF down the hill behind the building. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Surface soil, subsurface soil, groundwater, surface water, and sediment samples from AFFF Area 7 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 7.

As discussed in Section 4.7, individual and combined PFOA and PFOS concentrations detected in one or more groundwater samples exceeded the screening level. Based on the analytical results, a release of AFFF has been confirmed at AFFF Area 7 that has impacted shallow groundwater. However, in the absence of a downgradient drinking water well within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Sections 5.7, the surface water sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating that surface water has not been impacted by an AFFF release. In the absence of target analyte concentrations above the screening levels, the human exposure pathways for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.7, the surface soil and sediment analytical results indicate that concentrations of the target analytes were below the screening levels, indicating that surface soil and sediment have not been impacted by an AFFF release. However, PFOS was detected above the screening level in one subsurface soil sample, indicating subsurface soil at AFFF Area 7 has been impacted by an AFFF release. Although current land use does not involve any human health exposures, workers could be exposed to AFFF-impacted subsurface soil during excavations or other ground disturbing activities.

Based on the analytical results and potential exposure pathways, AFFF Area 7 is recommended for a remedial investigation.

8.8 FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)

The Fire Prevention Headquarters building is a former aircraft assembly facility that includes an active AFFF fire suppression system. On at least one occasion, a fire suppression system pipe froze and ruptured, releasing an unknown volume of AFFF inside the building. The AFFF was washed out of the building and into the surrounding soil. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Surface soil, subsurface soil, and groundwater samples from AFFF Area 8 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 8.

As discussed in Section 4.8, individual and combined PFOA and PFOS concentrations detected in groundwater samples exceeded the screening level, indicating that shallow groundwater has been impacted by an AFFF release. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Section 5.8, although surface water was not sampled, UCMR3 data for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating the human exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.8, the subsurface soil sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating subsurface soil has not been impacted by an AFFF release. However, PFOS was detected above the screening level in surface soil, indicating the surface soil has been impacted by an AFFF release. Although current land use does not involve any human health exposures, workers could be exposed to AFFF-impacted subsurface soil during excavations or other ground disturbing activities.

Based on the analytical results and potential exposure pathways, AFFF Area 8 is recommended for a remedial investigation.

8.9 INDUSTRIAL WASTEWATER TREATMENT PLANT (AFFF AREA 9)

The IWTP treats process wastewater collected from buildings throughout the North Campus. On at least one occasion, the aeration pond was inundated with AFFF foam, causing foam to settle on the surrounding soil. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Groundwater, surface water, and sediment samples from AFFF Area 9 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 9.

As discussed in Section 4.9, individual and combined PFOA and PFOS concentrations detected in groundwater samples exceeded the screening level, indicating that shallow groundwater has been impacted by an AFFF release. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Section 5.9, individual and combined PFOA and PFOS concentrations exceeded the screening levels in surface water. Based on the analytical results, a release of AFFF at AFFF Area 9 is confirmed that has impacted surface water. The Atlanta Water Intake is approximately 12.1 miles downstream from AFFF Area 2. However, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating the human exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.9, the sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating sediment has not been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 9 is recommended for a remedial investigation.

8.10 SANITARY WASTEWATER TREATMENT PLANT (AFFF AREA 10)

The WWTP treats effluent from the IWTP, which may have contained AFFF. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns and the groundwater flow direction. Surface soil, subsurface soil, groundwater, surface water, and sediment samples from AFFF Area 10 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 10.

As discussed in Section 4.10, individual and combined PFOA and PFOS concentrations detected in groundwater samples exceeded the screening level, indicating that shallow groundwater has been impacted by an AFFF release. However, in the absence of downgradient drinking water wells within 4 miles of the area, the human exposure pathway for groundwater is incomplete and not an immediate threat to human health.

As discussed in Section 5.10, PFOS and the combined PFOA and PFOS concentrations detected in surface water samples exceeded the screening level, indicating that surface water has been impacted by an AFFF release. However, in the absence of a downstream surface water intake within 15 miles of AFFF Area 10, the human health exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.10, the subsurface soil and sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating neither subsurface soil nor sediment have been impacted by an AFFF release. However, PFOS was detected above the screening level in surface soil, indicating the surface soil has been impacted by an AFFF release. Although current land use does not involve any human health exposures, workers could be exposed to AFFF-impacted surface soil during excavations or other ground disturbing activities.

Based on the analytical results and potential exposure pathways, AFFF Area 10 is recommended for a remedial investigation.

8.11 OUTFALL 1 (AFFF AREA 11)

Outfall 1 is the NPDES-permitted stormwater outfall for Drainage Area 1. No known AFFF releases have occurred at the outfall location. However, AFFF releases that have occurred within Drainage Area 1 may have resulted in an AFFF release from the outfall. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns. Surface water and sediment samples from AFFF Area 11 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 11.

As discussed in Section 4.11, groundwater is not a media of concern at AFFF Area 11 because the area is a surface water outfall.

As discussed in Sections 5.11 and 6.11 respectively, the surface water and sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating that neither surface water nor sediment have been impacted by an AFFF release. In the absence of target analyte concentrations above the screening levels, the human health exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

Based on the analytical results and potential exposure pathways, AFFF Area 11 is recommended for No Further Response Action Planned.

8.12 OUTFALL 2 (AFFF AREA 12)

Outfall 2 is the NPDES-permitted stormwater outfall for Drainage Area 2. No known AFFF releases have occurred at the outfall location. However, AFFF releases have occurred within Drainage Area 2 that may have resulted in an AFFF release from the outfall. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns. Surface water and sediment samples from AFFF Area 12 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 12.

As discussed in Section 4.12, groundwater is not a media of concern at AFFF Area 12 because the area is a surface water outfall.

As discussed in Sections 5.12, individual and combined PFOA and PFOS concentrations detected in surface water samples exceeded the screening level, indicating that surface water has been impacted by an AFFF release. The Atlanta Water Intake is approximately 11.1 miles downstream from AFFF Area 12; however, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating the human exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.12, the sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating that sediment has not been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 12 is recommended for a remedial investigation.

8.13 OUTFALL 5 (AFFF AREA 13)

Outfall 5 is the NPDES-permitted stormwater outfall for Drainage Area 5. No known AFFF releases have occurred at the outfall location. However, AFFF releases within Drainage Area 5 may have resulted in an AFFF release from the outfall. Samples were collected in the areas most likely for PFAS contamination to be detected based on surface drainage patterns. Surface water and sediment samples from AFFF Area 13 were analyzed for PFBS, PFOA, and PFOS. Table 47 summarizes the concentrations of PFBS, PFOA, and PFOS detected in the samples from AFFF Area 13.

As discussed in Section 4.13, groundwater is not a media of concern at AFFF Area 13 because the area is a surface water outfall.

As discussed in Sections 5.13, individual and the combined PFOA and PFOS concentrations detected in surface water samples exceeded the screening level, indicating that surface water has been impacted by an AFFF release. The Atlanta Water Intake is approximately 9.5 miles downstream from AFFF Area 13; however, UCMR3 sampling for the Chattahoochee and Hemphill Water Plants did not detect PFBS, PFOA, or PFOS in the treated drinking water, indicating the human exposure pathway for ingestion of surface water is incomplete and not an immediate threat to human health.

As discussed in Section 6.12, the sediment sample analytical results indicate that concentrations of the target analytes were below the screening levels, indicating that sediment has not been impacted by an AFFF release.

Based on the analytical results and potential exposure pathways, AFFF Area 13 is recommended for a remedial investigation.

Table 47 Summary of Analytical Results and Screening Level Exceedances

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration^1	Screening Value	Units	No. Exceedances/ No. of Samples^2	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
Structural Fire Training Area (B-64) (AFFF Area 1)	FT-08 (FPTA is SWMU 8 and FPTA is SWMU 50)	**Surface Soil**						No^3	Advance area to a Remedial Investigation
		PFBS	N/D	130,000	µg/kg	0/5	No		
		PFOA	3.3	126	µg/kg	0/5	No		
		PFOS	9.3	126	µg/kg	0/5	No		
		Subsurface Soil							
		PFBS	N/D	130,000	µg/kg	0/3	No		
		PFOA	N/D	126	µg/kg	0/3	No		
		PFOS	N/D	126	µg/kg	0/3	No		
AFFF Spray Test Area (AFFF Area 2)	New Site	**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	N/D	130,000	µg/kg	0/4	No		
		PFOA	27	126	µg/kg	0/4	No		
		PFOS	**2,800**	126	µg/kg	**2/4**	**Yes**		
		Subsurface Soil							
		PFBS	1.9	130,000	µg/kg	0/3	No		
		PFOA	13	126	µg/kg	0/3	No		
		PFOS	7.3	126	µg/kg	0/3	No		
		Groundwater							
		PFBS	23	40	µg/L	0/3	No		
		PFOA	**57**	0.07	µg/L	**3/3**	**Yes**		
		PFOS	**41**	0.07	µg/L	**2/3**	**Yes**		
		PFOA+PFOS	**98**	0.07	µg/L	**3/3**	**Yes**		
		Surface Water							
		PFBS	0.88	40	µg/L	0/1	No		
		PFOA	**2.1**	0.07	µg/L	**1/1**	**Yes**		
		PFOS	**1.9**	0.07	µg/L	**1/1**	**Yes**		
		PFOA+PFOS	**4.0**	0.07	µg/L	**1/1**	**Yes**		
		Sediment							

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration[1]	Screening Value	Units	No. Exceedances/ No. of Samples[2]	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	0.60 J	126	µg/kg	0/1	No		
		PFOS	1.0 J	126	µg/kg	0/1	No		
Hangar T-728, Corporate Hangar (AFFF Area 3)	New Site	**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	3.2	126	µg/kg	0/1	No		
		PFOS	6.1	126	µg/kg	0/1	No		
		Subsurface Soil							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	N/D	126	µg/kg	0/1	No		
		PFOS	N/D	126	µg/kg	0/1	No		
		Groundwater							
		PFBS	0.061	40	µg/L	0/2	No		
		PFOA	**0.32**	0.07	µg/L	**2/2**	**Yes**		
		PFOS	0.038	0.07	µg/L	0/2	No		
		PFOA+PFOS	**0.345**	0.07	µg/L	**2/2**	**Yes**		
		Surface Water							
		PFBS	0.034	40	µg/L	0/1	No		
		PFOA	0.030	0.07	µg/L	0/1	No		
		PFOS	0.011 J	0.07	µg/L	0/1	No		
		PFOA+PFOS	0.041 J	0.07	µg/L	0/1	No		
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	N/D	126	µg/kg	0/1	No		
		PFOS	0.69 J	126	µg/kg	0/1	No		
Fire Station #1 (B-4)		**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	1.7	130,000	µg/kg	0/3	No		
		PFOA	24	126	µg/kg	0/3	No		
		PFOS	100	126	µg/kg	0/3	No		

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration^1	Screening Value	Units	No. Exceedances/ No. of Samples^2	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
(AFFF Area 4)		**Subsurface Soil**							
		PFBS	1.6	130,000	μg/kg	0/3	No		
		PFOA	N/D	126	μg/kg	0/3	No		
		PFOS	0.74 J	126	μg/kg	0/3	No		
		Groundwater							
		PFBS	1.7	40	μg/L	0/3	No		
		PFOA	**1.5**	0.07	μg/L	**3/3**	**Yes**		
		PFOS	**1.1**	0.07	μg/L	**3/3**	**Yes**		
		PFOA+PFOS	**1.75**	0.07	μg/L	**3/3**	**Yes**		
Fire Station #2 (B-69) (AFFF Area 5)	New Site	**Surface Water**						No	No Further Response Action Planned
		PFBS	0.0081 J	40	μg/L	0/1	No		
		PFOA	N/D	0.07	μg/L	0/1	No		
		PFOS	N/D	0.07	μg/L	0/1	No		
		PFOA+PFOS	N/D	0.07	μg/L	0/1	No		
		Sediment							
		PFBS	N/D	130,000	μg/kg	0/1	No		
		PFOA	N/D	126	μg/kg	0/1	No		
		PFOS	N/D	126	μg/kg	0/1	No		
C-5 Engine Fire (AFFF Area 6)	New Site	**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	N/D	130,000	μg/kg	0/3	No		
		PFOA	0.52 J	126	μg/kg	0/3	No		
		PFOS	23	126	μg/kg	0/3	No		
		Subsurface Soil							
		PFBS	N/D	130,000	μg/kg	0/3	No		
		PFOA	0.84 J	126	μg/kg	0/3	No		
		PFOS	N/D	126	μg/kg	0/3	No		
		Groundwater							
		PFBS	0.028	40	μg/L	0/3	No		
		PFOA	**1.9**	0.07	μg/L	**2/3**	**Yes**		

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration[1]	Screening Value	Units	No. Exceedances/ No. of Samples[2]	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
		PFOS	0.0094 J	0.07	µg/L	0/3	No		
		PFOA+PFOS	**1.9094 J**	0.07	µg/L	**2/3**	**Yes**		
		Surface Water							
		PFBS	N/D	40	µg/L	0/1	No		
		PFOA	**0.22**	0.07	µg/L	**1/1**	**Yes**		
		PFOS	0.0082 J	0.07	µg/L	0/1	No		
		PFOA+PFOS	**0.22**	0.07	µg/L	**1/1**	**Yes**		
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	0.45 J	126	µg/kg	0/1	No		
		PFOS	N/D	126	µg/kg	0/1	No		
C-5 Fuel System Test Facility (B-96) (AFFF Area 7)	New Site	**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	N/D	130,000	µg/kg	0/3	No		
		PFOA	7.4	126	µg/kg	0/3	No		
		PFOS	15	126	µg/kg	0/3	No		
		Subsurface Soil							
		PFBS	1.7	130,000	µg/kg	0/3	No		
		PFOA	38	126	µg/kg	0/3	No		
		PFOS	**570**	126	µg/kg	**1/3**	**Yes**		
		Groundwater							
		PFBS	N/D	40	µg/L	0/3	No		
		PFOA	**0.31**	0.07	µg/L	**3/3**	**Yes**		
		PFOS	**0.077**	0.07	µg/L	**1/3**	**Yes**		
		PFOA+PFOS	**0.362**	0.07	µg/L	**3/3**	**Yes**		
		Surface Water							
		PFBS	N/D	40	µg/L	0/1	No		
		PFOA	0.048	0.07	µg/L	0/1	No		
		PFOS	0.011 J	0.07	µg/L	0/1	No		
		PFOA+PFOS	0.059 J	0.07	µg/L	0/1	No		

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration[1]	Screening Value	Units	No. Exceedances/ No. of Samples[2]	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	3.6	126	µg/kg	0/1	No		
		PFOS	9.8	126	µg/kg	0/1	No		
Fire Prevention Headquarters (B-102) (AFFF Area 8)	CG-705	**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	N/D	130,000	µg/kg	0/4	No		
		PFOA	5.8	126	µg/kg	0/4	No		
		PFOS	**420**	126	µg/kg	**1/4**	**Yes**		
		Subsurface Soil							
		PFBS	N/D	130,000	µg/kg	0/3	No		
		PFOA	N/D	126	µg/kg	0/3	No		
		PFOS	N/D	126	µg/kg	0/3	No		
		Groundwater							
		PFBS	0.17	40	µg/L	0/3	No		
		PFOA	**0.67**	0.07	µg/L	**2/3**	**Yes**		
		PFOS	**1.8**	0.07	µg/L	**3/3**	**Yes**		
		PFOA+PFOS	**2.47**	0.07	µg/L	**3/3**	**Yes**		
Industrial Wastewater Treatment Plant (AFFF Area 9)	WP-006	**Groundwater**						No	Advance area to a Remedial Investigation
		PFBS	0.30	40	µg/L	0/3	No		
		PFOA	**0.80**	0.07	µg/L	**3/3**	**Yes**		
		PFOS	**2.4**	0.07	µg/L	**3/3**	**Yes**		
		PFOA+PFOS	**3.12**	0.07	µg/L	**3/3**	**Yes**		
		Surface Water							
		PFBS	0.084	40	µg/L	0/2	No		
		PFOA	**0.21**	0.07	µg/L	**1/2**	**Yes**		
		PFOS	**0.084**	0.07	µg/L	**1/2**	**Yes**		
		PFOA+PFOS	**0.255**	0.07	µg/L	**2/2**	**Yes**		
		Sediment							
		PFBS	0.83 J	130,000	µg/kg	0/2	No		

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration[1]	Screening Value	Units	No. Exceedances/ No. of Samples[2]	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
		PFOA	0.93 J	126	µg/kg	0/2	No		
		PFOS	9.9	126	µg/kg	0/2	No		
Sanitary Wastewater Treatment Plant (AFFF Area 10)	New Site	**Surface Soil**						No	Advance area to a Remedial Investigation
		PFBS	0.39 J	130,000	µg/kg	0/4	No		
		PFOA	3.7	126	µg/kg	0/4	No		
		PFOS	**160 J**	126	µg/kg	**2/4**	**Yes**		
		Subsurface Soil							
		PFBS	N/D	130,000	µg/kg	0/4	No		
		PFOA	N/D	126	µg/kg	0/4	No		
		PFOS	10	126	µg/kg	0/4	No		
		Groundwater							
		PFBS	0.25	40	µg/L	0/4	No		
		PFOA	**0.40**	0.07	µg/L	**4/4**	**Yes**		
		PFOS	**2.1**	0.07	µg/L	**4/4**	**Yes**		
		PFOA+PFOS	**2.25**	0.07	µg/L	**4/4**	**Yes**		
		Surface Water							
		PFBS	0.028	40	µg/L	0/1	No		
		PFOA	0.055	0.07	µg/L	0/1	No		
		PFOS	**0.18 J**	0.07	µg/L	**1/1**	**Yes**		
		PFOA+PFOS	**0.235 J**	0.07	µg/L	**1/1**	**Yes**		
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	N/D	126	µg/kg	0/1	No		
		PFOS	0.99 J	126	µg/kg	0/1	No		
Outfall 1 (AFFF Area 11)	AOC-9	**Surface Water**						No	No Further Response Action Planned
		PFBS	N/D	40	µg/L	0/1	No		
		PFOA	0.014 J	0.07	µg/L	0/1	No		
		PFOS	0.0062 J	0.07	µg/L	0/1	No		
		PFOA+PFOS	0.0202 J	0.07	µg/L	0/1	No		

AFFF Area	Associated Existing ERP Site	Parameter	Maximum Detected Concentration[1]	Screening Value	Units	No. Exceedances/ No. of Samples[2]	Exceeds Screening Criteria	Potentially Complete Drinking Water Exposure Pathway	Recommendations
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	N/D	126	µg/kg	0/1	No		
		PFOS	N/D	126	µg/kg	0/1	No		
Outfall 2 (AFFF Area 12)	SD-005	**Surface Water**						No	Advance area to a Remedial Investigation
		PFBS	0.087	40	µg/L	0/1	No		
		PFOA	**0.67**	0.07	µg/L	**1/1**	**Yes**		
		PFOS	**0.49**	0.07	µg/L	**1/1**	**Yes**		
		PFOA+PFOS	**1.16**	0.07	µg/L	**1/1**	**Yes**		
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	N/D	126	µg/kg	0/1	No		
		PFOS	3.6	126	µg/kg	0/1	No		
Outfall 5 (AFFF Area 13)	New Site	**Surface Water**						No	Advance area to a Remedial Investigation
		PFBS	0.095	40	µg/L	0/1	No		
		PFOA	**0.24**	0.07	µg/L	**1/1**	**Yes**		
		PFOS	**0.15**	0.07	µg/L	**1/1**	**Yes**		
		PFOA+PFOS	**0.39**	0.07	µg/L	**1/1**	**Yes**		
		Sediment							
		PFBS	N/D	130,000	µg/kg	0/1	No		
		PFOA	N/D	126	µg/kg	0/1	No		
		PFOS	N/D	126	µg/kg	0/1	No		

[1] The maximum PFOA + PFOS concentration shown is the highest combined PFOA and PFOS concentration detected in a specific groundwater sample and may not be the sum of the individual maximum PFOA and PFOS concentrations listed because they occurred in two separate samples.

[2] The number of samples does not include the field duplicate unless the field duplicate has a higher result than the primary sample; if the field duplicate is higher, then that result is used.

[3] Although groundwater was not sampled, in the absence of drinking water wells within 4 miles of the area, the groundwater exposure pathway for a human ingestion scenario is incomplete based on the current drinking water receptors..

Bold values exceed screening levels.

µg/kg = micrograms per kilogram
ERP = Installation Restoration Program
PFBS = Perfluorobutane sulfonate
µg/L = micrograms per liter
J = estimated value
PFOA = Perfluorooctanoic acid
AFFF = aqueous film forming foam
ND = not detected at the method detection limit
PFOS = Perfluorooctane sulfonate

9.0 REFERENCES

Aerostar SES LLC (ASL), January 2016. *Final Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the United States.*

ASL, November 2017. *Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for Site Inspections of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States, Addendum 19, Field Sampling Plan for Air Force Plant 6, Cobb County, Georgia.*

ASL, February 2017. *Final Preliminary Assessment Report for Perfluorinated Compounds at Air Force Plant 6, Cobb County, Georgia.*

CH2M Hill, October 2015. *Final Preliminary Assessment Report for Perfluorinated Compounds at Dobbins Air Reserve Base, Marietta, Georgia.*

United States Environmental Protection Agency (EPA), March 2001. *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5. EPA/240/B-01/003).

EPA, June 2008. *National Functional Guidelines for Superfund Organic Methods Data Review. Final. USEPA Contract Laboratory Program* (OSWER 9240.1-48. USEPA-540-R-08-01) (http://www.epa.gov/superfund/programs/clp/download/somnfg.pdf).

EPA, January 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (OSWER No. 9200.1-85. EPA 540-R-08-005).

EPA, January 2010. *National Functional Guidelines for Inorganic Superfund Data Review. Final. USEPA Contract Laboratory Program* (OSWER 9240.1-51. USEPA-540-R-10-011) (http://www.epa.gov/superfund/programs/clp/download/ism/ism1nfg.pdf).

EPA, March 2012. *Uniform Federal Policy for Quality Assurance Project Plans Workbook.*

EPA, July 2014. Provisional Peer-Review Toxicity Values for Perfluorobutane Sulfonate (CASRN 375-73-5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420-49-3) Superfund Health Risk Technical Support Center, National Center for Environmental Assessment, Office of Research and Development.

EPA, May 2016a. *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA).*

EPA, May 2016b. *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).*

EPA, June 2017, EPA Regional Screening Level calculator (https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search).

U.S. Army Corps of Engineers (USACE), February 2001. *Requirements for the Preparation of Sampling and Analysis Plans* (CEMP-RA Engineer Manual 200-1-3).

USACE Savannah District, August 2015. *Performance Work Statement for Site Investigations of Fire Fighting Foam Usage at Various Air Force Bases in the Eastern United States.*

Appendix A

AFFF Area-Specific Figures

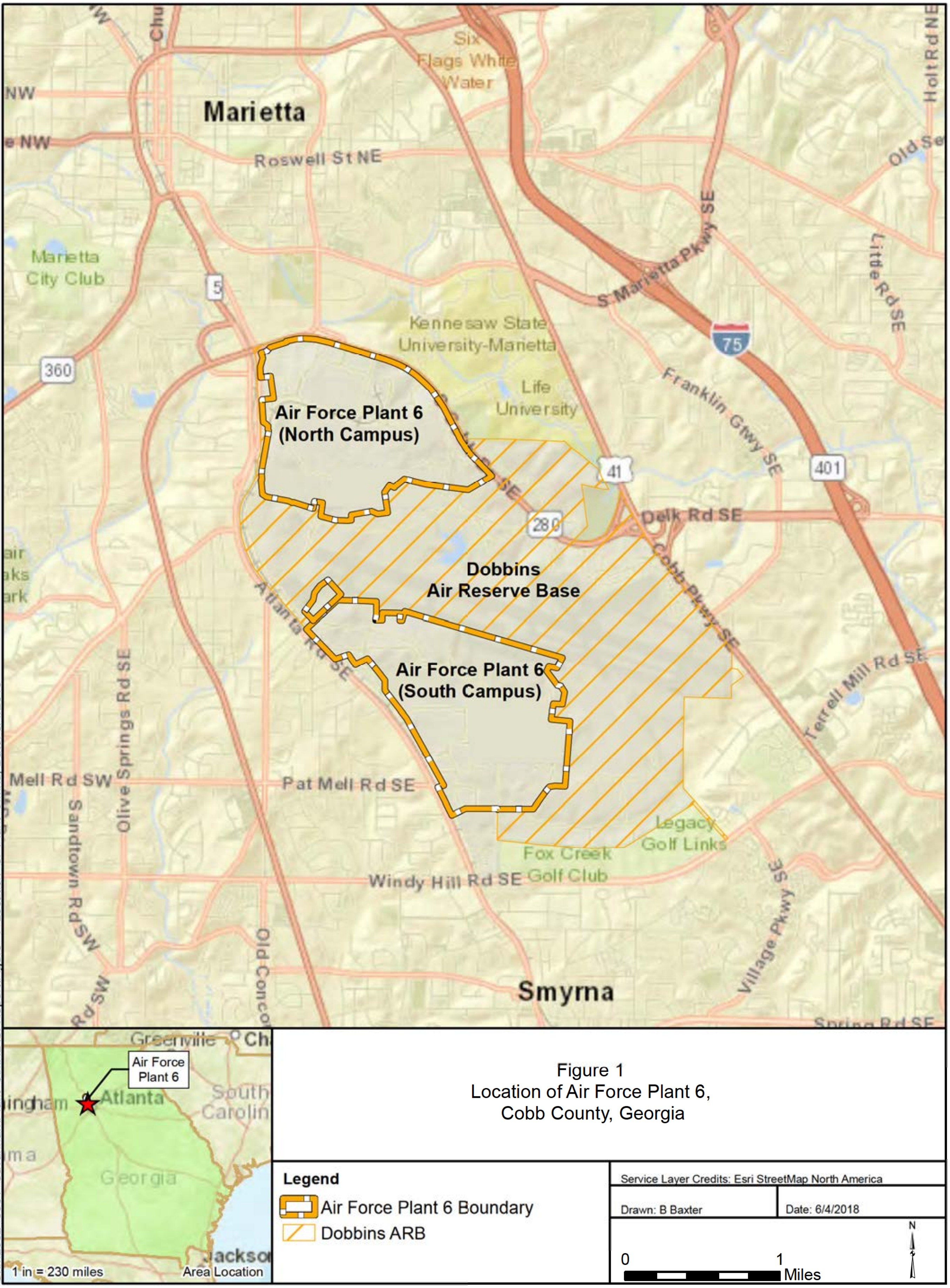


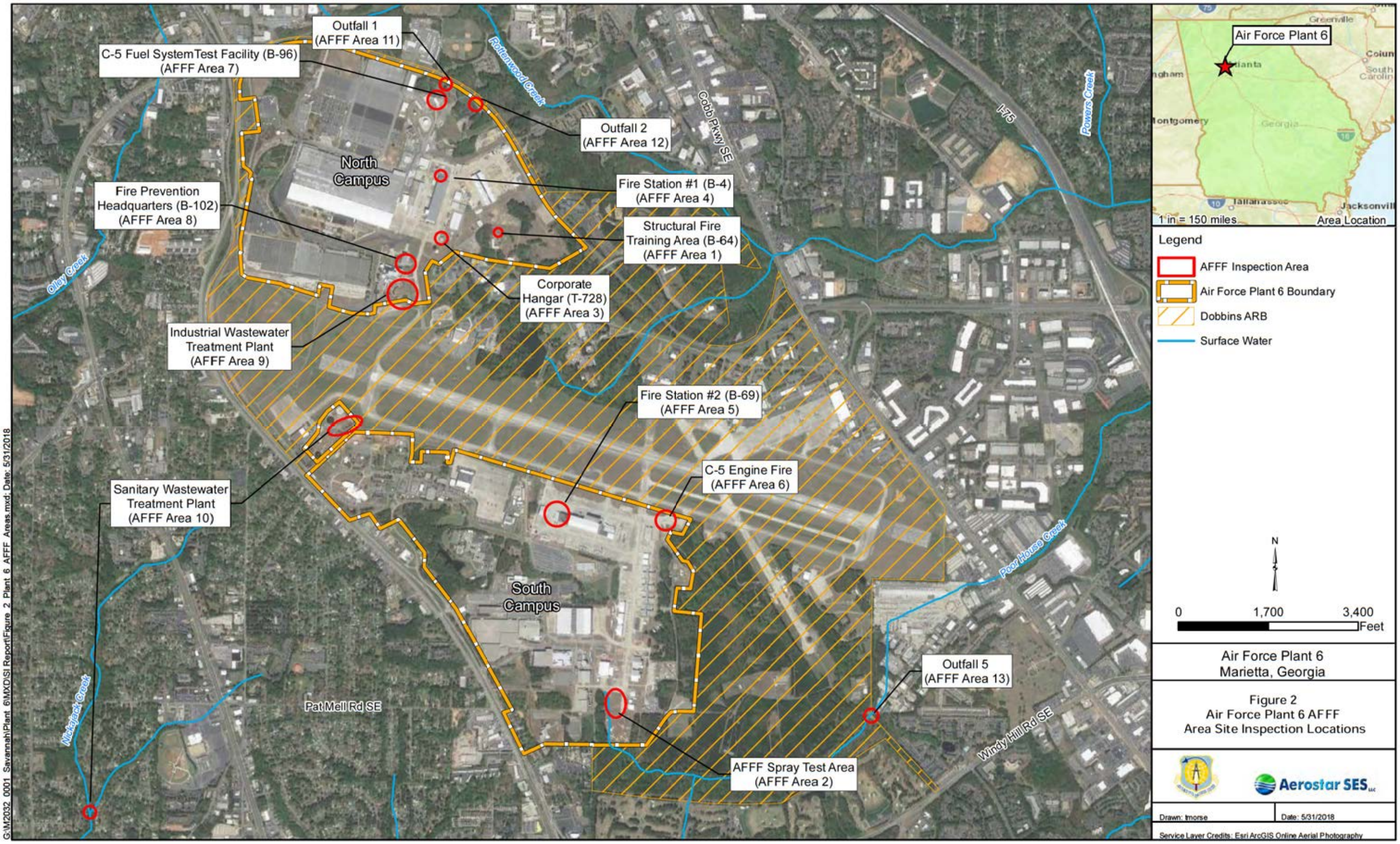
Figure 1
Location of Air Force Plant 6,
Cobb County, Georgia

Service Layer Credits: Esri StreetMap North America

Drawn: B Baxter

Date: 6/4/2018

G:\M2032_0001_Savannah\Plant 6\MXD\SI Report\Figure 1 Location of Plant 6.mxd; Date: 6/4/2018



Legend

🟥	AFFF Inspection Area
🟧	Air Force Plant 6 Boundary
▨	Dobbins ARB
—	Surface Water

Air Force Plant 6
Marietta, Georgia

Figure 2
Air Force Plant 6 AFFF
Area Site Inspection Locations

Drawn: lmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

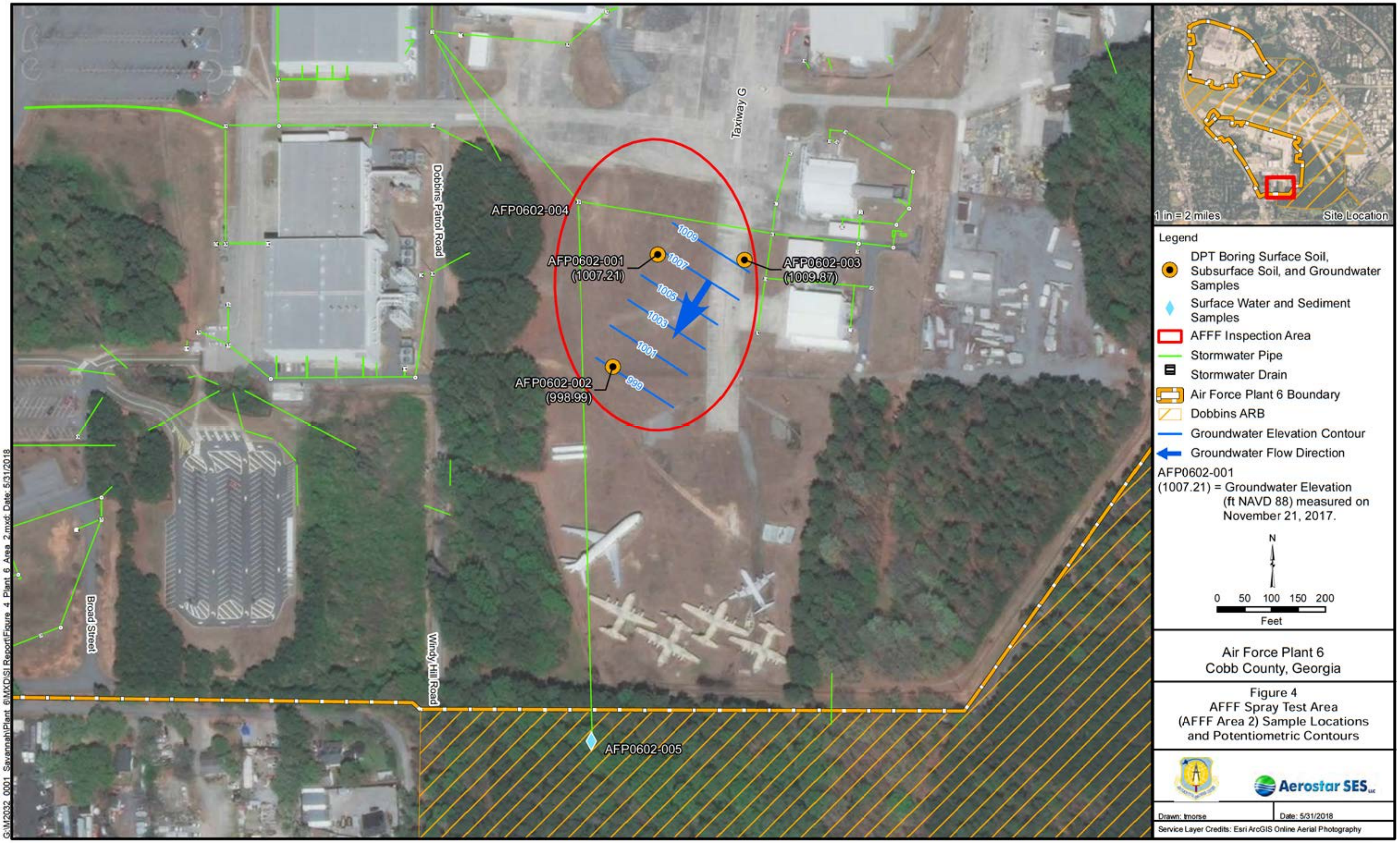
G:\M2032_0001_Savannah\Plant 6\MXD\SI Report\Figure 2 Plant 6 AFFF Areas.mxd; Date: 5/31/2018

Note: * Soil boring did not encounter groundwater.

Air Force Plant 6
Cobb County, Georgia

Figure 3
Structural Fire Training Area (B-64)
(AFFF Area 1) Sample Locations

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_3_Plant_6_Area_1.mxd; Date: 5/31/2018

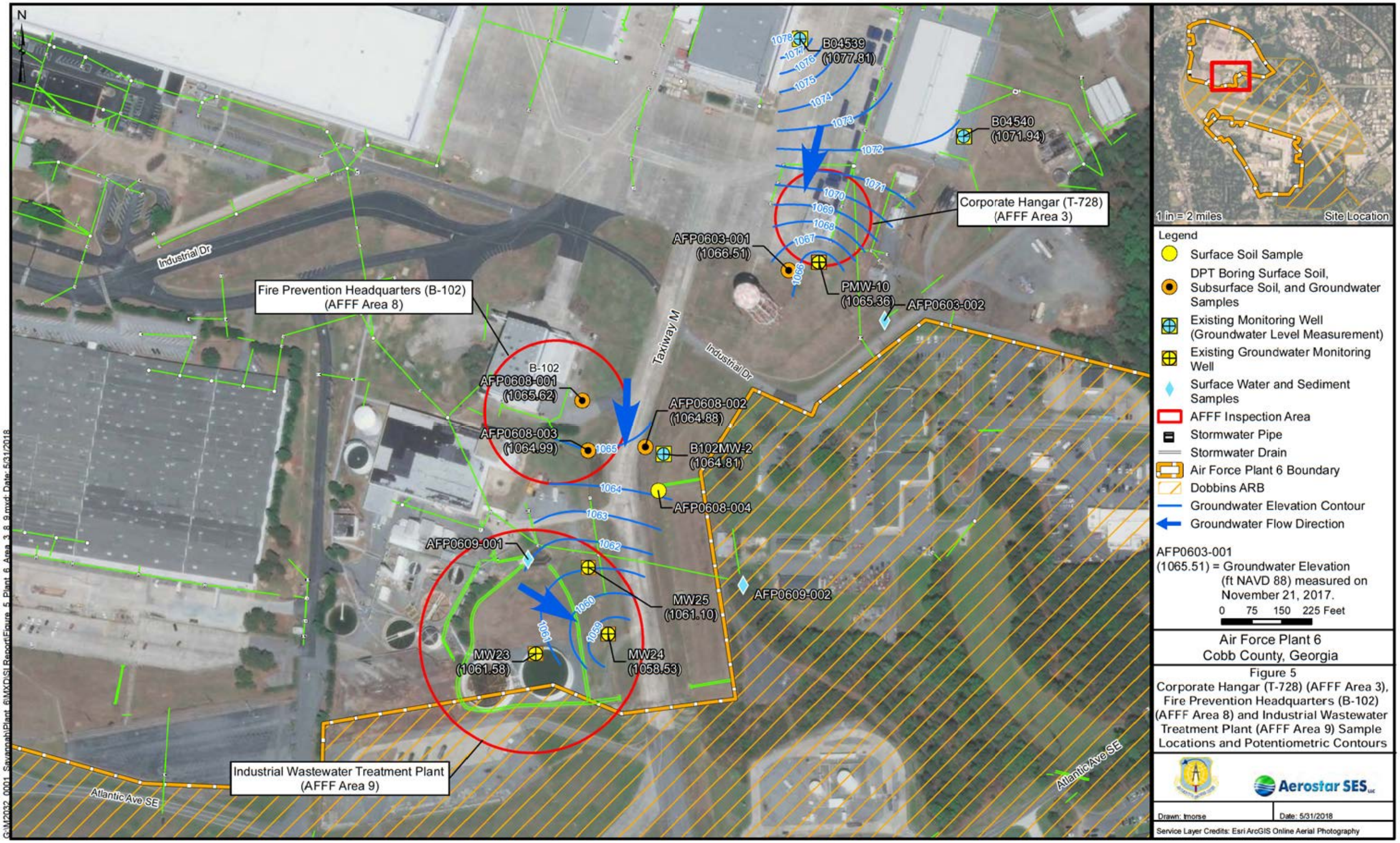


Air Force Plant 6
Cobb County, Georgia

Figure 4
AFFF Spray Test Area
(AFFF Area 2) Sample Locations
and Potentiometric Contours

Drawn: lmorse
Date: 5/31/2018
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant 6\MXD\SI Report\Figure 4 Plant 6 Area 2.mxd; Date: 5/31/2018



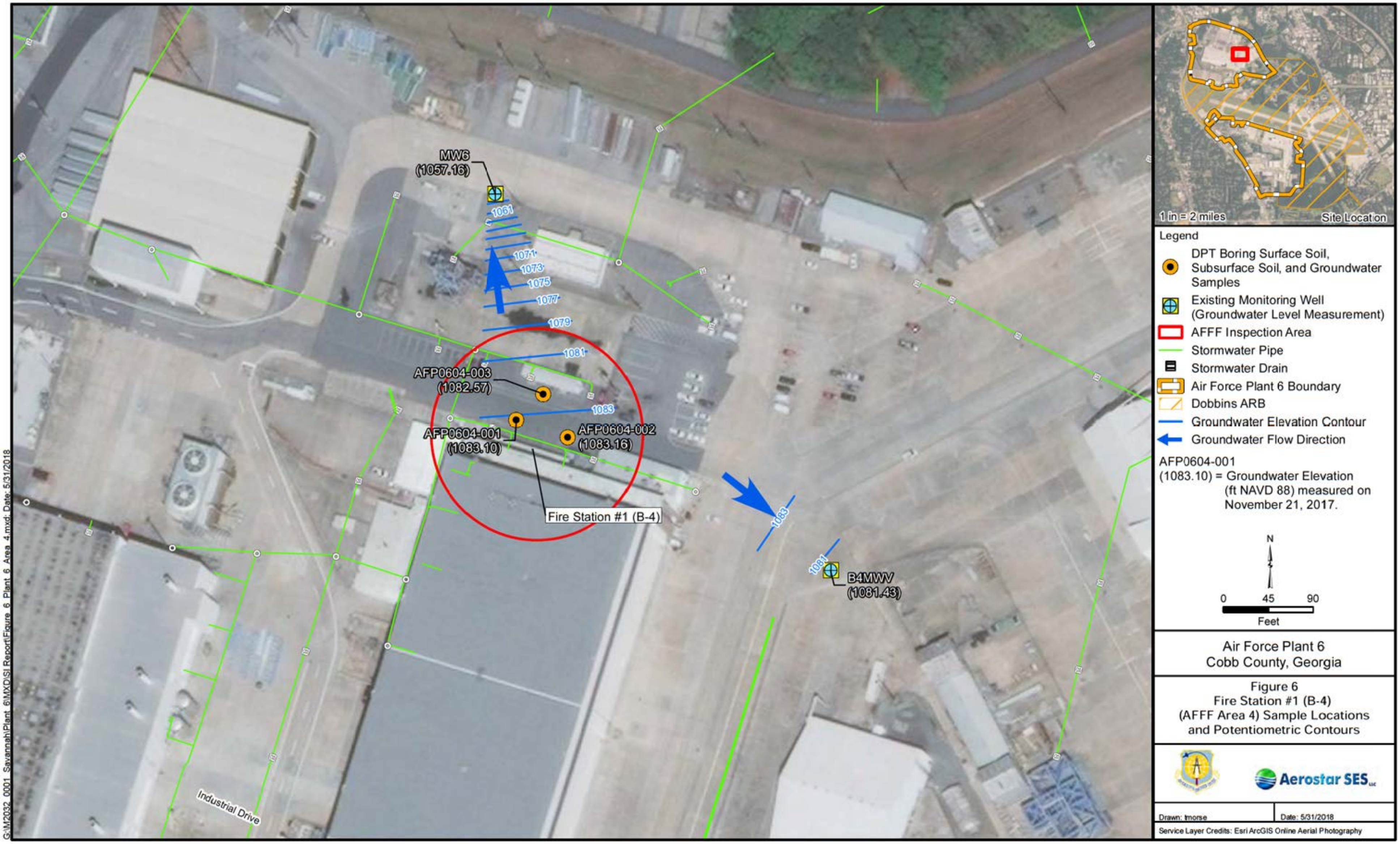
Air Force Plant 6
Cobb County, Georgia

Figure 5
Corporate Hangar (T-728) (AFFF Area 3), Fire Prevention Headquarters (B-102) (AFFF Area 8) and Industrial Wastewater Treatment Plant (AFFF Area 9) Sample Locations and Potentiometric Contours

Drawn: lmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_5_Plant_6_Area_3_8_9.mxd; Date: 5/31/2018



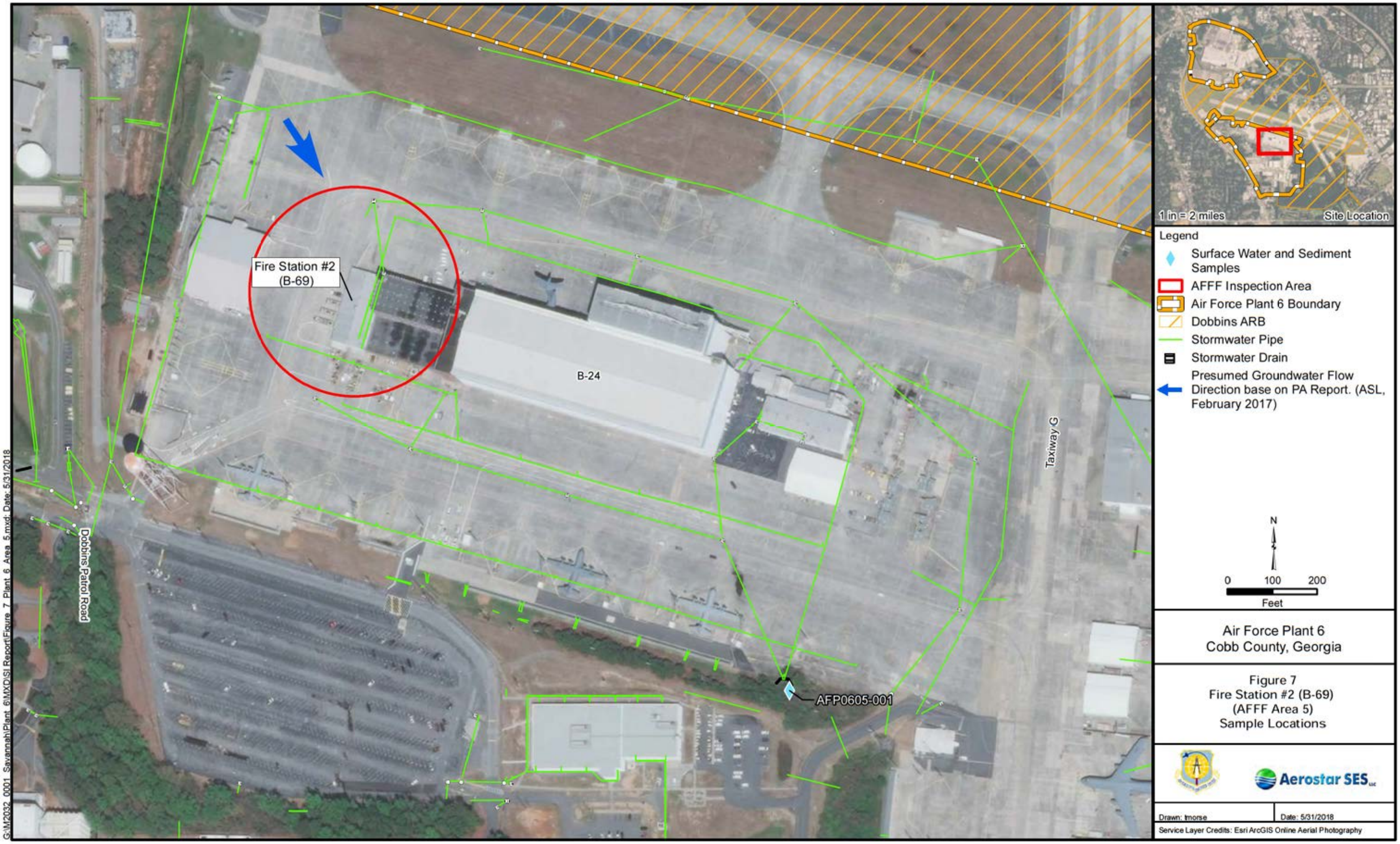
Air Force Plant 6
Cobb County, Georgia

Figure 6
Fire Station #1 (B-4)
(AFFF Area 4) Sample Locations
and Potentiometric Contours

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032 0001 Savannah\Plant 6\MXD\SI Report\Figure 6 Plant 6 Area 4.mxd; Date: 5/31/2018



Legend

- 🔷 Surface Water and Sediment Samples
- 🟥 AFFF Inspection Area
- Air Force Plant 6 Boundary
- ▨ Dobbins ARB
- Stormwater Pipe
- ▣ Stormwater Drain
- ← Presumed Groundwater Flow Direction base on PA Report. (ASL, February 2017)

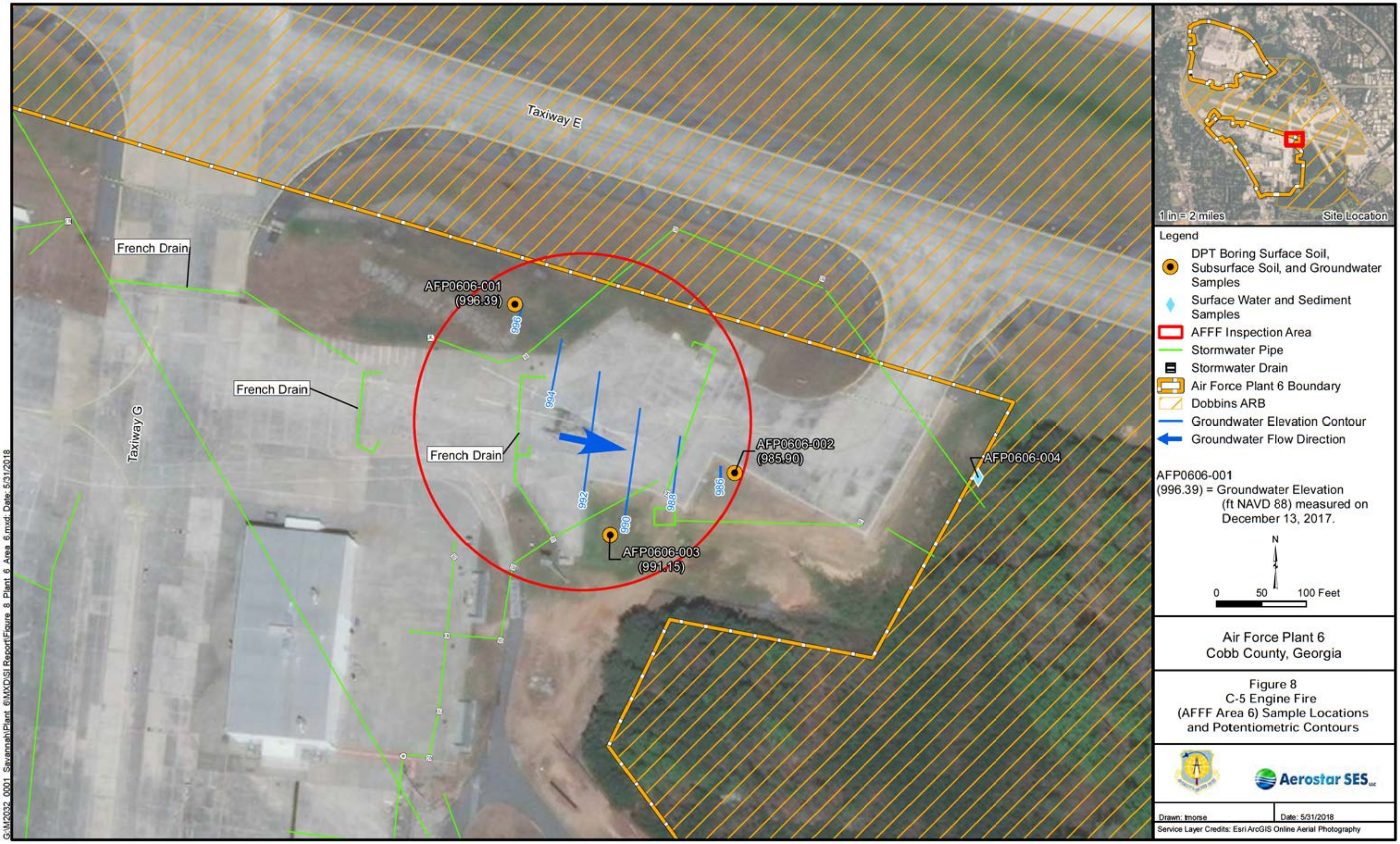
Air Force Plant 6
Cobb County, Georgia

Figure 7
Fire Station #2 (B-69)
(AFFF Area 5)
Sample Locations

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant 6\MXD\SI Report\Figure_7_Plant_6_Area_5.mxd; Date: 5/31/2018



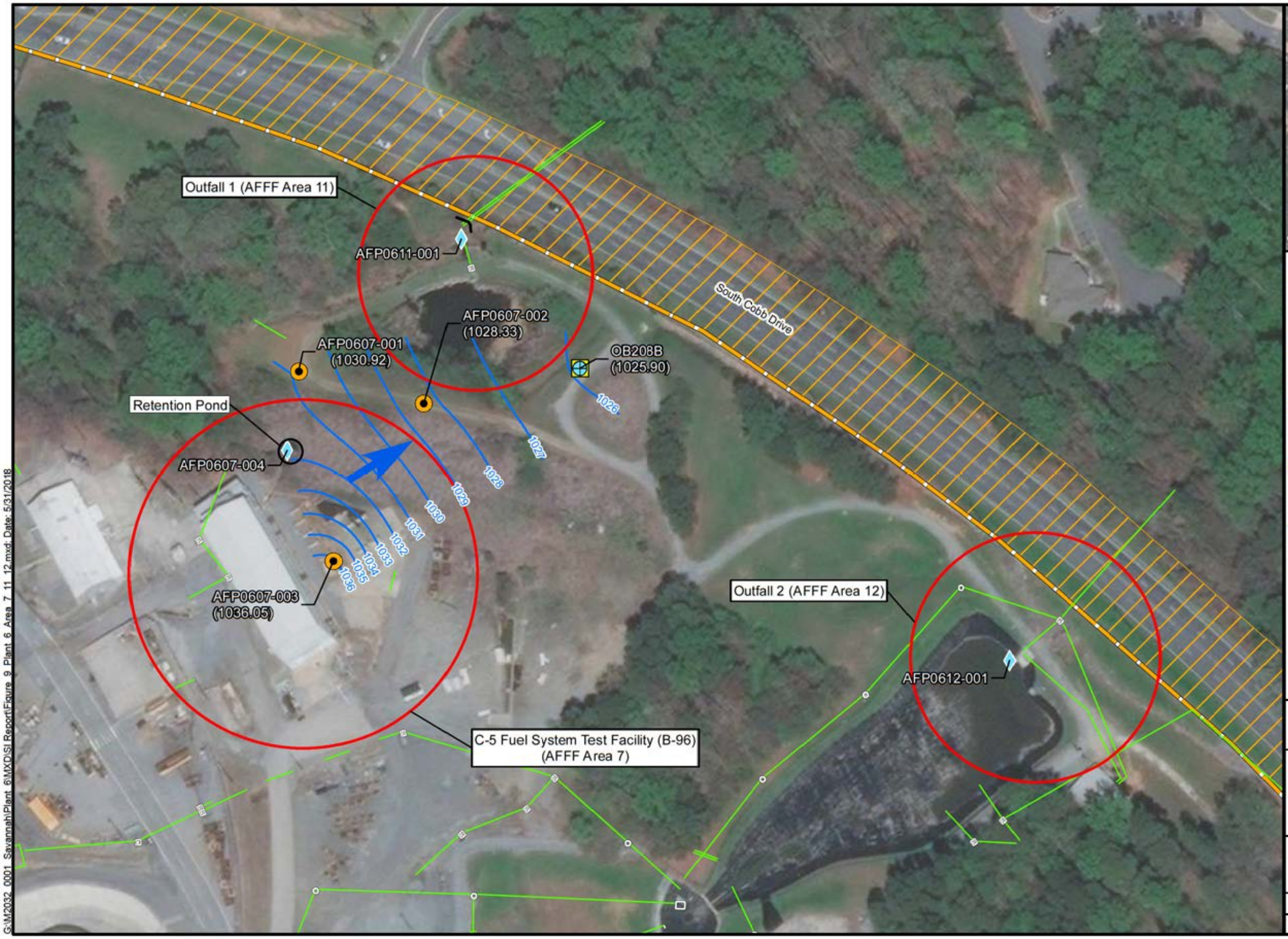
Air Force Plant 6
Cobb County, Georgia

Figure 8
C-5 Engine Fire
(AFFF Area 6) Sample Locations
and Potentiometric Contours

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_8_Plant_6_Area_6.mxd; Date: 5/31/2018



Legend

- ● DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- ⊕ Existing Monitoring Well (Groundwater Level Measurement)
- ◆ Surface Water and Sediment Samples
- ▭ AFFF Inspection Area
- ─ Stormwater Pipe
- ▬ Stormwater Drain
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB
- ─ Groundwater Elevation Contour
- ← Groundwater Flow Direction

AFP0607-001
(1030.92) = Groundwater Elevation (ft NAVD 88) measured on November 21, 2017.

N

0 50 100 Feet

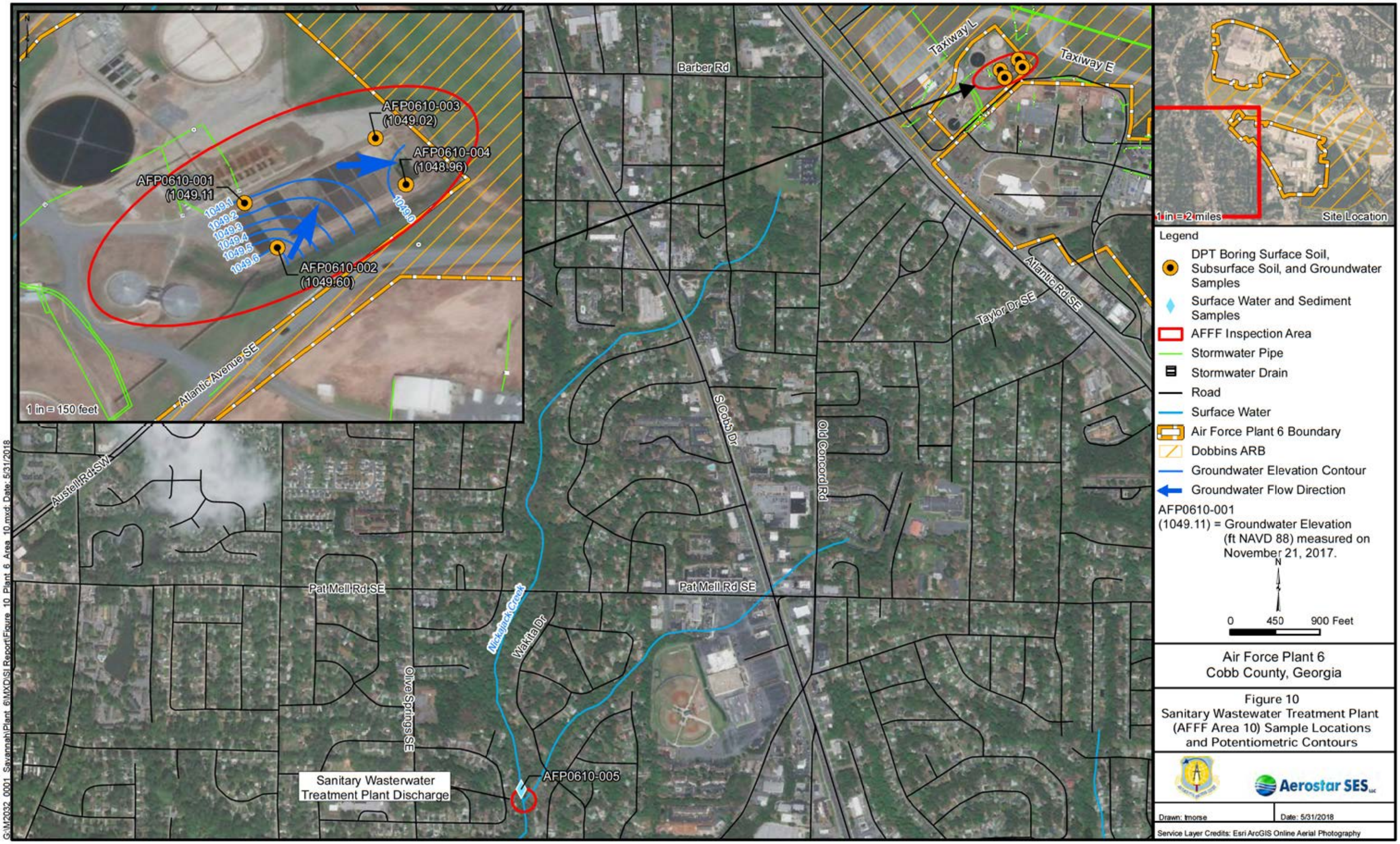
Air Force Plant 6
Cobb County, Georgia

Figure 9
C-5 Fuel System Test Facility (B-96) (AFFF Area 7), Outfall 1 (AFFF Area 11), and Outfall 2 (AFFF Area 12) Sample Locations and Potentiometric Contours

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_9_Plant_6_Area_7_11_12.mxd; Date: 5/31/2018



Air Force Plant 6
Cobb County, Georgia

Figure 10
Sanitary Wastewater Treatment Plant
(AFFF Area 10) Sample Locations
and Potentiometric Contours

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018

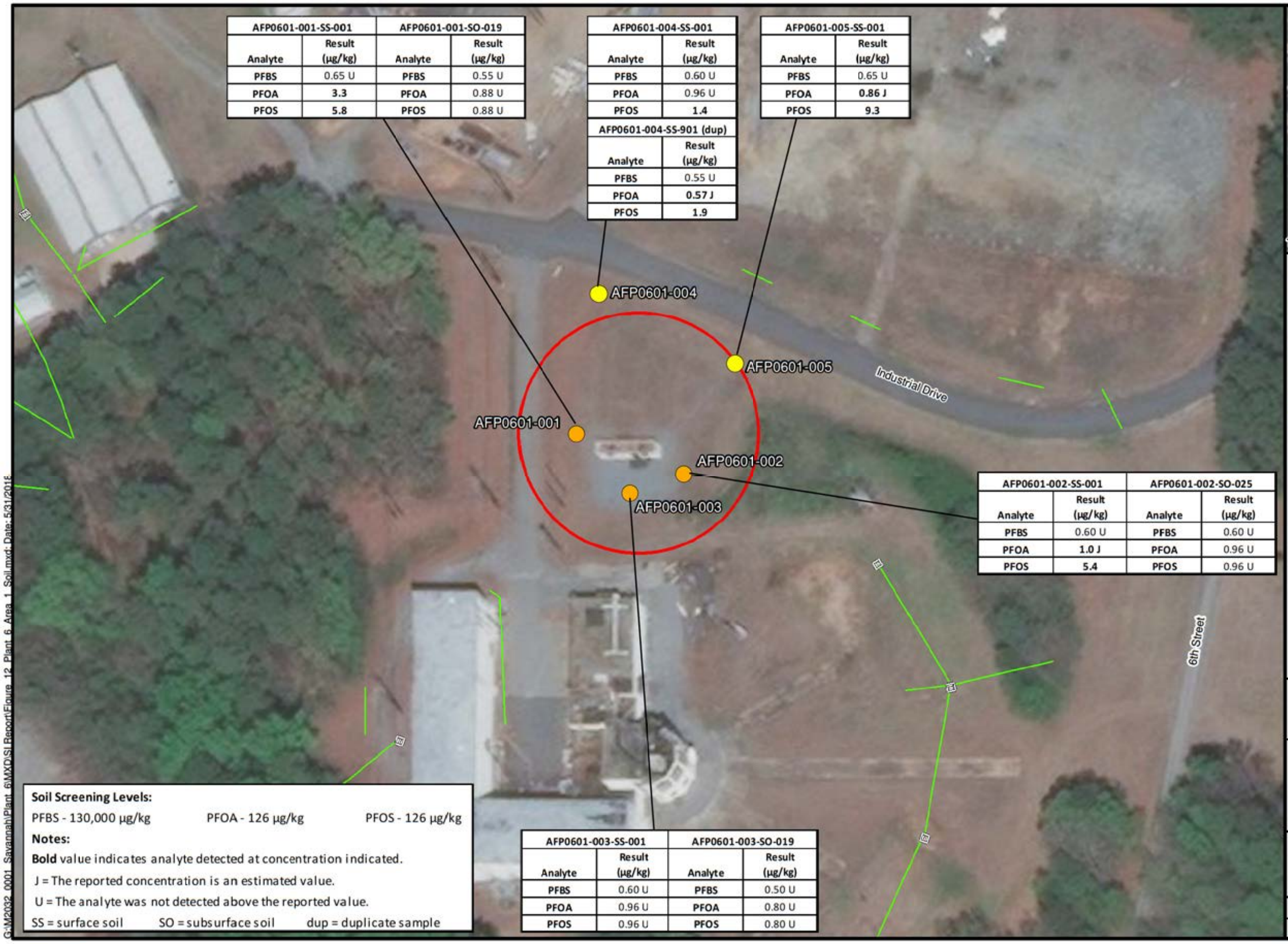
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_10_Plant_6_Area_10.mxd; Date: 5/31/2018

Air Force Plant 6
Cobb County, Georgia

Figure 11
Outfall 5
(AFFF Area 13)
Sample Locations

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_11_Plant_6_Area_13.mxd; Date: 5/31/2018



AFP0601-001-SS-001		AFP0601-001-SO-019	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.65 U	PFBS	0.55 U
PFOA	**3.3**	PFOA	0.88 U
PFOS	**5.8**	PFOS	0.88 U

AFP0601-004-SS-001	
Analyte	Result (µg/kg)
PFBS	0.60 U
PFOA	0.96 U
PFOS	**1.4**

AFP0601-004-SS-901 (dup)	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	**0.57 J**
PFOS	**1.9**

AFP0601-005-SS-001	
Analyte	Result (µg/kg)
PFBS	0.65 U
PFOA	**0.86 J**
PFOS	**9.3**

AFP0601-002-SS-001		AFP0601-002-SO-025	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.60 U	PFBS	0.60 U
PFOA	**1.0 J**	PFOA	0.96 U
PFOS	**5.4**	PFOS	0.96 U

AFP0601-003-SS-001		AFP0601-003-SO-019	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.60 U	PFBS	0.50 U
PFOA	0.96 U	PFOA	0.80 U
PFOS	0.96 U	PFOS	0.80 U

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SS = surface soil SO = subsurface soil dup = duplicate sample

Legend

- ● Surface Soil Sample
- ● DPT Boring Surface Soil, Subsurface Soil Samples
- ☐ AFFF Inspection Area
- Stormwater Pipe
- ■ Stormwater Drain
- Air Force Plant 6 Boundary
- ▨ Dobbins ARB

N

0 25 50 75 100
Feet

Air Force Plant 6
Cobb County, Georgia

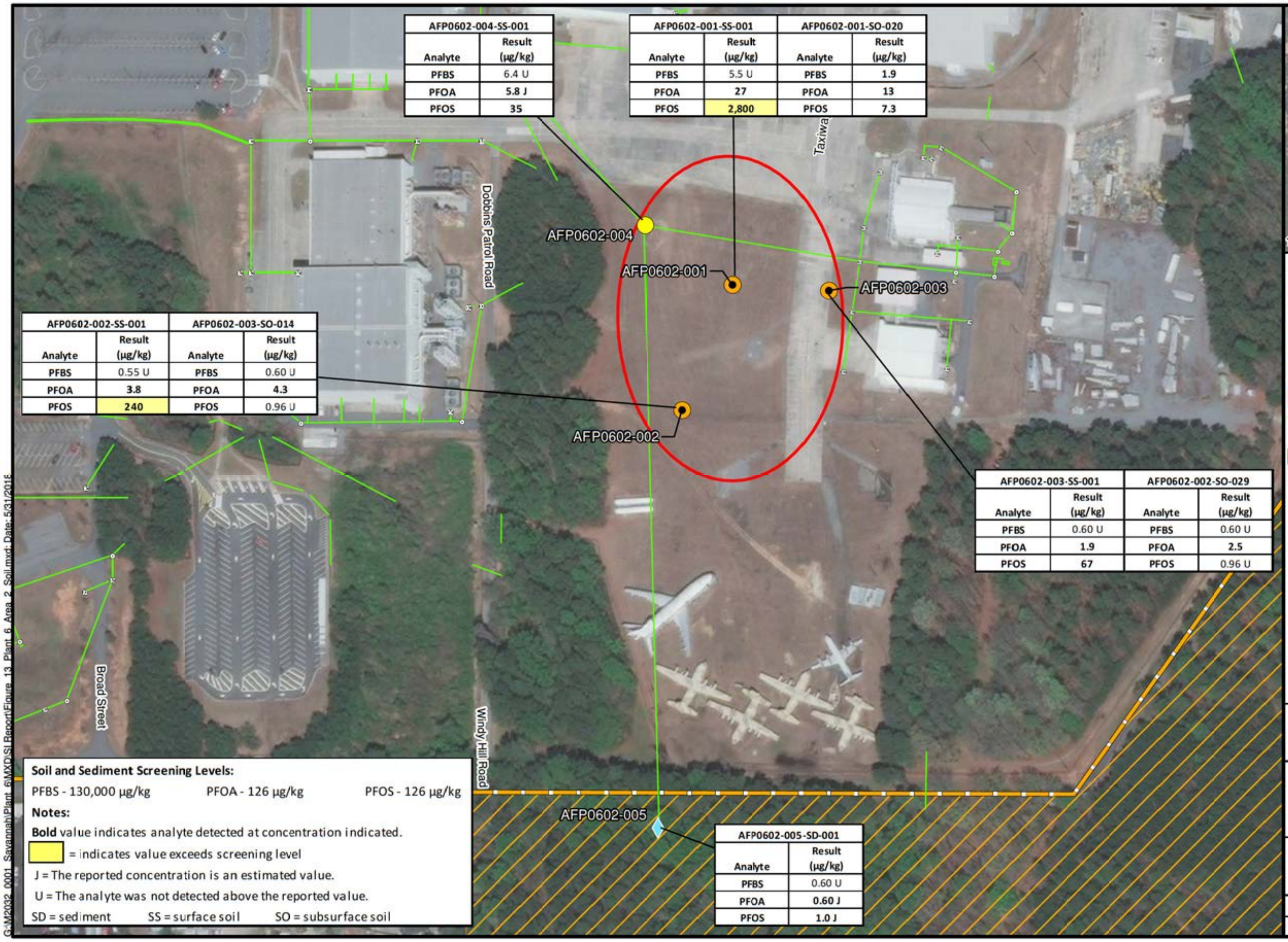
Figure 12
Structural Fire Training Area (B-64) (AFFF Area 1) - PFBS, PFOA, and PFOS in Soil

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_12_Plant_6_Area_1_Soil.mxd; Date: 5/31/2018



AFP0602-004-SS-001	
Analyte	Result (µg/kg)
PFBS	6.4 U
PFOA	5.8 J
PFOS	**35**

AFP0602-001-SS-001		AFP0602-001-SO-020	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	5.5 U	PFBS	**1.9**
PFOA	**27**	PFOA	**13**
PFOS	**2,800**	PFOS	**7.3**

AFP0602-002-SS-001		AFP0602-003-SO-014	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.55 U	PFBS	0.60 U
PFOA	**3.8**	PFOA	**4.3**
PFOS	**240**	PFOS	0.96 U

AFP0602-003-SS-001		AFP0602-002-SO-029	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.60 U	PFBS	0.60 U
PFOA	**1.9**	PFOA	**2.5**
PFOS	**67**	PFOS	0.96 U

AFP0602-005-SD-001	
Analyte	Result (µg/kg)
PFBS	0.60 U
PFOA	**0.60 J**
PFOS	**1.0 J**

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates value exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SD = sediment SS = surface soil SO = subsurface soil

Legend

- ● Surface Soil Sample
- ◉ DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- ♦ Surface Water and Sediment Samples
- ☐ AFFF Inspection Area
- — Stormwater Pipe
- ■ Stormwater Drain
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB

N

0 50 100 150 200
Feet

Air Force Plant 6
Cobb County, Georgia

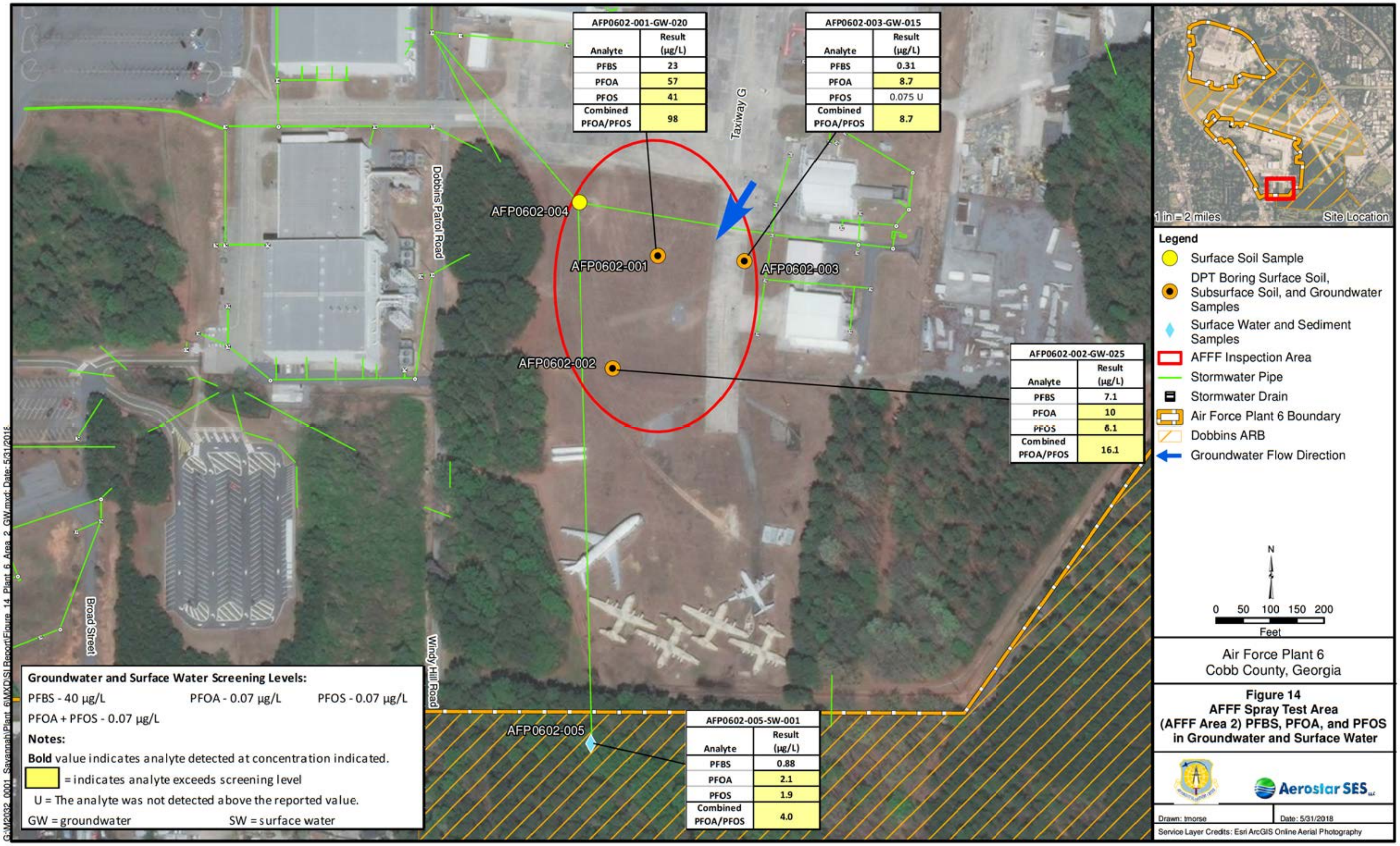
Figure 13
AFFF Spray Test Area (AFFF Area 2) PFBS, PFOA, and PFOS in Soil and Sediment

Aerostar SES LLC

Drawn: tmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_13_Plant_6_Area_2_Soil.mxd; Date: 5/31/2018



AFP0602-001-GW-020

Analyte	Result (µg/L)
PFBS	23
PFOA	57
PFOS	41
Combined PFOA/PFOS	98

AFP0602-003-GW-015

Analyte	Result (µg/L)
PFBS	0.31
PFOA	8.7
PFOS	0.075 U
Combined PFOA/PFOS	8.7

AFP0602-002-GW-025

Analyte	Result (µg/L)
PFBS	7.1
PFOA	10
PFOS	6.1
Combined PFOA/PFOS	16.1

AFP0602-005-SW-001

Analyte	Result (µg/L)
PFBS	0.88
PFOA	2.1
PFOS	1.9
Combined PFOA/PFOS	4.0

Legend

○	Surface Soil Sample
●	DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
◆	Surface Water and Sediment Samples
☐	AFFF Inspection Area
—	Stormwater Pipe
■	Stormwater Drain
☐	Air Force Plant 6 Boundary
▨	Dobbins ARB
←	Groundwater Flow Direction

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

U = The analyte was not detected above the reported value.

GW = groundwater SW = surface water

Air Force Plant 6
Cobb County, Georgia

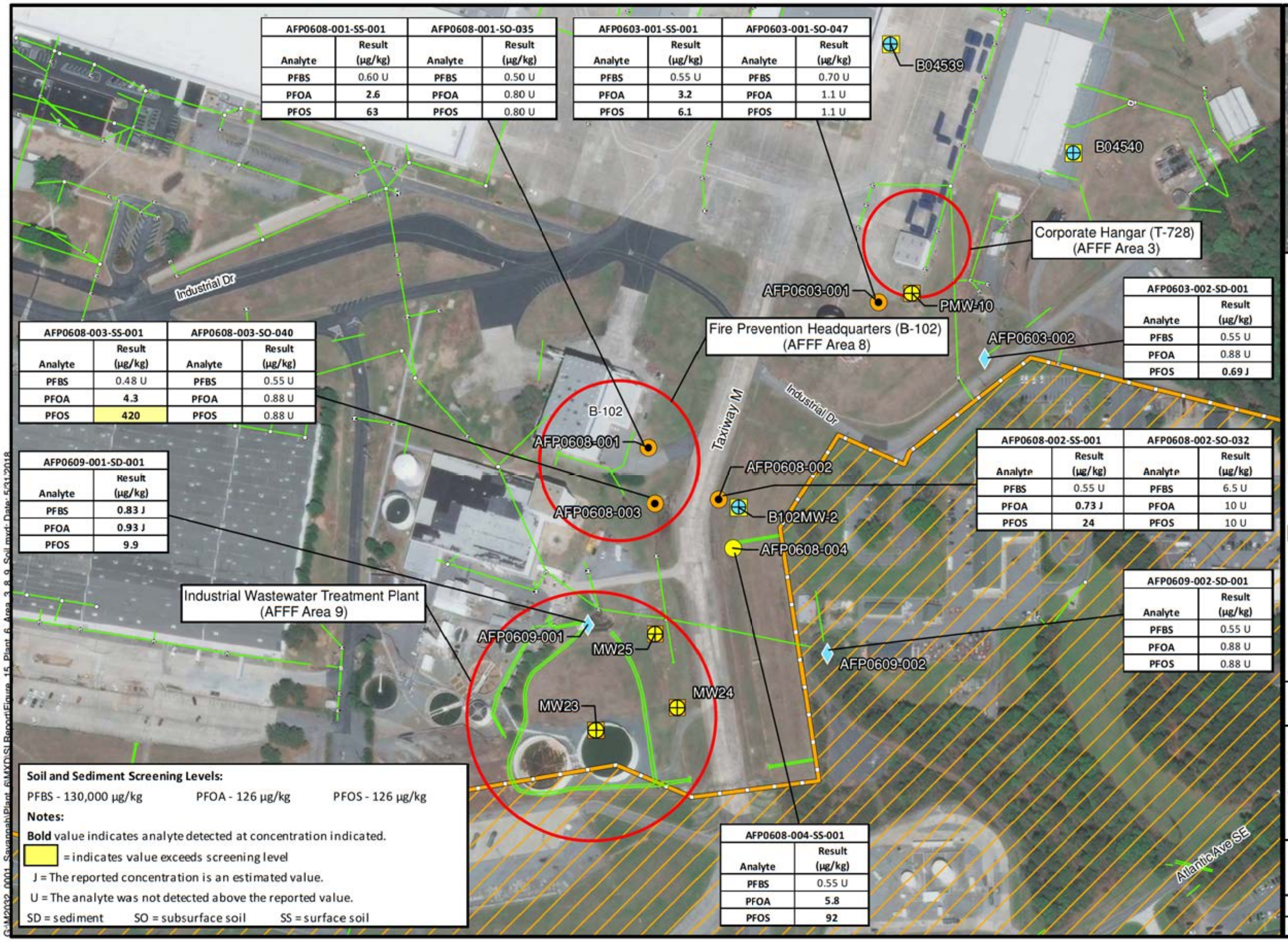
Figure 14
AFFF Spray Test Area
(AFFF Area 2) PFBS, PFOA, and PFOS
in Groundwater and Surface Water

Aerostar SES LLC

Drawn: tmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_14_Plant_6_Area_2_GW.mxd; Date: 5/31/2018



AFP0608-001-SS-001	
Analyte	Result (µg/kg)
PFBS	0.60 U
PFOA	**2.6**
PFOS	**63**

AFP0608-001-SO-035	
Analyte	Result (µg/kg)
PFBS	0.50 U
PFOA	0.80 U
PFOS	0.80 U

AFP0603-001-SS-001	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	**3.2**
PFOS	**6.1**

AFP0603-001-SO-047	
Analyte	Result (µg/kg)
PFBS	0.70 U
PFOA	1.1 U
PFOS	1.1 U

AFP0608-003-SS-001	
Analyte	Result (µg/kg)
PFBS	0.48 U
PFOA	**4.3**
PFOS	**420** 🟨

AFP0608-003-SO-040	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	0.88 U
PFOS	0.88 U

AFP0609-001-SD-001	
Analyte	Result (µg/kg)
PFBS	**0.83 J**
PFOA	**0.93 J**
PFOS	**9.9**

AFP0603-002-SD-001	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	0.88 U
PFOS	**0.69 J**

AFP0608-002-SS-001	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	**0.73 J**
PFOS	**24**

AFP0608-002-SO-032	
Analyte	Result (µg/kg)
PFBS	6.5 U
PFOA	10 U
PFOS	10 U

AFP0609-002-SD-001	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	0.88 U
PFOS	0.88 U

AFP0608-004-SS-001	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	**5.8**
PFOS	**92**

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates value exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SD = sediment SO = subsurface soil SS = surface soil

Legend

- ● Surface Soil Sample
- ● DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- ⊕ Existing Monitoring Well (Groundwater Level Measurement)
- ⊕ Existing Groundwater Monitoring Well
- ◆ Surface Water and Sediment Samples
- 🟥 AFFF Inspection Area
- — Stormwater Pipe
- ▬ Stormwater Drain
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB

N

0 75 150 225 Feet

Air Force Plant 6
Cobb County, Georgia

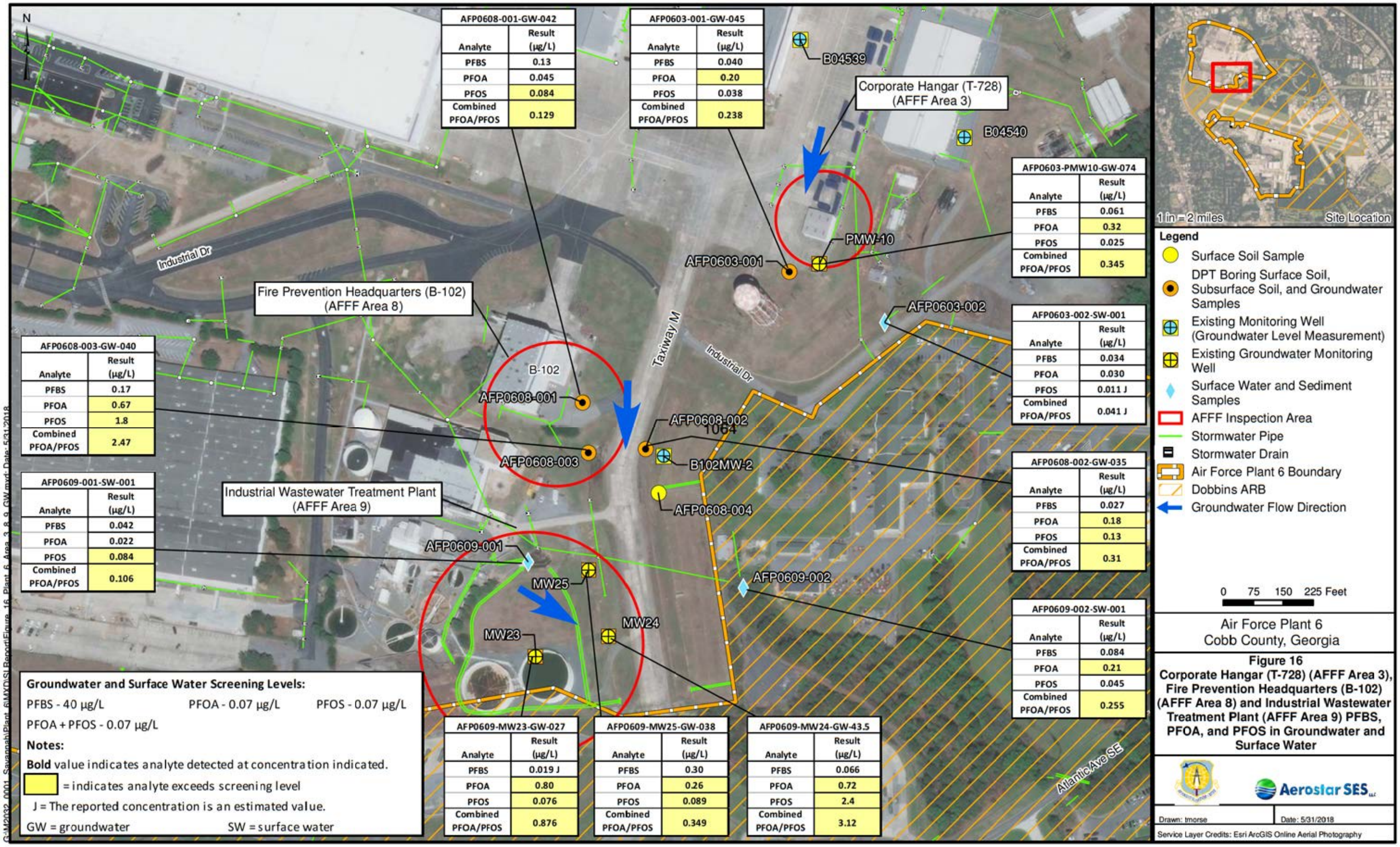
Figure 15
Corporate Hangar (T-728) (AFFF Area 3), Fire Prevention Headquarters (B-102) (AFFF Area 8) and Industrial Wastewater Treatment Plant (AFFF Area 9) PFBS, PFOA, and PFOS in Soil and Sediment

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_15_Plant_6_Area_3_8_9_Soil.mxd; Date: 5/31/2018



AFP0608-001-GW-042

Analyte	Result (µg/L)
PFBS	0.13
PFOA	0.045
PFOS	0.084
Combined PFOA/PFOS	0.129

AFP0603-001-GW-045

Analyte	Result (µg/L)
PFBS	0.040
PFOA	0.20
PFOS	0.038
Combined PFOA/PFOS	0.238

AFP0603-PMW10-GW-074

Analyte	Result (µg/L)
PFBS	0.061
PFOA	0.32
PFOS	0.025
Combined PFOA/PFOS	0.345

AFP0603-002-SW-001

Analyte	Result (µg/L)
PFBS	0.034
PFOA	0.030
PFOS	0.011 J
Combined PFOA/PFOS	0.041 J

AFP0608-003-GW-040

Analyte	Result (µg/L)
PFBS	0.17
PFOA	0.67
PFOS	1.8
Combined PFOA/PFOS	2.47

AFP0609-001-SW-001

Analyte	Result (µg/L)
PFBS	0.042
PFOA	0.022
PFOS	0.084
Combined PFOA/PFOS	0.106

AFP0608-002-GW-035

Analyte	Result (µg/L)
PFBS	0.027
PFOA	0.18
PFOS	0.13
Combined PFOA/PFOS	0.31

AFP0609-002-SW-001

Analyte	Result (µg/L)
PFBS	0.084
PFOA	0.21
PFOS	0.045
Combined PFOA/PFOS	0.255

AFP0609-MW23-GW-027

Analyte	Result (µg/L)
PFBS	0.019 J
PFOA	0.80
PFOS	0.076
Combined PFOA/PFOS	0.876

AFP0609-MW25-GW-038

Analyte	Result (µg/L)
PFBS	0.30
PFOA	0.26
PFOS	0.089
Combined PFOA/PFOS	0.349

AFP0609-MW24-GW-43.5

Analyte	Result (µg/L)
PFBS	0.066
PFOA	0.72
PFOS	2.4
Combined PFOA/PFOS	3.12

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

GW = groundwater SW = surface water

Legend

●	Surface Soil Sample
●	DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
⊕	Existing Monitoring Well (Groundwater Level Measurement)
⊕	Existing Groundwater Monitoring Well
◆	Surface Water and Sediment Samples
▭	AFFF Inspection Area
—	Stormwater Pipe
▪	Stormwater Drain
▭	Air Force Plant 6 Boundary
▨	Dobbins ARB
←	Groundwater Flow Direction

Air Force Plant 6
Cobb County, Georgia

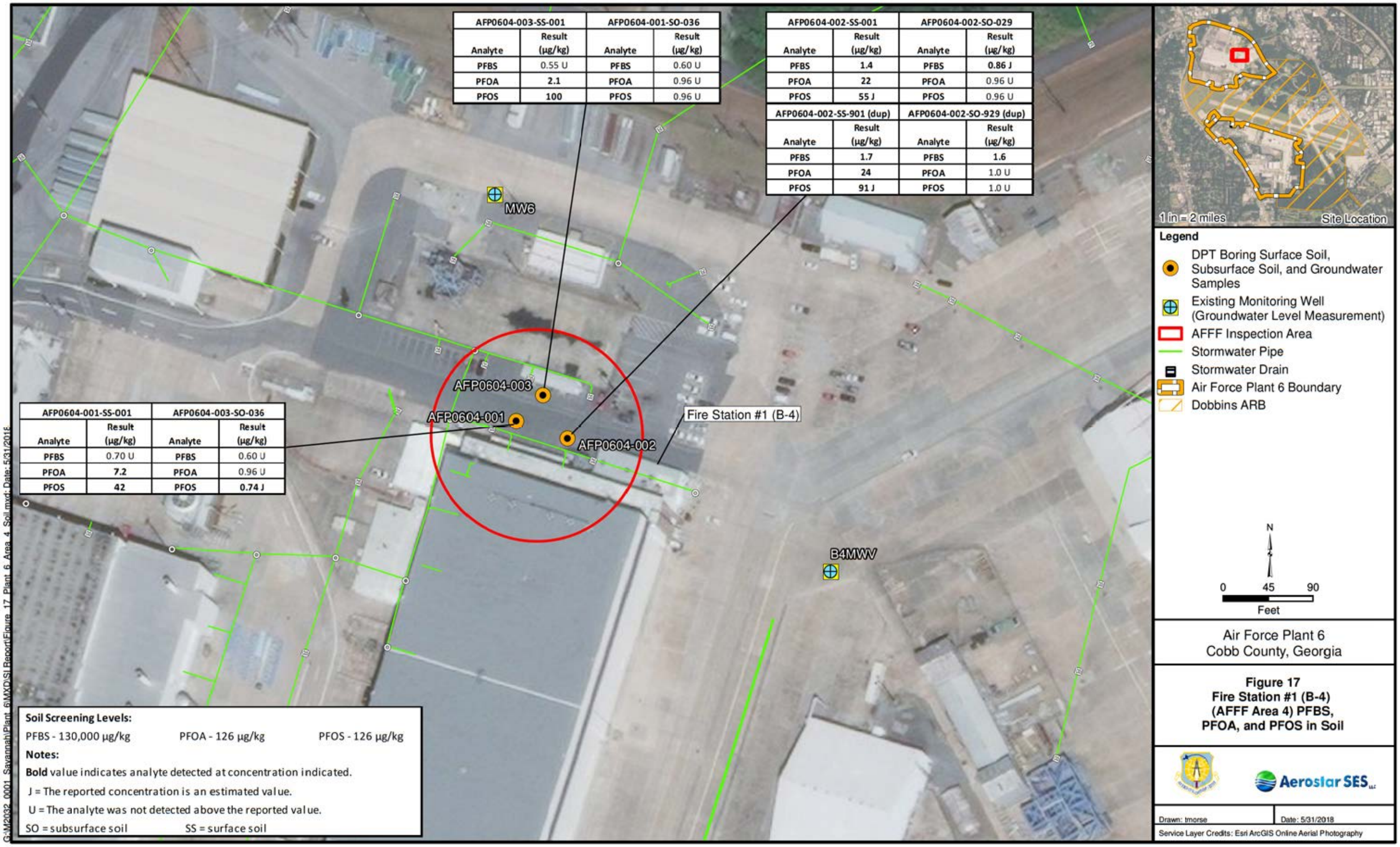
Figure 16
Corporate Hangar (T-728) (AFFF Area 3), Fire Prevention Headquarters (B-102) (AFFF Area 8) and Industrial Wastewater Treatment Plant (AFFF Area 9) PFBS, PFOA, and PFOS in Groundwater and Surface Water

Aerostar SES LLC

Drawn: lmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_16_Plant_6_Area_3_8_9_GW.mxd; Date: 5/31/2018



AFP0604-003-SS-001		AFP0604-001-SO-036	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.55 U	PFBS	0.60 U
PFOA	**2.1**	PFOA	0.96 U
PFOS	**100**	PFOS	0.96 U

AFP0604-002-SS-001		AFP0604-002-SO-029	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**1.4**	PFBS	**0.86 J**
PFOA	**22**	PFOA	0.96 U
PFOS	**55 J**	PFOS	0.96 U

AFP0604-002-SS-901 (dup)		AFP0604-002-SO-929 (dup)	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**1.7**	PFBS	**1.6**
PFOA	**24**	PFOA	1.0 U
PFOS	**91 J**	PFOS	1.0 U

AFP0604-001-SS-001		AFP0604-003-SO-036	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.70 U	PFBS	0.60 U
PFOA	**7.2**	PFOA	0.96 U
PFOS	**42**	PFOS	**0.74 J**

Soil Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SO = subsurface soil SS = surface soil

Air Force Plant 6
Cobb County, Georgia

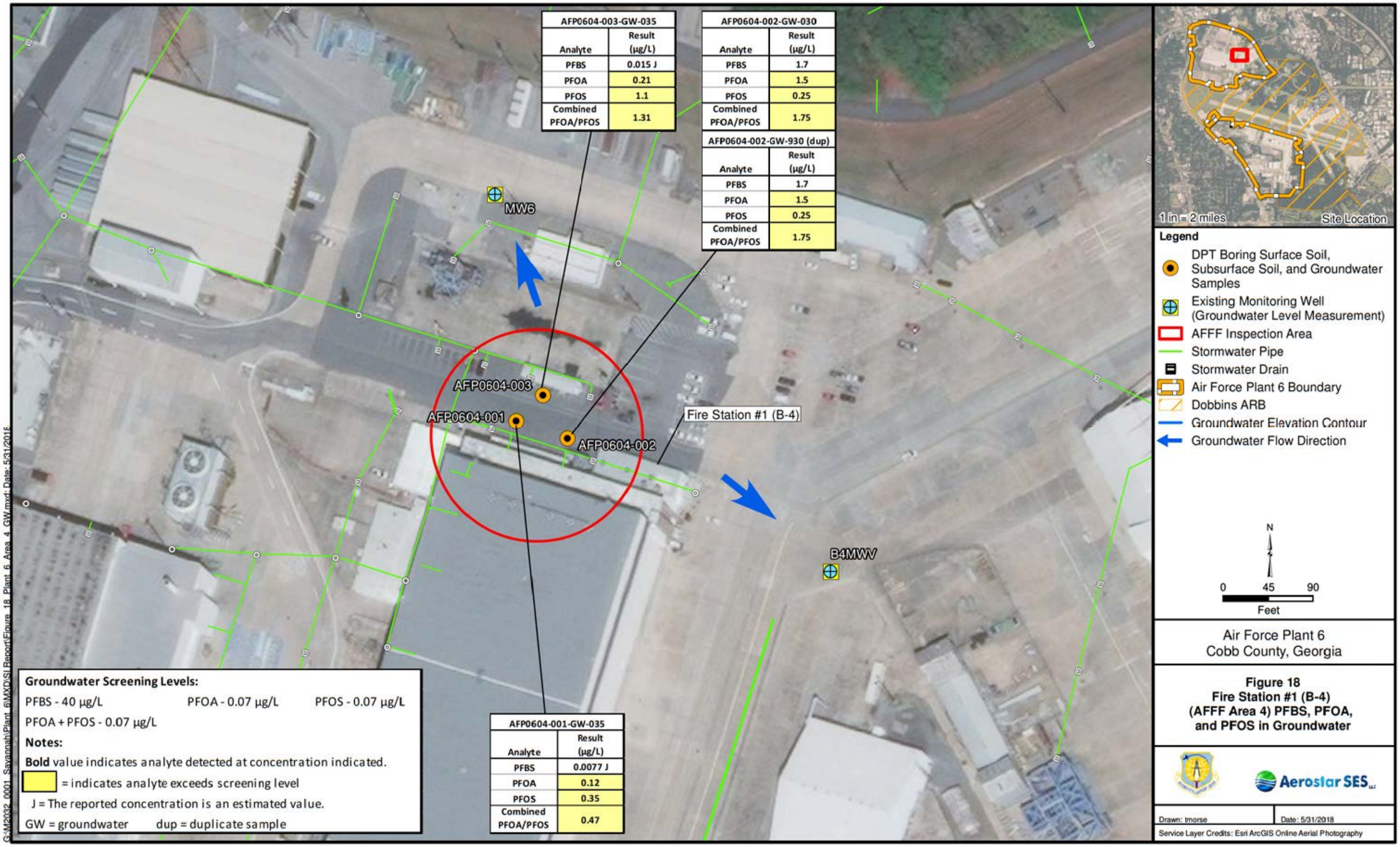
Figure 17
Fire Station #1 (B-4)
(AFFF Area 4) PFBS,
PFOA, and PFOS in Soil

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_17_Plant_6_Area_4_Soil.mxd; Date: 5/31/2018



AFP0604-003-GW-035	
Analyte	Result (µg/L)
PFBS	0.015 J
PFOA	**0.21**
PFOS	**1.1**
Combined PFOA/PFOS	**1.31**

AFP0604-002-GW-030	
Analyte	Result (µg/L)
PFBS	**1.7**
PFOA	**1.5**
PFOS	**0.25**
Combined PFOA/PFOS	**1.75**

AFP0604-002-GW-930 (dup)	
Analyte	Result (µg/L)
PFBS	**1.7**
PFOA	**1.5**
PFOS	**0.25**
Combined PFOA/PFOS	**1.75**

AFP0604-001-GW-035	
Analyte	Result (µg/L)
PFBS	0.0077 J
PFOA	**0.12**
PFOS	**0.35**
Combined PFOA/PFOS	**0.47**

Groundwater Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

GW = groundwater dup = duplicate sample

Legend

- ● DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- ⊕ Existing Monitoring Well (Groundwater Level Measurement)
- 🟥 AFFF Inspection Area
- — Stormwater Pipe
- ▪ Stormwater Drain
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB
- — Groundwater Elevation Contour
- ← Groundwater Flow Direction

Air Force Plant 6
Cobb County, Georgia

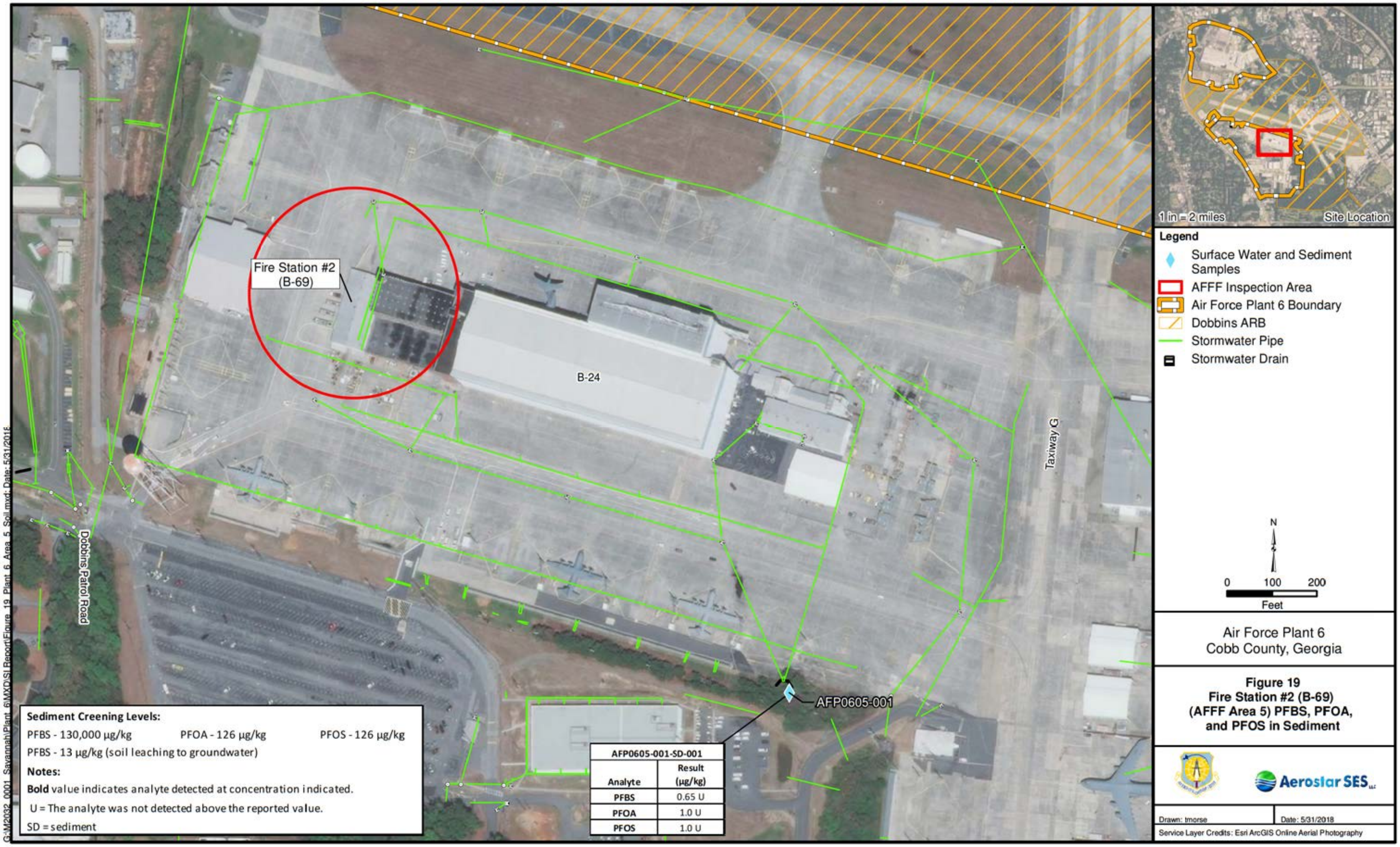
Figure 18
Fire Station #1 (B-4)
(AFFF Area 4) PFBS, PFOA,
and PFOS in Groundwater

Aerostar SES LLC

Drawn: tmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_18_Plant_6_Area_4_GW.mxd; Date: 5/31/2018



Legend

- ♦ Surface Water and Sediment Samples
- 🟥 AFFF Inspection Area
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB
- — Stormwater Pipe
- ▬ Stormwater Drain

Air Force Plant 6
Cobb County, Georgia

Figure 19
Fire Station #2 (B-69)
(AFFF Area 5) PFBS, PFOA,
and PFOS in Sediment

Aerostar SES LLC

Drawn: tmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

Sediment Creening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

PFBS - 13 µg/kg (soil leaching to groundwater)

Notes:

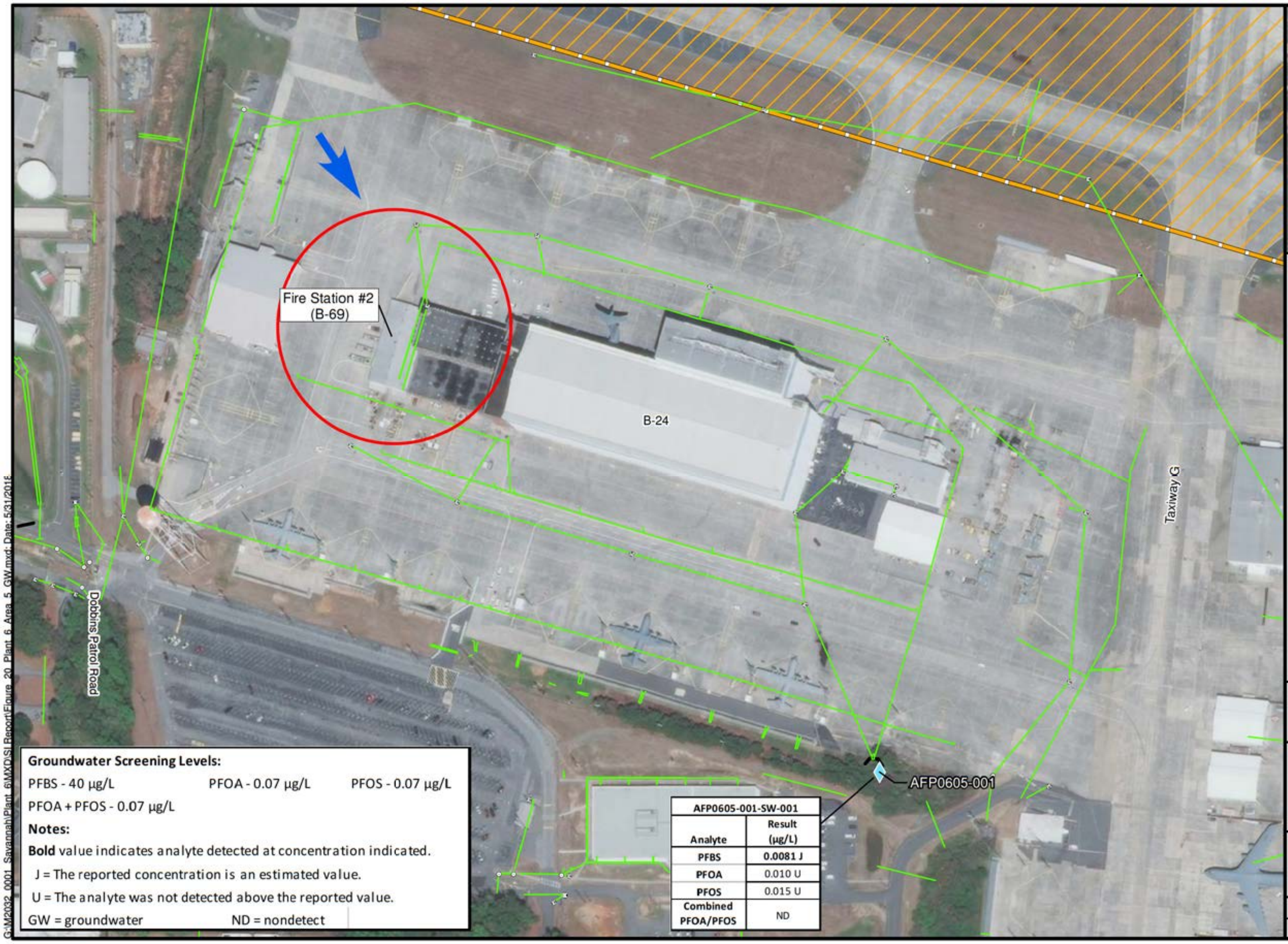
Bold value indicates analyte detected at concentration indicated.

U = The analyte was not detected above the reported value.

SD = sediment

AFP0605-001-SD-001	
Analyte	**Result (µg/kg)**
PFBS	0.65 U
PFOA	1.0 U
PFOS	1.0 U

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_19_Plant_6_Area_5_Soil.mxd; Date: 5/31/2018



Groundwater Screening Levels:

PFBS - 40 µg/L

PFOA - 0.07 µg/L

PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

GW = groundwater

ND = nondetect

AFP0605-001-SW-001	
Analyte	Result (µg/L)
PFBS	**0.0081 J**
PFOA	0.010 U
PFOS	0.015 U
Combined PFOA/PFOS	ND

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_20_Plant_6_Area_5_GW.mxd; Date: 5/31/2018

Legend

- ♦ Surface Water and Sediment Samples
- 🟥 AFFF Inspection Area
- Air Force Plant 6 Boundary
- ▨ Dobbins ARB
- Stormwater Pipe
- ▬ Stormwater Drain
- ← Presumed Groundwater Flow Direction base on PA Report. (ASL, February 2017)

N

0 100 200
Feet

Air Force Plant 6
Cobb County, Georgia

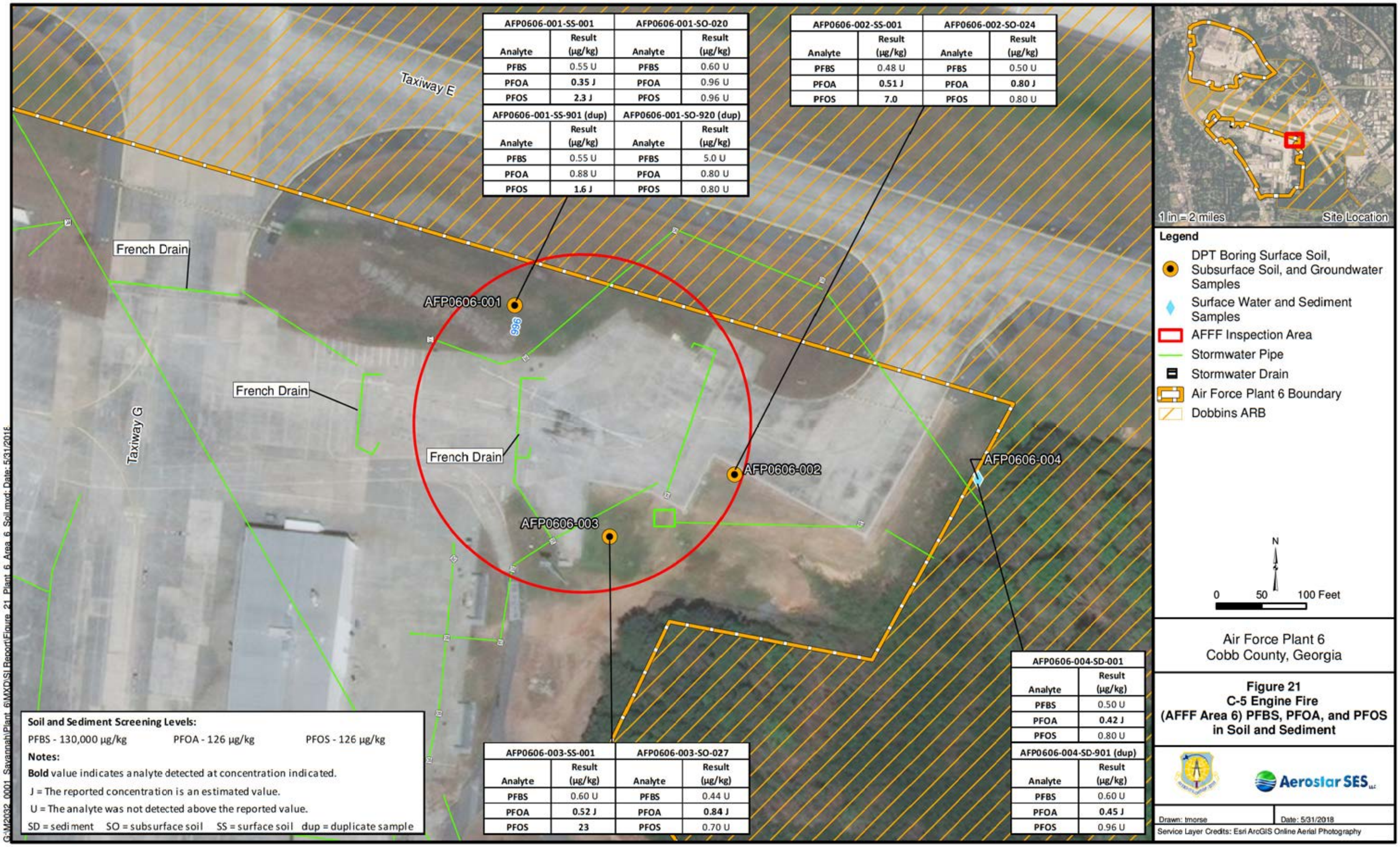
Figure 20
Fire Station #2 (B-69) (AFFF Area 5) PFBS, PFOA, and PFOS in Groundwater

Aerostar SES LLC

Drawn: tmorse

Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography



AFP0606-001-SS-001		AFP0606-001-SO-020	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.55 U	PFBS	0.60 U
PFOA	**0.35 J**	PFOA	0.96 U
PFOS	**2.3 J**	PFOS	0.96 U
AFP0606-001-SS-901 (dup)		**AFP0606-001-SO-920 (dup)**	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.55 U	PFBS	5.0 U
PFOA	0.88 U	PFOA	0.80 U
PFOS	**1.6 J**	PFOS	0.80 U

AFP0606-002-SS-001		AFP0606-002-SO-024	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.48 U	PFBS	0.50 U
PFOA	**0.51 J**	PFOA	**0.80 J**
PFOS	**7.0**	PFOS	0.80 U

AFP0606-003-SS-001		AFP0606-003-SO-027	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.60 U	PFBS	0.44 U
PFOA	**0.52 J**	PFOA	**0.84 J**
PFOS	**23**	PFOS	0.70 U

AFP0606-004-SD-001	
Analyte	Result (µg/kg)
PFBS	0.50 U
PFOA	**0.42 J**
PFOS	0.80 U
AFP0606-004-SD-901 (dup)	
Analyte	Result (µg/kg)
PFBS	0.60 U
PFOA	**0.45 J**
PFOS	0.96 U

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SD = sediment SO = subsurface soil SS = surface soil dup = duplicate sample

Air Force Plant 6
Cobb County, Georgia

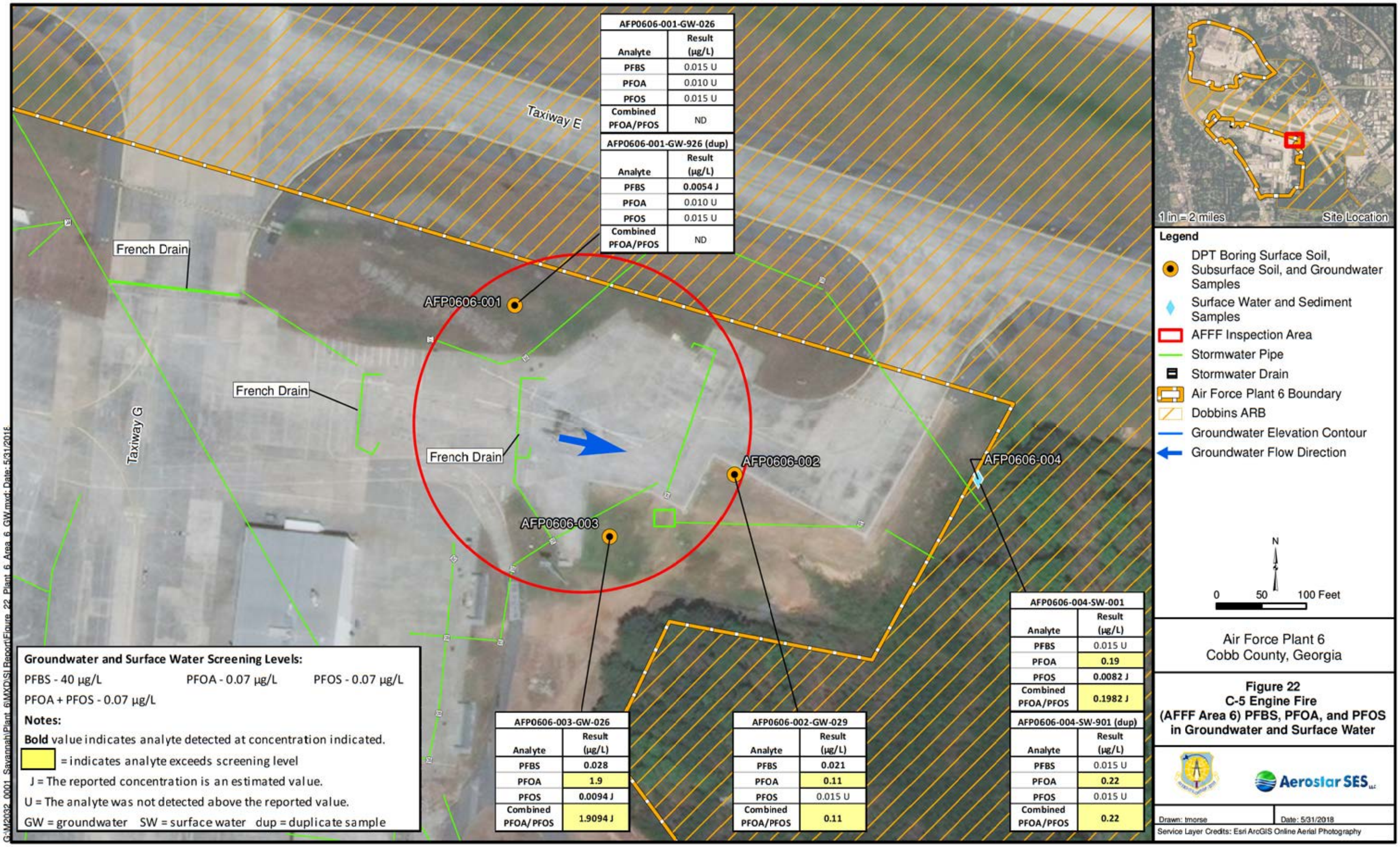
Figure 21
C-5 Engine Fire
(AFFF Area 6) PFBS, PFOA, and PFOS
in Soil and Sediment

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_21_Plant_6_Area_6_Soil.mxd; Date: 5/31/2018



AFP0606-001-GW-026

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	0.010 U
PFOS	0.015 U
Combined PFOA/PFOS	ND

AFP0606-001-GW-926 (dup)

Analyte	Result (µg/L)
PFBS	**0.0054 J**
PFOA	0.010 U
PFOS	0.015 U
Combined PFOA/PFOS	ND

AFP0606-003-GW-026

Analyte	Result (µg/L)
PFBS	**0.028**
PFOA	**1.9**
PFOS	**0.0094 J**
Combined PFOA/PFOS	**1.9094 J**

AFP0606-002-GW-029

Analyte	Result (µg/L)
PFBS	**0.021**
PFOA	**0.11**
PFOS	0.015 U
Combined PFOA/PFOS	**0.11**

AFP0606-004-SW-001

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	**0.19**
PFOS	**0.0082 J**
Combined PFOA/PFOS	**0.1982 J**

AFP0606-004-SW-901 (dup)

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	**0.22**
PFOS	0.015 U
Combined PFOA/PFOS	**0.22**

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L   PFOA - 0.07 µg/L   PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

GW = groundwater   SW = surface water   dup = duplicate sample

Air Force Plant 6
Cobb County, Georgia

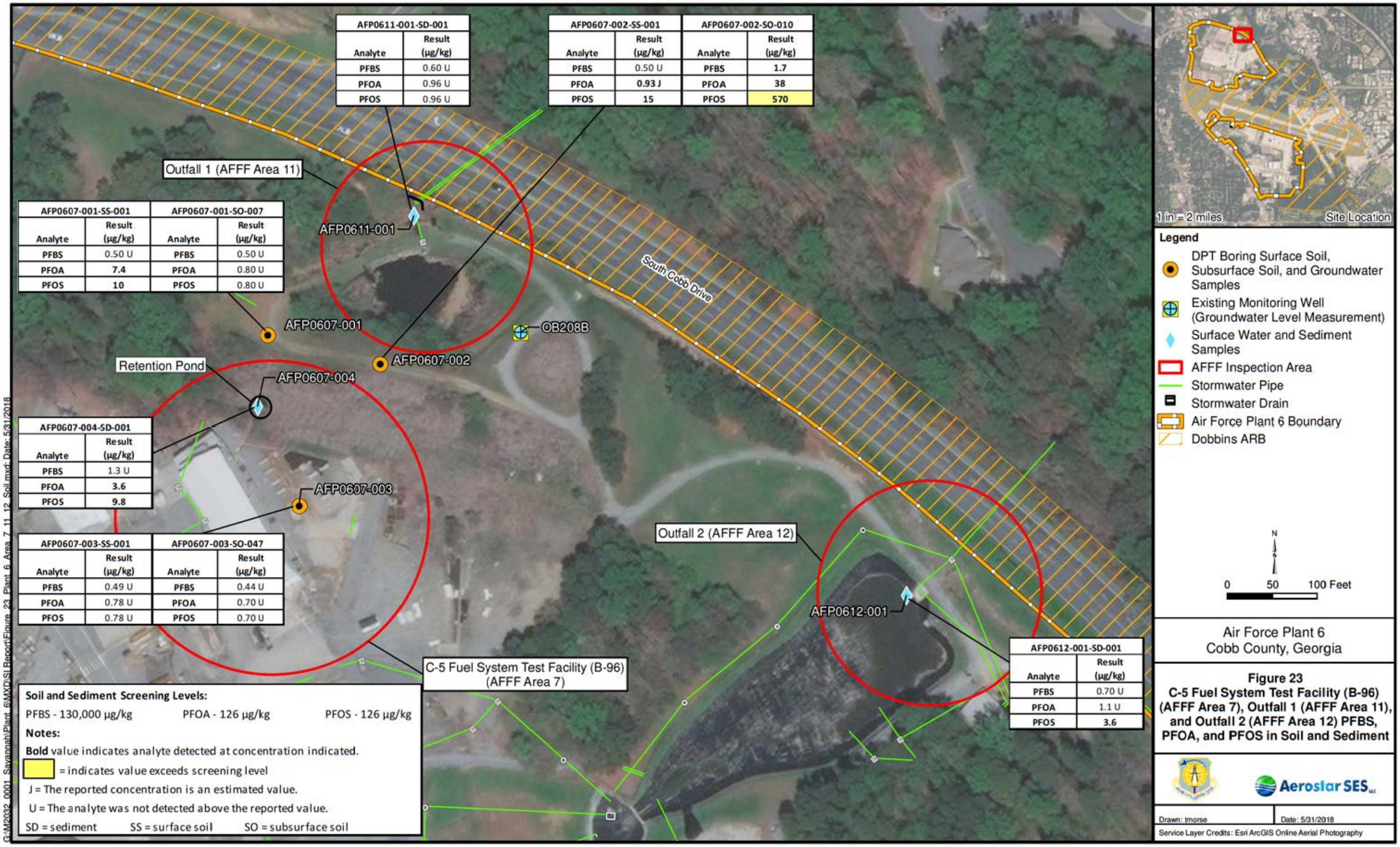
Figure 22
C-5 Engine Fire (AFFF Area 6) PFBS, PFOA, and PFOS in Groundwater and Surface Water

Aerostar SES LLC

Drawn: tmorse   Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_22_Plant_6_Area_6_GW.mxd; Date: 5/31/2018



AFP0611-001-SD-001	
Analyte	Result (µg/kg)
PFBS	0.60 U
PFOA	0.96 U
PFOS	0.96 U

AFP0607-002-SS-001	
Analyte	Result (µg/kg)
PFBS	0.50 U
PFOA	**0.93 J**
PFOS	**15**

AFP0607-002-SO-010	
Analyte	Result (µg/kg)
PFBS	**1.7**
PFOA	**38**
PFOS	**570**

AFP0607-001-SS-001	
Analyte	Result (µg/kg)
PFBS	0.50 U
PFOA	**7.4**
PFOS	**10**

AFP0607-001-SO-007	
Analyte	Result (µg/kg)
PFBS	0.50 U
PFOA	0.80 U
PFOS	0.80 U

AFP0607-004-SD-001	
Analyte	Result (µg/kg)
PFBS	1.3 U
PFOA	**3.6**
PFOS	**9.8**

AFP0607-003-SS-001	
Analyte	Result (µg/kg)
PFBS	0.49 U
PFOA	0.78 U
PFOS	0.78 U

AFP0607-003-SO-047	
Analyte	Result (µg/kg)
PFBS	0.44 U
PFOA	0.70 U
PFOS	0.70 U

AFP0612-001-SD-001	
Analyte	Result (µg/kg)
PFBS	0.70 U
PFOA	1.1 U
PFOS	**3.6**

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates value exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SD = sediment SS = surface soil SO = subsurface soil

Legend

- ● DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- ⊕ Existing Monitoring Well (Groundwater Level Measurement)
- ◆ Surface Water and Sediment Samples
- 🟥 AFFF Inspection Area
- — Stormwater Pipe
- ▪ Stormwater Drain
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB

Air Force Plant 6
Cobb County, Georgia

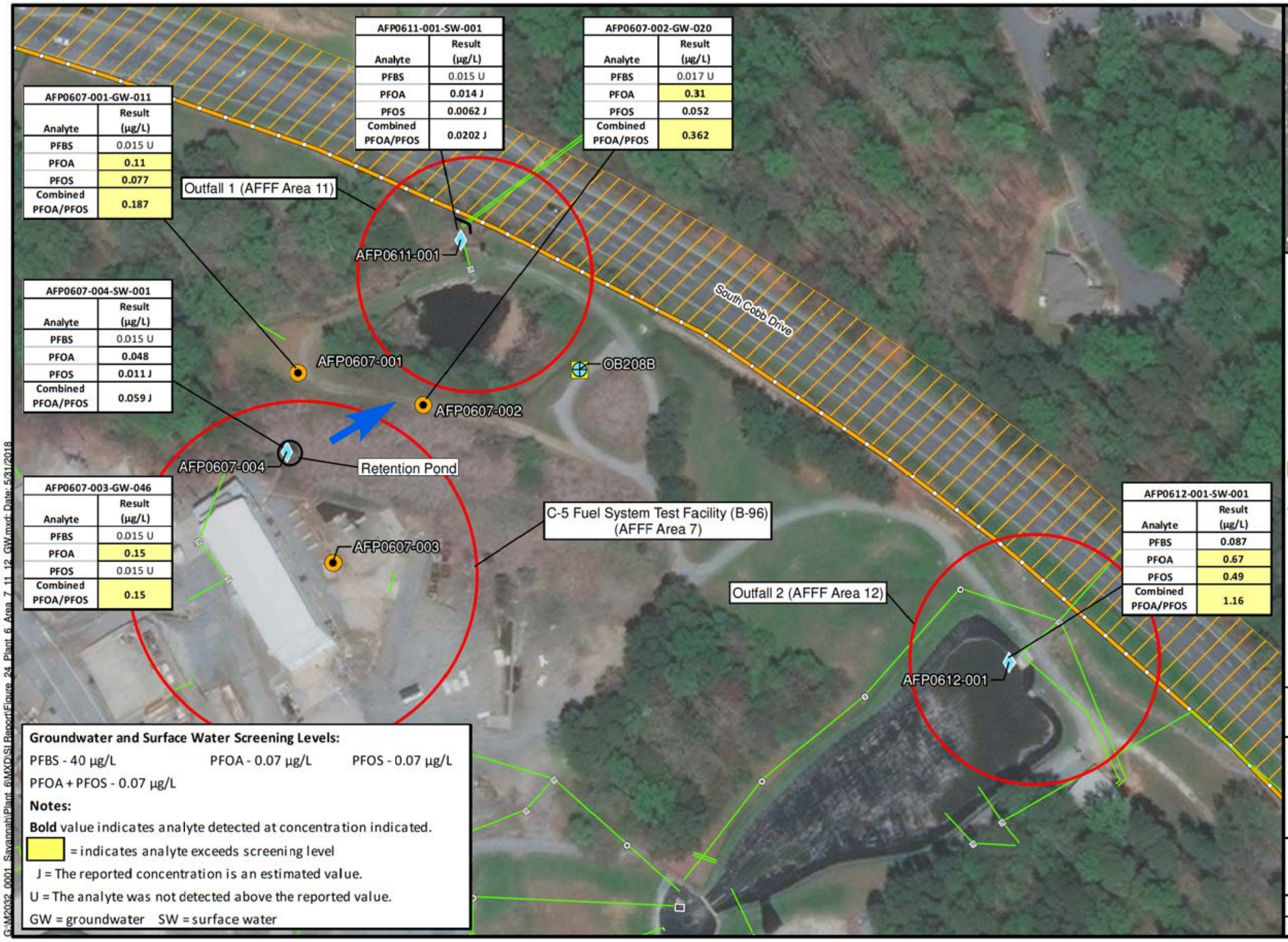
Figure 23
C-5 Fuel System Test Facility (B-96) (AFFF Area 7), Outfall 1 (AFFF Area 11), and Outfall 2 (AFFF Area 12) PFBS, PFOA, and PFOS in Soil and Sediment

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_23_Plant_6_Area_7_11_12_Soil.mxd; Date: 5/31/2018



AFP0607-001-GW-011

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	**0.11**
PFOS	**0.077**
Combined PFOA/PFOS	**0.187**

AFP0611-001-SW-001

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	**0.014 J**
PFOS	**0.0062 J**
Combined PFOA/PFOS	**0.0202 J**

AFP0607-002-GW-020

Analyte	Result (µg/L)
PFBS	0.017 U
PFOA	**0.31**
PFOS	**0.052**
Combined PFOA/PFOS	**0.362**

AFP0607-004-SW-001

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	**0.048**
PFOS	**0.011 J**
Combined PFOA/PFOS	**0.059 J**

AFP0607-003-GW-046

Analyte	Result (µg/L)
PFBS	0.015 U
PFOA	**0.15**
PFOS	0.015 U
Combined PFOA/PFOS	**0.15**

AFP0612-001-SW-001

Analyte	Result (µg/L)
PFBS	**0.087**
PFOA	**0.67**
PFOS	**0.49**
Combined PFOA/PFOS	**1.16**

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

GW = groundwater SW = surface water

Legend

- ● DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
- ⊕ Existing Monitoring Well (Groundwater Level Measurement)
- ♦ Surface Water and Sediment Samples
- ☐ AFFF Inspection Area
- — Stormwater Pipe
- ■ Stormwater Drain
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB
- ← Groundwater Flow Direction

Air Force Plant 6
Cobb County, Georgia

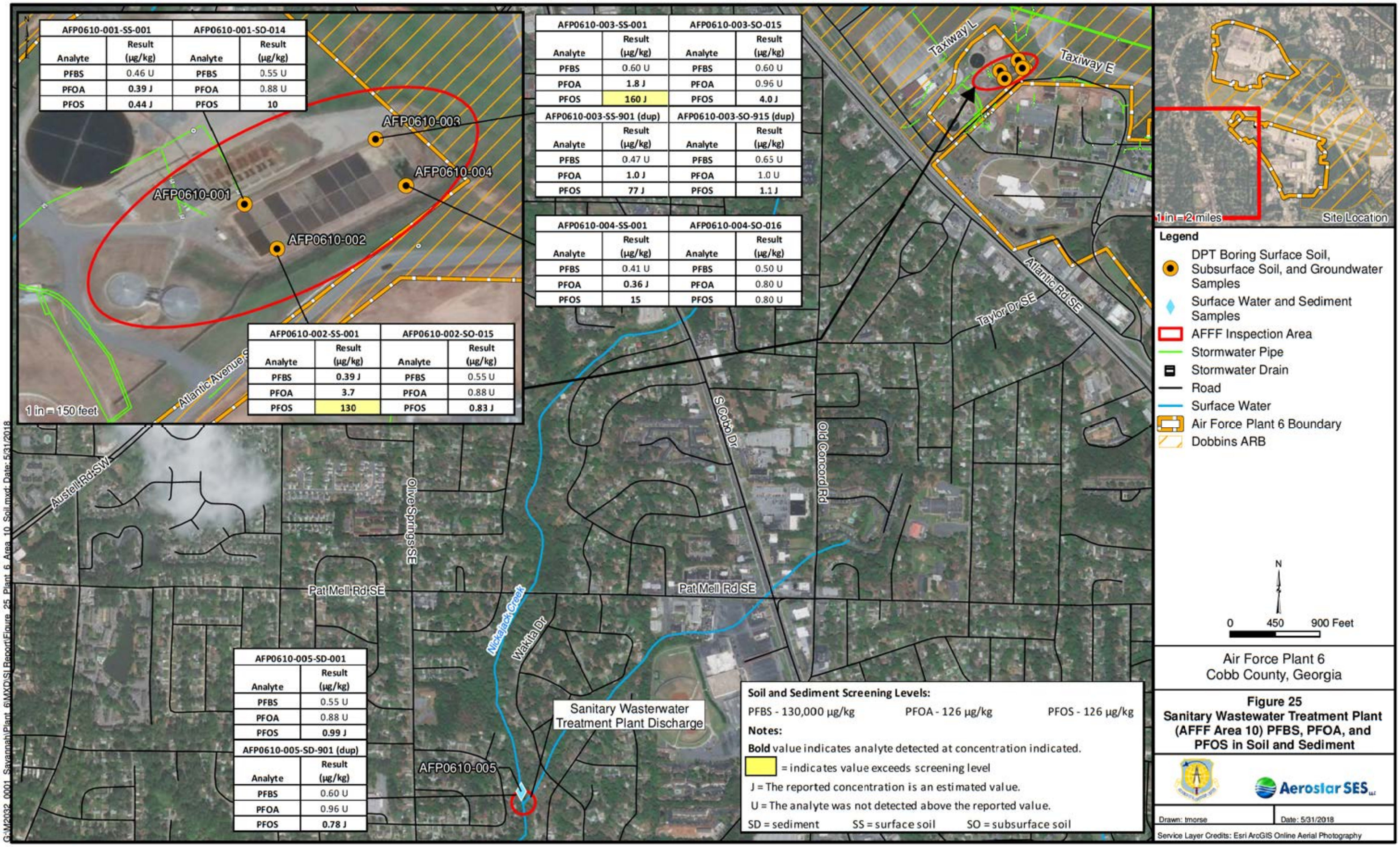
Figure 24
C-5 Fuel System Test Facility (B-96) (AFFF Area 7), Outfall 1 (AFFF Area 11), and Outfall 2 (AFFF Area 12) PFBS, PFOA, and PFOS in Groundwater and Surface Water

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_24_Plant_6_Area_7_11_12_GW.mxd; Date: 5/31/2018



AFP0610-001-SS-001		AFP0610-001-SO-014	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.46 U	PFBS	0.55 U
PFOA	**0.39 J**	PFOA	0.88 U
PFOS	**0.44 J**	PFOS	**10**

AFP0610-003-SS-001		AFP0610-003-SO-015	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.60 U	PFBS	0.60 U
PFOA	**1.8 J**	PFOA	0.96 U
PFOS	**160 J**	PFOS	**4.0 J**
AFP0610-003-SS-901 (dup)		AFP0610-003-SO-915 (dup)	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.47 U	PFBS	0.65 U
PFOA	**1.0 J**	PFOA	1.0 U
PFOS	**77 J**	PFOS	**1.1 J**

AFP0610-004-SS-001		AFP0610-004-SO-016	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	0.41 U	PFBS	0.50 U
PFOA	**0.36 J**	PFOA	0.80 U
PFOS	**15**	PFOS	0.80 U

AFP0610-002-SS-001		AFP0610-002-SO-015	
Analyte	Result (µg/kg)	Analyte	Result (µg/kg)
PFBS	**0.39 J**	PFBS	0.55 U
PFOA	**3.7**	PFOA	0.88 U
PFOS	**130**	PFOS	**0.83 J**

AFP0610-005-SD-001	
Analyte	Result (µg/kg)
PFBS	0.55 U
PFOA	0.88 U
PFOS	**0.99 J**
AFP0610-005-SD-901 (dup)	
Analyte	Result (µg/kg)
PFBS	0.60 U
PFOA	0.96 U
PFOS	**0.78 J**

Soil and Sediment Screening Levels:

PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates value exceeds screening level

J = The reported concentration is an estimated value.

U = The analyte was not detected above the reported value.

SD = sediment SS = surface soil SO = subsurface soil

Legend

●	DPT Boring Surface Soil, Subsurface Soil, and Groundwater Samples
◆	Surface Water and Sediment Samples
▭	AFFF Inspection Area
—	Stormwater Pipe
▣	Stormwater Drain
—	Road
—	Surface Water
▭	Air Force Plant 6 Boundary
▨	Dobbins ARB

Air Force Plant 6
Cobb County, Georgia

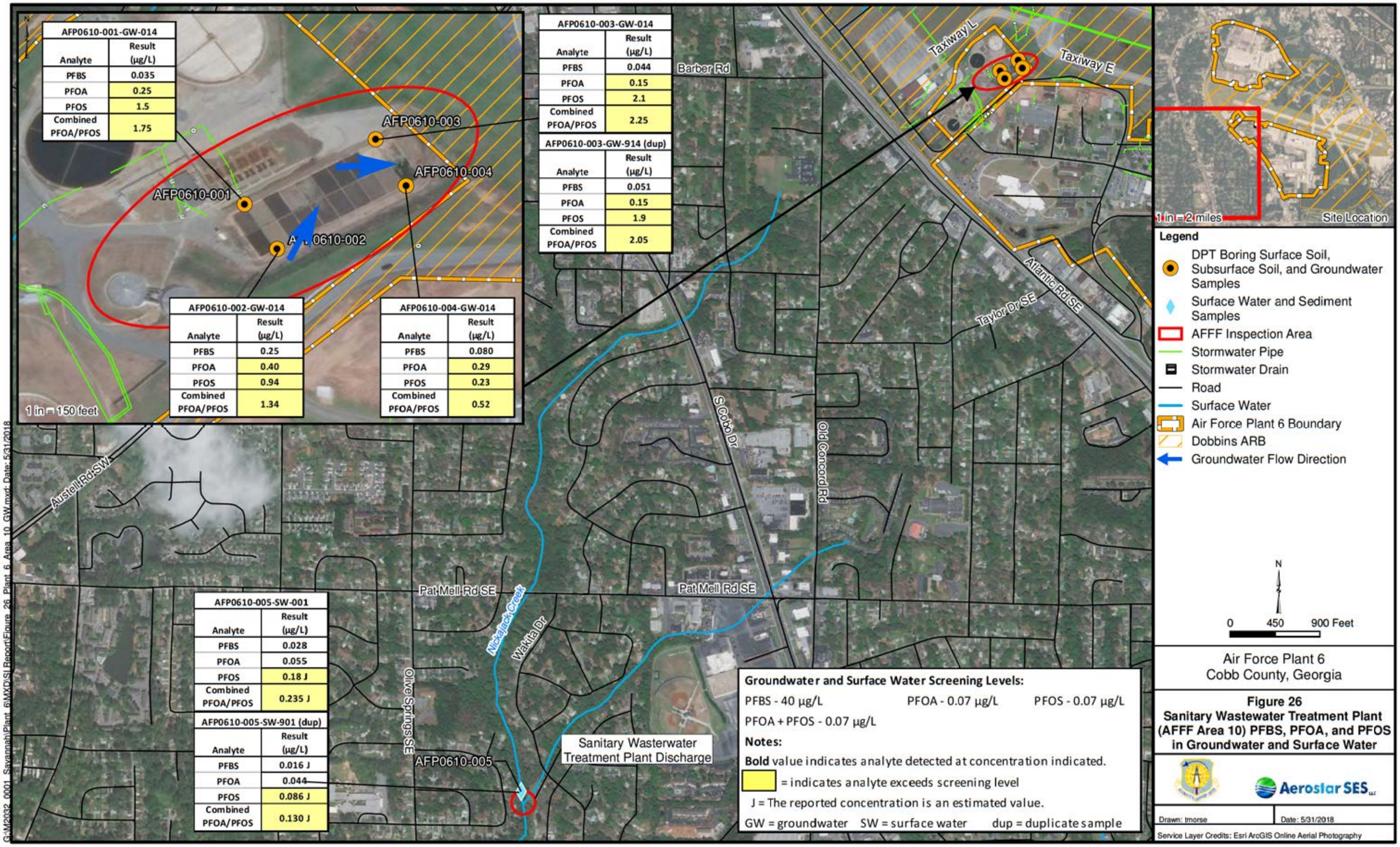
Figure 25
Sanitary Wastewater Treatment Plant (AFFF Area 10) PFBS, PFOA, and PFOS in Soil and Sediment

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_25_Plant_6_Area_10_Soil.mxd; Date: 5/31/2018



AFP0610-001-GW-014	
Analyte	Result (µg/L)
PFBS	0.035
PFOA	0.25
PFOS	1.5
Combined PFOA/PFOS	1.75

AFP0610-002-GW-014	
Analyte	Result (µg/L)
PFBS	0.25
PFOA	0.40
PFOS	0.94
Combined PFOA/PFOS	1.34

AFP0610-004-GW-014	
Analyte	Result (µg/L)
PFBS	0.080
PFOA	0.29
PFOS	0.23
Combined PFOA/PFOS	0.52

AFP0610-003-GW-014	
Analyte	Result (µg/L)
PFBS	0.044
PFOA	0.15
PFOS	2.1
Combined PFOA/PFOS	2.25

AFP0610-003-GW-914 (dup)	
Analyte	Result (µg/L)
PFBS	0.051
PFOA	0.15
PFOS	1.9
Combined PFOA/PFOS	2.05

AFP0610-005-SW-001	
Analyte	Result (µg/L)
PFBS	0.028
PFOA	0.055
PFOS	0.18 J
Combined PFOA/PFOS	0.235 J

AFP0610-005-SW-901 (dup)	
Analyte	Result (µg/L)
PFBS	0.016 J
PFOA	0.044
PFOS	0.086 J
Combined PFOA/PFOS	0.130 J

Groundwater and Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

J = The reported concentration is an estimated value.

GW = groundwater SW = surface water dup = duplicate sample

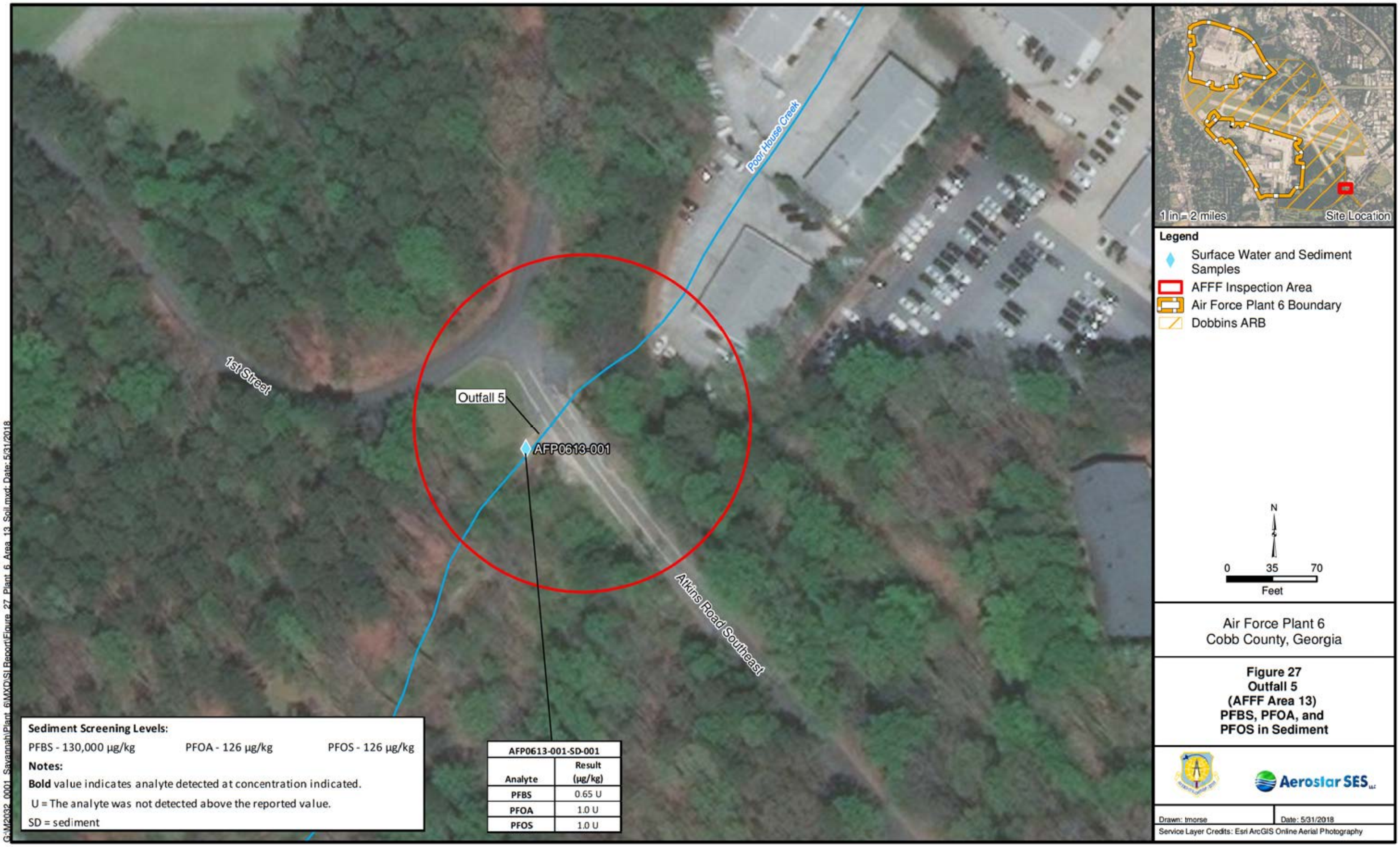
Air Force Plant 6
Cobb County, Georgia

Figure 26
Sanitary Wastewater Treatment Plant (AFFF Area 10) PFBS, PFOA, and PFOS in Groundwater and Surface Water

Drawn: tmorse
Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_26_Plant_6_Area_10_GW.mxd; Date: 5/31/2018



Legend

- ♦ Surface Water and Sediment Samples
- 🟥 AFFF Inspection Area
- ▭ Air Force Plant 6 Boundary
- ▨ Dobbins ARB

Air Force Plant 6
Cobb County, Georgia

Figure 27
Outfall 5
(AFFF Area 13)
PFBS, PFOA, and
PFOS in Sediment

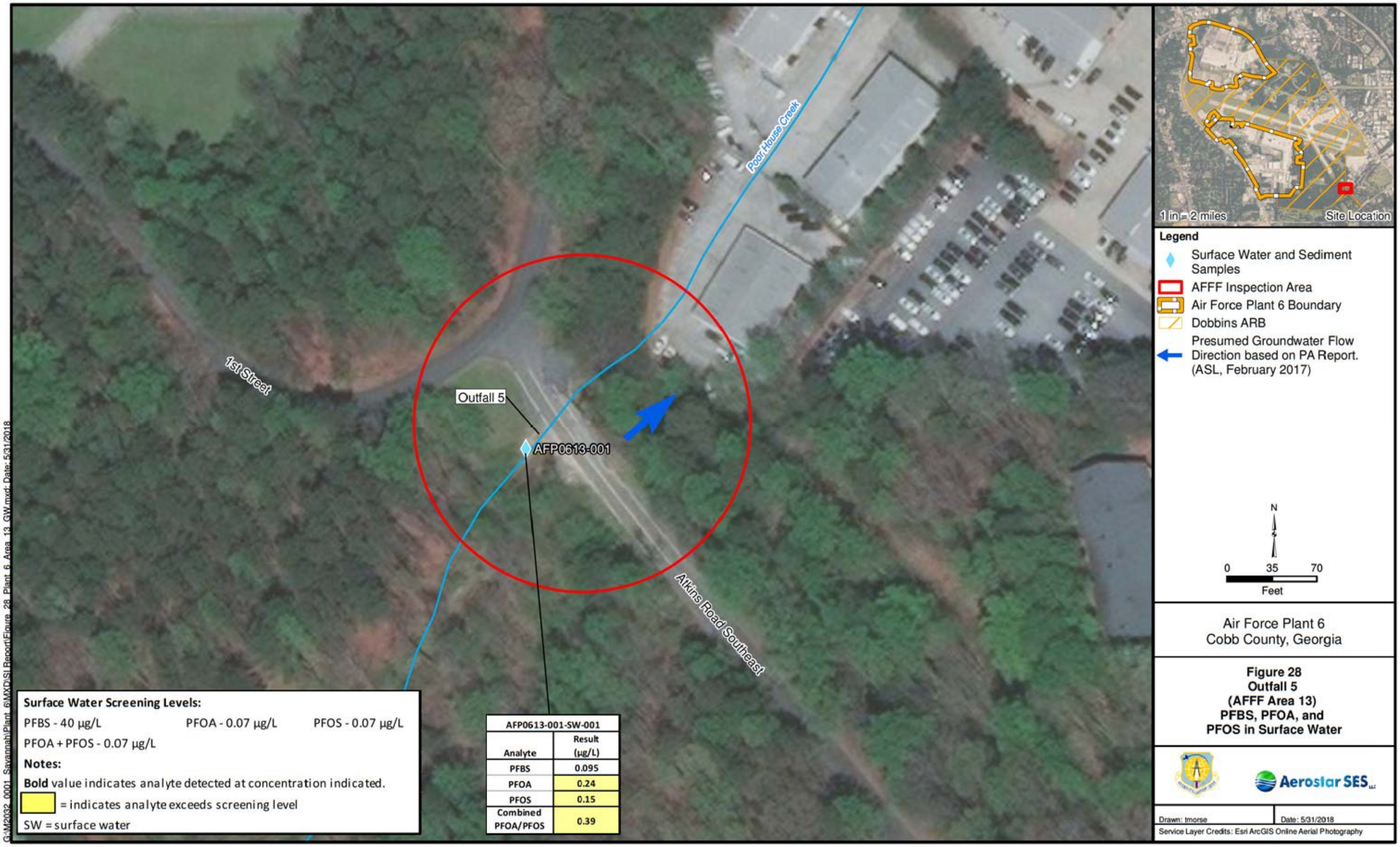
AFP0613-001-SD-001	
Analyte	**Result (µg/kg)**
PFBS	0.65 U
PFOA	1.0 U
PFOS	1.0 U

Sediment Screening Levels:
PFBS - 130,000 µg/kg PFOA - 126 µg/kg PFOS - 126 µg/kg

Notes:
Bold value indicates analyte detected at concentration indicated.
U = The analyte was not detected above the reported value.
SD = sediment

Aerostar SES LLC
Drawn: tmorse
Date: 5/31/2018
Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_27_Plant_6_Area_13_Soil.mxd; Date: 5/31/2018



Legend
- Surface Water and Sediment Samples
- AFFF Inspection Area
- Air Force Plant 6 Boundary
- Dobbins ARB
- Presumed Groundwater Flow Direction based on PA Report. (ASL, February 2017)

AFP0613-001-SW-001	
Analyte	Result (µg/L)
PFBS	0.095
PFOA	0.24
PFOS	0.15
Combined PFOA/PFOS	0.39

Surface Water Screening Levels:

PFBS - 40 µg/L PFOA - 0.07 µg/L PFOS - 0.07 µg/L

PFOA + PFOS - 0.07 µg/L

Notes:

Bold value indicates analyte detected at concentration indicated.

🟨 = indicates analyte exceeds screening level

SW = surface water

Air Force Plant 6
Cobb County, Georgia

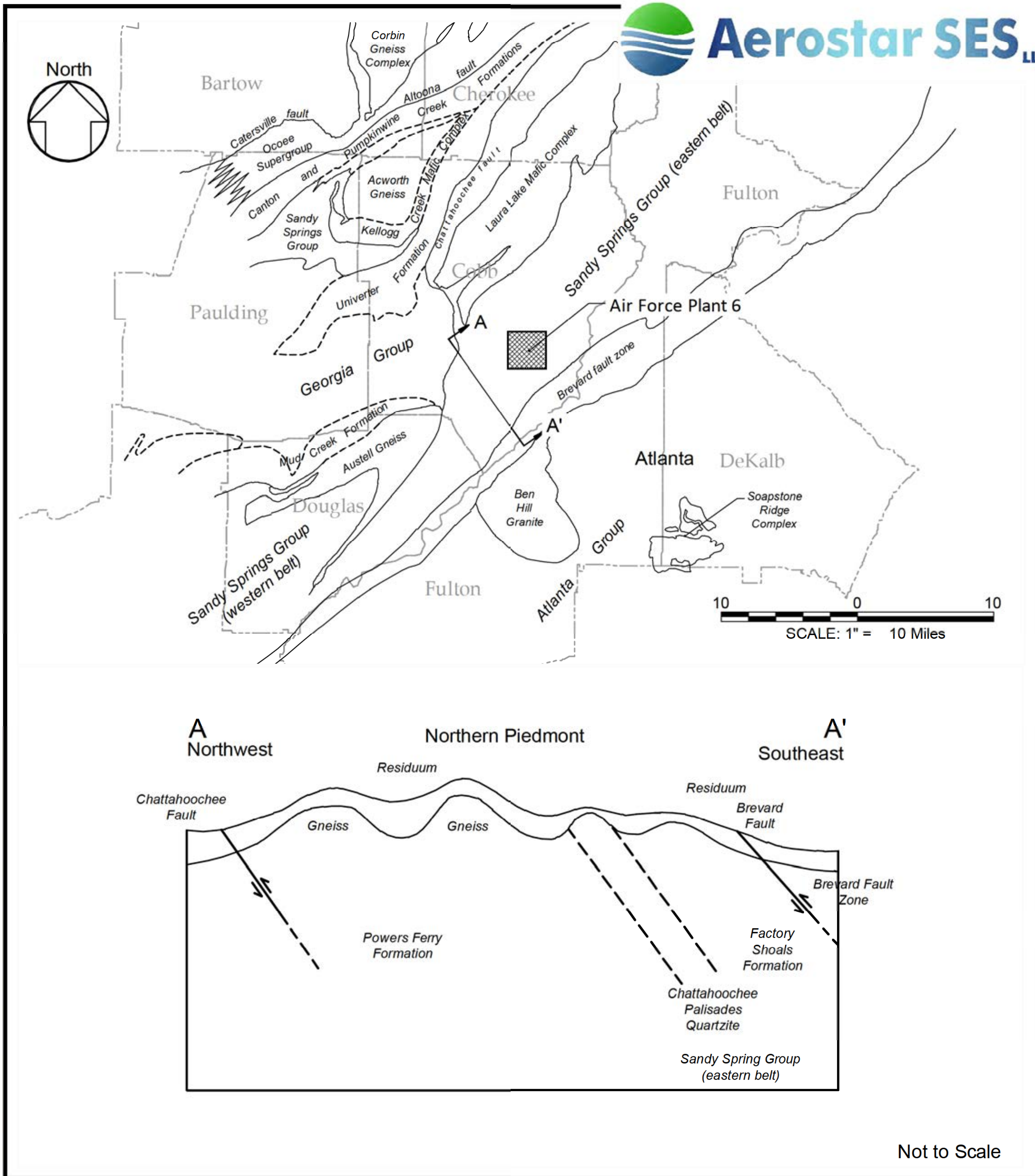
Figure 28
Outfall 5
(AFFF Area 13)
PFBS, PFOA, and PFOS in Surface Water

Aerostar SES LLC

Drawn: tmorse Date: 5/31/2018

Service Layer Credits: Esri ArcGIS Online Aerial Photography

G:\M2032_0001_Savannah\Plant_6\MXD\SI Report\Figure_28_Plant_6_Area_13_GW.mxd; Date: 5/31/2018



Legend

⇅	Fault
– – –	Gradational Contact Between Geologic Units

Modified from Bulletin 96, Figure 3 Group Formation Boundaries of the Crystalline Rock of the Greater Atlanta Regional Map. *Geology of the Greater Atlanta Region*, Department of Natural Resources, Environmental Protection Division, Georgia Geologic Survey, 1984.

Figure 29 Conceptual Geologic Cross-Section Across North Piedmont
Air Force Plant 6, Marietta, Georgia

Appendix B

Regional Screening Level Calculation

Default
Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	0.1
TR (target risk) unitless	1E-06
LT (lifetime) years	70
ET_{res} (exposure time) hours/day	24
ET_{res-c} (child exposure time) hours/day	24
ET_{res-a} (adult exposure time) hours/day	24
ET_{0-2} (mutagenic exposure time) hours/day	24
ET_{2-6} (mutagenic exposure time) hours/day	24
ET_{6-16} (mutagenic exposure time) hours/day	24
ET_{16-26} (mutagenic exposure time) hours/day	24
ED_{res} (exposure duration) years	26
ED_{res-c} (exposure duration - child) years	6
ED_{res-a} (exposure duration - adult) years	20
ED_{0-2} (mutagenic exposure duration) years	2
ED_{2-6} (mutagenic exposure duration) years	4
ED_{6-16} (mutagenic exposure duration) years	10
ED_{16-26} (mutagenic exposure duration) years	10
BW_{res-c} (body weight - child) kg	15
BW_{res-a} (body weight - adult) kg	80
BW_{0-2} (mutagenic body weight) kg	15
BW_{2-6} (mutagenic body weight) kg	15
BW_{6-16} (mutagenic body weight) kg	80
BW_{16-26} (mutagenic body weight) kg	80
SA_{res-c} (skin surface area - child) cm ^{2}/day	2373
SA_{res-a} (skin surface area - adult) cm ^{2}/day	6032
SA_{0-2} (mutagenic skin surface area) cm ^{2}/day	2373
SA_{2-6} (mutagenic skin surface area) cm ^{2}/day	2373
SA_{6-16} (mutagenic skin surface area) cm ^{2}/day	6032
SA_{16-26} (mutagenic skin surface area) cm ^{2}/day	6032
EF_{res} (exposure frequency) days/year	350
EF_{res-c} (exposure frequency - child) days/year	350
EF_{res-a} (exposure frequency - adult) days/year	350

Default
Resident Equation Inputs for Soil

Variable	Value
EF_{0-2} (mutagenic exposure frequency) days/year	350
EF_{2-6} (mutagenic exposure frequency) days/year	350
EF_{6-16} (mutagenic exposure frequency) days/year	350
EF_{16-26} (mutagenic exposure frequency) days/year	350
$IFS_{res-adj}$ (age-adjusted soil ingestion factor) mg/kg	36750
$IFSM_{res-adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.3
IRS_{res-c} (soil intake rate - child) mg/day	200
IRS_{res-a} (soil intake rate - adult) mg/day	100
IRS_{0-2} (mutagenic soil intake rate) mg/day	200
IRS_{2-6} (mutagenic soil intake rate) mg/day	200
IRS_{6-16} (mutagenic soil intake rate) mg/day	100
IRS_{16-26} (mutagenic soil intake rate) mg/day	100
AF_{res-a} (skin adherence factor - adult) mg/cm ^{2}	0.07
AF_{res-c} (skin adherence factor - child) mg/cm ^{2}	0.2
AF_{0-2} (mutagenic skin adherence factor) mg/cm ^{2}	0.2
AF_{2-6} (mutagenic skin adherence factor) mg/cm ^{2}	0.2
AF_{6-16} (mutagenic skin adherence factor) mg/cm ^{2}	0.07
AF_{16-26} (mutagenic skin adherence factor) mg/cm ^{2}	0.07
$DFS_{res-adj}$ (age-adjusted soil dermal factor) mg/kg	103390
$DFSM_{res-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	428260
AT_{res} (averaging time - resident carcinogenic)	365
$City_{PEF}$ (Climate Zone) Selection	Default
A_c (PEF acres)	0.5
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77
PEF (particulate emission factor) m ^{3}/kg	1359344438
A (PEF Dispersion Constant)	16.2302
B (PEF Dispersion Constant)	18.7762
C (PEF Dispersion Constant)	216.108
V (fraction of vegetative cover) unitless	0.5
U_m (mean annual wind speed) m/s	4.69
U_t (equivalent threshold value)	11.32
F(x) (function dependent on U_m/U_t) unitless	0.194

Default

Resident Equation Inputs for Soil

Variable	Value
City$_{VF}$ (Climate Zone) Selection	Default
A$_c$ (VF acres)	0.5
Q/C$_{vol}$ (g/m^2-s per kg/m^3)	68.18
foc (fraction organic carbon in soil) g/g	0.006
p$_b$ (dry soil bulk density) g/cm ^{3}	1.5
p$_s$ (soil particle density) g/cm ^{3}	2.65
n (total soil porosity) L $_{pore}$/L$_{soil}$	0.43396
Theta$_a$ (air-filled soil porosity) L $_{air}$/L$_{soil}$	0.28396
Theta$_w$ (water-filled soil porosity) L $_{water}$/L$_{soil}$	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845
City$_{VF\ mass-loading}$ (Climate Zone) Selection	Default
VF$_{ml}$ (volitization factor - mass-limit) m ^{3}/kg	.
Q/C$_{vol}$ (g/m^2-s per kg/m^3)	68.18
A$_c$ (VF mass-limit acres)	0.5
T (exposure interval) yr	26
d$_c$ (depth of source) m	.
p$_b$ (dry soil bulk density) g/cm ^{3}	1.5
A (VF Dispersion Constant - Mass Limit)	11.911
B (VF Dispersion Constant - Mass Limit)	18.4385
C (VF Dispersion Constant - Mass Limit)	209.7845
T$_w$ (groundwater temperature) Celsius	25

Default

Resident Risk-Based Screening Levels (RSL) for Soil

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide); U = User-provided

Chemical	CAS Number	Mutagen?	VOC?	Ingestion SF (mg/kg-day)$^{-1}$	SFO Ref	Inhalation Unit Risk (ug/m^3)$^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Soil Saturation Concentration (mg/kg)	S (mg/L)
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	No	No	-		-		2.00E-05	D	-		1	0.1	1	-	6.80E+02
Perfluorooctanoic acid (PFOA)	335-67-1	No	No	7.00E-02	D	-		2.00E-05	D	-		1	0.1	1	-	9.50E+03

K_{oc} (cm3/g)	K_d (cm³/g)	HLC (atm-m^3/mole)	Henry's Law Constant (unitless)	H` and HLC Ref	Normal Boiling Point T_{boil} (K)	BP Ref	Critical Temperature T_{crit} (K)	T_{crit} Ref	D_{ia} (cm^2/s)	D_{iw} (cm^2/s)	D_A (cm^2/s)	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)
3.72E+02	-	-	-		532.15	PHYSPROP	-		2.07E-02	5.25E-06	-	1.36E+09	-
1.15E+02	-	-	-		465.55	PHYSPROP	-		2.26E-02	5.79E-06	-	1.36E+09	-

Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=0.1 (mg/kg)	Dermal SL Child THQ=0.1 (mg/kg)	Inhalation SL Child THQ=0.1 (mg/kg)	Noncarcinogenic SL Child THI=0.1 (mg/kg)	Ingestion SL Adult THQ=0.1 (mg/kg)	Dermal SL Adult THQ=0.1 (mg/kg)	Inhalation SL Adult THQ=0.1 (mg/kg)	Noncarcinogenic SL Adult THI=0.1 (mg/kg)	Screening Level (mg/kg)
-	-	-	-	1.56E-01	6.59E-01	-	1.26E-01	1.67E+00	3.95E+00	-	1.17E+00	1.26E-01 nc
9.93E+00	3.53E+01	-	7.75E+00	1.56E-01	6.59E-01	-	1.26E-01	1.67E+00	3.95E+00	-	1.17E+00	1.26E-01 nc

Inhalation Unit Risk Toxicity Metadata

Chemical	CASNUM	Inhalation Unit Risk (µg/m ^{3})$^{-1}$	Toxicity Source	EPA Cancer Classification	Inhalation Unit Risk Tumor Type	Inhalation Unit Risk Target Organ	Inhalation Unit Risk Species	Inhalation Unit Risk Method	Inhalation Unit Risk Route	Inhalation Unit Risk Treatment Duration	Inhalation Unit Risk Study Reference	Inhalation Unit Risk Notes
Perfluorooctane sulfonic acid (PFOS)	1763-23-1											
Perfluorooctanoic acid (PFOA)	335-67-1											

Oral Slope Factor Toxicity Metadata

Chemical	CASNUM	Oral Slope Factor (mg/kg-day) $^{-1}$	Toxicity Source	EPA Cancer Classification	Oral Slope Factor Tumor Type	Oral Slope Factor Target Organ	Oral Slope Factor Species	Oral Slope Factor Method	Oral Slope Factor Route	Oral Slope Factor Treatment Duration	Oral Slope Factor Study Reference	Oral Slope Factor Notes
Perfluorooctane sulfonic acid (PFOS)	1763-23-1											
Perfluorooctanoic acid (PFOA)	335-67-1	7.00E-02	DWSHA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Oral Chronic Toxicity Metadata

Chemical	CASNUM	Chronic Oral Reference Dose (mg/kg-day)	Toxicity Source	Oral Chronic Reference Dose Basis	Oral Chronic Reference Dose Confidence Level	Oral Chronic Reference Dose Critical Effect	Oral Chronic Reference Dose Target Organ	Oral Chronic Reference Dose Modifying Factor	Oral Chronic Reference Dose Uncertainty Factor	Oral Chronic Reference Dose Species	Oral Chronic Reference Dose Route	Oral Chronic Reference Dose Study Duration	Oral Chronic Reference Dose Study Reference	Oral Chronic Reference Dose Notes
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	2.00E-05	DWSHA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	335-67-1	2.00E-05	DWSHA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Inhalation Chronic Toxicity Metadata

Chemical	CASNUM	Chronic Inhalation Reference Concentration (mg/m³)	Toxicity Source	Inhalation Chronic Reference Concentration Basis	Inhalation Chronic Reference Concentration Confidence Level	Inhalation Chronic Reference Concentration Critical Effect	Inhalation Chronic Reference Concentration Target Organ
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	-					
Perfluorooctanoic acid (PFOA)	335-67-1	-					

Inhalation Chronic Reference Concentration Modifying Factor	Inhalation Chronic Reference Concentration Uncertainty Factor	Inhalation Chronic Reference Concentration Species	Inhalation Chronic Reference Concentration Route	Inhalation Chronic Reference Concentration Study Duration	Inhalation Chronic Reference Concentration Study Reference	Inhalation Chronic Reference Concentration Notes

Appendix C

Field Forms and Boring Logs

SES FIELD READINESS REVIEW FORM

Employee Name: Ash Willis

Job Number: M2032.0001

Job Location: AFP 06

Job Tasks:

Surface Sampling, Groundwater Sampling, Soil Sampling – Surface Soil and subsurface soil, Soil boring logging,, Surface water and sediment sampling, Mobe/demobe tasks

Equipment Needed:

Soil boring: Munsell Charts, Tape measure, pens, soil boring forms, USCS Table,

GW Sampling: YSI, peristaltic pump, multiRAE, sample containers etc.

Sediment Sampling: Sample containers, spoons

SW Sampling: Sample containers, SW collection device

Proper PPE for all above tasks is a minimum Level D, plus nitriles.

Documents Needed:

Field forms: Boring log, GW sampling log, sample log, log book, calibration sheets – Meshew to print copies 11-27

Readiness Review Notes:

Jeremy will be the site lead. We'll travel down on Sunday the 12th and stay through completion which is scheduled for November 22nd. Frank - I note that you have PTO scheduled to begin on the 21st. We should have things well at hand by then so you can cut loose a day early. There are only 23 borings though they are spread throughout a large portion of the installation.

Only one area called Position 53 by the local staff (C-5 engine fire in the QAPP) will require significant coordination. This is their test pad for the C-5's under maintenance or getting ready for delivery. NO WORK WILL BE CONDUCTED CLOSER THAN 50 FEET TO THE AIRCRAFT. Make sure we have a tape or wheel so that we can double check based on the current location of the aircraft once we get there. I've positioned the locates outside of that range based on current aircraft placement but we definitely want to recheck once we're there. That area is currently scheduled for work to be conducted on the 17, 18 and 19 of November.

I'd like Jeremy and Frank to work out who will take the lead on organizing equipment in the office the week before. We will of course be driving down since this is on the northern side of Atlanta. The hotel is:

Courtyard Atlanta Marietta/I-75 North

2455 Delk Road SE Marietta Georgia 30067 USA

All of your names, along with the drillers and surveyors have been submitted and cleared by Lockheed Martin. We'll need to stop at the badging office on the first day to get your badges and vehicle passes will be issued at the North Gate. When you get your pass have the guard put the 22nd of November on it as the expiration. The surveyor for this work is Wellston SURVEYORS (SAME GROUP WE USED AT ROBINS IF ANY OF YOU WERE THERE).

Equipment Packed for travel on: Ordered 11/21/17 – Packed 11/27/17 – Most in storage unit near installation

Travel Dates:

Site Supervisor Signature

Greg Carlson

SES FIELD READINESS REVIEW FORM

Employee Name: Franklin Johnson

Job Number: M2032.0001

Job Location: AFP 06

Job Tasks:

Surface Sampling, Groundwater Sampling, Soil Sampling – Surface Soil and subsurface soil, Soil boring logging,, Surface water and sediment sampling, Mobe/demobe tasks

Equipment Needed:

Soil boring: Munsell Charts, Tape measure, pens, soil boring forms, USCS Table,

GW Sampling: YSI, peristaltic pump, multiRAE, sample containers etc.

Sediment Sampling: Sample containers, spoons

SW Sampling: Sample containers, SW collection device

Proper PPE for all above tasks is a minimum Level D, plus nitriles.

Documents Needed:

Field forms: Boring log, GW sampling log, sample log, log book, calibration sheets – Meshew to print copies 11-27

Readiness Review Notes:

Jeremy will be the site lead. We'll travel down on Sunday the 12th and stay through completion which is scheduled for November 22nd. Frank - I note that you have PTO scheduled to begin on the 21st. We should have things well at hand by then so you can cut loose a day early. There are only 23 borings though they are spread throughout a large portion of the installation.

Only one area called Position 53 by the local staff (C-5 engine fire in the QAPP) will require significant coordination. This is their test pad for the C-5's under maintenance or getting ready for delivery. NO WORK WILL BE CONDUCTED CLOSER THAN 50 FEET TO THE AIRCRAFT. Make sure we have a tape or wheel so that we can double check based on the current location of the aircraft once we get there. I've positioned the locates outside of that range based on current aircraft placement but we definitely want to recheck once we're there. That area is currently scheduled for work to be conducted on the 17, 18 and 19 of November.

I'd like Jeremy and Frank to work out who will take the lead on organizing equipment in the office the week before. We will of course be driving down since this is on the northern side of Atlanta. The hotel is:

Courtyard Atlanta Marietta/I-75 North

2455 Delk Road SE Marietta Georgia 30067 USA

All of your names, along with the drillers and surveyors have been submitted and cleared by Lockheed Martin. We'll need to stop at the badging office on the first day to get your badges and vehicle passes will be issued at the North Gate. When you get your pass have the guard put the 22nd of November on it as the expiration. The surveyor for this work is Wellston SURVEYORS (SAME GROUP WE USED AT ROBINS IF ANY OF YOU WERE THERE).

Equipment Packed for travel on: Ordered 11/21/17 – Packed 11/27/17 – Most in storage unit near installation

Travel Dates:

Site Supervisor Signature

Greg Carlson

SES FIELD READINESS REVIEW FORM

Employee Name: Jeremy Meshew

Job Number: M2032.0001

Job Location: AFP 06

Job Tasks:

Surface Sampling, Groundwater Sampling, Soil Sampling – Surface Soil and subsurface soil, Soil boring logging,, Surface water and sediment sampling, Mobe/demobe tasks

Equipment Needed:

Soil boring: Munsell Charts, Tape measure, pens, soil boring forms, USCS Table,

GW Sampling: YSI, peristaltic pump, multiRAE, sample containers etc.

Sediment Sampling: Sample containers, spoons

SW Sampling: Sample containers, SW collection device

Proper PPE for all above tasks is a minimum Level D, plus nitriles.

Documents Needed:

Field forms: Boring log, GW sampling log, sample log, log book, calibration sheets – Meshew to print copies 11-27

Readiness Review Notes:

Jeremy will be the site lead. We'll travel down on Sunday the 12th and stay through completion which is scheduled for November 22nd. Frank - I note that you have PTO scheduled to begin on the 21st. We should have things well at hand by then so you can cut loose a day early. There are only 23 borings though they are spread throughout a large portion of the installation.

Only one area called Position 53 by the local staff (C-5 engine fire in the QAPP) will require significant coordination. This is their test pad for the C-5's under maintenance or getting ready for delivery. NO WORK WILL BE CONDUCTED CLOSER THAN 50 FEET TO THE AIRCRAFT. Make sure we have a tape or wheel so that we can double check based on the current location of the aircraft once we get there. I've positioned the locates outside of that range based on current aircraft placement but we definitely want to recheck once we're there. That area is currently scheduled for work to be conducted on the 17, 18 and 19 of November.

I'd like Jeremy and Frank to work out who will take the lead on organizing equipment in the office the week before. We will of course be driving down since this is on the northern side of Atlanta. The hotel is:

Courtyard Atlanta Marietta/I-75 North

2455 Delk Road SE Marietta Georgia 30067 USA

All of your names, along with the drillers and surveyors have been submitted and cleared by Lockheed Martin. We'll need to stop at the badging office on the first day to get your badges and vehicle passes will be issued at the North Gate. When you get your pass have the guard put the 22nd of November on it as the expiration. The surveyor for this work is Wellston **SURVEYORS (SAME GROUP WE USED AT ROBINS IF ANY OF YOU WERE THERE).**

Equipment Packed for travel on: Ordered 11/21/17 – Packed 11/27/17 – Most in storage unit near installation

Travel Dates:

Site Supervisor Signature

Greg Carlson

Aerostar SES LLC

BORING LOG - AFP06-01-001

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 11/14/17
End Date : 11/15/17
Northing : 1428538.31
Easting : 2188071.32
Surface Elev. (ft)* : 1080.04
Total Depth (ft)** : 20.0

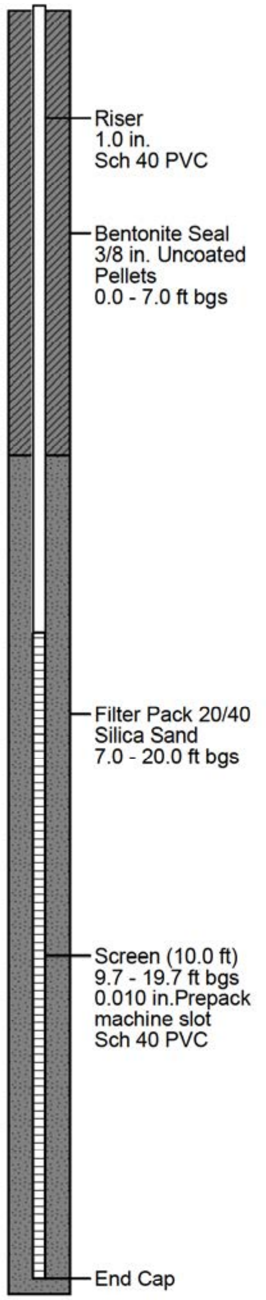
Site Name : Area 1
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : Dry during drilling
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 5.0) LEAN CLAY, 5YR 6/6, reddish yellow, non-plastic, ~5% coarse sand, soft, dry, no odor	0	CL	▨		SS	AFP06-01-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	92	(5.0 - 20.0) SILTY SAND, 5YR 6/6, reddish yellow, < 5% 5YR 4/1, dark gray staining bands ~ 3.0 cm wide, coarse to fine grained sand above 10.0 ft bgs, then medium to fine grained sand below 10.0 ft bgs, well graded sand, dry	0	SM	▨			
10	3	100		0					
15	4	94		0					
								SO	AFP06-01-001-S0-019 Note: Interval 19.0 - 20.0 ft
20			Refusal - End of Borehole 20.0 ft bgs						

Temporary Well:
AFP06-01-001
Elev (TOC): 1080.06



BORING LOG - AFP06-01-002

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 11/15/17
End Date : 11/15/17
Northing : 1428511.74
Easting : 2188142.88
Surface Elev. (ft)* : 1079.45
Total Depth (ft)** : 26.0

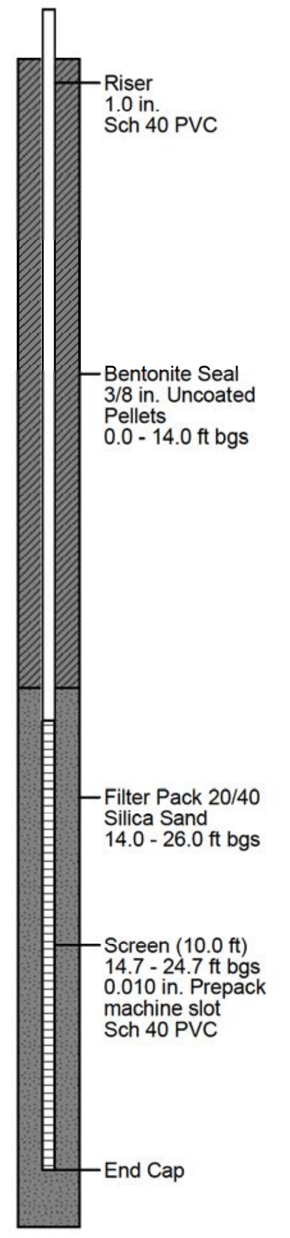
Site Name : Area 1
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : Dry during drilling
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0			(0.0 - 7.5) LEAN CLAY, non-plastic, 5YR 4/6, yellowish red, medium stiff, dry	0				SS	AFP06-01-002-SS-001 Note: Interval 0.0 - 0.5 ft
	1	100							
5				0	CL				
	2	98	(7.5 - 20.0) SILTY SAND, 10YR 3/6, dark yellowish red, ~ 10% fines, 90% fine grained sand, slightly moist, no odor						
10				0					
	3	90			SM				
15				0					
	4	78	18.0 ft bgs, color grading dark grayish black, 10YR 4/2						
20			(20.0 - 26.0) SILTY GRAVEL, 10YR 5/4, yellowish brown, ~ 70% fine to medium angular gravel, slightly moist, no odor						
	5	78			GM				
25	6	100						SO	AFP06-01-002-S0-025 Note: Interval 25.0 - 26.0 ft
			Refusal - End of Borehole 26.0 ft bgs						
30									

Temporary Well:
AFP06-01-002
Elev (TOC): 1080.65



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-01-003

(Page 1 of 1)

Start Date : 11/15/17
End Date : 11/15/17
Northing : 1428499.05
Easting : 2188106.82
Surface Elev. (ft)* : 1080.07
Total Depth (ft)** : 20.0

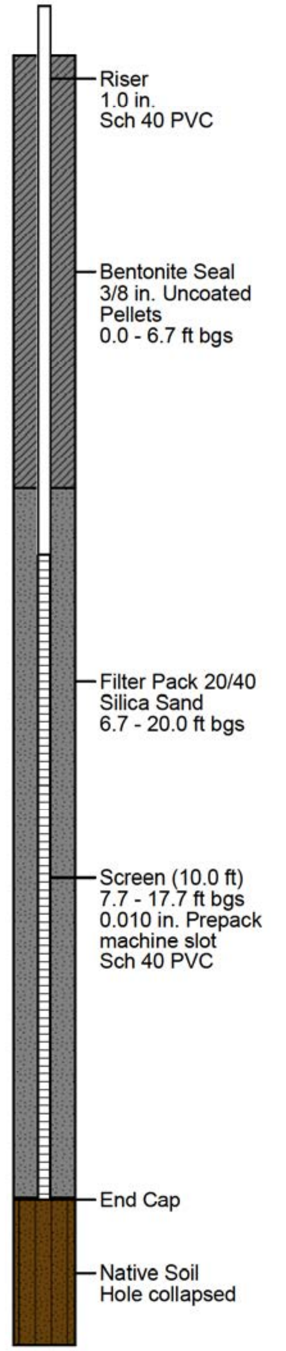
Site Name : Area 1
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : Dry during drilling
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0			(0.0 - 1.0) GRAVEL (FILL)	0	GP			SS	AFP06-01-003-SS-001 Note: Interval 0.0 - 0.5 ft
			(1.0 - 6.0) LEAN CLAY, 5YR 4/6, yellowish red, medium stiff, dry						
	1	100			CL				
5				0					
			(6.0 - 20.0) SILTY SAND, 10YR 3/6, dark yellowish red, ~ 20% fines, 80% fine grained sand, slightly moist, no odor						
	2	64							
10				0					
	3	68			SM				
15				0					
	4	68	17.0 ft bgs, Gravely sand (3.0" lense), 10YR 8/2, very pale brown, 20% medium to fine grained angular gravel						
								SO	AFP06-01-003-S0-019 Note: Interval 19.0 - 20.0 ft
20			End of Borehole 20.0 ft bgs						

Temporary Well:
AFP06-01-003
Elev (TOC): 1081.33



BORING LOG - AFP06-02-001

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 11/20/17
End Date : 11/20/17
Northing : 1419685.26
Easting : 2190339.00
Surface Elev. (ft)* : 1022.13
Total Depth (ft)** : 25.1

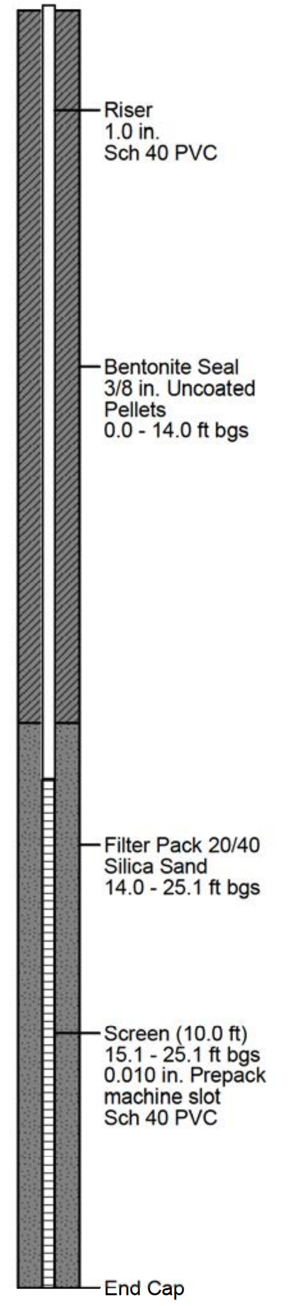
Site Name : Area 2
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 21.0
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 5.0) SILT with fine sand, ~ 25% sand, 10YR 5/6, yellowish brown, moist, no odor	0	ML			SS	AFP06-02-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	50	(5.0 - 5.5) CLAYEY GRAVEL, ~ 20% fines, 10YR 8/3, very pale brown, non-plastic, medium fine angular crystalline gravel, moist, no odor	0	GC				
			(5.5 - 20.0) SILTY SAND, 7.5YR 4/4 brown, moist, no odor, ~ 30% fines, no odor		SM				
10		88		0					
15	3	64		0					
19								SO	AFP06-02-001-S0-020 Note: Interval 19.0 - 20.0 ft
20	4	94	(20.0 - 25.0) SANDY SILT, 10YR 6/2, light brownish gray, ~ 10% fines, fine grained sand, wet below 21.0 ft bgs, no odor		SM		▼		
25			End of Borehole 25.1 ft bgs						

Temporary Well:
AFP06-02-001
Elev (TOC): 1022.24



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-02-002

(Page 1 of 1)

Start Date	: 11/20/17
End Date	: 11/20/17
Northing	: 1419476.64
Easting	: 2190256.20
Surface Elev. (ft)*	: 1021.73
Total Depth (ft)**	: 35.0

Site Name	: Area 2
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Brian Thomas
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 11/21/2017
DTW During Drilling (ft)	: 30.0
Logged By	: Franklin Johnson

Water Levels

▼ During Drilling

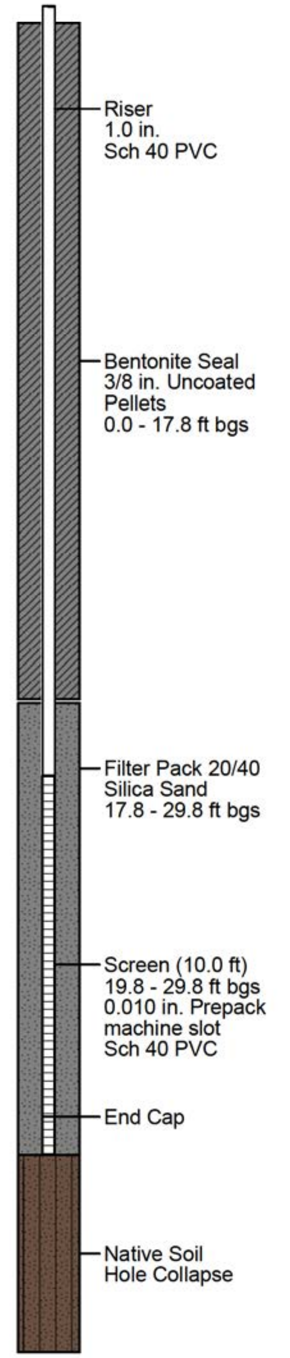
Measurements

*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 4.0) LEAN CLAY, non-plastic, 7.5YR 4/6, strong brown, medium stiff to soft, slightly moist, no odor	0	CL			SS	AFP06-02-002-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	80	(4.0 - 15.0) SILTY SAND, 7.5YR 4/4, brown, ~30% fines, ~ 70% fine grained sand, no odor	0	SM				
10		80		0					
15	3	88	(15.0 - 20.0) SILTY SAND, 7.5YR 4/4, brown, ~30% fines, ~ 70% medium to fine grained sand, no odor	0	SM				
20	4	100	(20.0 - 30.0) SILTY SAND, 10YR 4/3, brown, ~ 40% fines, 70% fine grained sand, soft, moist, no odor	0	SM				
25	5	100		0				SO	AFP0602-002-SO-029 Note: Interval 29.0 - 30.0 ft
30	6	100	(30.0 - 31.0) CLAYEY GRAVEL, non-plastic, 10YR 8/3, very pale brown, ~ 40% fines, crystalline (massive) gravel medium to fine, angular, wet, no odor	0	GC		▼		
			(31.0 - 35.0) SILTY SAND, 10YR 4/3, brown, ~ 40% fines, fine grained sand, wet, no odor		SM				
35			End of Borehole 35.0 ft bgs	0					

Temporary Well:
AFP06-02-002
Elev (TOC): 1022.17



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-02-003

(Page 1 of 1)

Start Date : 11/20/17
End Date : 11/20/17
Northing : 1419675.36
Easting : 2190500.05
Surface Elev. (ft)* : 1023.30
Total Depth (ft)** : 20.1

Site Name : Area 2
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 15.0
Logged By : Franklin Johnson

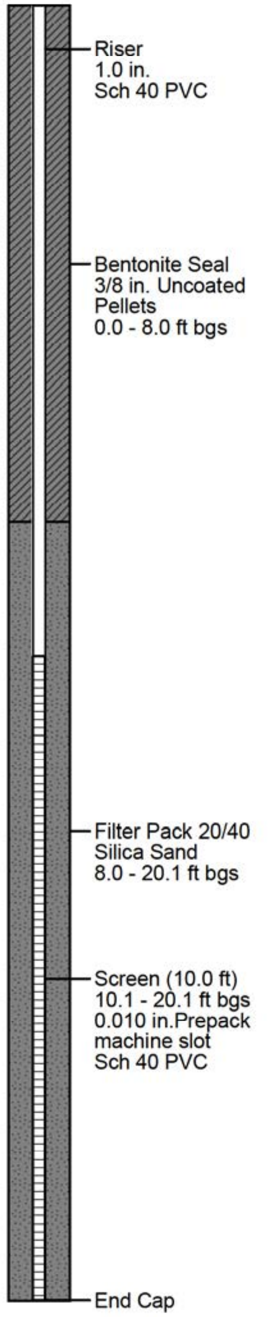
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 4.0) LEAN CLAY, non-plastic, 7.5YR 4/3, brown, medium stiff, moist, no odor	0	CL		SS	AFP06-02-003-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	74	(4.0 - 12.0) SILTY SAND, 7.5YR 4/4, brown, ~10% medium to fine angular gravel, fine grained sand, moist	0	SM			
10				0				
	3	76	(12.0 - 12.3) CLAYEY SAND, non-plastic, 10YR 8/3, very pale brown, soft, fine grained sand, moist		SC			
15			(12.3 - 18.0) SANDY SILT, 7.5YR 4/4, brown, ~ 10% medium to fine angular gravel, fine grained sand, wet below 15.0 ft bgs	0	SM	▼	SO	AFP06-02-003-S0-014 Note: Interval 14.0 - 15.0 ft
	4	84	(18.0 - 18.5) CLAYEY GRAVEL, non-plastic, 10YR 8/3, very pale brown, ~ 20% fines, medium to fine, angular crystalline gravel, wet	0	GC			
20			(18.5 - 20.09) SILTY SAND, 10YR 4/6, dark yellowish brown, ~ 30% fines, 70% sand, medium stiff, wet no odor		SM			

End of Borehole 20.1 ft bgs

Temporary Well:
AFP06-02-003
Elev (TOC): 1023.43



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-03-001

(Page 1 of 1)

Start Date	: 11/13/17
End Date	: 11/13/17
Northing	: 1428298.53
Easting	: 2186949.75
Surface Elev. (ft)*	: 1107.11
Total Depth (ft)**	: 60.0

Site Name	: Area 3
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Brian Thomas
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 11/21/17
DTW During Drilling (ft)	: 48.0
Logged By	: Franklin Johnson

Water Levels

▼ During Drilling

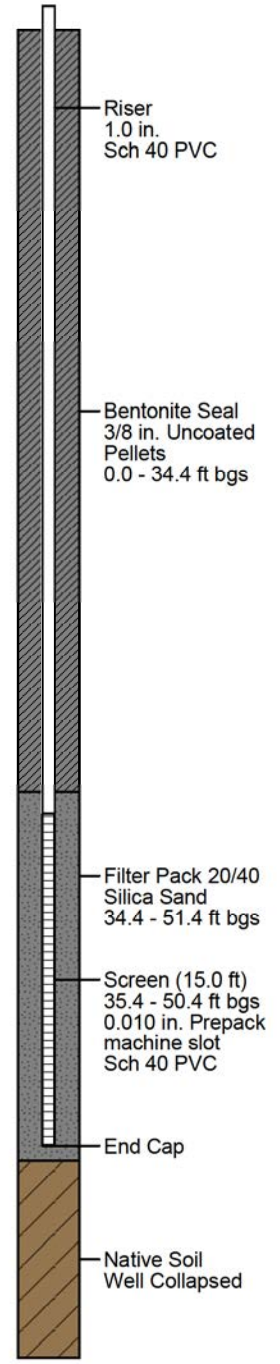
Measurements

*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 5.0) CLAYEY SILT, 7.5YR 4/4, brown, medium stiff, ~ 70% fines, trace micaceous content, slightly moist, no odor	0	CL		SS	AFP06-03-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	74	(5.0 - 8.6) CLAYEY SILT, 7.5YR 4/4, brown, medium stiff, ~ 70% fines, slightly moist, no odor (8.6 - 39.0) CLAYEY SILT, low to non-plastic, 2.5YR 4/6, red to 10YR 5/4, yellowish brown, medium stiff, slightly moist, trace medium gravel (intact micaceous parent rock, ~ 10% micaceous content	0	CL			
10	3	76		0				
15	4	74		0				
20	5	94		0	CL			
25	6	78		0				
30	7	80		0				
35	8	100	(39.0 - 39.3) SANDY CLAY, low plasticity, 10YR 8/3, very pale brown, medium stiff, micaceous sand, low plasticity, slightly moist	0	SC			
40	9	98	(39.3 - 50.0) CLAYEY SILT, low to non-plastic, 2.5YR 4/6, red to 10YR 5/4, yellowish brown, medium stiff, slightly moist, trace medium gravel (intact micaceous parent rock, ~ 10% micaceous content	0	CL			
45	10	98		0		▼	SO	AFP06-03-001-S0-047 Note: Interval 47.0 - 48.0 ft
50	11	90	(50.0 - 60.0) CLAYEY SILT, low to non-plasticity, 10YR 5/4, yellowish brown, medium stiff, slightly moist	0	CL			
55	12	100		0				
60			End of Borehole 60.0 ft bgs	0				

Temporary Well:
AFP06-03-001
Elev (TOC): 1108.21



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-04-001

(Page 1 of 1)

Start Date : 11/20/17
End Date : 11/20/17
Northing : 1429624.55
Easting : 2187003.20
Surface Elev. (ft)* : 1108.21
Total Depth (ft)** : 40.0

Site Name : Area 4
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 36.5
Logged By : Franklin Johnson

Water Levels

▼ During Drilling

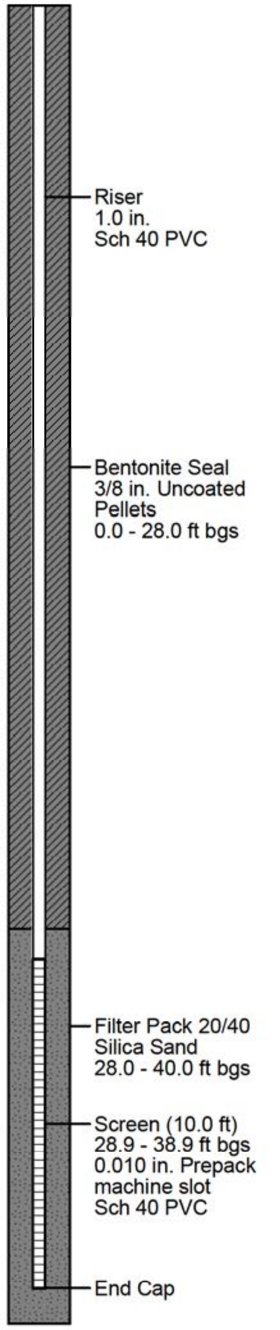
Measurements

*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 0.2) Asphalt (0.2 - 1.5) Concrete (1.5 - 5.0) LEAN CLAY, non-plastic, 7.5YR 4/6, strong brown, soft, wet from concrete coring	0	CL		SS	AFP06-04-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	74	(5.0 - 17.0) LEAN CLAY, non-plastic, 7.5YR 4/6, strong brown, medium stiff, slightly moist, trace medium to fine angular gravel	0	CL			
10	3	76		0 0				
15	4	74	(17.0 - 27.0) SILTY SAND, 10YR 8/4, very pale brown, ~ 40% fines, 60% fine grained sand, slightly moist, no odor	0	SM			
20	5	94						
25	6	78	(27.0 - 33.0) CLAYEY SAND, 10YR 8/1, white, low to non-plastic, slightly moist		SC			
30	7	80						
35	8	100	(33.0 - 40.0) SCHIST, 10YR 4/1, dark gray, heavily weathered, very brittle, wet below 36.5 ft			▼	SO	AFP06-04-001-S0-036 Note: Interval 36.0 - 37.0 ft
40			End of Borehole 40.0 ft bgs					

Temporary Well:
AFP06-04-001
Elev (TOC): 1108.21



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-04-002

(Page 1 of 1)

Start Date : 11/20/17
End Date : 11/20/17
Northing : 1429607.12
Easting : 2187054.46
Surface Elev. (ft)* : 1108.16
Total Depth (ft)** : 35.1

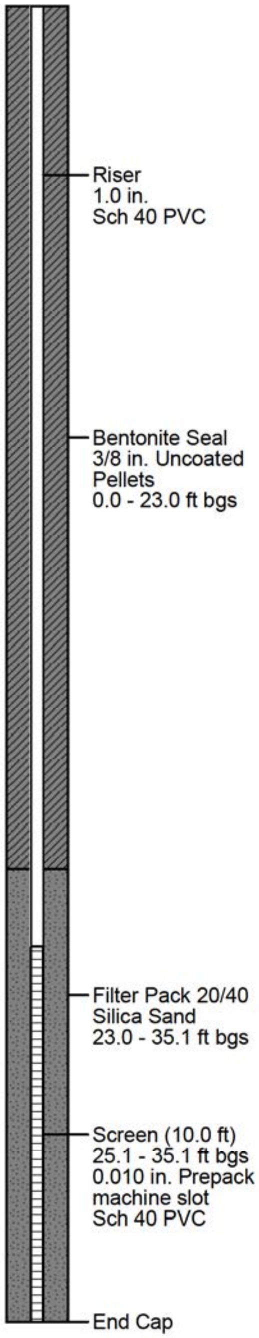
Site Name : Area 4
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 30.0
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0			(0.0 - 0.2) Asphalt					SS	AFP06-04-002-SS-001 Note: Interval 0.0 - 0.5 ft
			(0.2 - 1.5) Concrete	0					
	1	100	(1.5 - 5.0) LEAN CLAY, non-plastic, 7.5YR 4/6, strong brown, soft, wet (water seepage from concrete coring)		CL				
5 10	2 3	74 76	(5.0 - 15.0) LEAN CLAY, non-plastic, 7.5YR 4/6, strong brown, medium stiff, trace micaceous content, slightly moist	0 0	CL				
15 20	4 5	74 94	(15.0 - 23.5) SILTY SAND, 10YR 8/6, yellow, ~20% fines, 80% fine grained sand, trace fine angular gravel	0 0	SM				
25 30	6	78	(23.5 - 31.0) SILTY SAND, 10YR 4/4, dark yellowish brown, medium stiff, trace micaceous content, moist then wet below 30.0 ft bgs		SM		▼	SO	AFP06-04-002-S0-029 Note: Interval 29.0 - 30.0 ft
	7	80	(31.0 - 35.0) SILTY SAND, 10YR 8/2, very pale brown, ~ 40% fines, 60% sand, medium stiff, wet, no odor		SM				
35			End of Borehole 35.1 ft bgs						

Temporary Well:
AFP06-04-002
Elev (TOC): 1108.14


Riser
1.0 in.
Sch 40 PVC

Bentonite Seal
3/8 in. Uncoated
Pellets
0.0 - 23.0 ft bgs

Filter Pack 20/40
Silica Sand
23.0 - 35.1 ft bgs

Screen (10.0 ft)
25.1 - 35.1 ft bgs
0.010 in. Prepack
machine slot
Sch 40 PVC

End Cap

Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-04-003

(Page 1 of 1)

Start Date	: 11/16/17
End Date	: 11/16/17
Northing	: 1429650.35
Easting	: 2187029.78
Surface Elev. (ft)*	: 1107.75
Total Depth (ft)**	: 40.0

Site Name	: Area 4
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Brian Thomas
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 11/21/2017
DTW During Drilling (ft)	: 36.5
Logged By	: Franklin Johnson

Water Levels

▼ During Drilling

Measurements

*North American Vertical Datum (NAD83) feet (ft)

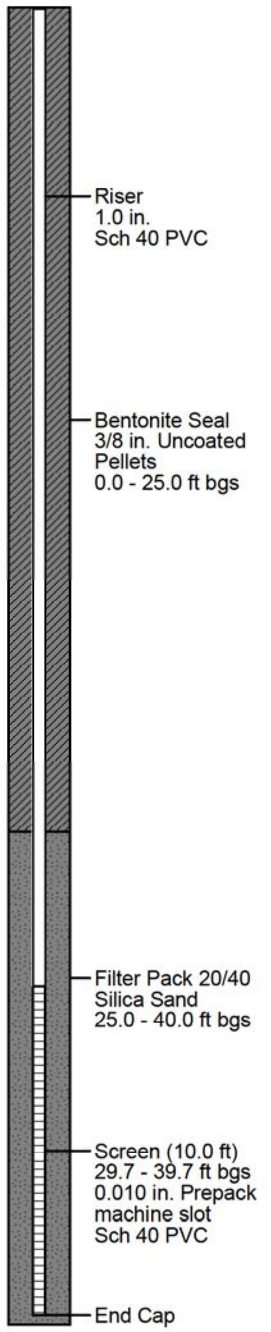
**Below Ground Surface (bgs) feet (ft)

Temporary Well:
AFP06-04-003
Elev (TOC): 1107.71

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	PID (ppm)
0 - 5	1	100	0
5 - 10	2	94	0
10 - 15	3	92	0
15 - 20	4	100	0
20 - 25	5	98	0
25 - 30	6	98	0
30 - 35	7	94	0
35 - 40	8	100	0

DESCRIPTION	USCS	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
(0.0 - 0.2) Asphalt			SS	AFP06-04-003-SS-001 Note: Interval 0.0 - 0.5 ft
(0.2 - 21.0) LEAN CLAY, non-plastic, 7.5YR 5/6, yellowish red, medium stiff, trace fine grained angular gravel 6.0 ft bgs, 3.0" thick layer of metamorphic rock, 50/50, 10YR 2/1, black and 10YR 8/3, very pale brown	CL			
(21.0 - 27.0) SILTY SAND, 7.5YR 4/6, strong brown, 20% fines, 80% fine grained sand slightly moist, no odor	SM			
(27.0 - 28.0) SILTY SAND, 10YR 8/2, very pale brown, ~ 10% fines, slightly moist, fine grained sand, no odor	SM			
(28.0 - 30.0) SILTY SAND, 10YR 6/4, v light yellowish brown, ~ 10% fines, slightly moist, fine grained sand, no odor	SM			
(30.0 - 40.0) SILTY SAND with ~10% medium to fine angular crystalline structure metamorphosed gravel/rock, wet from 36.5 - 37.0 ft, moist elsewhere	SM	▼	SO	AFP06-04-003-S0-036 Note: Interval 36.0 - 37.0 ft

End of Borehole 40.0 ft bgs



AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-06-001

(Page 1 of 1)

Start Date : 12/04/17
End Date : 12/04/17
Northing : 1423219.83
Easting : 2191202.02
Surface Elev. (ft)* : 1018.01
Total Depth (ft)** : 31.0

Site Name : Area 6
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Nate Minard
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 12/13/2017
DTW During Drilling (ft) : 21.0
Logged By : Jeremy Meshew

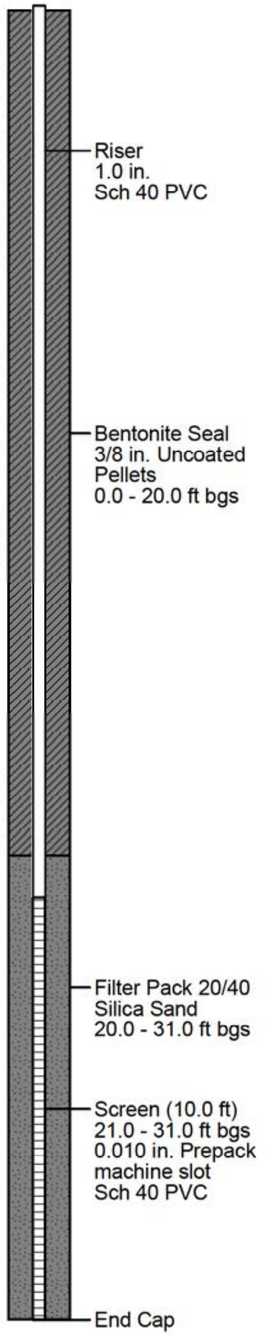
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 5.0) LEAN CLAY with abundant mica, non-plastic, 2.5YR 5/6, red, 80% fines, low density, 20% coarse gravel, sub-angular to sub-round gravel, dry	0	CL	▨		SS	AFP06-06-001-SS-001 AFP0606-001-SS-901 Note: Interval 0.0 - 0.5 ft
5	2	94	(5.0 - 10.0) LEAN CLAY with abundant mica, non-plastic, 2.5YR 5/6, red, 100% fines, medium density, dry	0	CL	▨			
10	3	92	(10.0 - 15.0) LEAN CLAY with abundant mica, non-plastic, 2.5YR 5/6, red, 100% fines, low density, dry	0	CL	▨			
15	4	100	(15.0 - 26.0) CLAYEY SILT, with abundant mica, 100% fines, non-plastic, 7.5YR 6/8, light red with trace 5YR 4/2, dark reddish gray motteling, low density, dry	0	ML	🟫			
20	5	98	21.0 ft bgs, wet	0	ML	🟫	▼	SO	AFP0606-001-SO-020 AFP0606-001-SO-920 Note: Interval 20.0 - 21.0 f
25	6	98	(26.0 - 31.0) CLAYEY SILT, with some mica, 5YR 8/2, pinkish white, 95% fines, 5% sand, non-plastic, sub-angular to sub-round, low density, wet	0	ML	🟫			
30	7	100		0		🟫			

End of Borehole 31.0 ft bgs

Temporary Well:
AFP06-06-001
Elev (TOC): 1018.13



Aerostar SES LLC

BORING LOG - AFP06-06-002

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 12/04/17
End Date : 12/04/17
Northing : 1423032.07
Easting : 2191446.29
Surface Elev. (ft)* : 1013.89
Total Depth (ft)** : 30.1

Site Name : Area 6
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Nate Minard
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips

Abandonment Date : 12/13/2017
DTW During Drilling (ft) : 25.0
Logged By : Jeremy Meshew

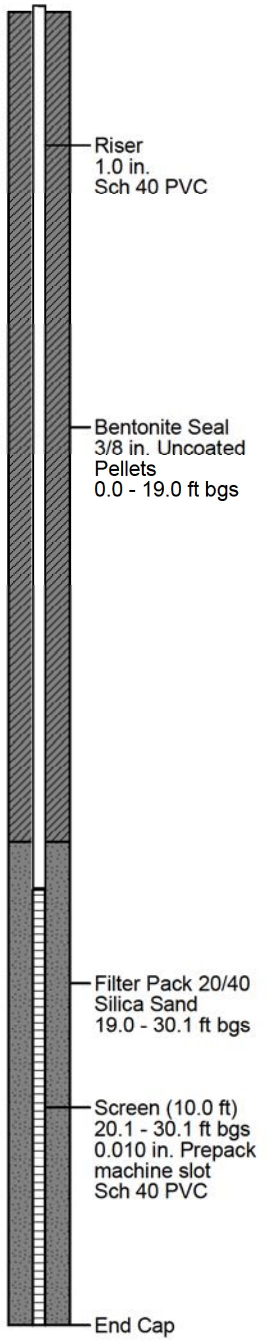
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 3.0) LEAN CLAY with abundant mica, 2.5YR 5/6, red, 100% fines, non-plastic, low density, dry	0	CL	▨		SS	AFP06-06-002-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	94	(3.0 - 10.0) LEAN CLAY with abundant mica, 2.5YR 5/6, red, 80% fines, non-plastic, low density, 20% gravel, sub-angular to sub-round, dry	0	CL	▨			
10	3	92	(10.0 - 22.5) CLAYEY SILT with abundant mica, non-plastic, 7.5YR 7/1, light gray, with 7.5YR 8/1 shi8te motteling, sub-angular to sub-round, dry	0	ML	▨			
15	4	100		0					
20	5	98	(22.5 - 25.0) CLAYEY SILT with abundant mica, non-plastic, 7.5YR 7/1, light gray, with 7.5YR 8/1 white motteling, sub-angular to sub-round, moist	0	ML	▨	▼	SO	AFP0606-002-SO-024 Note: Interval 24.0 - 25.0 ft
25	6	98	(25.0 - 30.0) CLAYEY SILT with abundant mica, non-plastic, 7.5YR 7/1, light gray, with 7.5YR 8/1 white motteling, sub-angular to sub-round, wet	0	ML	▨			
30			End of Borehole 30.1 ft bgs	0					

Temporary Well:
AFP06-06-002
Elev (TOC): 1014.05



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-06-003

(Page 1 of 1)

Start Date	: 12/04/17
End Date	: 12/04/17
Northing	: 1422963.13
Easting	: 2191307.77
Surface Elev. (ft)*	: 1014.51
Total Depth (ft)**	: 28.0

Site Name	: Area 6
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Nate Mainard
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 12/13/2017
DTW During Drilling (ft)	: GW Not ecountered
Logged By	: Jeremy Meshew

Water Levels

▼ During Drilling

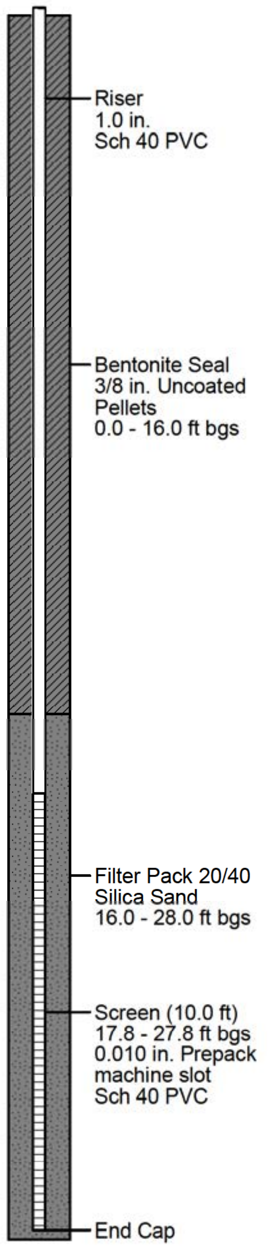
Measurements

*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 10.0) LEAN CLAY with abundant mica, 2.5YR 5/6, red, non-plastic, 100% fines, dry	0	CL	▨		SS	AFP06-06-003-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	76		0		▨			
10	3	72	(15.0 - 20.0) CLAYEY SILT with some mica, 95% fines, 5% fine sand, non-plastic, 7.5 YR 7/1, light gray with 7.5YR 8/1, white motteling, dry	0	ML	▨			
15	4	66	(15.0 - 28.0) CLAYEY SILT with some mica, 95% fines, 5% fine sand, sub-angular to sub-round, non-plastic, 7.5 YR 7/1, light gray with 7.5YR 4/4, brown motteling containing trace of biotite, dry	0	ML	▨			
20	5	72		0		▨			
25	6	106		0 0		▨	▼	SO	AFP0606-003-SO-027 Note: Interval 27.0 - 28.0 ft
30			Refusal - End of Borehole 28.0 ft bgs						

Temporary Well:
AFP06-06-003
Elev (TOC): 1014.70



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-07-001

(Page 1 of 1)

Start Date : 11/14/17
End Date : 11/14/17
Northing : 1431247.32
Easting : 2186946.93
Surface Elev. (ft)* : 1038.02
Total Depth (ft)** : 15.1

Site Name : Area 7
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 8.0
Logged By : Franklin Johnson

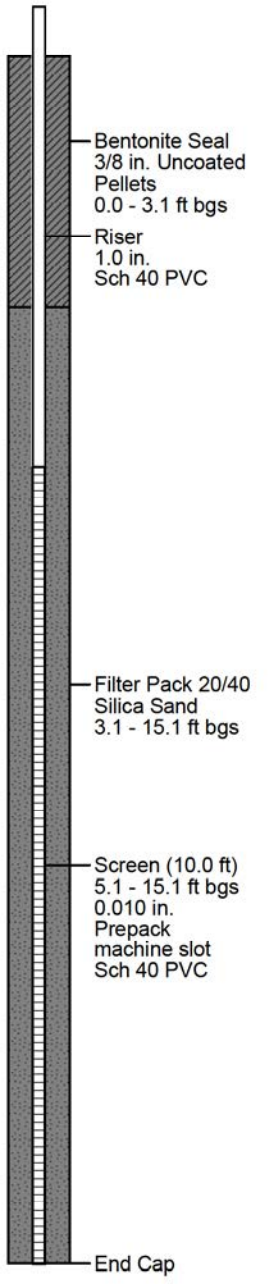
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 5.0) ORGANIC SLITS 2.5YR 5/6with trace fine grained sand and trace micaceous content, mois	0	OL	🟫		SS	AFP06-07-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	50	(5.0 - 15.14) SILTY SAND, 10YR 5/2, grayish brown, ~40% fines, trace fine gravel, moist,	0					
								SO	AFP06-07-001-007 Note: Interval 7.0 - 8.0 ft
			wet below 8.0 ft bgs				▼		
10	3	60		0	SM				
15				0					

End of Borehole 15.1 ft bgs

Temporary Well:
AFP06-07-001
Elev (TOC): 1039.40



BORING LOG - AFP06-07-002

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 11/14/17
End Date : 11/14/17
Northing : 1431215.31
Easting : 2187072.02
Surface Elev. (ft)* : 1039.26
Total Depth (ft)** : 25.0

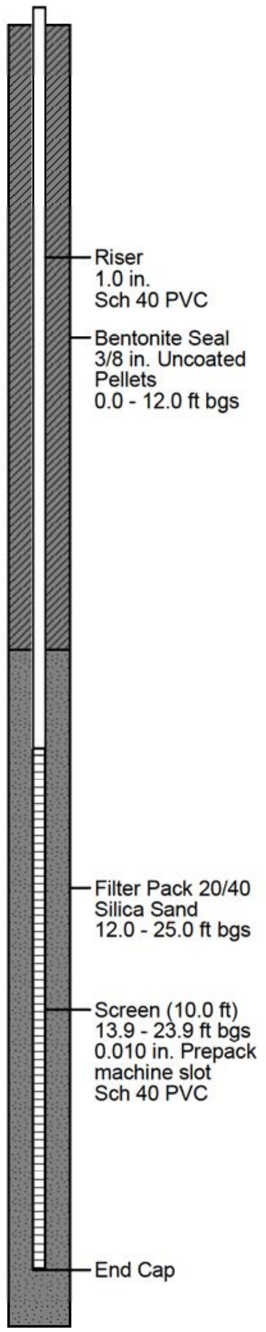
Site Name : Area 7
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 11.0
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 5.0) ORGANIC SILTS with trace fine grained sand and trace micaceous content, moist	0	OL			SS	AFP06-07-002-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	72	(5.0 - 10.0) SILTY GRAVEL, 10YR 4/6, dark yellowish brown, medium stiff, ~ 30% fines, no odor	0	GM				
10	3	80	(10.0 - 14.0) LEAN CLAY, non-plastic, 10YR 4/3, brown, medium stiff, slightly moist, wet below 11.0 ft bgs	0	CL		▼	SO	AFP06-07-002-010 Note: Interval 10.0 - 11.0 ft
			(14.0 - 20.0) SILTY GRAVEL, 10YR 4/6, dark yellowish brown, medium stiff, ~ 30% fine grained sand, slight fuel odor		GM				
15	4	10		3					
20	5	78	(20.0 - 25.0) SILTY SAND, 10YR 8/1, white, ~ 20% fines, fine grained sand, wet, slight fuel odor		SM				
25			Refusal - End of Borehole 25.0 ft bgs	3					

Temporary Well:
AFP06-07-002
Elev (TOC): 1039.70



Aerostar SES LLC

BORING LOG - AFP06-07-003

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 11/14/17
End Date : 11/14/17
Northing : 1431057.66
Easting : 2186981.74
Surface Elev. (ft)* : 1073.31
Total Depth (ft)** : 50.0

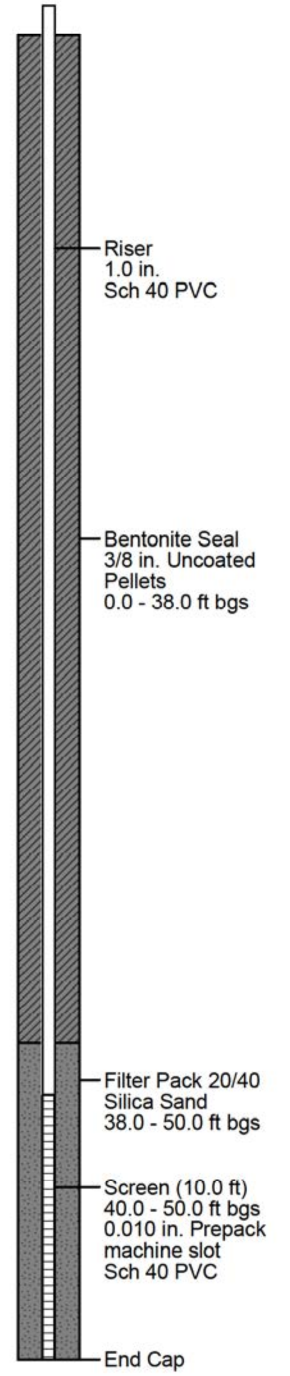
Site Name : Area 7
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 48.0
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 7.0) SILTY SANDY GRAVEL, 7.5YR 4/4, brown, ~ 60% medium to fine sub-angular gravel	0	GM			SS	AFP06-07-003-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	52	(7.0 - 8.0) LEAN CLAY, 7.5YR 5/6, strong brown, low plasticity, medium stiff, trace micaceous content, moist	0	CL				
10	3	52	(8.0 - 23.0) SILTY SANDY GRAVEL, 7.5YR 4/4, brown, ~ 60% medium to fine sub-angular gravel (gravel 5GY 2/1, greenish black (micaceous) very stiff	0	GM				
15	4	52		0					
20	5	80	(23.0 - 29.0) SCHIST, 5GY 2/1, greenish black, hard, weathered to very weathered with depth	0					
25	6	72		0					
30	7	72	(29.0 - 33.0) LEAN CLAY, low plasticity, 7.5YR 5/8, strong brown, medium stiff, no odor, moist	0	CL				
35	8	80	(33.0 - 45.0) CLAYEY SAND, non-plastic, 7.5YR 5/4, brown, micaceous content (trace)	0	SC				
40	9	80		0					
45	10	80	(45.0 - 50.0) MICACEOUS SILT, 8.5/N, white, non-plastic, medium stiff, wet, below 48.0 ft bgs, no odor	0	MH		▼	SO	AFP06-07-003-S0-047 Note: Interval 47.0 - 48.0 ft
50			End of Borehole 50.0 ft bgs						

Temporary Well:
AFP06-07-003
Elev (TOC): 1074.45



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-08-001

(Page 1 of 1)

Start Date	: 11/14/17
End Date	: 11/14/17
Northing	: 1427971.64
Easting	: 2186431.75
Surface Elev. (ft)*	: 1103.99
Total Depth (ft)**	: 45.0

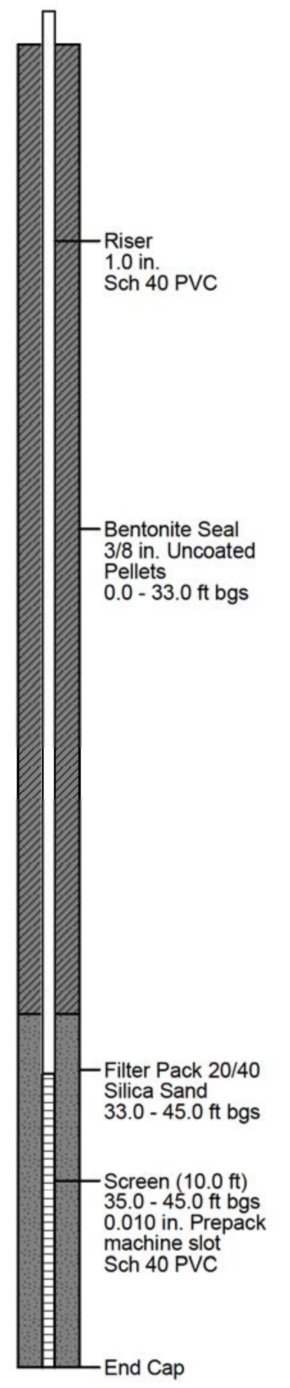
Site Name	: Area 8
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Brian Thomas
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 11/21/2017
DTW During Drilling (ft)	: 36.0
Logged By	: Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 12.0) LEAN CLAY, non-plastic, 7.5 4/4, brown, trace sub-angular fine gravel, stiff, dry	0	CL			SS	AFP06-08-001-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	62		0					
10	3	62		0					
			(12.0 - 18.0) LEAN CLAY, 5YR 5/6, yellowish red, non-plastic, no gravel content, stiff, dry		CL				
15	4	100		0					
			(18.0 - 18.5) SAND, poorly graded, 10YR 8/2, very pale brown, with ~ 10% fine gravel (parent rock)		SP				
			(18.5 - 22.0) LEAN CLAY, 5YR 5/6, yellowish red, non-plastic, no gravel content, dry, stiff		CL				
20	5	84		0					
			(22.0 - 36.0) SILTY SAND, 10YR 8/2, very pale brown, with 10% light brown staining (7.5YR 6/4), ~ 20% fines, moist		SM				
25	6	84		0					
30	7	84		0					
35	8	84		0			▼	SO	AFP06-08-001-S0-035 Note: Interval 35.0 - 36.0 ft
			(36.0 - 41.0) LEAN CLAY, low plasticity, 7.5YR 5/3, brown, with 20% black staining, wet soft, no odor		CL				
40	9	80		0					
			(41.0 - 45.05) SILTY SAND, 10YR 8/2, very pale brown with 10% black staining, wet		SM				
45			End of Borehole 45.0 ft bgs	0					

Temporary Well:
AFP06-08-001
Elev (TOC): 1105.14



BORING LOG - AFP06-08-002

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date	: 11/13/17
End Date	: 11/13/17
Northing	: 1427855.81
Easting	: 2186588.77
Surface Elev. (ft)*	: 1097.08
Total Depth (ft)**	: 40.2

Site Name	: Area 8
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Brian Thomas
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 11/21/2017
DTW During Drilling (ft)	: 33.0
Logged By	: Franklin Johnson

Water Levels

▼ During Drilling

Measurements

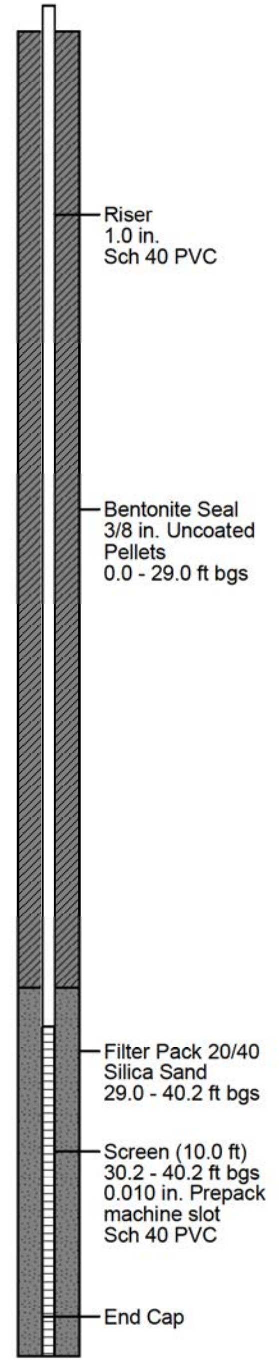
*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (BGS)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 31.0) LEAN CLAY, low to non-plastic, 10YR 4/6, dark yellowish brown, medium stiff, trace micaceous content, no odor	0	CL			SS	AFP06-08-002-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	84		0					
10	3	84		0					
15	4	86		0					
20	5	88		0					
25	6	88		0					
30	7	82	(31.0 - 33.0) LEAN CLAY, 10YR 4/3, brown, medium stiff, slightly moist, no odor (33.0 - 35.0) SILTY SAND, 2.5Y 8/1, white, with medium sub-round, gravel, wet below 33.0 ft bgs	0	CL SM		▼	SO	AFP06-08-002-S0-032 Note: Interval 32.0 - 33.0 ft
35	8	88	(35.0 - 40.0) LEAN CLAY, low plasticity, 2.5YR 8/2, pinkish white, soft, ~ 10% micaceous material	0	CL				
40				0					

End of Borehole 40.2 ft bgs

Temporary Well:
AFP06-08-002
Elev (TOC): 1097.88



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-08-003

(Page 1 of 1)

Start Date : 11/13/17
End Date : 11/13/17
Northing : 1427846.53
Easting : 2186446.53
Surface Elev. (ft)* : 1096.48
Total Depth (ft)** : 45.7

Site Name : Area 8
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 41.0
Logged By : Franklin Johnson

Water Levels

▼ During Drilling

Measurements

*North American Vertical Datum (NAD83) feet (ft)

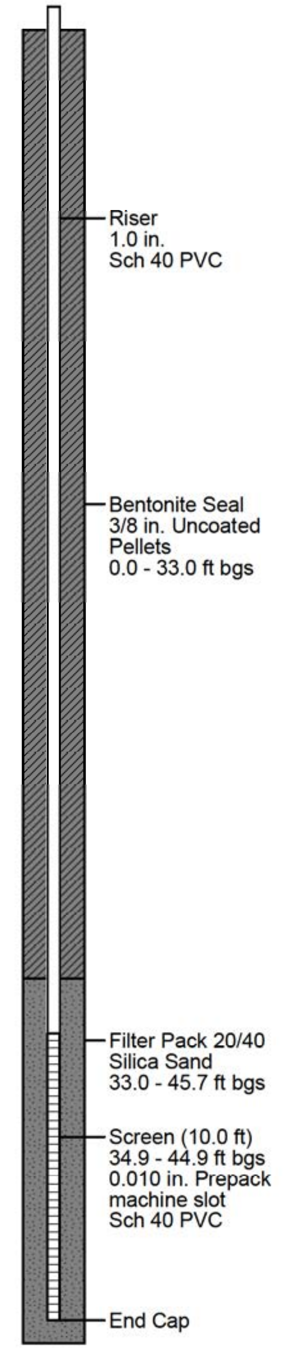
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 15.0) LEAN CLAY, low to non-plastic, plasticity, 10YR 4/4, brown, trace-micaceous content, medium stiff, slightly moist	0				SS	AFP06-08-003-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	92		0	CL				
10	3	92		0					
15	4	92	(15.0 - 23.0) LEAN CLAY, low plasticity, 10YR 4/4, brown, trace-micaceous content, soft, slightly moist	0 0	CL				
20	5	78							
			(23.0 - 26.0) MICACEOUS SILT, non-plastic, 7.5YR 4/4, brown, slightly moist		MH				
25	6	100		0					
			(26.0 - 27.0) SILTY GRAVEL, 7.5YR 5/4, brown, fine to medium angular gravel, ~40% fines, slightly moist		GM				
			(27.0 - 30.0) MICACEOUS SILT, 5YR 4/6, yellowish red, stiff, slightly moist, no odor		MH				
30	7	100	(30.0 - 31.0) MICACEOUS SILT, 2.5Y 8/4, yellowish red, stiff, slightly moist, no odor	0	MH				
			(31.0 - 40.0) MICACEOUS SILT, 10YR 4/4, dark yellowish brown, stiff, slightly moist, no odor						
35	8	100		0	MH				
40	9	100	(40.0 - 45.7) MICACEOUS SILT with Gravel, 10YR 3/3, dark brown, wet below 41.0 ft bgs	0	MH		▼	SO	AFP06-08-003-S0-041 Note: Interval 41.0 - 42.0 ft
45				0					

End of Borehole 45.7 ft bgs

Temporary Well:
AFP06-08-003

Elev (TOC): 1097.31



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-10-001

(Page 1 of 1)

Start Date	: 11/15/17
End Date	: 11/15/17
Northing	: 1424883.24
Easting	: 2185163.36
Surface Elev. (ft)*	: 1061.07
Total Depth (ft)**	: 20.0

Site Name	: Area 10
Drilling Company	: CASCADE
Drilling Method	: DPT, Geoprobe 7822DT
Driller	: Brian Thomas
Borehole Diameter	: 3.0 in.
Boring Completion	: Abandoned with Bentonite Chips
Abandonment Date	: 11/21/2017
DTW During Drilling (ft)	: 15.0
Logged By	: Franklin Johnson

Water Levels

▼ During Drilling

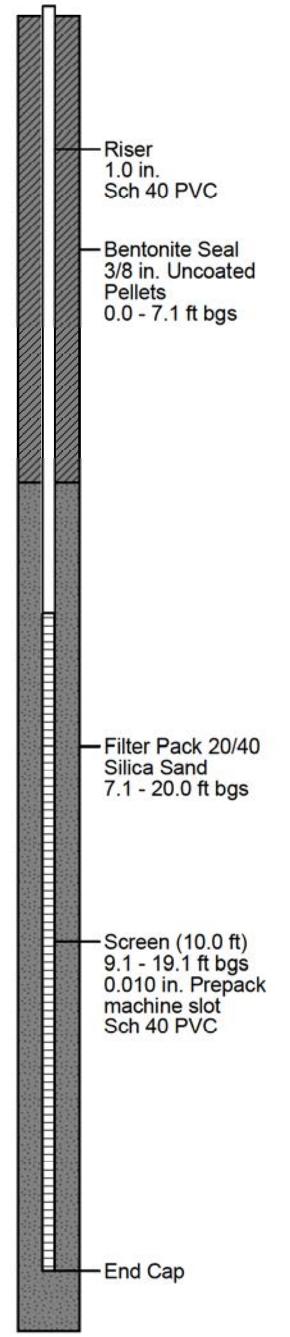
Measurements

*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0			(0.0 - 3.5) SILTY SAND, 7.5YR 4/6, strong brown, ~ 20% fines, fine grained sand	0	SM			SS	AFP06-10-001-SS-001 Note: Interval 0.0 - 0.5 ft
	1	100							
			(3.5 - 9.0) LEAN CLAY, 7.5YR 4/6, strong brown, low plasticity to non-plastic, fine grained sand						
5				0	CL				
	2	100							
			(9.0 - 20.0) CLAYEY SAND, non-plastic, 7.5YR 7/6, reddish yellow, ~ 10% fines, fine grained sand						
10				0					
	3	74							
					SC		▼	SO	AFP06-10-001-S0-014 Note: Interval 14.0 - 15.0 ft
15			wet below 15.0 ft bgs	0					
	4	100							
20			End of Borehole 20.0 ft bgs	0					

Temporary Well:
AFP06-10-001
Elev (TOC): 1061.23



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-10-002

(Page 1 of 1)

Start Date : 11/15/17
End Date : 11/15/17
Northing : 1424808.59
Easting : 2185209.23
Surface Elev. (ft)* : 1061.38
Total Depth (ft)** : 20.0

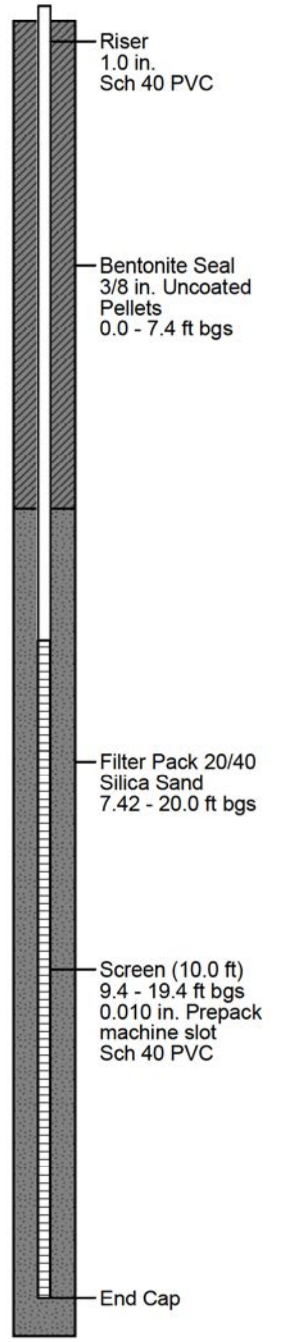
Site Name : Area 10
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 16.0
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 6.0) SILTY SAND, 10YR 6/4, light yellowish brown, ~ 5% fines, trace fine angular gravel	0	CL			SS	AFP06-10-002-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	74		0					
			(6.0 - 6.5) WEATHERED SCHIST, 5YR 8/1, pinkish gray to N3, dark gray (color mix, 50/50)		CL				
			(6.5 - 20.0) SILTY SAND, 10YR 5/4, yellowish brown, fine grained sand, moist, no odor		SM				
10	3	74		0					
15	4	70		0			▼	SO	AFP06-10-002-S0-015 Note: Interval 15.0 - 16.0 ft
			18.0 ft bgs, color changes to 10YR 4/4, dark yellowish brown						
			19.0 ft bgs, 1 cm thick lens of black fine grained sediment						
20				0					
			End of Borehole 20.0 ft bgs						

Temporary Well:
AFP06-10-002
Elev (TOC): 1061.62



Aerostar SES LLC

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

BORING LOG - AFP06-10-003

(Page 1 of 1)

Start Date : 11/15/17
End Date : 11/15/17
Northing : 1424990.55
Easting : 2185346.23
Surface Elev. (ft)* : 1061.15
Total Depth (ft)** : 25.0

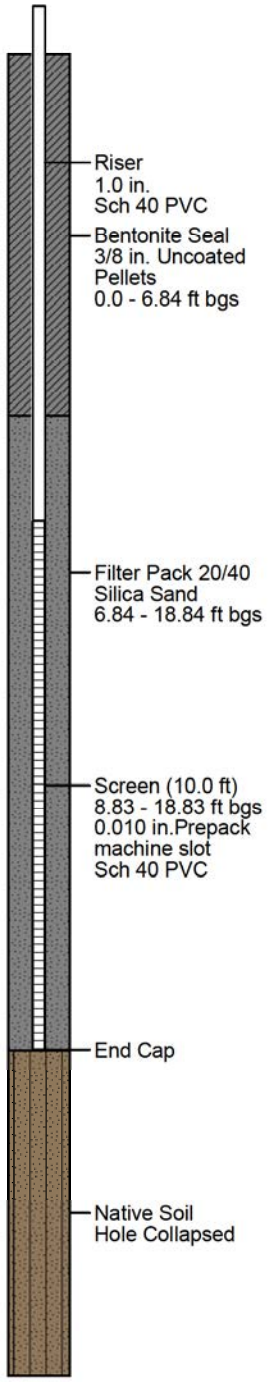
Site Name : Area 10
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 16.0
Logged By : Franklin Johnson

Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)
**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0			(0.0 - 10.0) LEAN CLAY, 5YR 5/6, yellowish red, non-plastic, soft slightly moist, no odor	0				SS	AFP06-10-003-SS-001 AFP06-10-003-SS-901 Note: Interval 0.0 - 0.5 ft
	1	100							
5			5.0 - 10.0 color grading to brown, 7.5YR 5/4	0	CL				
	2	88							
10			(10.0 - 16.0) SILTY SAND, 10YR 5/4, brown, ~ 10% fines, fine grained, well graded sand, no odor	0					
	3	82			SM				
15				0			▼	SO	AFP06-10-003-S0-015 AFP06-10-003-S0-915 Note: Interval 15.0 - 16.0 ft
	4	90	(16.0 - 19.0) SILTY SAND, 10YR 7/3, very pale brown, ~ 10% fines, fine grained, well graded sand, no odor		SM				
			(19.0 - 25.0) SILTY SAND, 10YR 5/3, BROWN, ~ 10% fines, fine grained, well graded sand, no odor						
20				0					
	5	100			SM				
25			End of Borehole 25.0 ft bgs						

Temporary Well:
AFP06-10-003
Elev (TOC): 1062.07



Aerostar SES LLC

BORING LOG - AFP06-10-004

(Page 1 of 1)

AFFF Areas (Savannah District)
AFFF Site Inspection
Project# M2032.0001

Air Force Plant 6

Start Date : 11/15/17
End Date : 11/15/17
Northing : 1424913.10
Easting : 2185388.06
Surface Elev. (ft)* : 1061.38
Total Depth (ft)** : 20.0

Site Name : Area 10
Drilling Company : CASCADE
Drilling Method : DPT, Geoprobe 7822DT
Driller : Brian Thomas
Borehole Diameter : 3.0 in.
Boring Completion : Abandoned with Bentonite Chips
Abandonment Date : 11/21/2017
DTW During Drilling (ft) : 17.0
Logged By : Franklin Johnson

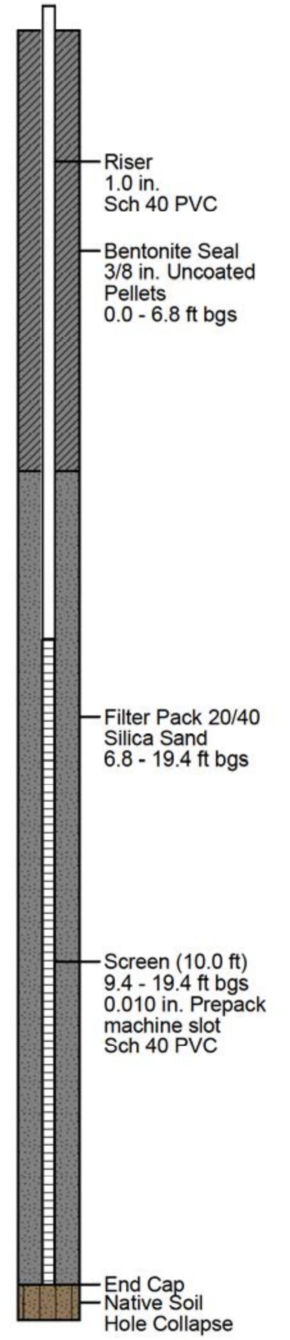
Water Levels
▼ During Drilling

Measurements
*North American Vertical Datum (NAD83) feet (ft)

**Below Ground Surface (bgs) feet (ft)

DEPTH IN FEET (bgs)	INTERVAL	% RECOVERY	DESCRIPTION	PID (ppm)	USCS	Munsell Soil Color	Depth to Water (DTW)	SAMPLE TYPE	SAMPLE ID
0	1	100	(0.0 - 6.0) SILTY SAND, with trace fine gravel, 7.5YR 5/4, brown, fine grained sand, slightly moist	0	SM			SS	AFP06-10-004-SS-001 Note: Interval 0.0 - 0.5 ft
5	2	100		0					
			(6.0 - 11.0) SILTY SAND, with trace fine gravel, 7.5YR 5/4, dark yellowish brown, ~ 5% micaceous fine grained sand, slightly moist		SM				
10	3	74		0					
			(11.0 - 12.5) SCHIST, N 6, medium light gray, very brittle						
			(12.5 - 15.0) SILTY SAND, 10YR 5/;2, grayish brown, ~ 20% fines, fine grained sand, moist		SM				
15	4	100	(15.0 - 20.0) SCHISTY SAND, 10YR 5/4, yellowish brown, ~ 40% fines, fine grained sand, wet below 17.0 ft bgs, no odor	0	SM				
								SO	AFP06-10-004-S0-016 Note: Interval 16.0 - 17.0 ft
							▼		
20			End of Borehole 20.0 ft bgs	0					

Temporary Well:
AFP06-10-004
Elev (TOC): 1061.78



AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)

Installation: AF Plant 6

WELL NO: ~~AFP06-001~~ AFP0602 - 001

SAMPLE ID: AFP0602-001-GW-020

DATE: 11/21/17

PURGING DATA

WELL DIAMETER (inches): 1.0"

TUBING DIAMETER (inches): 1/4" OD

WELL SCREEN INTERVAL DEPTH: 15.08 Ft - 25.08 Ft

STATIC DEPTH TO WATER (feet): 15.03

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (25.68 Ft - 15.03 Ft) x 0.041 gal/ft = 0.41 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= 0 gal + (0.0026 x 20 Ft) + 0.20 gal = 0.25 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 20

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 20

PURGING INITIATED AT: 0950

PURGING ENDED AT: 1025

TOTAL VOLUME PURGED (gallons): 1.75

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0950	—	—	0.05	*	—	—	—	—	—	—	Cloudy	none
1005	0.75	0.75	0.05	|	4.88	17.12	0.045	1.74	115.5	25.5	clear	|
1020	0.75	1.5	0.05	|	4.69	17.40	0.039	1.47	126.0	23.5	|	|
1025	0.25	1.75	0.05	|	4.71	17.38	0.037	1.48	128.9	13.5	|	|

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A.Wille, F.Johnson / ASL

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1025

SAMPLING ENDED AT: 1026

PUMP OR TUBING DEPTH IN WELL (feet): 20

TUBING MATERIAL CODE: PE

FIELD-FILTERED: Y [✓ N] Filter Size mm

Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0602-001 - GW - 020	2	PE	125 mL each	EPA 537M	APP	✓	200

REMARKS: * Due to size of well, both WLM and tubing could not fit – no WL data recorded during GW sampling.

Well Abandoned? [✓ Y] N Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0602-002
SAMPLE ID: AFP0602-002-GW-025
DATE: 11/21/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4" OD
WELL SCREEN INTERVAL DEPTH: 20.08 Ft - 30.08 Ft
STATIC DEPTH TO WATER (feet): 23.18'
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (30.08 Ft - 23.18 Ft) x 0.041 gal/ft = 0.28 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 25 Ft) + 0.20 gal = 0.27 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 25
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 25
PURGING INITIATED AT: 1048
PURGING ENDED AT: 1115
TOTAL VOLUME PURGED (gallons): 1.35

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1048	—	—	0.05	*	—	—	—	—	—	—	clear	none
1100	0.6	0.6	0.05		4.59	16.94	0.040	1.69	120.2	25.0		
1105	0.25	0.85	0.05		4.62	16.98	0.040	1.60	123.3	22.7		
1115	0.5	1.35	0.05		4.62	16.99	0.039	1.58	127.0	20.1		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F. Johnson / KSL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: ~~1047~~ 1115
SAMPLING ENDED AT: 1116
PUMP OR TUBING DEPTH IN WELL (feet): 25
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N] Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0602-002-GW-025	2	PE	125 mL each	EPA 537M	APP	✓	200 mL/min

REMARKS:
* Due to size of well, tubing and WLM could not both fit - no WL data recorded during GW sampling

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0602-003
SAMPLE ID: AFP0602-003-GW-015
DATE: 11/21/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4" OD
WELL SCREEN INTERVAL DEPTH: 10.09 Ft - 20.09 Ft
STATIC DEPTH TO WATER (feet): 13.56
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (20.09 Ft - 13.56 Ft) x 0.041 gal/ft = 0.26 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 15 Ft) + 0.20 gal = 0.24 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 15
PURGING INITIATED AT: 0845
PURGING ENDED AT: 0908
TOTAL VOLUME PURGED (gallons): 1.15

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0845	—	—	0.05	*	—	—	—	—	—	—	clear	none
0847	0.1	0.1	0.05		5.36	19.42	0.086	5.63	188.4	62.7		
0853	0.3	0.4	0.05		5.34	19.59	0.076	3.55	156.0	29.8		
0856	0.15	0.55	0.05		5.31	19.65	0.073	3.12	145.7	14.2		
0900	0.2	0.75	0.05		5.35	19.92	0.067	2.14	109.2	10.6		
0905	0.25	1.00	0.05		5.30	19.92	0.065	2.10	105.7	8.51		
0908	0.15	1.15	0.05		5.30	19.96	0.064	2.03	100.9	5.79		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 0908
SAMPLING ENDED AT: 0914
PUMP OR TUBING DEPTH IN WELL (feet): 15
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N]
Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0602-003-GW-015 w/MS/MSD	6	PE	125mL each (750)	EPA 537M	APP	✓	200 mL/min

REMARKS: * Due to size of well, tubing and WL both could not fit in well - no WL data recorded during groundwater Sampling

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ____

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0604-001
SAMPLE ID: AFP0604-001-GW-035
DATE: 11/21/2017

PURGING DATA

WELL DIAMETER (inches): 0.75
TUBING DIAMETER (inches): 1/4 OD
WELL SCREEN INTERVAL DEPTH: 29.91 Ft - 39.91 Ft
STATIC DEPTH TO WATER (feet): 25.11 ft BTOC
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (39.91 Ft BTOC - 25.11 Ft) x 0.02 gal/ft = 0.296 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) DNA = 0 gal + (x Ft) + gal = gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35.0
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35.6
PURGING INITIATED AT: 1310
PURGING ENDED AT: 1342
TOTAL VOLUME PURGED ~~(gallons)~~: L=9.6

TIME	VOLUME PURGED ~~(gallons)~~ L	CUMUL. VOLUME PURGED ~~(gallons)~~ L	PURGE RATE ~~(gpm)~~ mL/min	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1315	1.5	1.5	300	N/A	YSI	Malfunction	—	—	—	124	cloudy	none
1320	1.5	3.0	300		YSI	Malfunction	—	—	—	61.5	slight cloudy	none
1325	1.5	4.5	300		5.26	19.70	0.151	22.18	87.2	20.8	clear	none
1330	1.5	6.0	300		5.28	19.68	0.148	16.61	78.4	11.9	clear	none
1333	0.9	6.9	300		5.18	19.67	0.149	13.46	86.6	9.99	clear	none
1336	0.9	7.8	300		5.11	19.75	0.147	5.60	90.2	7.50	clear	none
1339	0.9	8.7	300		5.11	19.77	0.147	5.36	90.7	4.41	clear	none
1342	0.9	9.6	300		5.11	19.76	0.147	5.14	92.1	4.12	clear	none

F.J.

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: F. Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1342
SAMPLING ENDED AT: 1344
PUMP OR TUBING DEPTH IN WELL (feet): 35.0
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N] Filter Size n/a mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y N [✓ (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0604-001-GW-035	2	PE	125	EPA 537M	APP	✓	

F.J.

REMARKS:

Well Abandoned? [✓ Y] N Date Well Abandoned: 11/21/2017
Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0604-002
SAMPLE ID: AFP0604-002-GW-030
AFP0604-002-GW-930
DATE: 11/21/2017

PURGING DATA

WELL DIAMETER (inches): 0.75
TUBING DIAMETER (inches): 1/4 OD
WELL SCREEN INTERVAL DEPTH: 25.08 Ft - 35.08 Ft
STATIC DEPTH TO WATER (feet): 24.98
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (35.08 Ft - 24.98 Ft) x 0.02 gal/ft = Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = gal + (x Ft) + gal = gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 30.0
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 30.0
PURGING INITIATED AT: 1420
PURGING ENDED AT: 1448
TOTAL VOLUME PURGED ~~(gallons)~~: L=8.4

TIME	VOLUME PURGED ~~(gallons)~~ L	CUMUL. VOLUME PURGED ~~(gallons)~~ L	PURGE RATE ~~(gpm)~~ mL/min	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1425	1.5	1.5	300	N/A	5.97	19.80	0.168	2.07	65.2	74.7	cloudy brown	none
1430	1.5	3.0	300		5.80	19.76	0.124	1.83	36.5	19.8	clear	none
1435	1.5	4.5	300		5.64	19.13	0.102	1.73	28.6	7.73	clear	none
1440	1.5	6.0	300		5.48	19.72	0.083	2.45	40.7	4.14	clear	none
1445	1.5	7.5	300		5.24	19.63	0.082	1.71	39.0	4.50	clear	none
1448	0.9	8.4	300		5.24	19.61	0.080	1.82	38.0	2.65	clear	none

F.J

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Franklin Johnson / ASL
SAMPLER(S) SIGNATURE(S): Franklin Johnson
SAMPLING INITIATED AT: 1448
SAMPLING ENDED AT: 1452
PUMP OR TUBING DEPTH IN WELL (feet):
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N] Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y N [✓ (replaced)]
DUPLICATE: [✓ Y] N

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0604-002-GW-030	2	PE	125	EPA 537M	APP	✓	300
AFP0604-002-GW-930	2	PE	125	↓	APP	✓	300

F.J

REMARKS:

Well Abandoned? [✓ Y] N Date Well Abandoned: 11/21/2017
Well Measurement Method: [✓ Probe] Tape Other ____
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

300/5 W.

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)

Installation: AF Plant 6

WELL NO: AFP0604-003

SAMPLE ID: AFP0604-003-GW-035

DATE: 11/19/17

PURGING DATA

WELL DIAMETER (inches): 1.0"

TUBING DIAMETER (inches): 1/4" OD

WELL SCREEN INTERVAL DEPTH: 29.70 Ft - 39.70 Ft

STATIC DEPTH TO WATER (feet): 25.16

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (39.70 Ft - 25.16 Ft) x 0.04 gal/ft = 0.58 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 35 Ft) + 0.20 gal = 0.29 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35

PURGING INITIATED AT: 1332

PURGING ENDED AT: 1348

TOTAL VOLUME PURGED (gallons): 1.29

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1332	—	—	0.08	*	—	—	—	—	—	—	clear	none
1336	0.32	0.32	0.08		5.80	18.32	0.056	6.02	162.1	84.0		
1340	0.32	0.65	0.08		5.85	18.37	0.099	2.95	80.2	93.7		
1344	0.32	0.97	0.08		5.90	18.35	0.124	2.85	66.9	15.7		
1348	0.32	1.29	0.08		5.89	18.30	0.121	2.82	62.9	19.0		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F. Johnson / ASL

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1348

SAMPLING ENDED AT: 1350

PUMP OR TUBING DEPTH IN WELL (feet): 35

TUBING MATERIAL CODE: PE

FIELD-FILTERED: Y [✓ N] Filter Size mm

Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0604-003-GW-035	2	PE	125mL each	EPA 537M	APP	✓	300mL/min

REMARKS: * Could not fit WLM and tubing both in well due to size. NO WL DATA for low sampling.

Well Abandoned? [✓ Y] N Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: ~~Dobbins ARB~~ AFP06

WELL NO: AFP0606-001
SAMPLE ID: AFP0606-001-GW-026
DATE: 12/13/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4 OD
WELL SCREEN INTERVAL DEPTH: 21.0 Ft - 31.0 Ft
STATIC DEPTH TO WATER (feet): 21.74
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (31.0 Ft - 21.74 Ft) x 0.041 gal/ft = 0.38 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 26 Ft) + 0.20 gal = 0.27 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 26
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 26
PURGING INITIATED AT: 1323
PURGING ENDED AT: 1340
TOTAL VOLUME PURGED (gallons): 2.25

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1323	—	—	0.09	*	—	—	—	—	—	—	Clear	none
1328	0.45	0.45	0.09	↓	4.33	17.6	0.037	3.39	294.7	193	Cloudy	↓
1332	0.36	0.81	0.09	↓	4.28	17.7	0.036	3.25	279.5	74.2	Clear	↓
1335	0.27	1.08	0.09	↓	4.23	17.8	0.036	3.24	285.1	35.0	↓	↓
1340	0.45	1.53	0.09	↓	4.26	17.9	0.036	3.22	280.1	6.25	↓	↓

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1340
SAMPLING ENDED AT: 1348

PUMP OR TUBING DEPTH IN WELL (feet): 26
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N]
Filter Size mm
Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: [✓ Y] N

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0606-001-GW-026	2	PE	125 each	537M	APP	✓	340
AFP0606-001-GW-926	2	PE	125 each	537M	APP	✓	340

REMARKS: * Due to size of well, both tubing and WLM could not fit – no WL data during GW sampling.

Well Abandoned? Y N Date Well Abandoned:

Well Measurement Method: Probe Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: ~~Dobbins ARB~~ AF PLANT 6
WELL NO: AFP0606-002
SAMPLE ID: ~~DUP~~ AFP0606-002-GW-029
DATE: 12/12/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4 OD
WELL SCREEN INTERVAL DEPTH: 20.07 Ft - 30.07 Ft
STATIC DEPTH TO WATER (feet): 28.15
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (30.07 Ft - 28.15 Ft) x 0.041 gal/ft = 0.08 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 29 Ft) + 0.20 gal = 0.28 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 29
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 29
PURGING INITIATED AT: 1618
PURGING ENDED AT: 1632
TOTAL VOLUME PURGED (gallons): 0.70

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1618	—	—	0.05	✱	—	—	—	—	—	—	Cloudy	none
1622	0.20	0.20	0.05	↓	8.79	17.9	0.037	6.75	119.0	102	Clear	↓
1628	0.30	0.50	0.05	↓	7.82	18.1	0.038	6.72	125.7	14.5	↓	↓
1632	0.20	0.70	0.05	↓	8.85	18.1	0.038	6.72	130.1	9.7	↓	↓

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1632
SAMPLING ENDED AT: 1634
PUMP OR TUBING DEPTH IN WELL (feet): 29
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N] Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0606-002-GW-	2	PE	125mL	EPA 537M	APP	✓	200

REMARKS: ✱ Due to size of well, both tubing and WLM could not fit - no WL data recorded during GW sampling

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)

Installation: ~~Dobbins ARB~~ AF PLANT 6

WELL NO: AFP0606-003

SAMPLE ID: AFP0606-003-GW-026

DATE: 12/12/17

PURGING DATA

WELL DIAMETER (inches): 1.0"

TUBING DIAMETER (inches): 1/4 OD

WELL SCREEN INTERVAL DEPTH: 17.83 Ft - 27.83 Ft

STATIC DEPTH TO WATER (feet): 24.78

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (27.83 Ft - 24.78 Ft) x 0.041 gal/ft = 0.13 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + 0.0026 x 26 Ft) + 0.20 gal = 0.27 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 26

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 26

PURGING INITIATED AT: 1530

PURGING ENDED AT: 1556

TOTAL VOLUME PURGED (gallons): 1.3

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1530	—	—	0.05	*	—	—	—	—	—	—	Cloudy	none
1542	0.6	0.6	0.05	|	8.24	15.7	0.046	6.57	80.7	25.6	Clear	|
1550	0.4	1.0	0.05	|	8.27	15.4	0.045	6.50	81.2	13.5	|	|
1556	0.3	1.3	0.05	|	8.28	15.2	0.044	6.49	79.1	9.22	|	|

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A Willis / ASL

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1556

SAMPLING ENDED AT: 1558

PUMP OR TUBING DEPTH IN WELL (feet): 26

TUBING MATERIAL CODE: PE

FIELD-FILTERED: Y [✓ N] Filter Size mm

Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
~~DOB~~ AFP0606-003-GW-026	2	HPP	125 each	EPA537M	APP	✓	200

REMARKS: * Due to size of well, both tubing and WLM could not fit — no WL data recorded during GW sampling

Well Abandoned? [✓ Y] N Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0607-001
SAMPLE ID: AFP0607-001 - GW-011
DATE: 11/18/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4 OD
WELL SCREEN INTERVAL DEPTH: 16.4 Ft - ~~7.58~~ 6.4 Ft
STATIC DEPTH TO WATER (feet): 8.53
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (16.4 Ft - 8.53 Ft) x 0.04 gal/ft = 0.315 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 11 Ft) + 0.20 gal = 0.23 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11
PURGING INITIATED AT: 0930
PURGING ENDED AT: 0955
TOTAL VOLUME PURGED (gallons): 2.0

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0930	—	—	0.09	*	—	—	—	—	—	—	Cloudy	none
0935	0.40	0.40	0.08	↓	6.75	17.75	0.288	4.53	-42.5	992	↓	↓
0938	0.24	0.64	0.08	↓	6.90	18.05	0.265	3.83	-71.1	371	↓	↓
0942	0.32	0.96	0.08	↓	7.00	17.11	0.244	3.12	-83.7	124	↓	↓
0946	0.32	1.28	0.08	↓	7.01	18.14	0.240	3.00	-100.3	65.7	Clear	none
0950	0.32	1.60	0.08	↓	7.04	18.15	0.225	3.10	-104.5	38.4	↓	↓
0955	0.~~32~~4	~~1.92~~ 2.0	0.08	↓	7.05	18.19	0.220	3.05	-106.0	23.9	↓	↓

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, J. Methew / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: ~~0953~~ 0955
SAMPLING ENDED AT: 0958
PUMP OR TUBING DEPTH IN WELL (feet): 11
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N] Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0607-001-GW-011 with MS/MSD	6	PE	125mL each	EPA 537M	APP	✓	

REMARKS: * Due to size of well, both tubing and WL could not fit - no WL data w/ around return purge.

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)	Installation: AF Plant 6

WELL NO: AFP0607-002	SAMPLE ID: AFP0607 002-GW-020	DATE: 11/13/17

PURGING DATA

WELL DIAMETER (inches): 1.0"	TUBING DIAMETER (inches): 1/4 OD	WELL SCREEN INTERVAL DEPTH: 24.3 Ft - 14.3 Ft	STATIC DEPTH TO WATER (feet): 11.4	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (24.3 Ft - 14.3 Ft) x 0.041 gal/ft = 0.41 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 20 Ft) + 0.20 gal = 0.252 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 20	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 20	PURGING INITIATED AT: 0850	PURGING ENDED AT: 0904	TOTAL VOLUME PURGED (gallons): 1.26

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0850	—	—	~~350~~ 0.09	11.4 *	—	—	—	—	—	—	Clear	non
0855	0.45	0.45	0.09	*	7.08	17.38	0.273	16.53	-119.0	15.0		
0858	0.27	0.72	0.09		7.13	17.41	0.273	14.65	-124.9	14.9		
0901	0.27	0.99	0.09		7.11	17.43	0.271	13.25	-130.8	14.2		
0904	0.27	1.26	0.09		7.16	17.48	0.2769	12.99	-135.7	9.69		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: AWillis	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 0904	SAMPLING ENDED AT: ENDED AT: 0905

PUMP OR TUBING DEPTH IN WELL (feet): 20 | TUBING MATERIAL CODE: PE | FIELD-FILTERED: Y [✓ N] Filter Size mm
Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)] DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0607- ~~AFP06-~~002-GW-020	2	PE	125 mL each	EPA 537M	APP	✓	350mL

REMARKS: * Due to size of well, both tubing and WL could not fit – No WL data w/ groundwater purge.

Well Abandoned? [✓ Y] N Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0610-001
SAMPLE ID: AFP0610-001-GW-014
DATE: 11/18/17

PURGING DATA

WELL DIAMETER (inches): 1.0"	TUBING DIAMETER (inches): 1/4" OD	WELL SCREEN INTERVAL DEPTH: 9.08 Ft - 19.08 Ft	STATIC DEPTH TO WATER (feet): 12.09	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (19.08 Ft - ~~9.08~~ 12.09 Ft) x 0.041 gal/ft = 0.28 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 14 Ft) + 0.2 gal = 0.24 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14	PURGING INITIATED AT: 1256	PURGING ENDED AT: 1310	TOTAL VOLUME PURGED (gallons): 0.35

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1256	—	—	0.09	*	—	—	—	—	—	—	clear	none
1304	0.05	0.05	0.05	|	5.03	20.14	1.827	7.29	154.5	2.65	|	|
1306	0.1	0.15	0.05	|	5.00	20.16	1.858	7.00	100.9	1.75	|	|
1308	0.1	0.25	0.05	|	4.87	20.20	1.878	7.01	153.3	1.91	|	|
1310	0.1	0.35	0.05	|	4.85	20.21	1.879	7.03	155.2	2.98	|	|

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1310
SAMPLING ENDED AT: 1311
PUMP OR TUBING DEPTH IN WELL (feet): 14
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N]
Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N] (replaced)
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0610-001-GW-014	2	PE	125 mL each	EPA 537M	APP	✓	200mL/min

REMARKS: * Due to size of well, both tubing and WLM could not fit -- no WL data during ground water purge.

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6

WELL NO: AFP0610-002
SAMPLE ID: AFP0610-002-GW-
DATE: 11/18/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4" o
WELL SCREEN INTERVAL DEPTH: 9.60 Ft - 19.60 Ft
STATIC DEPTH TO WATER (feet): 11.97'
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (19.60 Ft - 11.97 Ft) x 0.041 gal/ft = 0.31 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 14 Ft) + 0.20 gal = 0.24 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14
PURGING INITIATED AT: 1448
PURGING ENDED AT: 1506
TOTAL VOLUME PURGED (gallons): 1.26

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1448	—	—	0.07	*	—	—	—	—	—	—	CLEAR	NONE
1455	0.49	0.49	0.07	|	6.36	18.90	0.540	3.31	-79.5	11.0	|	|
Ⓐ ~~1459~~ 1502	0.49	0.98	0.07	|	6.36	18.93	0.539	3.29	-86.8	7.18	|	|
1504	0.14	1.12	0.07	|	6.35	18.96	0.522	3.23	-93.4	8.65	|	|
1506	0.14	1.26	0.07	⊥	6.35	18.95	0.520	3.26	-91.5	4.66	⊥	⊥

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F. Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1506
SAMPLING ENDED AT: 1508

PUMP OR TUBING DEPTH IN WELL (feet): 14
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N]
Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
	# CONTAINERS	MATERIAL CODE	VOLUME (mL)				
AFP0610-002 - GW - 014	2	PE	125ml each	EPA 537M	APP	✓	250

REMARKS: * Due to size of well, both tubing and WLM couldn't fit - No WL DATA for groundwater sampling.

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: AFP0610-003
SAMPLE ID: AFP0610-003-GW-014
DATE: 11/18/17

PURGING DATA

WELL DIAMETER (inches): 1.0"	TUBING DIAMETER (inches): 1/4" OD	WELL SCREEN INTERVAL DEPTH: 9.62 Ft - 19.62 Ft	STATIC DEPTH TO WATER (feet): 13.02	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (19.62 Ft - 13.02 Ft) x 0.041 gal/ft = 0.27 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 14 Ft) + 0.2 gal = 0.24 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14*	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14	PURGING INITIATED AT: 1327	PURGING ENDED AT: 1348	TOTAL VOLUME PURGED (gallons): 0.84

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1327	—	—	0.05	*	—	—	—	—	—	—	clear	none
1340	0.52	0.52	0.04	|	6.73	19.09	2.198	5.46	58.0	6.15	|	|
1345	0.20	0.72	0.04	|	6.79	18.99	2.194	5.72	48.0	4.89	|	|
1348	0.12	0.84	0.04	|	6.78	18.95	2.189	5.67	52.0	4.09	|	|

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F. Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1348
SAMPLING ENDED AT: 1353
PUMP OR TUBING DEPTH IN WELL (feet): 14
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N] Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: [✓ Y] N

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0610-003-GW-014	2	PE	125mL each	EPA 537M	APP	✓	200
AFP0610-003-GW-914	2	PE	125mL each	EPA 537M	APP	✓	200

REMARKS: * Due to Size of well, tubing and WLM could not both fit – no WL data for groundwater sampling.

Well Abandoned? [✓ Y] N Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6

WELL NO: AFP0610-004
SAMPLE ID: AFP0610-004-GW-014
DATE: 11/18/17

PURGING DATA

WELL DIAMETER (inches): 1.0"
TUBING DIAMETER (inches): 1/4" OD
WELL SCREEN INTERVAL DEPTH: 9.81 Ft - 19.81 Ft
STATIC DEPTH TO WATER (feet): 12.72'
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (19.81 Ft - 12.72 Ft) x 0.04 gal/ft = 0.28 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 14 Ft) + 0.20 gal = 0.34 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 14
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 14
PURGING INITIATED AT: 1408
PURGING ENDED AT: 1428
TOTAL VOLUME PURGED (gallons): 0.85

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1408	—	—	0.04	*	—	—	—	—	—	—	clear	none
1420	0.48	0.48	0.04	↓	5.78	18.71	1.023	4.00	46.3	7.52	↓	↓
1426	0.24	0.77	0.04	↓	5.71	18.73	1.031	4.00	52.0	7.14	↓	↓
1428	0.08	0.85	0.04	↓	5.69	17.75	1.033	4.01	54.6	7.23	↓	↓

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1~~3~~28 4
SAMPLING ENDED AT: 1432

PUMP OR TUBING DEPTH IN WELL (feet): 14
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N]
Filter Size mm
Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0610-004-GW-014	2	PE	125mL each	EPA 537M	APP	✓	150

REMARKS: * Due to size of well - tubing and WL both couldn't fit - no data recorded during Groundwater sampling

Well Abandoned? [✓ Y] N Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) | Installation: AF Plant 6

WELL NO: MW23 | SAMPLE ID: AFP0609-MW23-GW-027 | DATE: 11/18/17

PURGING DATA

WELL DIAMETER (inches): 2.0" | TUBING DIAMETER (inches): 1/4 OD | WELL SCREEN INTERVAL DEPTH: 22.23 Ft - 32.23 Ft | STATIC DEPTH TO WATER (feet): 22.13 | PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (32.21 Ft - 22.23 Ft) x 0.16 gal/ft = 1.43 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 27 Ft) + 0.20 gal = 0.27 gal

Location (Circle one): [✓ Monitoring Well] Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 27 | FINAL PUMP OR TUBING DEPTH IN WELL (feet): 27 | PURGING INITIATED AT: 1200 | PURGING ENDED AT: 1212 | TOTAL VOLUME PURGED (gallons): 1.08

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1200	—	—	0.09	22.10	—	—	—	—	—	—	Clear	none
1208	0.72	0.72	0.09	24.78	5.94	18.64	0.367	43.00	126.3	13.2	|	|
1210	0.18	0.90	0.09	25.06	5.92	18.65	0.368	40.75	127.1	9.80	|	|
1212	0.18	1.08	0.09	25.52	5.91	18.62	0.367	41.29	129.9	7.54	⊥	⊥

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A.Willis, F. Johnson / ASL | SAMPLER(S) SIGNATURE(S): | SAMPLING INITIATED AT: 1212 | SAMPLING ENDED AT: 1213

PUMP OR TUBING DEPTH IN WELL (feet): 27 | TUBING MATERIAL CODE: PE | FIELD-FILTERED: Y [✓ N] | Filter Size mm
Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)] | DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0609-MW23-GW-027	2	PE	125ml each	EPA537M	APP	✓	350ml/min

REMARKS:

Well Abandoned? Y [✓ N] Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) | Installation: AF Plant 6

WELL NO: MW24 | SAMPLE ID: AFP0609-MW24-GW-0~~38~~ 43.5 | DATE: 11/19/17

PURGING DATA

WELL DIAMETER (inches): 2.0"

TUBING DIAMETER (inches): 1/2" OD

WELL SCREEN INTERVAL DEPTH: 34.1 Ft - 44.1 Ft

STATIC DEPTH TO WATER (feet): 32.16

PURGE PUMP TYPE OR BAILER: Monsoon *

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (44.1 Ft - 32.16 Ft) x 0.16 gal/ft = 1.91 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.010 x 43.5 Ft) + 0.2 gal = 0.64 gal

Location (Circle one): [✓ Monitoring Well] Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 38

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 44

PURGING INITIATED AT: 1210

PURGING ENDED AT: 1230

TOTAL VOLUME PURGED (gallons): 1.24

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1210	–	–	0.11	32.05	–	–	–	–	–	–	clear	none
1214	0.44	0.44	0.11	40.10	6.96	18.04	1.172	1.37	116.7	49.8		
1224	0.50	6.94	0.05	41.2	7.02	18.00	1.173	1.50	111.0	48.5		
1228	0.20	1.14	0.05	42.3	7.06	17.99	1.169	1.65	112.7	36.0		
1230	0.10	1.24	0.05	43.0	7.07	18.00	1.170	1.69	114.9	20.8		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Wallis, F. Johnson / ASL

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1230

SAMPLING ENDED AT: 1234

PUMP OR TUBING DEPTH IN WELL (feet): 44

TUBING MATERIAL CODE: PE

FIELD-FILTERED: Y [✓ N] Filter Size mm

Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP [✓ Y] N TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0609-MW24-GW-043.5	2	PE	125mL each	EPA 537M	*monsoon	✓	200 mL/min

REMARKS: Due to depth of water, Monsoon pump used to GW sample

Well Abandoned? Y [✓ N] Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)
Installation: AF Plant 6
WELL NO: MW25
SAMPLE ID: AFP0609-MW25-GW-038
DATE: 11/19/17

PURGING DATA

WELL DIAMETER (inches): 2.0"
TUBING DIAMETER (inches): 1/4 OD
WELL SCREEN INTERVAL DEPTH: 33.67Ft - 43.67Ft
STATIC DEPTH TO WATER (feet): 26.25
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (43.67 Ft - 26.25 Ft) x 0.16 gal/ft = 2.78 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 38 Ft) + 0.2 gal = 0.30 gal

Location (Circle one): [✓ Monitoring Well] Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 38
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 38
PURGING INITIATED AT: 1111
PURGING ENDED AT: 1132
TOTAL VOLUME PURGED (gallons): 1.89

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1111	—	—	0.09	26.62	—	—	—	—	—	—	Clear	none
1120	0.81	0.81	0.09	2662	6.65	16.33	0.308	1.44	64.3	12.1		
1124	0.36	1.17	0.09	26.91	6.68	16.28	0.302	1.43	63.5	11.8		
1128	0.36	1.53	0.09	26.96	6.68	16.35	0.314	1.90	59.5	11.5		
1132	0.36	1.89	0.09	26.98	6.69	16.30	0.320	1.91	50.5	11.1		

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A. Willis, F. Johnson / ASL
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1132
SAMPLING ENDED AT: 1134
PUMP OR TUBING DEPTH IN WELL (feet): 38
TUBING MATERIAL CODE: PE
FIELD-FILTERED: Y [✓ N]
Filter Size mm
Filtration Equipment Type:
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
	# CONTAINERS	MATERIAL CODE	VOLUME (mL)				
AFP0609-MW25-GW-038	2	PE	125mL each	EPA 537m	APP	✓	350mL

REMARKS:

Well Abandoned? Y [✓ N] Date Well Abandoned:
Well Measurement Method: [✓ Probe] Tape Other ______
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah) | Installation: AF Plant 6

WELL NO: PMW10 | SAMPLE ID: AFP0603-PMW10-GW-074 | DATE: 11/19/17

PURGING DATA

WELL DIAMETER (inches): 2.0"

TUBING DIAMETER (inches): 3/8" ID, 1/2" OD

WELL SCREEN INTERVAL DEPTH: 66 Ft - 81 Ft

STATIC DEPTH TO WATER (feet): 41.72

PURGE PUMP TYPE OR BAILER: Monsoon (due to depth of water)

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (81 Ft - 41.72 Ft) x 0.16 gal/ft = 6.28 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.010 x 74 Ft) + 1.20 gal = 0.94 gal

Location (Circle one): [✓ Monitoring Well] Temporary Well Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 74

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 74

PURGING INITIATED AT: 0958

PURGING ENDED AT: 1040

TOTAL VOLUME PURGED (gallons): 4.7

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0958	—	—	0.10	41.65	—	—	—	—	—	—	Cloudy	none
1000	0.20	0.20	0.10	41.92	5.21	1890	0.072	16.82	227.9	313	↓	↓
1005	0.50	0.70	0.10	41.92	5.34	18.83	0.063	10.33	229.4	237	↓	↓
1015	1.5	2.2	0.10	41.92	4.98	19.14	0.060	6.48	253.0	183	↓	↓
1020	0.5	2.7	0.10	41.92	5.14	18.79	0.059	5.19	236.1	12.6	Clear	↓
1026	0.6	3.3	0.10	42.92	4.99	18.85	0.059	5.00	253.4	5.46	↓	↓
1030	0.4	3.7	0.10	42.92	5.07	18.84	0.059	5.92	250.1	3.20	↓	↓
1035	0.5	4.2	0.10	42.92	4.80	18.85	0.058	5.96	249.5	2.78	↓	↓
1040	0.5	4.7	0.10	42.92	4.80	18.85	0.059	5.90	250.0	2.75	↓	↓

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A.Willis, F. Johnson / ASL

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1040

SAMPLING ENDED AT: 1042

PUMP OR TUBING DEPTH IN WELL (feet): 74

TUBING MATERIAL CODE: PE

FIELD-FILTERED: Y [✓ N] Filter Size mm

Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP [✓ Y] N TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE ID CODE	SAMPLE CONTAINER SPECIFICATION # CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0603-PMW10-GW-074	2	PE	125 mL each	EPA 537M	Monsoon	no*	400ml/min

REMARKS: * Due to depth of water, Monsoon pump had to be used for sampling

Well Abandoned? Y [✓ N] Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump;
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC

GROUNDWATER SAMPLING LOG

PROJECT: SI of AFFF Areas (Savannah)

Installation: AF Plant 6

WELL NO: AFP0602 - 003

SAMPLE ID: AFP0602-003 - GW-015

DATE: 11/21/17

PURGING DATA

WELL DIAMETER (inches): 1.0"

TUBING DIAMETER (inches): 1/4 " OD

WELL SCREEN INTERVAL DEPTH: 10.09 Ft - 20.09 Ft

STATIC DEPTH TO WATER (feet): 13.56

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) = (20.09 Ft - 13.56 Ft) x 0.041 gal/ft = 0.26 Gal

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) = 0 gal + (0.0026 x 15 Ft) + 0.20 gal = 0.24 gal

Location (Circle one): Monitoring Well [✓ Temporary Well] Other

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 15

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 15

PURGING INITIATED AT: 0845

PURGING ENDED AT: 0908

TOTAL VOLUME PURGED (gallons): 1.15

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. [✓ mS/cm] or µS/cm	DISSOLVED OXYGEN mg/L	ORP (mV)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
0845	—	—	0.05	*	—	—	—	—	—	—	clear	none
0847	0.1	0.1	0.05	↓	5.36	19.42	0.086	5.63	188.4	62.7	↓	↓
0853	0.3	0.4	0.05	↓	5.34	19.59	0.076	3.55	156.0	29.8	↓	↓
0856	0.15	0.55	0.05	↓	5.31	19.65	0.073	3.12	145.7	14.2	↓	↓
0900	0.2	0.75	0.05	↓	5.35	19.92	0.067	2.14	109.2	10.6	↓	↓
0905	0.25	1.00	0.05	↓	5.30	19.92	0.065	2.10	105.7	8.51	↓	↓
0908	0.15	1.15	0.05	↓	5.30	19.96	0.064	2.02	100.9	5.79	↓	↓

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: A.Willis, F Johnson / ASL

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 0908

SAMPLING ENDED AT: 0914

PUMP OR TUBING DEPTH IN WELL (feet): 15

TUBING MATERIAL CODE: PE

FIELD-FILTERED: Y [✓ N] Filter Size mm

Filtration Equipment Type:

DUPLICATE: Y [✓ N]

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME (mL)	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	Low Flow Sampling ✓	SAMPLE PUMP FLOW RATE (mL per minute)
AFP0602-003 - GW-015 w/MS/MSD	6	PE	125mL each (750)	EPA 537M	APP	✓	200mL/min

REMARKS: * Due to size of well, tubing and WL both could not fit in well - no WL data recorded during groundwater Sampling

Well Abandoned? [✓ Y] N Date Well Abandoned:

Well Measurement Method: [✓ Probe] Tape Other ______

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

AerostarSES LLC SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/15/17

Sample Technician(s): A. Willis, J. Meshew

Station ID: AFP0603-001

Location Description: Corporate Hanger (T-728) (AFFF AREA 3)
SEE BORING LOG AFP0603-001

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench [✓ Other GRAB]

SEDIMENT SAMPLE

Sample ID: ______ Sample Collection Time: ______

Sample Depth: ______ Sediment Description: ______

Collection Method: ______ Analysis/Method: ______

Sample Container: ______ Preservative: ______

SURFACE WATER SAMPLE

Sample ID: ______ Sample Collection Time: ______

Sample Depth: ______ Collection Method: ______

Analysis/Method: ______ Sample Container: ______

Preservative: ______ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well [✓ Temporary Well] Other______

GROUNDWATER SAMPLE

Sample ID: AFP0603-001-GW-045 ~~0475~~ (AN) Sample Collection Time: 1245

Sample Depth: ~~48'~~ 45' Collection Method: GRAB - Check valve used

Analysis/Method: EPA 537M Sample Container: 2, 125mL each PE bottles

Preservative: N/A Water Quality (circle one): Clear Cloudy [✓ Turbid] Other

REMARKS: SCREEN 35.4' - 50.4" Riser is sticking up
WL 41.65' BTOC
Turbidity = over range

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/18/17

Sample Technician(s): A. Willis

Station ID: C-5 Fuel Systems Test Facility (B-96) (AFFF AREA 7)
AFP0607 - 003

Location Description: See boring log for location

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench [✓ Other Grab w/ check valve]

SEDIMENT SAMPLE

Sample ID:
Sample Collection Time:
Sample Depth:
Sediment Description:
Collection Method:
Analysis/Method:
Sample Container:
Preservative:

SURFACE WATER SAMPLE

Sample ID:
Sample Collection Time:
Sample Depth:
Collection Method:
Analysis/Method:
Sample Container:
Preservative:
Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well [✓ Temporary Well] Other

GROUNDWATER SAMPLE

Sample ID: AFP0607-003-GW-046
Sample Collection Time: 1022
Sample Depth: 46'
Collection Method: Grab w/ Check valve
Analysis/Method: EPA 537M
Sample Container: 2, 125ml PE bottles
Preservative: N/A
Water Quality (circle one): Clear Cloudy [✓ Turbid] Other

REMARKS: Screen 51.24 - 41.24' BTOC
WL = 38.47 BTOC
Over range NTUs

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11-15-17

Sample Technician(s): A. Willis

Station ID: APF0608-001

Location Description: FIRE PREVENTION HEADQUARTERS (B-102) (AFFF AREA 8)
See boring log for APF0608-001

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch   Holding Pond/Lagoon   Lake/Pond   River/Stream   Trench   [✓ Other] GRAB w/ check valve

SEDIMENT SAMPLE

Sample ID: ______   Sample Collection Time: ______

Sample Depth: ______   Sediment Description: ______

Collection Method: ______   Analysis/Method: ______

Sample Container: ______   Preservative: ______

SURFACE WATER SAMPLE

Sample ID: ______   Sample Collection Time: ______

Sample Depth: ______   Collection Method: ______

Analysis/Method: ______   Sample Container: ______

Preservative: ______   Water Quality (circle one): Clear   Cloudy   Turbid   Other

Groundwater Sample Collected from (circle one): Hydropunch   Monitoring Well   [✓ Temporary Well]   Other ______

GROUNDWATER SAMPLE

Sample ID: APF0608-001-GW-042   Sample Collection Time: 1416

Sample Depth: 42'   Collection Method: GRAB w/ check value

Analysis/Method: EPA 537M   Sample Container: 2, 125ML each PE

Preservative: N/A   Water Quality (circle one): Clear   Cloudy   [✓ Turbid]   Other

REMARKS: Screen 35.05 - 45.05'   Casing SS —— Above SS

WL 39.6' BTOC

Turbidity - over range

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/15/17

Sample Technician(s): A. Willis

Station ID: AFP0608 - 002

Location Description: FIRE PREVENTION HEADQUARTERS (B-102)
See boring log for AFP0603-002

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench [✓ Other GRAB]

SEDIMENT SAMPLE

Sample ID: ____ Sample Collection Time: ____

Sample Depth: ____ Sediment Description: ____

Collection Method: ____ Analysis/Method: ____

Sample Container: ____ Preservative: ____

SURFACE WATER SAMPLE

Sample ID: ____ Sample Collection Time: ____

Sample Depth: ____ Collection Method: ____

Analysis/Method: ____ Sample Container: ____

Preservative: ____ Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well [✓ Temporary Well] Other ____

GROUNDWATER SAMPLE

Sample ID: AFP0608-002-GW-035 Sample Collection Time: 1315

Sample Depth: 35 Collection Method: GRAB w/ check valve

Analysis/Method: EPA 537M Sample Container: 2, 125mL each PE

Preservative: N/A Water Quality (circle one): Clear Cloudy [✓ Turbid] Other

REMARKS: Screen 40.19 - 30.19
WL 32.95' BTOC
Turbidity: over range

Riser/stick up ____ above gs

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)
ASL Project No: M2032.0001
Installation: AF Plant 6
Date: 11-15-17
Sample Technician(s): A. Willis
Station ID: AFP0608-003
Location Description: Fire Prevention Headquarters (B-102)(AFFF Area 8)
See Boring log For AFP0608-003

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond River/Stream Trench [✓ Other Grab w/ check valve]

SEDIMENT SAMPLE

Sample ID:
Sample Collection Time:
Sample Depth:
Sediment Description:
Collection Method:
Analysis/Method:
Sample Container:
Preservative:

SURFACE WATER SAMPLE

Sample ID:
Sample Collection Time:
Sample Depth:
Collection Method:
Analysis/Method:
Sample Container:
Preservative:
Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well [✓ Temporary Well] Other

GROUNDWATER SAMPLE

Sample ID: AFP0608-003-GW-040
Sample Collection Time: 1432
Sample Depth: 40'
Collection Method: Grab w/ check valve
Analysis/Method: EPA 537M
Sample Container: 2, 125ml each PE
Preservative: N/A
Water Quality (circle one): Clear Cloudy [✓ Turbid] Other

REMARKS:
screen 34.9'-44.9'
WL = 32.25'
Turbidity = over range
Casing/Riser ___ above gs

AerostarSES LLC SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/21/17

Sample Technician(s): A. Willis, J. Meshew

Station ID: Structural Fire Training Area
AFP0601-004

Location Description: 400' West of the intersection of Industrial Drive and 6th Street

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

Surface ~~SEDIMENT~~ SAMPLE

Sample ID: * AFP0601-004-SS-901
AFP0601-004-SS-001

Sample Collection Time: 1408

Sample Depth: 0-0.5'

Sediment Description: Silty Clay

Collection Method: Spoon

Analysis/Method: EPA 537M

Sample Container: 1, 250ml bottle PE

Preservative: None

SURFACE WATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: * Area dry - changed SW/SD to SS
GPS

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/21/17

Sample Technician(s): A. Willis, J. Moslew

Station ID: Structural Fire Training Area
AFP0601-005

Location Description: 325' 260° SW of the intersection of Industrial Drive and 6th Street

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

* Surface ~~SEDIMENT~~ SAMPLE

Sample ID: AFP0601-005-SS-001

Sample Collection Time: 1430

Sample Depth: 0 - 0.5'

Sediment Description: silty clay

Collection Method: Spoon

Analysis/Method: EPA 537M

Sample Container: 1, 250 mL

Preservative: none

SURFACE WATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: * Area Dry - changed SD/SW to SS

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/21/17

Sample Technician(s): A.Willis, J.Meehan

Station ID: AFFF SPRAY TEST AREA
AFP0602-004

Location Description: 310' Southeast, 120° from the intersection of flight line (taxiway 6) and Dobbins Patrol Road

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

Surface ~~SEDIMENT~~ SAMPLE

Sample ID: AFP0602-004-SS-001

Sample Collection Time: 1142

Sample Depth: 0-0.5'

Sediment Description: Silt

Collection Method: Spoon

Analysis/Method: EPA 537M

Sample Container: 1, 250mL PE

Preservative: none

SURFACE WATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other NA

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: * Area Dry

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: ~~Dobbins ARB~~ @ AF PLANT 6

Date: 11/27/17

Sample Technician(s): A.Willis, G. Carlson

Station ID: AFFF SPRAY TEST AREA
AFP0602-005

Location Description: 300', 110° SE of the end of Windy Hill RD

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond [✓ River/Stream] Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0602-005-SD-001

Sample Collection Time: 1355

Sample Depth: 0-0.5'

Sediment Description: Coarse to fine, Well sorted SAND

Collection Method: SPOON

Analysis/Method: EPA 537M

Sample Container: 1, 250ml/min

Preservative: None

SURFACE WATER SAMPLE

Sample ID: AFP0602-005-SW-001

Sample Collection Time: 1355

Sample Depth: 0-0.5'

Collection Method: GRAB

Analysis/Method: EPA 537M

Sample Container: 2, 125ml PE bottle

Preservative: None

Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: GPS✓

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11·19·17

Sample Technician(s): Jeremy A Meshew

Station ID: AFP0603

Location Description: ~~Boring~~ JM 11.19 Collected 5' W of adjacent culvert.

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0603-002-SD-001

Sample Collection Time: 0932

Sample Depth: 0.5'

Sediment Description: Sand Poorly Graded SP

Collection Method: Spoon

Analysis/Method: EPA 537 M

Sample Container: 250mL PE Jar

Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0603-002-SW-001

Sample Collection Time: 0932

Sample Depth: 0.5'

Collection Method: Jar Submersion

Analysis/Method: EPA 537M

Sample Container: 2 125mL PE Jars

Preservative: NA

Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other

GROUNDWATER SAMPLE

JM

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/21/17

Sample Technician(s): A. Willis, J. Meshew

Station ID: Fire Station #2 (B-69) (AFFF Area 5)
AFP0605-001

Location Description: 250' from the NE corner of B-130 Building

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID:	with MS/MSD AFP0605-001-SD-001	Sample Collection Time:	1540
Sample Depth:	0-0.5'	Sediment Description:	Well sorted SAND w/ gravel
Collection Method:	spoon	Analysis/Method:	EPA 537M
Sample Container:	2, 250mL PE	Preservative:	None

SURFACE WATER SAMPLE

Sample ID:	with MS/MSD AFP0605-001-SW-001	Sample Collection Time:	1540
Sample Depth:	0-0.5'	Collection Method:	GRAB
Analysis/Method:	EPA 537M	Sample Container:	6, 125mL PE
Preservative:	none	Water Quality (circle one):	[✓ Clear] Cloudy Turbid Other

Groundwater Sample ~~Collected from (circle one):~~ Hydropunch Monitoring Well Temporary Well ~~Other~~

GROUNDWATER SAMPLE

~~Sample ID:~~		Sample Collection Time:	
Sample Depth:		Collection Method:	
Analysis/Method:		Sample Container:	
Preservative:		Water Quality (circle one):	Clear Cloudy ~~Turbid~~ Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: Dobbins ARB

Date: 12/4/17

Sample Technician(s): A. Willis / J. Meshaw

Station ID: AFFF 6 C-5 ENGINE FIRE
~~DOBN60~~ AFP0606 - 004

Location Description: 950', 130' SE of Taxiway Echo and Golf

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0606-004-SD-001

Sample Collection Time: 1515

Sample Depth: 0 - 0.5'

Sediment Description: gravelly Sand

Collection Method: Spoon

Analysis/Method: EPA 537M

Sample Container:

Preservative: none

SURFACE WATER SAMPLE

AFP0606-004-SW-901

Sample ID: AFP0606-004-SW-001

Sample Collection Time: 1515

Sample Depth: 0-0.5'

Collection Method: GRAB

Analysis/Method: EPA 537M

Sample Container: 4, 125mL PE

Preservative: none

Water *Quality (circle one): Clear [✓ Cloudy] Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well
Other

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS: * Sheen on top of water

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)
ASL Project No: M2032.0001
Installation: AF Plant 6
Date: 11.19.17
Sample Technician(s): Jeremy Meshew
Station ID: AFP0607

Location Description: Loadtion at bottom of runoff off NE side of adjacent building

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch [✓ Holding Pond/Lagoon] Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0607-004-SD-001	Sample Collection Time: 1018
Sample Depth: 0.5'	Sediment Description: SP Sand with Organics
Collection Method: Spoon	Analysis/Method: EPA 537 M
Sample Container: 250mL PE Jar	Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0607-004-SW-001	Sample Collection Time: 1018
Sample Depth: 0.5'	Collection Method: Jar Submersion
Analysis/Method: EPA 537 M	Sample Container: 2 125mL PE Jar
Preservative: NA	Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other

GROUNDWATER SAMPLE

NA

Sample ID:	Sample Collection Time:
Sample Depth:	Collection Method:
Analysis/Method:	Sample Container:
Preservative:	Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11/21/17

Sample Technician(s): A.Willis, J.Mechew

Station ID: Fire Prevention Headquarters (B-102) (AFFF Area 8)
AFP0608-004

Location Description: 350' From the SE corner of building B-102

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

Surface ~~SEDIMENT~~ SAMPLE

Sample ID: *AFP0608-004-SS-001

Sample Collection Time: 1630

Sample Depth: 0-0.5'

Sediment Description: Silty Clay

Collection Method: Spoon

Analysis/Method: EPA 537M

Sample Container: 1, 250mL PE

Preservative: None

SURFACE WATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well [✓ Other] NA

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

Collection Method:

Analysis/Method:

Sample Container:

Preservative:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

* Area dry

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)
ASL Project No: M2032.0001
Installation: AF Plant 6
Date: 11·16·17
Sample Technician(s): Jeremy A Meshew
Station ID: AFP0609

Location Description: Collected 1' W of Drainage Pond Walkway.

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch [✓ Holding Pond/Lagoon] Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0609-001-SD-001
Sample Collection Time: 1240
Sample Depth: 0.5'
Sediment Description: SW
Collection Method: SS Spoon
Analysis/Method: EPA 537 M
Sample Container: 250mL PE Jar
Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0609-001-SW
Sample Collection Time: 1240
Sample Depth: 0.5'
Collection Method: Jar Submersion
Analysis/Method: EPA 537 M
Sample Container: 2 125mL PE Jars
Preservative: ~~2 125mL PE Jars~~ JM 11·16 NA
Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well
Other__________

GROUNDWATER SAMPLE

Sample ID: __________
JM
Sample Collection Time: __________
Sample Depth: __________
Collection Method: __________
Analysis/Method: __________
Sample Container: __________
Preservative: __________
Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)
ASL Project No: M2032.0001
Installation: AF Plant 6
Date: 11·18 ~~16~~ JM 11·18 · 17
Sample Technician(s): Jeremy Meshew
Station ID: AFP0609

Location Description: Located 40' downstream from adjacent Culvert.

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0609-002-SD-001
Sample Collection Time: 1130
Sample Depth: 0.5'
Sediment Description: Gravel with Sand GW
Collection Method: Spoon
Analysis/Method: EPA 537 M
Sample Container: 250mL PE Jar
Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0609-002-SW-001
Sample Collection Time: 1130
Sample Depth: 0.5'
Collection Method: Jar Submersion
Analysis/Method: EPA 537M
Sample Container: 2 125mL PE Jars
Preservative: NA
Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other_____

GROUNDWATER SAMPLE

JM

Sample ID: _____
Sample Collection Time: _____
Sample Depth: _____
Collection Method: _____
Analysis/Method: _____
Sample Container: _____
Preservative: _____
Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: AF Plant 6

Date: 11·18·17

Sample Technician(s): Jeremy A Meshew

Station ID: AFP0610

Location Description: Collected approximately 10' downstream of adjacent culvert.

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0610-005-SD-001 (+FD) Sample Collection Time: 1410

Sample Depth: 0.5' Sediment Description: Sand with Gravel SW

Collection Method: Spoon Analysis/Method: EPA 537 M

Sample Container: 250mL PE Jar Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0610-005-SW-001 (+FD) Sample Collection Time: 1410

Sample Depth: 0.5' Collection Method: Jar Submersion

Analysis/Method: EPA 537 M Sample Container: 2 125mL PE Jars

Preservative: NA Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other

GROUNDWATER SAMPLE

JM

Sample ID: Sample Collection Time:

Sample Depth: Collection Method:

Analysis/Method: Sample Container:

Preservative: Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)
ASL Project No: M2032.0001
Installation: AF Plant 6
Date: 11·16·17
Sample Technician(s): Jeremy A Meshew
Station ID: AFP0611

Location Description: Collected 1' N of Outfall Walkway.

Surface Water and/or Sediment Sample Collected from (circle one): [✓ Channel/Ditch] Holding Pond/Lagoon Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0611-001-SD-001
Sample Collection Time: 1355
Sample Depth: 0.5'
Sediment Description: Fine Gravel with Sand GW+ SW
Collection Method: Spoon
Analysis/Method: EPA 537M
Sample Container: 250mL PE Jar
Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0611-001-SW-001
Sample Collection Time: 1355
Sample Depth: 0.5'
Collection Method: Jar Submersion
Analysis/Method: EPA 537M
Sample Container: 2 125mL PE Jars
Preservative: NA
Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other________

GROUNDWATER SAMPLE

Sample ID:
Sample Collection Time:
Sample Depth:
Collection Method:
Analysis/Method:
Sample Container:
Preservative:
Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)
ASL Project No: M2032.0001
Installation: AF Plant 6
Date: 11.16.17
Sample Technician(s): Jeremy A Meshew
Station ID: AFP0612

Location Description: Collected 1' off end of E Walkway.

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch [✓ Holding Pond/Lagoon] Lake/Pond River/Stream Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0612-001-SD-001
Sample Collection Time: ~~1340~~ 1440 JM 11.16
Sample Depth: 0.5'
Sediment Description: Gravely Sand w/ Organics SW
Collection Method: Spoon
Analysis/Method: EPA 537 M
Sample Container: 250mL PE Jar
Preservative: NA

SURFACE WATER SAMPLE

Sample ID: AFP0612-001-SW-001
Sample Collection Time: ~~1340~~ 1440 JM 11.16
Sample Depth: 0.5'
Collection Method: Jar Submerston
Analysis/Method: EPA 537 M
Sample Container: 2 125mL PE
Preservative: NA
Water Quality (circle one): Clear [✓ Cloudy] Turbid Other

Groundwater Sample Collected from (circle one): Hydropunch Monitoring Well Temporary Well Other_____

GROUNDWATER SAMPLE

JM

Sample ID:
Sample Collection Time:
Sample Depth:
Collection Method:
Analysis/Method:
Sample Container:
Preservative:
Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

AerostarSES LLC

SAMPLE COLLECTION LOG

Project Name: SI of AFFF Areas (Savannah)

ASL Project No: M2032.0001

Installation: ~~Niagara Falls Air Reserve Station~~ JM 11.18 Air Force Plant 6

Date: 11.18.17

Sample Technician(s): Jeremy A Meshew

Station ID: AFP0613-001

Location Description: Sample located 8' N of adjacent culvert on river bank.

Surface Water and/or Sediment Sample Collected from (circle one): Channel/Ditch Holding Pond/Lagoon Lake/Pond [✓ River/Stream] Trench Other

SEDIMENT SAMPLE

Sample ID: AFP0613-001-SD-001

Sample Collection Time: 1240

Sample Depth: 0.5' BGS

Sediment Description: SP

Collection Method: Spoon

Analysis/Method: EPA 537 M

Sample Container: 1 250mL PE Jar

Preservative: Ice

SURFACE WATER SAMPLE

Sample ID: AFP0613-001-SW-001

Sample Collection Time: 1240

Sample Depth: 0.5' BGS

Collection Method: Submersion

Analysis/Method: EPA 537 M

Sample Container: 2 125mL PE Jars

Preservative: Ice

Water Quality (circle one): [✓ Clear] Cloudy Turbid Other

Groundwater Sample Collected from ~~(circle one)~~: Hydropunch ~~Monitoring Well~~ Temporary Well JM

Other

GROUNDWATER SAMPLE

Sample ID:

Sample Collection Time:

Sample Depth:

JM Collection Method:

Analysis/Method:

Sample Container:

~~Preservative~~:

Water Quality (circle one): Clear Cloudy Turbid Other

REMARKS:

Appendix D

Data Validation Report and Laboratory Data Tables

DATA VALIDATION REPORT

M2032.0001 (Savannah) Air Force Plant 6

SAMPLE DELIVERY GROUP: B7Q0389, B7Q3711, B7R2779, B7R6307, B7S5224

Prepared for

Aerostar SES LLC

January 16, 2018

TABLE OF CONTENTS

TABLES

ACRONYMS AND ABBREVIATIONS

°C	Celsius
%	Percent
%D	percent difference
B	blank contamination
CB	calibration blank
CCAL	continuing calibration
CCB	continuing calibration blank
CCV	continuing calibration verification
COC	chain of custody
CLP	Contract Laboratory Program
EPA	US Environmental Protection Agency
ER	equipment rinsate
FB	field blank
FD	field duplicate
ICAL	initial calibration
ICB	initial calibration blank
ICL	instrument calibration limit
ICV	initial calibration verification
IS	internal standard
J	estimated value
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantification
MB	method blank
MDL	method detection limit
MS	matrix spike
MSD	matrix spike duplicate
ND	nondetect
PARCC	precision, accuracy, representativeness, comparability, completeness
PFC	perfluorinated compound
QAPP	Quality Assurance Program Plan
QC	quality control
QSM	Quality Systems Manual
R	Rejected
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SDG	sample delivery group
TB	trip blank
U	not detected
UJ	not detected; associated value is an estimate

I. INTRODUCTION

Task Order Title: M2032.0001 (Savannah) Air Force Plant 6

Contract: W9128F-15-D-0051

MEC^X Project No.: 1529.001H.01

Sample Delivery Group: B7Q0389, B7Q3711, B7R2779, B7R6307, B7S5224

Project Manager: Jenny Vance

Matrix: Soil/Water

QC Level: Stage 2B, Stage 4

No. of Samples: 123

Laboratory: Maxxam

TABLE 1 - SAMPLE IDENTIFICATION

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
AFP0601-001-SO-019	FOW126	SO	2017-11-15 16:35	EPA 537 m	Stage 2B
AFP0601-001-SS-001	FOW099	SO	2017-11-14 16:30	EPA 537 m	Stage 2B
AFP0601-002-SO-025	FOW129	SO	2017-11-15 17:40	EPA 537 m	Stage 2B
AFP0601-002-SS-001	FOW128	SO	2017-11-15 17:10	EPA 537 m	Stage 2B
AFP0601-003-SO-019	FOW127	SO	2017-11-15 16:55	EPA 537 m	Stage 2B
AFP0601-003-SS-001	FOW125	SO	2017-11-15 16:20	EPA 537 m	Stage 2B
AFP0603-001-GW-045	FOW133	WG	2017-11-15 12:45	EPA 537 m	Stage 2B
AFP0603-001-SO-047	FOW112	SO	2017-11-13 11:30	EPA 537 m	Stage 2B
AFP0603-001-SS-001	FOW111	SO	2017-11-13 09:20	EPA 537 m	Stage 2B
AFP0604-003-SO-036	FOW131	SO	2017-11-16 09:25	EPA 537 m	Stage 2B
AFP0604-003-SS-001	FOW130	SO	2017-11-16 08:50	EPA 537 m	Stage 2B
AFP0607-001-SO-007	FOW096	SO	2017-11-14 14:30	EPA 537 m	Stage 4
AFP0607-001-SS-001	FOW124	SO	2017-11-14 13:40	EPA 537 m	Stage 2B
AFP0607-002-SO-010	FOW098	SO	2017-11-14 15:20	EPA 537 m	Stage 4
AFP0607-002-SS-001	FOW097	SO	2017-11-14 15:00	EPA 537 m	Stage 2B
AFP0607-003-SO-047	FOW123	SO	2017-11-14 12:20	EPA 537 m	Stage 2B
AFP0607-003-SS-001	FOW121	SO	2017-11-14 10:10	EPA 537 m	Stage 4
AFP0608-001-GW-042	FOW135	WG	2017-11-15 14:16	EPA 537 m	Stage 4

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
AFP0608-001-SO-035	FOW120	SO	2017-11-14 09:10	EPA 537 m	Stage 2B
AFP0608-001-SS-001	FOW119	SO	2017-11-14 08:25	EPA 537 m	Stage 2B
AFP0608-002-GW-035	FOW134	WG	2017-11-15 13:15	EPA 537 m	Stage 2B
AFP0608-002-SO-032	FOW116	SO	2017-11-13 14:50	EPA 537 m	Stage 2B
AFP0608-002-SS-001	FOW114	SO	2017-11-13 14:20	EPA 537 m	Stage 2B
AFP0608-003-GW-040	FOW136	WG	2017-11-15 14:32	EPA 537 m	Stage 2B
AFP0608-003-SO-040	FOW118	SO	2017-11-13 16:40	EPA 537 m	Stage 2B
AFP0608-003-SS-001	FOW117	SO	2017-11-13 15:55	EPA 537 m	Stage 2B
AFP0609-001-SD-001	FOW137	SE	2017-11-16 12:40	EPA 537 m	Stage 2B
AFP0609-001-SW-001	FOW138	WS	2017-11-16 12:40	EPA 537 m	Stage 2B
AFP0610-001-SO-014	FOW110	SO	2017-11-15 15:30	EPA 537 m	Stage 2B
AFP0610-001-SS-001	FOW109	SO	2017-11-15 15:20	EPA 537 m	Stage 2B
AFP0610-002-SO-015	FOW108	SO	2017-11-15 14:30	EPA 537 m	Stage 2B
AFP0610-002-SS-001	FOW106	SO	2017-11-15 14:05	EPA 537 m	Stage 2B
AFP0610-003-SO-015	FOW102	SO	2017-11-15 11:45	EPA 537 m	Stage 2B
AFP0610-003-SO-915	FOW103	SO	2017-11-15 11:45	EPA 537 m	Stage 2B
AFP0610-003-SS-001	FOW100	SO	2017-11-15 11:20	EPA 537 m	Stage 2B
AFP0610-003-SS-901	FOW101	SO	2017-11-15 11:20	EPA 537 m	Stage 2B
AFP0610-004-SO-016	FOW105	SO	2017-11-15 13:22	EPA 537 m	Stage 2B
AFP0610-004-SS-001	FOW104	SO	2017-11-15 12:25	EPA 537 m	Stage 2B
AFP0611-001-SD-001	FOW140	SE	2017-11-16 13:55	EPA 537 m	Stage 2B
AFP0611-001-SW-001	FOW139	WS	2017-11-16 13:55	EPA 537 m	Stage 4
AFP0612-001-SD-001	FOW142	SE	2017-11-16 14:40	EPA 537 m	Stage 2B
AFP0612-001-SW-001	FOW141	WS	2017-11-16 14:40	EPA 537 m	Stage 2B
AFP06-RS-001	FOW115	WQ	2017-11-13 14:30	EPA 537 m	Stage 2B
AFP06-RS-002	FOW122	WQ	2017-11-14 10:15	EPA 537 m	Stage 2B
AFP06-RS-003	FOW107	WQ	2017-11-15 14:15	EPA 537 m	Stage 2B
AFP06-RS-004	FOW132	WQ	2017-11-16 10:40	EPA 537 m	Stage 2B
AFP06-SB-001	FOW113	WQ	2017-11-13 13:30	EPA 537 m	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
AFP0602-005-SD-001	FRH317	SE	2017-11-29 13:55	EPA 537 m	Stage 2B
AFP0602-005-SW-001	FRH318	WS	2017-11-29 13:55	EPA 537 m	Stage 2B
AFP0601-004-SS-001	FPM604	SO	2017-11-21 14:08	EPA 537 m	Stage 2B
AFP0601-004-SS-901	FPM605	SO	2017-11-21 14:08	EPA 537 m	Stage 2B
AFP0601-005-SS-001	FPM603	SO	2017-11-21 14:30	EPA 537 m	Stage 4
AFP0602-001-GW-020	FPM601	WG	2017-11-21 10:25	EPA 537 m	Stage 2B
AFP0602-001-SO-020	FPM612	SO	2017-11-20 10:40	EPA 537 m	Stage 2B
AFP0602-001-SS-001	FPM611	SO	2017-11-20 10:15	EPA 537 m	Stage 2B
AFP0602-002-GW-025	FPM619	WG	2017-11-21 11:15	EPA 537 m	Stage 2B
AFP0602-002-SO-029	FPM614	SO	2017-11-20 12:20	EPA 537 m	Stage 2B
AFP0602-002-SS-001	FPM613	SO	2017-11-20 11:25	EPA 537 m	Stage 2B
AFP0602-003-GW-015	FPM599	WG	2017-11-21 09:08	EPA 537 m	Stage 4
AFP0602-003-SO-014	FPM610	SO	2017-11-20 09:42	EPA 537 m	Stage 2B
AFP0602-003-SS-001	FPM609	SO	2017-11-20 09:20	EPA 537 m	Stage 2B
AFP0602-004-SS-001	FPX422	SO	2017-11-21 11:42	EPA 537 m	Stage 2B
AFP0603-002-SD-001	FPM620	SE	2017-11-19 09:32	EPA 537 m	Stage 2B
AFP0603-002-SW-001	FPM587	WS	2017-11-19 09:32	EPA 537 m	Stage 2B
AFP0603-PMW10-GW-074	FPM595	WG	2017-11-19 10:40	EPA 537 m	Stage 2B
AFP0604-001-GW-035	FPM602	WG	2017-11-21 13:42	EPA 537 m	Stage 2B
AFP0604-001-SO-036	FPX419	SO	2017-11-20 14:35	EPA 537 m	Stage 2B
AFP0604-001-SS-001	FPM615	SO	2017-11-20 14:00	EPA 537 m	Stage 4
AFP0604-002-GW-030	FPX417	WG	2017-11-21 14:48	EPA 537 m	Stage 4
AFP0604-002-GW-930	FPX418	WG	2017-11-21 14:48	EPA 537 m	Stage 2B
AFP0604-002-SO-029	FPM617	SO	2017-11-20 15:30	EPA 537 m	Stage 2B
AFP0604-002-SO-929	FPM618	SO	2017-11-20 15:30	EPA 537 m	Stage 2B
AFP0604-002-SS-001	FPX420	SO	2017-11-20 15:00	EPA 537 m	Stage 2B
AFP0604-002-SS-901	FPX421	SO	2017-11-20 15:00	EPA 537 m	Stage 2B
AFP0604-003-GW-035	FPM598	WG	2017-11-19 13:48	EPA 537 m	Stage 2B
AFP0605-001-SD-001	FPM606	SE	2017-11-21 15:40	EPA 537 m	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
AFP0605-001-SW-001	FPM607	WS	2017-11-21 15:40	EPA 537 m	Stage 2B
AFP0607-001-GW-011	FPM578	WG	2017-11-18 09:55	EPA 537 m	Stage 2B
AFP0607-002-GW-020	FPX388	WG	2017-11-18 09:04	EPA 537 m	Stage 2B
AFP0607-003-GW-046	FPX389	WG	2017-11-18 10:22	EPA 537 m	Stage 2B
AFP0607-004-SD-001	FPX423	SE	2017-11-19 10:18	EPA 537 m	Stage 2B
AFP0607-004-SW-001	FPM621	WS	2017-11-19 10:18	EPA 537 m	Stage 2B
AFP0608-004-SS-001	FPM608	SO	2017-11-21 16:30	EPA 537 m	Stage 4
AFP0609-002-SD-001	FPM580	SE	2017-11-18 11:30	EPA 537 m	Stage 2B
AFP0609-002-SW-001	FPM579	WS	2017-11-18 11:30	EPA 537 m	Stage 2B
AFP0609-MW23-GW-027	FPM589	WG	2017-11-18 12:12	EPA 537 m	Stage 2B
AFP0609-MW24-GW-43.5	FPM597	WG	2017-11-19 12:30	EPA 537 m	Stage 2B
AFP0609-MW25-GW-038	FPM596	WG	2017-11-19 11:32	EPA 537 m	Stage 2B
AFP0610-001-GW-014	FPM591	WG	2017-11-18 13:10	EPA 537 m	Stage 2B
AFP0610-002-GW-014	FPM594	WG	2017-11-18 15:06	EPA 537 m	Stage 2B
AFP0610-003-GW-014	FPX414	WG	2017-11-18 13:48	EPA 537 m	Stage 2B
AFP0610-003-GW-914	FPX415	WG	2017-11-18 13:48	EPA 537 m	Stage 2B
AFP0610-004-GW-014	FPM592	WG	2017-11-18 14:28	EPA 537 m	Stage 2B
AFP0610-005-SD-001	FPX401	SE	2017-11-18 14:10	EPA 537 m	Stage 2B
AFP0610-005-SD-901	FPX403	SE	2017-11-18 14:10	EPA 537 m	Stage 2B
AFP0610-005-SW-001	FPM583	WS	2017-11-18 14:10	EPA 537 m	Stage 2B
AFP0610-005-SW-901	FPM585	WS	2017-11-18 14:10	EPA 537 m	Stage 2B
AFP0613-001-SD-001	FPM582	SE	2017-11-18 12:40	EPA 537 m	Stage 2B
AFP0613-001-SW-001	FPM581	WS	2017-11-18 12:40	EPA 537 m	Stage 4
AFP06-RS-005	FPM577	WQ	2017-11-18 08:47	EPA 537 m	Stage 2B
AFP06-RS-006	FPX416	WQ	2017-11-19 09:45	EPA 537 m	Stage 2B
AFP06-RS-007	FPM616	WQ	2017-11-20 14:05	EPA 537 m	Stage 2B
AFP06-RS-008	FPM600	WQ	2017-11-21 09:45	EPA 537 m	Stage 2B
AFP0606-001-SO-020	FRZ856	SO	2017-12-04 16:10	EPA 537 m	Stage 2B
AFP0606-001-SO-920	FRZ857	SO	2017-12-04 16:10	EPA 537 m	Stage 2B

Sample Name	Lab Sample Name	Matrix	Collection	Method	Validation Level
AFP0606-001-SS-001	FRZ854	SO	2017-12-04 15:40	EPA 537 m	Stage 2B
AFP0606-001-SS-901	FRZ855	SO	2017-12-04 15:40	EPA 537 m	Stage 2B
AFP0606-002-SO-024	FRZ853	SO	2017-12-04 15:15	EPA 537 m	Stage 4
AFP0606-002-SS-001	FRZ848	SO	2017-12-04 14:20	EPA 537 m	Stage 2B
AFP0606-003-SO-027	FRZ847	SO	2017-12-04 13:55	EPA 537 m	Stage 2B
AFP0606-003-SS-001	FRZ845	SO	2017-12-04 13:32	EPA 537 m	Stage 2B
AFP0606-004-SD-001	FRZ849	SE	2017-12-04 15:15	EPA 537 m	Stage 2B
AFP0606-004-SD-901	FRZ851	SE	2017-12-04 15:15	EPA 537 m	Stage 2B
AFP0606-004-SW-001	FRZ850	WS	2017-12-04 15:15	EPA 537 m	Stage 2B
AFP0606-004-SW-901	FRZ852	WS	2017-12-04 15:15	EPA 537 m	Stage 2B
AFP06-RS-A01	FRZ846	WQ	2017-12-04 13:45	EPA 537 m	Stage 2B
AFP0606-001-GW-026	FTU248	WG	2017-12-13 13:40	E537	Stage 2B
AFP0606-001-GW-926	FTU249	WG	2017-12-13 13:40	E537	Stage 2B
AFP0606-002-GW-029	FTU244	WG	2017-12-12 16:32	E537	Stage 2B
AFP0606-003-GW-026	FTU245	WG	2017-12-12 15:56	E537	Stage 4
AFP06-RS-A02	FTU246	WQ	2017-12-12 15:40	E537	Stage 2B
AFP06-RS-A03	FTU247	WQ	2017-12-13 13:00	E537	Stage 2B

II. SAMPLE MANAGEMENT

According to the case narratives and the chains-of-custody (COCs) provided by the laboratory for sample delivery groups (SDGs) B7Q0389, B7Q3711, B7R2779, B7R6307 and B7S5224:

- Cooler temperatures recorded on the COCs were within the temperature limits of ≤6°C and ≥0°C.
- Specific cooler temperatures were not available on the B7Q0389 COC; however, the case narrative noted all samples were received at temperatures ≤10°C and the temperatures may have been hidden with the electronic copy stamp.
- Field and laboratory personnel signed and dated the COCs.
- The case narrative noted custody seals were present and intact on the coolers upon receipt at the laboratory.

TABLE 2 - DATA QUALIFIER REFERENCE

Qualifier	Definition
R	The sample results are rejected because of serious deficiencies in the ability to analyze the sample and to meet quality control (QC) criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was analyzed for but was nondetect (ND) above the reported sample quantification limit.
B	The reported concentration is less than 5 times the concentration reported in an associated field or lab blank.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. J- denotes a low bias for the sample results and J+ for a high bias.
UJ	The material was analyzed for but was ND. The associated value is an estimate and may be inaccurate or imprecise.

TABLE 3 - REASON CODE REFERENCE

Reason Code	Definition
01	Sample received outside of 4+/-2 degrees Celsius (°C)
01A	Improper sample preservation
02	Holding time exceeded
02A	Extraction
02B	Analysis
03	Instrument performance – outside criteria
03A*	Bromofluorobenzene (BFB)
03B*	Decafluorotriphenylphosphine (DFTPP)
03C*	dichlorodiphenyltrichloroethane (DDT) and/or endrin % breakdown exceeds criteria
03D	Retention time windows
03E	Resolution
04	ICAL results outside specified criteria
04A	Compound mean RRF QC criteria not met
04B	Individual % RSD criteria not met
04C	$r < 0.995$ or $r^2 < 0.99$
04D	ICAL % Recovery
05	Continuing calibration results outside specified criteria

Reason Code	Definition
05A	Compound mean RRF QC criteria not met
05B	Compound % Difference QC criteria not met
06	Result qualified as a result of the 5x/10x blank correction
06A	Method or preparation blank
06B	ICB or CCB
06C	ER
06D	TB
06E	FB
07	Surrogate recoveries outside control limits
07A	Sample
07B	Associated MB or LCS
08	MS/MSD/Duplicate results outside criteria
08A	MS and/or MSD recovery not within control limits (accuracy)
08B	% RPD outside acceptance criteria (precision)
09*	Post digestion spike outside criteria graphite furnace atomic absorption (GFAA)
10	Internal standards outside specified control limits
10A	Recovery
10B	Retention time
11	LCS recoveries outside specified limits
11A	Recovery
11B	% RPD (if run in duplicate)
12*	Interference check standard
13*	Serial dilution
14*	Tentatively identified compounds
15	Quantification
16	Multiple results available; alternate analysis preferred
17	Field duplicate RPD criteria is exceeded
18*	Percent difference between original and second column exceeds QC criteria
19	Professional judgment was used to qualify the data
20*	Pesticide clean-up checks
21	Target compound identification

Reason Code	Definition
22*	Radiological calibration
23*	Radiological quantification
24	Reported result and/or lab qualifier revised to reflect validation findings

*Indicates that this code is not expected to apply to the evaluation of PFAS analyses

III. METHOD ANALYSIS- PERFLUORINATED COMPOUNDS BY MODIFIED EPA METHOD 537 MODIFIED

K. Zilis of MEC^X reviewed these SDGs January 16-30, 2018.

III.1. HOLDING TIMES

Except as noted below, the holding times specified in the QAPP were met. The QAPP holding times specify samples need to be extracted within 28 days of collection and analyzed within 45 days of extraction. Reasons for samples re-extracted beyond the holding time are detailed below. Specific analytes retained and reported from re-extraction analyses listed in the tables below were qualified as estimated (J or UJ).

SDGs B7Q0389, B7R2779 and B7R6307

No holding time exceedances

SDG B7Q3711
Soil sample AFP0607-004-SD-001 was originally extracted and analyzed within holding times. Extracted internal standard MPFTeDA was below recovery criteria and the sample was re-extracted 30 days after sample collection, 2 days past the 28-day holding time for PFTeDA and PFTriDA only. The low internal standard recovery was confirmed; however, the results were reported from a 10x dilution where the internal standard recoveries were compliant. (see Internal Standards section). PFTeDA and PFTriDA were qualified as estimated (UJ) for the nondetects at an elevated reporting limit.

SDG B7S5224
Internal standard M2-PFTeA was below control limits in the original analysis of sample AFP0606-002-GW-029. The sample was re-extracted and re-analyzed outside of holding times with compliant internal standards. PFTriDA and PFTeDA were qualified as estimated (UJ) due extraction outside of the QAPP defined holding time of 28 days for the nondetects.

III.2. CALIBRATION

Calibration criteria were met, with one exception noted in the table below.

III.2.1. *INITIAL CALIBRATION*

Initial calibration criteria were met. Recoveries were within 70-130% for the lowest level of each initial calibration and 75-125% for the remaining levels, and all correlation coefficient r^2 values were within the control limit of ≥0.990 or r values ≥0.995. Applicable %RSDs were within the control limit of ≤20%. The calculated peak asymmetry factors were within the control range of 0.8-1.5. MEC^X noted the laboratory utilized as the calibration method a weighted (1/X) linear initial calibration standard curve not forced through zero.

III.2.2. *CONTINUING CALIBRATION*

The initial calibration verification (ICV) and continuing calibration verification (CCV) recoveries were within the control limits of 75-125%. Low-level check standard (ICS) recoveries were within the control limits of 70-130%.

III.3. QUALITY CONTROL SAMPLES

III.3.1. *METHOD BLANKS*

The method blanks associated with the analyses of the soil and water samples had no target analyte detects above the respective soil and water detection limits (DLs).

III.3.2. *LABORATORY CONTROL SAMPLES*

LCS recoveries were within the control limits of 70-130%, and RPDs for water LCS/LCSD pairs were within the control limit of ≤30.

III.3.3. *MATRIX SPIKE/MATRIX SPIKE DUPLICATE*

MS/MSD analyses were performed on soil and water samples listed below. MS/MSD recoveries were not evaluated if the parent sample concentration exceeded 4× the spike amount. Qualifications were not assigned for a single recovery outlier not occurring in both the MS and MSD of a pair. Nondetects in the parent sample were not qualified for RPD outliers. Remaining recoveries and RPDs affecting sample data were within the control limits of 70-130% and ≤30%, respectively.

SDGs B7Q0389
MS/MSD analyses were performed on soil samples AFP0607-001-SO-007, AFP0601-001-SS-001, AFP0607-001-SS-001, and AFP0601-001-SS-019. The MS and MSD recoveries for PFDeS were below criteria at 52% and 43% for AFP0607-001-SS-001. The parent sample result for PFDeS was qualified as estimated (J) in the site sample. No water samples were designated for matrix spike analyses in this SDG.

SDGs B7Q3711
MS/MSD analyses were designated for soil sample AF AFP0605-001-SD-001 and water samples AFP0604-003-GW-035 and AFP0605-001-SW-001. Due to high levels of target analytes, a matrix spike and matrix duplicate was analyzed for sample AFP0607-001-GW-011 and an MS/MSD was performed on sample AFP0607-001-GW-011 instead. Recoveries and RPDs affecting sample data were within the control limits of 70-130% and ≤30%, respectively.

SDGs B7R2779
There was one soil and one water sample in this SDG. No matrix spikes assigned or performed. An LCS was performed in each batch, in addition to a method blank. No precision data was assessed.

SDGs B7R6307
Matrix spike analyses were not requested or performed on samples within this SDG. An LCS/LCSD was performed for water QC, batch 5320438 and an LCS along with MS/MSD samples unrelated to this site for soil QC, batch 5321280.

SDGs B7S5224
Matrix spike analyses were not requested or performed on samples within this SDG. An LCS/LCSD was performed for each QC batch with the exception of the reextraction batch for sample FTU244, which included an LCS along with MS/MSD samples unrelated to this site.

III.4. FIELD QC SAMPLES

MEC^X evaluated field QC samples, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. MEC^X used the remaining detects to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

III.4.1. *FIELD BLANKS AND EQUIPMENT BLANKS*

The field and equipment blanks are listed in the table below. None of the field QC samples had reported detects above the DL.

Table 4-FB/EB Detects

SDG B7Q0389

Field or Equipment Blank	Detects	Concentration	LOQ
AFP06-SB-001 (field blank)	none	N/A	N/A
AFP06-RS-001 (equipment blank)	none	N/A	N/A
AFP06-RS-002 (equipment blank)	none	N/A	N/A
AFP06-RS-003 (equipment blank)	none	N/A	N/A
AFP06-RS-004 (equipment blank)	none	N/A	N/A

SDG B7Q3711

Field or Equipment Blank	Detects	Concentration	LOQ
AFP06-RS-005	none	N/A	N/A
AFP06-RS-006	none	N/A	N/A
AFP06-RS-007	none	N/A	N/A
AFP06-RS-008	none	N/A	N/A

SDG B7R2779

Field or Equipment Blank	Detects	Concentration	LOQ
none	none	N/A	N/A

SDG B7R6307

Field or Equipment Blank	Detects	Concentration	LOQ
AFP06-RS-A01	none	N/A	N/A

SDG B7S5224

Field or Equipment Blank	Detects	Concentration	LOQ
AFP06-RS-A02	none	N/A	N/A
AFP06-RS-A03	none	N/A	N/A

III.4.2. *FIELD DUPLICATES*

Field duplicate pairs are listed below. Field duplicate pairs are listed below. RPDs for common detects above the LOQ were within the control limit of ≤30%, and detects below the LOQ in one or both samples of a pair were within the reasonable control limit of ±LOQ, with exceptions noted in the table below. Results for the outlier target analytes were qualified as estimated (J or UJ) in both samples of a pair.

Table 5-FD RPDs

SDGs B7Q0389

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0610-003-SS-001	AFP0610-003-SS-901	PERFLUORODECANE SULFONATE PERFLUORODECANOIC ACID PERFLUORODODECANOIC ACID PFHxS PFOA PFNA PFOS PERFLUOROUNDECANOIC ACID	82% 80% >±LOQ 75% 57% 46% 70% 70%

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0610-003-SO-015	AFP0610-003-SO-915	PERFLUOROOCTANE SULFONATE	>±LOQ

SDGs B7Q3711

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0610-005-SW-001	AFP0610-005-SW-901	PERFLUOROHEXANE SULFONATE PERFLUOROHEXANOIC ACID PERFLUOROOCTANE SULFONATE PERFLUOROPENTANOIC ACID	103% 48% 71% 64%

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0601-004-SS-901	AFP0601-004-SS-901	none	NA

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0604-002-SO-029	AFP0604-002-SO-929	PERFLUOROHEXANOIC ACID	73%

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0610-005-SD-001	AFP0610-005-SD-901	none	NA

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0610-003-GW-014	AFP0610-003-GW-914	none	NA

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0604-002-GW-030	AFP0604-002-GW-930	none	NA

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0604-002-SS-001	AFP0604-002-SS-901	8:2 FLUOROTELOMER SULFONATE PERFLUOROOCTANE SULFONATE	42% 49%

SDGs B7R2779

No field duplicates were identified in this SDG

SDGs B7R6307

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0606-004-SD-001	AFP0606-004-SD-901	none	NA

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0606-004-SW-001	AFP0606-004-SW-901	none	NA

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0606-001-SS-001	AFP0606-001-SS-901	PERFLUOROOCTANE SULFONATE	35%

The field duplicate sample was analyzed at a 10x dilution, the parent sample at 1x:

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0606-001-SO-020	AFP0606-001-SO-920	none	NA

SDGs B7S5224

Parent Sample	Field Duplicate	Target Analyte	RPD Outliers
AFP0606-001-GW-026	AFP0606-001-GW-926	none	NA

III.5. INTERNAL STANDARDS PERFORMANCE

The applicable extracted labeled internal standard recoveries were within the control limits of ±50% of the true value.

SDG B7Q0389

Internal standards were below control limits in the original analysis for 8 of the 35 soil samples; however, all affected samples were either re-extracted and re-analyzed with compliant recoveries, or reported from a dilution analysis with compliant internal standard recoveries. In those cases, reporting limits were adjusted accordingly (see Compound Quantification and Reported Detection Limits section). Samples AFP0607-001-SS-001 and AFP0604-003-SO-036 were re-extracted and re-analyzed with compliant recoveries.

Internal Standard	% Recovery	Affected Sample	Associated Target Analyte(s)
M2-PFTeA	10x compliant	AFP0607-002-SO-010 AFP0610-003-SS-001 AFP0610-002-SS-001 AFP0603-001-SO-047 AFP0608-002-SO-032 AFP0608-003-SO-040	PFTeA PFTriA

SDG B7Q3711

Internal standards were below control limits in the original analysis in the samples listed below; however, affected samples were reported from a dilution analysis with compliant internal standard recoveries. Reporting limits were adjusted accordingly (see Compound Quantification and Reported Detection Limits section).

Internal Standard	% Recovery	Affected Sample	Associated Target Analyte(s)
M2-PFTeA	10x compliant	AFP0607-004-SD-001 AFP0607-002-GW-020	PFTeA PFTriA

Internal standard M2-PFTeA recovery in the original analysis of sample AFP0602-003-GW-015 was below QC criteria at a 5x dilution. The sample was re-extracted and re-analyzed with compliant recovery at the same 5x dilution.

SDG B7R6307

Internal standards were below control limits in the original analysis in the samples listed below, however, affected samples were reported from a 10x dilution analysis with compliant internal standard recoveries. Target compounds were undetected in both analyses. Reporting limits were adjusted accordingly (see Compound Quantification and Reported Detection Limits section).

Analytes reported as nondetects with elevated reporting limits due to reporting from 10x dilution when internal standard recoveries were below criteria in the 1x dilution:

Internal Standard	% Recovery	Affected Sample	Associated Target Analyte(s)
MPFBA	10x compliant	AFP0606-002-SO-024	PFBA
MPFUnA M8:2 FTS	10x compliant	AFP0606-001-SO-020	PFBA

Internal Standard	% Recovery	Affected Sample	Associated Target Analyte(s)
MPFBA MPFHxA MPFHxS MPFHpA MPFNA MPFDA MPFUnA MPFDoA MPFTeDA M6:2 FTS M8:2 FTS	10x compliant	AFP0606-001-SO-920	PFBA PFHxA PFBS PFHxS PFNA PFDA PFUnA PFDoA PFTriDA PFTeDA 6:2 FTS 8:2 FTS

SDG B7S5224

Internal standard M2-PFTeA was below control limits in the original analysis of sample AFP0606-002-GW-029. The sample was re-extracted and re-analyzed outside of holding times with compliant internal standards. The nondetect results for target analytes PFTriDA and PFTeDA were qualified as estimated (UJ) due to the extraction outside of the QAPP defined holiding time of 28 days. (See holding time section.)

III.6. COMPOUND IDENTIFICATION

Compound identification was verified for the following samples in each SDG:

SDG B7Q3089

Soil samples AFP0607-001-SO-007, AFP0607-002-SO-010 and AFP0607-001-SS-001 and water samples AFP0608-001-GW-042 and AFP0611-001-SW-001.

SDG B7Q3711

Soil samples AFP0601-005-SS-001, AFP0608-004-SS-001 and AFP0604-001-SS-001 and water samples AFP0613-001-SW-001, AFP0602-003-GW-015 and AFP0604-002-GW-030.

SDG B7R2779

No level 4 validations were performed for this SDG.

SDG B7R6307

Soil sample AFP0606-002-SO-024.

SDG B7S5224

Water sample AFP0606-003-GW-026

The laboratory analyzed for 18 perfluorinated compounds by Modified EPA Method 537. Review of retention times indicated no issues with compound identification.

III.7. COMPOUND QUANTIFICATION AND REPORTED DETECTION LIMITS

Calculations and sample results were verified against the raw data for the samples listed above (see Compound Identification section). Quantitation verification was limited based upon the significant figures presented in the raw data and were therefore estimations of the actual sample amounts. The reviewer considered the concentration verified within that limitation. The laboratory calculated and reported compound-specific detection limits. Detects below the LOQ were qualified as estimated (J). Nondetects are valid to the LOD.

The laboratory integrated isomeric forms for the PFCs with linear and branched isomers as required by Revision 1.1 of EPA Method 537.

Out of a total of 123 samples, including equipment blanks and field duplicates, 6 samples, 4 waters and 2 soils, were initially analyzed at dilutions based on pre-screening results. Water samples AFP0602-003-GW-015, AFP0602-001-GW-020, and AFP0602-002-GW-025 in SDG B7Q3711 and sample AFP0602-005-SW-001 in SDG B7R2779, and soil samples AFP0602-001-SS-001 and AFP0602-004-SS-001 in SDG B7Q3711. Reporting limits for these samples were raised accordingly. Remaining results were reported from the undiluted or least dilute compliant analyses. Samples were reanalyzed at various dilutions to report one or more target analytes within the linear range of the calibration or to report results from analyses with QC compliant internal standard recoveries. The DLs and LOQs were adjusted accordingly based on the dilution for each analyte result.

III.8. SYSTEM PERFORMANCE

No issues were noted with system performance.

IV. SUMMARY AND CONCLUSIONS

MEC^X evaluated a total of 1980 data records from field samples during the validation and qualified 40 records (2.0% of the data) as estimated values (J for detects and UJ for nondetects). The qualification was required for holding time exceedance, continuing calibration outliers, matrix spike recovery outliers and field duplicate precision outliers. Nondetect compounds were flagged (U) to indicate that the compound was analyzed for but not detected above the limit of detection (LOD). Specific qualification is discussed in the text above.

Overall, the quality of the data was acceptable. The precision (98.3%) and accuracy results (99.7%) were acceptable. Other data quality indicators (DQI) (representativeness, comparability and completeness) met the project objectives. Each of these DQIs is discussed below.

IV.1. PRECISION

Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the relative percent difference (RPD) between spikes and the RPD for the field duplicate pair analysis. Precision was measured at 98.3% primarily due to field duplicate outliers. Precision was considered acceptable for the project.

IV.2. ACCURACY

Accuracy is measured by the results from the recovery of known amounts of compounds or elements from calibration, method blanks, laboratory control samples (LCS), matrix spikes (MS), internal standard recoveries and surrogate recoveries. The primary qualification for accuracy was holding time exceednace (0.2%). The accuracy was 99.7%. Accuracy was considered acceptable for the project.

IV.3. REPRESENTATIVENESS

The measures of representativeness – sample handling, analytical blank analysis, were met. Designated analytical protocols were followed. The laboratory did utilize a weighted 1/X calibration curve which was not forced through zero. Although this is a deviation from Method 537, it is acceptable on DoD projects and was considered acceptable by the reviewer. Holding times were met for all analyses with the exception of four re-extraction and reanalyses for internal stand outliers. No analytical problems were noted which would impact data representativeness.

IV.4. COMPARABILITY

The samples were analyzed using appropriate approved methods of analysis. All data were reported correctly using standard units.

IV.5. COMPLETENESS

Completeness is the amount of validated data compared to the planned amount of data and is expressed as a percentage of the usable data divided by the total number of data points. Although one data point was rejected by the reviewer, it was not a target compound and was not counted against the overall percent completeness. Of the 1980 target data points, no data points were rejected, resulting in a completeness of 100%.

V. REFERENCES

Aerostar, 2016. *Final Quality Assurance Project Plan for Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites United States Air Force Installations*, March 2016

Aerostar, 2016a. *Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) for Site Inspection of Aqueous Film Forming Foam Areas, Multiple Sites, United States Air Force Installations, Addendum 19, Field Sampling Plan for Air Force Plant 6, Cobb County, Georgia,* November 2017.

Department of Defense (DOD), 2017. *DoD Quality Systems Manual for Environmental Laboratories,* Version 5.1. January 2017.

EPA, 2009. *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS),* Version 1.1, September 2009. EPA Document #: EPA/600/R-08/092.

EPA, 2014. *EPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review*, EPA/540-R-014-002.

EPA (U.S. Environmental Protection Agency), January 2009. OSWER 9200-1-85. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use.* EPA-540/R-08-005.

Validated Sample Result Forms: B7Q0389

Analysis Method: EPA 537 m

Sample Name AFP0601-001-SO-019 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW126 **Sample Date/Time:** 2017-11-15 16:35 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.88	0.29	0.88	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.88	0.43	0.88	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.55	0.21	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.55	0.26	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.24	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.88	0.29	0.88	1.1	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	0.34	0.88	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.88	0.37	0.88	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0601-001-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW099 **Sample Date/Time:** 2017-11-14 16:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<1.0	0.34	1.0	1.3	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<1.0	0.43	1.0	1.3	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.65	0.22	0.65	1.3	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<1.0	0.51	1.0	1.3	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<1.0	0.36	1.0	1.3	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<1.0	0.36	1.0	1.3	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.73	0.25	0.65	1.3	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.96	0.31	0.65	1.3	ug/kg	J	J	05B
PERFLUOROHEXANOIC ACID	307-24-4	0.86	0.18	0.65	1.3	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.65	0.29	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.18	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	5.8	0.34	1.0	1.3	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.3	0.33	1.0	1.3	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	0.43	0.33	1.0	1.3	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.0	0.40	1.0	1.3	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.0	0.43	1.0	1.3	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<1.0	0.44	1.0	1.3	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0601-002-SO-025 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW129 **Sample Date/Time:** 2017-11-15 17:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.96	0.47	0.96	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.23	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.29	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.26	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.96	0.31	0.96	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.96	0.37	0.96	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.96	0.41	0.96	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0601-002-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW128 **Sample Date/Time:** 2017-11-15 17:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.96	0.47	0.96	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	1.8	0.34	0.96	1.2	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.41	0.23	0.60	1.2	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.29	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	2.5	0.26	0.60	1.2	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	5.4	0.31	0.96	1.2	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	1.0	0.30	0.96	1.2	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.96	0.37	0.96	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.85	0.41	0.96	1.2	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name AFP0601-003-SO-019 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW127 **Sample Date/Time:** 2017-11-15 16:55 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.80	0.26	0.80	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.17	0.50	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.50	0.23	0.50	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.80	0.39	0.80	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.50	0.19	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.50	0.24	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.50	0.22	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.80	0.26	0.80	1.0	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.80	0.31	0.80	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.80	0.34	0.80	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0601-003-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW125 **Sample Date/Time:** 2017-11-15 16:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.96	0.47	0.96	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.23	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.29	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.26	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.96	0.31	0.96	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.96	0.37	0.96	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.96	0.41	0.96	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0603-001-GW-045 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW133 **Sample Date/Time:** 2017-11-15 12:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.50	0.0066	0.015	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.015	0.0066	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.040	0.0054	0.015	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.10	0.0055	0.015	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.070	0.0074	0.015	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.18	0.0056	0.015	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.47	0.0035	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.025	0.0087	0.018	0.020	ug/L			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.038	0.0060	0.015	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.20	0.0033	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.42	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0603-001-SO-047 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW112 **Sample Date/Time:** 2017-11-13 11:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<1.1	0.36	1.1	1.4	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<1.1	0.46	1.1	1.4	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.70	0.24	0.70	1.4	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.65	0.30	0.65	1.3	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<1.1	0.55	1.1	1.4	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<1.1	0.39	1.1	1.4	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<1.1	0.39	1.1	1.4	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.70	0.27	0.70	1.4	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.70	0.34	0.70	1.4	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.70	0.20	0.70	1.4	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.70	0.31	0.70	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.70	0.20	0.70	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<1.1	0.36	1.1	1.4	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<1.1	0.35	1.1	1.4	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<1.1	0.35	1.1	1.4	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<11	4.3	11	14	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<11	4.6	11	14	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<1.1	0.48	1.1	1.4	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0603-001-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW111 **Sample Date/Time:** 2017-11-13 09:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	6.5	0.29	0.88	1.1	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	3.5	0.23	0.49	0.98	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	<0.88	0.43	0.88	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	3.6	0.21	0.55	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.55	0.26	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	6.1	0.15	0.55	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	4.6	0.24	0.55	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	6.1	0.29	0.88	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.2	0.28	0.88	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	17	0.28	0.88	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	0.34	0.88	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.88	0.37	0.88	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0604-003-SO-036 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW131 **Sample Date/Time:** 2017-11-16 09:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.96	0.47	0.96	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.23	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.29	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.26	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.74	0.31	0.96	1.2	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.1	0.43	1.1	1.4	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.1	0.46	1.1	1.4	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.96	0.41	0.96	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0604-003-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW130 **Sample Date/Time:** 2017-11-16 08:50 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.1	0.29	0.88	1.1	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	38	0.36	0.88	1.1	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.88	0.43	0.88	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.82	0.31	0.88	1.1	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.24	0.21	0.55	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	4.5	0.26	0.55	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.53	0.15	0.55	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.24	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	12	0.15	0.55	1.1	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	100	2.9	8.8	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.1	0.28	0.88	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	0.81	0.28	0.88	1.1	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	0.34	0.88	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.88	0.37	0.88	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0607-001-SO-007 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW096 **Sample Date/Time:** 2017-11-14 14:30 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.80	0.26	0.80	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.17	0.50	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.51	0.23	0.51	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.80	0.39	0.80	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.34	0.19	0.50	1.0	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.50	0.24	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.50	0.22	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.80	0.26	0.80	1.0	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.80	0.31	0.80	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.80	0.34	0.80	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0607-001-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW124 **Sample Date/Time:** 2017-11-14 13:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.2	0.26	0.80	1.0	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	21	0.33	0.80	1.0	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.17	0.50	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.50	0.23	0.50	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	0.45	0.39	0.80	1.0	ug/kg	J	J	08A
PERFLUORODECANOIC ACID	335-76-2	12	0.28	0.80	1.0	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	1.4	0.31	0.88	1.1	ug/kg			
PERFLUOROHEPTANOIC ACID	375-85-9	5.7	0.19	0.50	1.0	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	2.0	0.24	0.50	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.0	0.14	0.50	1.0	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	7.6	0.22	0.50	1.0	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	1.1	0.14	0.50	1.0	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	10	0.26	0.80	1.0	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	7.4	0.25	0.80	1.0	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	3.2	0.25	0.80	1.0	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	3.4	0.88	11	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	3.6	0.88	11	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	5.2	0.37	0.88	1.1	ug/kg			

Analysis Method: EPA 537 m

Sample Name AFP0607-002-SO-010 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW098 **Sample Date/Time:** 2017-11-14 15:20 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.44	0.34	1.0	1.3	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.61	0.43	1.0	1.3	ug/kg	J	J	
PERFLUOROBUTANE SULFONATE	29420-43-3	1.7	0.22	0.65	1.3	ug/kg			
PERFLUOROBUTANOIC ACID	375-22-4	5.0	0.28	0.60	1.2	ug/kg			
PERFLUORODECANE SULFONATE	335-77-3	63	0.51	1.0	1.3	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	18	0.36	1.0	1.3	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	3.5	0.36	1.0	1.3	ug/kg			
PERFLUOROHEPTANOIC ACID	375-85-9	10	0.25	0.65	1.3	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	68	3.1	6.5	13	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	13	0.18	0.65	1.3	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	18	0.29	0.65	1.3	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	3.9	0.18	0.65	1.3	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	570	3.4	10	13	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	38	0.33	1.0	1.3	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	13	0.33	1.0	1.3	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<10	4.0	10	13	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<10	4.3	10	13	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	3.6	0.44	1.0	1.3	ug/kg			

Analysis Method: EPA 537 m

Sample Name AFP0607-002-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW097 **Sample Date/Time:** 2017-11-14 15:00 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.80	0.26	0.80	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.17	0.50	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.80	0.39	0.80	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.52	0.28	0.80	1.0	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.50	0.19	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.5	0.24	0.50	1.0	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.50	0.22	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	15	0.26	0.80	1.0	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.93	0.25	0.80	1.0	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.38	0.25	0.80	1.0	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.80	0.31	0.80	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.80	0.34	0.80	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0607-003-SO-047 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW123 **Sample Date/Time:** 2017-11-14 12:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.70	0.23	0.70	0.88	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.70	0.29	0.70	0.88	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.44	0.15	0.44	0.88	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.44	0.20	0.44	0.88	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.70	0.34	0.70	0.88	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.70	0.25	0.70	0.88	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.70	0.25	0.70	0.88	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.44	0.17	0.44	0.88	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.44	0.21	0.44	0.88	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.44	0.12	0.44	0.88	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.44	0.19	0.44	0.88	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.44	0.12	0.44	0.88	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.70	0.23	0.70	0.88	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.70	0.22	0.70	0.88	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.70	0.22	0.70	0.88	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.70	0.27	0.70	0.88	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.70	0.29	0.70	0.88	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.70	0.30	0.70	0.88	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0607-003-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW121 **Sample Date/Time:** 2017-11-14 10:10 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.78	0.25	0.78	0.97	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	31	0.32	0.78	0.97	ug/kg			
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.49	0.16	0.49	0.97	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.49	0.22	0.49	0.97	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.78	0.38	0.78	0.97	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	1.6	0.27	0.78	0.97	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	0.57	0.27	0.78	0.97	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.49	0.18	0.49	0.97	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.49	0.23	0.49	0.97	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.49	0.14	0.49	0.97	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.49	0.21	0.49	0.97	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.49	0.14	0.49	0.97	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.78	0.25	0.78	0.97	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.78	0.24	0.78	0.97	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.78	0.24	0.78	0.97	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.78	0.30	0.78	0.97	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.78	0.32	0.78	0.97	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	2.2	0.33	0.78	0.97	ug/kg			

Analysis Method: EPA 537 m

Sample Name AFP0608-001-GW-042 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW135 **Sample Date/Time:** 2017-11-15 14:16 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.015	0.0066	0.015	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.015	0.0066	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.13	0.0054	0.015	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.046	0.0055	0.015	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.015	0.0074	0.015	0.020	ug/L	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.11	0.0056	0.015	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.37	0.0035	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.010	0.0087	0.018	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.084	0.0060	0.015	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.045	0.0033	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.15	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-001-SO-035 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW120 **Sample Date/Time:** 2017-11-14 09:10 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.80	0.26	0.80	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.17	0.50	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.50	0.23	0.50	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.80	0.39	0.80	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.50	0.19	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.50	0.24	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.50	0.22	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.80	0.26	0.80	1.0	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.80	0.31	0.80	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.80	0.34	0.80	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-001-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW119 **Sample Date/Time:** 2017-11-14 08:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.84	0.25	0.55	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	1.5	0.47	0.96	1.2	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.69	0.34	0.96	1.2	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.72	0.23	0.60	1.2	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	15	0.29	0.60	1.2	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.1	0.17	0.60	1.2	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	4.3	0.26	0.60	1.2	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	1.0	0.17	0.60	1.2	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	63	3.1	9.6	12	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	2.6	0.30	0.96	1.2	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.8	0.30	0.96	1.2	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.96	0.37	0.96	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.96	0.41	0.96	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-002-GW-035 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW134 **Sample Date/Time:** 2017-11-15 13:15 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.016	0.0066	0.015	0.020	ug/L	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.015	0.0066	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.027	0.0054	0.015	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.030	0.0055	0.015	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.032	0.0074	0.015	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.20	0.0056	0.015	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.21	0.0035	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	0.015	0.0087	0.018	0.020	ug/L	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.13	0.0060	0.015	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.18	0.0033	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.055	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-002-SO-032 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW116 **Sample Date/Time:** 2017-11-13 14:50 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<1.0	0.34	1.0	1.3	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<10	4.3	10	13	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<6.5	2.2	6.5	13	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<6.5	3.0	6.5	13	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<10	5.1	10	13	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<10	3.6	10	13	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<10	3.6	10	13	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.65	0.25	0.65	1.3	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.65	0.31	0.65	1.3	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<6.5	1.8	6.5	13	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<6.5	2.9	6.5	13	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.18	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<10	3.4	10	13	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<10	3.3	10	13	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<10	3.3	10	13	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<10	4.0	10	13	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<10	4.3	10	13	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<10	4.4	10	13	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-002-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW114 **Sample Date/Time:** 2017-11-13 14:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.88	0.29	0.88	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.40	0.22	0.48	0.96	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	1.8	0.43	0.88	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	1.5	0.31	0.88	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.63	0.21	0.55	1.1	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.6	0.26	0.55	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.89	0.15	0.55	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	1.4	0.24	0.55	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	24	0.29	0.88	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.73	0.28	0.88	1.1	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	1.2	0.28	0.88	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	0.34	0.88	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	1.5	0.37	0.88	1.1	ug/kg			

Analysis Method: EPA 537 m

Sample Name AFP0608-003-GW-040 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW136 **Sample Date/Time:** 2017-11-15 14:32 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.015	0.0066	0.015	0.020	ug/L	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.015	0.0066	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.17	0.0054	0.015	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.066	0.0055	0.015	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.11	0.0074	0.015	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	1.4	0.056	0.15	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	1.2	0.035	0.10	0.20	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.018	0.0087	0.018	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.067	0.0034	0.010	0.020	ug/L			
PERFLUOROOCTANE SULFONATE	1763-23-1	1.8	0.060	0.15	0.20	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.67	0.0033	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.22	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-003-SO-040 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW118 **Sample Date/Time:** 2017-11-13 16:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.88	0.29	0.88	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.88	0.43	0.88	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.55	0.21	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.55	0.26	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.24	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.88	0.29	0.88	1.1	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<8.8	3.4	8.8	11	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<8.8	3.6	8.8	11	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.88	0.37	0.88	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0608-003-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW117 **Sample Date/Time:** 2017-11-13 15:55 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.77	0.25	0.77	0.96	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.77	0.32	0.77	0.96	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.48	0.16	0.48	0.96	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	0.48	0.25	0.55	1.1	ug/kg	J	J	
PERFLUORODECANE SULFONATE	335-77-3	4.3	0.37	0.77	0.96	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	1.0	0.27	0.77	0.96	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	1.0	0.27	0.77	0.96	ug/kg			
PERFLUOROHEPTANOIC ACID	375-85-9	0.28	0.18	0.48	0.96	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	21	0.23	0.48	0.96	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	2.3	0.13	0.48	0.96	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	0.69	0.21	0.48	0.96	ug/kg	J	J	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	9.4	0.13	0.48	0.96	ug/kg			
PERFLUOROOCTANE SULFONATE	1763-23-1	420	2.5	7.7	9.6	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	4.3	0.24	0.77	0.96	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.3	0.24	0.77	0.96	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.77	0.30	0.77	0.96	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.77	0.32	0.77	0.96	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.68	0.33	0.77	0.96	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name AFP0609-001-SD-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW137 **Sample Date/Time:** 2017-11-16 12:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.4	0.34	1.0	1.3	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<1.0	0.43	1.0	1.3	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.83	0.22	0.65	1.3	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.65	0.30	0.65	1.3	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<1.0	0.51	1.0	1.3	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	0.53	0.36	1.0	1.3	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	<1.0	0.36	1.0	1.3	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.65	0.25	0.65	1.3	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.8	0.31	0.65	1.3	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	<0.65	0.18	0.65	1.3	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.65	0.29	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.18	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	9.9	0.34	1.0	1.3	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.93	0.33	1.0	1.3	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<1.0	0.33	1.0	1.3	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.0	0.40	1.0	1.3	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.0	0.43	1.0	1.3	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<1.0	0.44	1.0	1.3	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0609-001-SW-001 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW138 **Sample Date/Time:** 2017-11-16 12:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.21	0.0066	0.015	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	0.026	0.0066	0.015	0.020	ug/L			
PERFLUOROBUTANE SULFONATE	29420-43-3	0.042	0.0054	0.015	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	<0.015	0.0055	0.015	0.020	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.010	0.0074	0.015	0.020	ug/L	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.022	0.0056	0.015	0.020	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.046	0.0035	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.018	0.0087	0.018	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.084	0.0060	0.015	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.022	0.0033	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.045	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-001-SO-014 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW110 **Sample Date/Time:** 2017-11-15 15:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.88	0.29	0.88	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.88	0.43	0.88	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.55	0.21	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.55	0.26	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.24	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	10	0.29	0.88	1.1	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	0.34	0.88	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.88	0.37	0.88	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-001-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW109 **Sample Date/Time:** 2017-11-15 15:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	1.1	0.24	0.74	0.92	ug/kg			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.74	0.30	0.74	0.92	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.46	0.16	0.46	0.92	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.74	0.36	0.74	0.92	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.74	0.26	0.74	0.92	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.74	0.26	0.74	0.92	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.24	0.17	0.46	0.92	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.46	0.22	0.46	0.92	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.46	0.13	0.46	0.92	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.46	0.20	0.46	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.46	0.13	0.46	0.92	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.44	0.24	0.74	0.92	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.39	0.23	0.74	0.92	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.74	0.23	0.74	0.92	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.74	0.29	0.74	0.92	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.74	0.30	0.74	0.92	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.74	0.31	0.74	0.92	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-002-SO-015 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW108 **Sample Date/Time:** 2017-11-15 14:30 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.88	0.29	0.88	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.55	0.19	0.55	1.1	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.65	0.30	0.65	1.3	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.88	0.43	0.88	1.1	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.88	0.31	0.88	1.1	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.55	0.21	0.55	1.1	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.6	0.26	0.55	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.21	0.15	0.55	1.1	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.55	0.24	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.55	0.15	0.55	1.1	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.83	0.29	0.88	1.1	ug/kg	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.88	0.28	0.88	1.1	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.88	0.34	0.88	1.1	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.88	0.37	0.88	1.1	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-002-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW106 **Sample Date/Time:** 2017-11-15 14:05 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.88	0.29	0.88	1.1	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.88	0.36	0.88	1.1	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.39	0.19	0.55	1.1	ug/kg	J	J	
PERFLUOROBUTANOIC ACID	375-22-4	<0.50	0.23	0.50	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	32	0.43	0.88	1.1	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	14	0.31	0.88	1.1	ug/kg			
PERFLUORODODECANOIC ACID	307-55-1	3.9	0.31	0.88	1.1	ug/kg			
PERFLUOROHEPTANOIC ACID	375-85-9	1.4	0.21	0.55	1.1	ug/kg			
PERFLUOROHEXANE SULFONATE	108427-53-8	7.1	0.26	0.55	1.1	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	1.4	0.15	0.55	1.1	ug/kg			
PERFLUORONONANOIC ACID	375-95-1	6.7	0.24	0.55	1.1	ug/kg			
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.62	0.15	0.55	1.1	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	130	2.9	8.8	11	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	3.7	0.28	0.88	1.1	ug/kg			
PERFLUOROPENTANOIC ACID	2706-90-3	1.4	0.28	0.88	1.1	ug/kg			
PERFLUOROTETRADECANOIC ACID	376-06-7	<8.8	3.4	8.8	11	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<8.8	3.6	8.8	11	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	6.0	0.37	0.88	1.1	ug/kg			

Analysis Method: EPA 537 m

Sample Name AFP0610-003-SO-015 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW102 **Sample Date/Time:** 2017-11-15 11:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.96	0.47	0.96	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.23	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.29	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.26	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	4.0	0.31	0.96	1.2	ug/kg		j	17
PERFLUOROOCTANOIC ACID	335-67-1	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.96	0.37	0.96	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.96	0.41	0.96	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-003-SO-915 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW103 **Sample Date/Time:** 2017-11-15 11:45 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<1.0	0.34	1.0	1.3	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<1.0	0.43	1.0	1.3	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.65	0.22	0.65	1.3	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<1.0	0.51	1.0	1.3	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<1.0	0.36	1.0	1.3	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<1.0	0.36	1.0	1.3	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.65	0.25	0.65	1.3	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.65	0.31	0.65	1.3	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.65	0.18	0.65	1.3	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.65	0.29	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.65	0.18	0.65	1.3	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	1.1	0.34	1.0	1.3	ug/kg	J	J	17
PERFLUOROOCTANOIC ACID	335-67-1	<1.0	0.33	1.0	1.3	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<1.0	0.33	1.0	1.3	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.0	0.40	1.0	1.3	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.0	0.43	1.0	1.3	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<1.0	0.44	1.0	1.3	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-003-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW100 **Sample Date/Time:** 2017-11-15 11:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	21	0.47	0.96	1.2	ug/kg		J	17
PERFLUORODECANOIC ACID	335-76-2	6.8	0.34	0.96	1.2	ug/kg		J	17
PERFLUORODODECANOIC ACID	307-55-1	2.1	0.34	0.96	1.2	ug/kg		J	17
PERFLUOROHEPTANOIC ACID	375-85-9	0.73	0.23	0.60	1.2	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	4.4	0.29	0.60	1.2	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	0.72	0.17	0.60	1.2	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	2.7	0.26	0.60	1.2	ug/kg		J	17
PERFLUOROOCTANE SULFONAMIDE	754-91-6	0.62	0.17	0.60	1.2	ug/kg	J	J	
PERFLUOROOCTANE SULFONATE	1763-23-1	160	3.1	9.6	12	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	1.8	0.30	0.96	1.2	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	0.95	0.30	0.96	1.2	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<9.6	3.7	9.6	12	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<9.6	4.0	9.6	12	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	3.1	0.41	0.96	1.2	ug/kg		J	17

Analysis Method: EPA 537 m

Sample Name AFP0610-003-SS-901 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW101 **Sample Date/Time:** 2017-11-15 11:20 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.74	0.24	0.74	0.93	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.74	0.31	0.74	0.93	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.47	0.16	0.47	0.93	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.55	0.25	0.55	1.1	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	8.8	0.36	0.74	0.93	ug/kg		J	17
PERFLUORODECANOIC ACID	335-76-2	2.9	0.26	0.74	0.93	ug/kg		J	17
PERFLUORODODECANOIC ACID	307-55-1	0.86	0.26	0.74	0.93	ug/kg	J	J	17
PERFLUOROHEPTANOIC ACID	375-85-9	0.41	0.18	0.47	0.93	ug/kg	J	J	
PERFLUOROHEXANE SULFONATE	108427-53-8	2.0	0.22	0.47	0.93	ug/kg		J	17
PERFLUOROHEXANOIC ACID	307-24-4	0.44	0.13	0.47	0.93	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	1.7	0.20	0.47	0.93	ug/kg		J	17
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.47	0.13	0.47	0.93	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	77	2.4	7.4	9.3	ug/kg		J	17
PERFLUOROOCTANOIC ACID	335-67-1	1.0	0.23	0.74	0.93	ug/kg		J	17
PERFLUOROPENTANOIC ACID	2706-90-3	0.36	0.23	0.74	0.93	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.74	0.29	0.74	0.93	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.74	0.31	0.74	0.93	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	1.5	0.32	0.74	0.93	ug/kg		J	17

Analysis Method: EPA 537 m

Sample Name AFP0610-004-SO-016 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW105 **Sample Date/Time:** 2017-11-15 13:22 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.80	0.26	0.80	1.0	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.50	0.17	0.50	1.0	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.50	0.23	0.50	1.0	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.80	0.39	0.80	1.0	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.80	0.28	0.80	1.0	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.50	0.19	0.50	1.0	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.31	0.24	0.50	1.0	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.50	0.22	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.50	0.14	0.50	1.0	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.80	0.26	0.80	1.0	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.80	0.25	0.80	1.0	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.80	0.31	0.80	1.0	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.80	0.33	0.80	1.0	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.80	0.34	0.80	1.0	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0610-004-SS-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW104 **Sample Date/Time:** 2017-11-15 12:25 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.65	0.21	0.65	0.81	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.65	0.27	0.65	0.81	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.41	0.14	0.41	0.81	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.47	0.21	0.47	0.93	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	3.9	0.32	0.65	0.81	ug/kg			
PERFLUORODECANOIC ACID	335-76-2	0.57	0.23	0.65	0.81	ug/kg	J	J	
PERFLUORODODECANOIC ACID	307-55-1	0.39	0.23	0.65	0.81	ug/kg	J	J	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.41	0.15	0.41	0.81	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	0.77	0.19	0.41	0.81	ug/kg	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.16	0.11	0.41	0.81	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.41	0.18	0.41	0.81	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.41	0.11	0.41	0.81	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	15	0.21	0.65	0.81	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	0.36	0.20	0.65	0.81	ug/kg	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.38	0.20	0.65	0.81	ug/kg	J	J	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.65	0.25	0.65	0.81	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.65	0.27	0.65	0.81	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	0.51	0.28	0.65	0.81	ug/kg	J	J	

Analysis Method: EPA 537 m

Sample Name AFP0611-001-SD-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW140 **Sample Date/Time:** 2017-11-16 13:55 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	<0.96	0.31	0.96	1.2	ug/kg	U	U	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.60	0.20	0.60	1.2	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.60	0.28	0.60	1.2	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.96	0.47	0.96	1.2	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.96	0.34	0.96	1.2	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.60	0.23	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	<0.60	0.29	0.60	1.2	ug/kg	U	U	
PERFLUOROHEXANOIC ACID	307-24-4	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUORONONANOIC ACID	375-95-1	<0.60	0.26	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.60	0.17	0.60	1.2	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	<0.96	0.31	0.96	1.2	ug/kg	U	U	
PERFLUOROOCTANOIC ACID	335-67-1	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<0.96	0.30	0.96	1.2	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.96	0.37	0.96	1.2	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.96	0.40	0.96	1.2	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.96	0.41	0.96	1.2	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0611-001-SW-001 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW139 **Sample Date/Time:** 2017-11-16 13:55 **Validation Level:** Stage 4

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.013	0.0066	0.015	0.020	ug/L	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.015	0.0066	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.015	0.0054	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.015	0.0055	0.015	0.020	ug/L	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.023	0.0074	0.015	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	0.0074	0.0056	0.015	0.020	ug/L	J	J	
PERFLUOROHEXANOIC ACID	307-24-4	0.030	0.0035	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.018	0.0087	0.018	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.0062	0.0060	0.015	0.020	ug/L	J	J	
PERFLUOROOCTANOIC ACID	335-67-1	0.014	0.0033	0.010	0.020	ug/L	J	J	
PERFLUOROPENTANOIC ACID	2706-90-3	0.049	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0612-001-SD-001 **Matrix Type:** S **Result Type:** TRG

Lab Sample Name: FOW142 **Sample Date/Time:** 2017-11-16 14:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.79	0.36	1.1	1.4	ug/kg	J	J	
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<1.1	0.46	1.1	1.4	ug/kg	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	<0.70	0.24	0.70	1.4	ug/kg	U	U	
PERFLUOROBUTANOIC ACID	375-22-4	<0.70	0.32	0.70	1.4	ug/kg	U	U	
PERFLUORODECANE SULFONATE	335-77-3	<1.1	0.55	1.1	1.4	ug/kg	U	U	
PERFLUORODECANOIC ACID	335-76-2	<1.1	0.39	1.1	1.4	ug/kg	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<1.1	0.39	1.1	1.4	ug/kg	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	<0.70	0.27	0.70	1.4	ug/kg	U	U	
PERFLUOROHEXANE SULFONATE	108427-53-8	1.4	0.34	0.70	1.4	ug/kg			
PERFLUOROHEXANOIC ACID	307-24-4	0.45	0.20	0.70	1.4	ug/kg	J	J	
PERFLUORONONANOIC ACID	375-95-1	<0.70	0.31	0.70	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.70	0.20	0.70	1.4	ug/kg	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	3.6	0.36	1.1	1.4	ug/kg			
PERFLUOROOCTANOIC ACID	335-67-1	<1.1	0.35	1.1	1.4	ug/kg	U	U	
PERFLUOROPENTANOIC ACID	2706-90-3	<1.1	0.35	1.1	1.4	ug/kg	U	U	
PERFLUOROTETRADECANOIC ACID	376-06-7	<1.1	0.43	1.1	1.4	ug/kg	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<1.1	0.46	1.1	1.4	ug/kg	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<1.1	0.48	1.1	1.4	ug/kg	U	U	

Analysis Method: EPA 537 m

Sample Name AFP0612-001-SW-001 **Matrix Type:** **Result Type:** TRG

Lab Sample Name: FOW141 **Sample Date/Time:** 2017-11-16 14:40 **Validation Level:** Stage 2B

Analyte	CAS No	Result Value	DL	LOD	LOQ	Result Units	Lab Qualifier	Validation Qualifier	Validation Reason Code
6:2 FLUOROTELOMER SULFONATE	27619-97-2	0.21	0.0066	0.015	0.020	ug/L			
8:2 FLUOROTELOMER SULFONATE	39108-34-4	<0.015	0.0066	0.015	0.020	ug/L	U	U	
PERFLUOROBUTANE SULFONATE	29420-43-3	0.087	0.0054	0.015	0.020	ug/L			
PERFLUOROBUTANOIC ACID	375-22-4	0.055	0.0055	0.015	0.020	ug/L			
PERFLUORODECANE SULFONATE	335-77-3	<0.015	0.0060	0.015	0.020	ug/L	U	U	
PERFLUORODECANOIC ACID	335-76-2	<0.015	0.0061	0.015	0.020	ug/L	U	U	
PERFLUORODODECANOIC ACID	307-55-1	<0.010	0.0050	0.010	0.020	ug/L	U	U	
PERFLUOROHEPTANOIC ACID	375-85-9	0.083	0.0074	0.015	0.020	ug/L			
PERFLUOROHEXANE SULFONATE	108427-53-8	1.6	0.056	0.15	0.20	ug/L			
PERFLUOROHEXANOIC ACID	307-24-4	0.57	0.0035	0.010	0.020	ug/L			
PERFLUORONONANOIC ACID	375-95-1	<0.018	0.0087	0.018	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONAMIDE	754-91-6	<0.010	0.0034	0.010	0.020	ug/L	U	U	
PERFLUOROOCTANE SULFONATE	1763-23-1	0.49	0.0060	0.015	0.020	ug/L			
PERFLUOROOCTANOIC ACID	335-67-1	0.67	0.0033	0.010	0.020	ug/L			
PERFLUOROPENTANOIC ACID	2706-90-3	0.16	0.0075	0.018	0.020	ug/L			
PERFLUOROTETRADECANOIC ACID	376-06-7	<0.010	0.0027	0.010	0.020	ug/L	U	U	
PERFLUOROTRIDECANOIC ACID	72629-94-8	<0.010	0.0038	0.010	0.020	ug/L	U	U	
PERFLUOROUNDECANOIC ACID	2058-94-8	<0.010	0.0025	0.010	0.020	ug/L	U	U	