Final
Preliminary Assessment Report
Morrisville Army Aviation Support Facility #1, North Carolina

Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

August 2020

Prepared for:

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

UNCLASSIFIED

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Acronyms and Abbreviations

°F	degrees Fahrenheit
AASF	Army Aviation Support Facility
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
CFMO	Construction Facilities Management Office
CSM	conceptual site model
DOA	Department of the Army
EDR™	Environmental Data Resources, Inc.™
FTA	fire training area
GSE	ground support equipment
HA	Health Advisory
NCARNG	North Carolina Army National Guard
NCDEQ	North Carolina Department of Environmental Quality
NCWRF	North Cary Water Reclamation Facility
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
RDU	Raleigh-Durham International Airport
SI	Site Inspection
TFFT	Tactical Firefighting Truck
UCMR3	Unregulated Contaminant Monitoring Rule 3
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VSI	visual site inspection

Executive Summary

The Army National Guard (ARNG) is performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. A PA for per- and polyfluoroalkyl substances (PFAS)-containing materials was completed for the Army Aviation Support Facility (AASF) #1(also referred to as the "facility") in Morrisville, North Carolina to assess potential PFAS release areas and exposure pathways to receptors. The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 22 October 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed Morrisville AASF personnel during the site visit including North Carolina ARNG (NCARNG) environmental managers, the Morrisville AASF Fire Chief, and Morrisville AASF operations staff; and,
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

Five AOIs related to PFAS releases were identified at the Morrisville AASF during the PA. The AOIs are shown on **Figure ES-1** and described below:

Table ES-1: AOIs at Morrisville AASF #1

Area of Interest	Name	Used by	Release Date
AOI 1	Wash Rack Area and GSE Building	NCARNG	1988-2009, 2018
AOI 2	Delta Row FTA	NCARNG	1988-2009
AOI 3	Firehouse Storage and Flush Area	NCARNG	2014
AOI 4	Hangar Leak Area	NCARNG	2015
AOI 5	Long-Term Tri-Max 30™ Storage Area	NCARNG	2009-Present

Based on the potential PFAS releases at the AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. Potential off-facility PFAS release areas exist adjacent to Morrisville AASF #1. Because this area includes property upgradient of the facility, it is unknown whether the off-facility sources affect the facility. The preliminary CSM for the Morrisville AASF is shown on **Figure ES-2**. Based on the United States Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the USEPA's lifetime Health Advisory (HA) within 20 miles of the facility. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Morrisville AASF #1, NC			
REVISED	8/28/2020	GIS BY	HO	8/28/2020
SCALE	1:3,600	CHK BY	ZN	8/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	8/28/2020

Area of Interest
Potential PFAS Release
No Suspected Release
Facility Boundary
Water Body
River/Stream

N

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure ES-1

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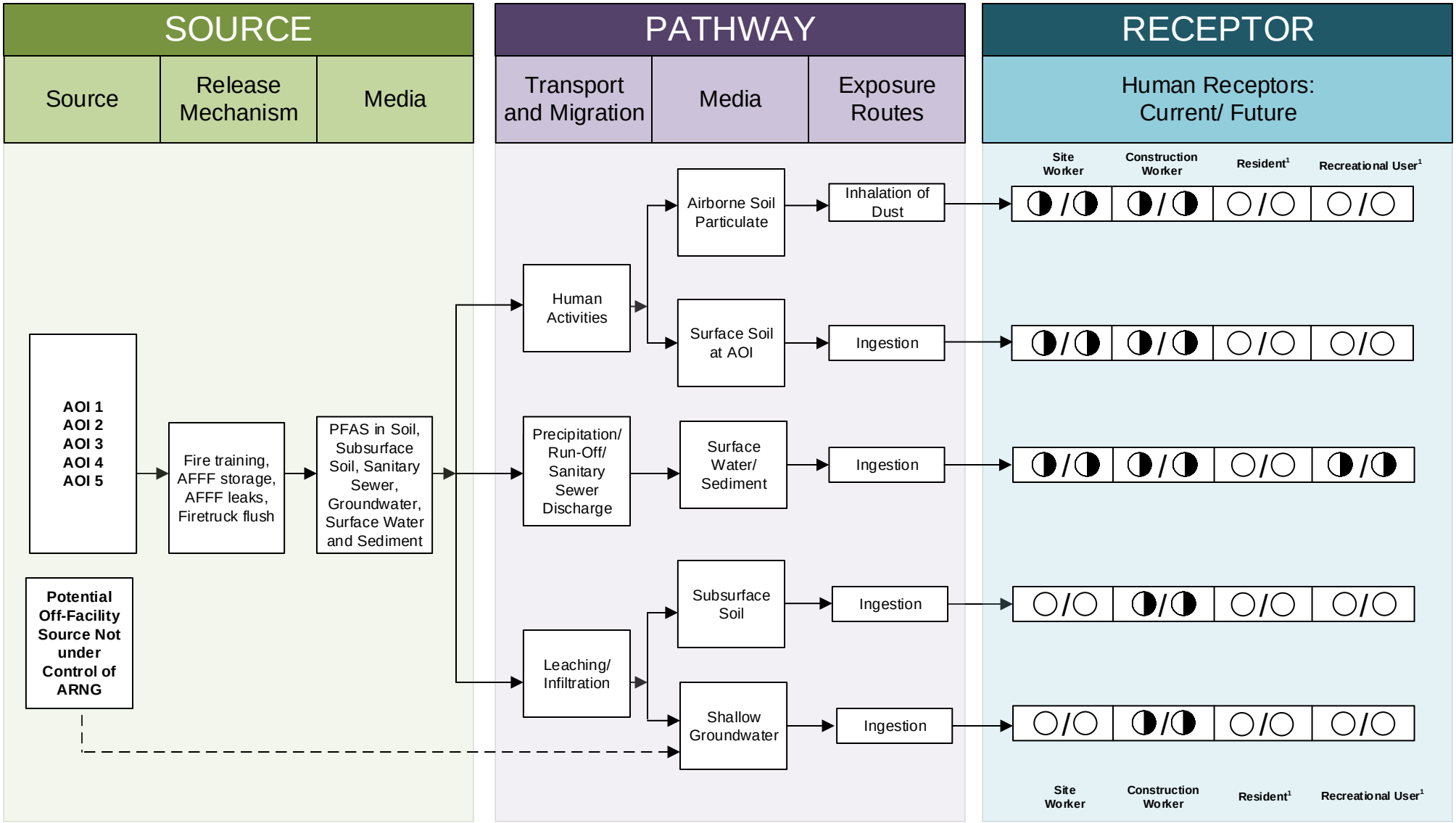


LEGEND

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

Notes:

1. The resident and recreational user receptors refer to an off-site resident and recreational user.
2. Dermal contact exposure pathway is incomplete for PFAS.

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

1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG)-G9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) at Impacted Sites at ARNG Facilities Nationwide. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) 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 their facilities that used per- and polyfluoroalkyl substances (PFAS) (a suite of related chemicals), primarily releases of aqueous film forming foam (AFFF) although other sources of PFAS 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 these PFAS compounds in the environment will vary. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories (HAs) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined.

This report presents findings of a PA for PFAS-containing materials at the Morrisville Army Aviation Support Facility (AASF) #1 (also referred to as the “facility”) in Morrisville, North Carolina, 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 Army requirements and guidance.

This PA documents the known fire training areas (FTAs) as well as additional locations where PFAS may have been released into the environment at Morrisville AASF #1. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components of AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 22 October 2019 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed Morrisville AASF #1 personnel during the site visit including North Carolina ARNG (NCARNG) environmental managers, the Morrisville AASF #1 Fire Chief, and Morrisville AASF #1 operations staff; and,

- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

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 as follows:

- **Section 1** – **Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA.
- **Section 2** – **Fire Training Areas:** describes the FTAs at the facility identified during the site visit.
- **Section 3** – **Non-Fire Training Areas:** describes other locations of PFAS releases at the facility identified during the site visit.
- **Section 4** – **Emergency Response Areas:** describes areas of AFFF release at the facility, specifically in response to emergency situations.
- **Section 5** – **Adjacent Sources:** describes sources of PFAS release adjacent to the facility that are not under the control of ARNG.
- **Section 6** – **Preliminary Conceptual Site Model:** describes the pathways of potential PFAS transport and receptors at each AOI.
- **Section 7** – **Conclusions:** summarizes the data findings and presents the conclusions and uncertainties 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

Morrisville AASF #1 is adjacent to RDU in Morrisville, North Carolina. The facility is approximately 34 acres and resides in Wake County, North Carolina, approximately 10 miles northwest from Raleigh and 10 miles southeast of Durham. The facility was opened in 1988 for the purpose of supporting rotary aircraft operations for the NCARNG. The facility is on North Carolina state property, which is controlled and operated by the Department of Public Safety (DPS). The NCARNG is a division within the DPS. The facility is accessible from the main gate located along National Guard Drive. The Airport Joint Services Agreement (**Appendix A**) establishes that the RDU Crash Rescue Unit is responsible for all fire protection of tenants and users of the airport. The AASF #1 fire department, known as the 677th Engineer Firefighting Team, is only responsible for the parcel of land leased to the NCARNG, and they have a direct line to the RDU Crash Rescue Unit to call for emergency aid if needed.

1.5 Facility Environmental Setting

Morrisville AASF #1 is located next to the southeast portion of RDU. The facility property lies within the eastern Piedmont physiographic region characterized by rolling hill topography with moderately well-drained Creedmoor sandy loam soil (Cawthorn, 1970). The facility borders

William B. Umstead State Park, which is made up of over 5,500 acres of densely wooded land surrounding three man-made lakes (North Carolina State Parks, 2019). Outside of the state park, the land use surrounding the facility is mostly commercial.

1.5.1 Geology

The Triassic Basin underlies Morrisville AASF #1, with bedrock of mostly Precambrian and Paleozoic age comprised of igneous, metamorphosed igneous, and sedimentary rocks (Heath, 1980). The bedrock is exposed at the surface along steep hillsides, stream channels, and in roadcuts. Overlaying the bedrock is saprolite, or residuum, which ranges in thickness from 1-2 feet to more than 100 feet (Heath, 1980).

Depth to bedrock at the site is more than 80 feet, with a firm clay layer in the subsurface. The local soils have been distributed due to construction of the facility and are probably more compacted near the surface than the natural soils in the vicinity (North Carolina Department of Environmental Quality [NCDEQ], 2017). Soils in the area are characterized as having widespread red clayey soils, abundant large mud clasts within sandstone channel deposits, and thick siltstone beds. Sedimentary rocks in the property vicinity are comprised of fine to medium grained sandstone, siltstone, and mudstone. The sandstone sequences are usually thick and are crossbedded and interbedded with siltstone and muddy, fine-grained sandstone (Department of the Army [DOA], 2018).

1.5.2 Hydrogeology

Regional groundwater flows through fractures within metamorphic, igneous, and sedimentary (Triassic basin) bedrock. There is a complex tow-component groundwater system where the regolith, composed of soil residuum, saprolite, alluvium, and colluvium, provides sheet like openings along the fractures for water storage (Heath, 1980). There is also a transition zone between the regolith and bedrock that consists of weathered and altered granite and numerous open near-horizontal fractures near the top of the bedrock (McSwain, 2013). This 15-foot-thick transition zone is a primary lateral transmitter of groundwater and is the most permeable zone (Harned and Daniel, 1992).

The saprolite that forms the land surface in the Piedmont consists of unconsolidated granular material that contains water in the pore spaces between rock particles (Heath, 1980). When it rains, water moves laterally and downward through this layer to points of groundwater seepage on the hillsides and to the streams in the adjacent valleys. The remaining water moves downward into the bedrock and, thereafter, through the fractures to the adjacent valleys (Heath, 1980).

An EDR™ report conducted a well search for a 1-mile radius surrounding the facility (**Appendix A**). Using additional online resources, such as state and local Geographic Information System databases, wells were researched to a 4-mile radius of the facility. No drinking water wells exist at Morrisville AASF #1; the facility is provided drinking water from Jordan Lake by the Town of Cary (Town of Cary, 2018). The NCDEQ maintains a database of registered wells in the area. Several public water supply wells exist within 4 miles of the facility to the east, northeast, and southeast (**Figure 1-2**). These wells are cross-gradient and upgradient of the facility and not likely to be influenced by potential PFAS releases at Morrisville AASF #1.

Based on the USEPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the HA within 20 miles of the facility. The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

1.5.3 Hydrology

Wake County is part of an uplifted peneplain dissected in places by a network of streams that generally flow in a southeasterly direction (Cawthorn, 1970). The Neuse River and its tributaries drain about 80 percent of the county. In the Triassic Basin, the valleys are U-shaped, and the flood plains are wide. The Basin is categorized as swampy depression or lake where the rock and mineral deposits were made during the Triassic period (Cawthorn, 1970). The soil at the facility is moderately well-drained with a fair infiltration rate and has moderate runoff. The runoff from the facility drains southeast toward Haleys Branch, which flows into Lake Crabtree, Crabtree Creek, and eventually the Neuse River (DOA, 2018) (**Figure 1-3**). The facility's surface drainage is diverted into two stormwater discharge outfalls as designated on the as-built drawings (**Appendix A**). Outfall SDO-001 drains runoff from the eastern portion of AASF #1, including the aircraft apron, fuel farm, fueling station, firehouse, tactical equipment parking areas, and the armory. Outfall SDO-002 discharges the stormwater from the western portion of the facility that includes the area surrounding the hangar, the western boundary of the apron, gravel equipment parking areas, and the parking lot. There is minimal overland flow from the adjacent property, but runoff does not directly enter the AASF #1 outfalls (DOA, 2018). Two RDU outfalls are located near SDO-002. One of the RDU outfalls is directly adjacent to the SDO-002 pipe, housed in the same concrete structure. The other RDU outfall is located approximately 100 feet to the north of SDO-002 and drains the RDU stormwater retention pond. Surface drainage from the RDU Maintenance Shop is diverted to this retention pond located to the south of the shop building. Flow from the RDU outfalls and both AASF #1 outfalls go in the direction of Haleys Branch on RDU property. Haleys Branch empties to Lake Crabtree, Crabtree Creek, and eventually the Neuse River. The facility also receives minimal overland flow from the RDU Airport property that does not directly release into the stormwater outfalls (NCDEQ, 2017).

Drains in the wash rack, ground support equipment (GSE) building, hangar, and several other structures onsite are diverted to the Airport Authority's force main before transitioning to the sanitary sewer operated by the Town of Cary. The sanitary sewer drainage is diverted to the North Cary Water Reclamation Facility (NCWRF) located approximately 2 miles south of Morrisville AASF #1. The NCWRF discharges treated wastewater to Crabtree Creek, which flows into the Neuse River several miles downstream. The NCWRF is also a source of reclaimed water and biosolids. A portion of the treated effluent water is piped directly to homes and businesses in the area for reuse in irrigation, manufacturing processes and industrial cooling. The system serves customers in designated service districts near the NCWRF (Town of Cary, 2019). A map of the reclaimed water service area is provided in **Appendix A**. The State of North Carolina permits Cary to divert up to 5.14 million gallons per day for direct reuse from their water reclamation facilities, but it is unclear what volume comes specifically from the NCWRF. Cary also operates a free bulk reclaimed water program at all three of its water reclamation facilities, including the NCWRF. Through this program, non-potable reclaimed water is available to approved customers in minimum volumes of 250 gallons per customer. The Town of Cary is permitted to provide a total of up to 600,000 gallons a day from its bulk systems; however, it is unclear what volume is produced from the NCWRF. Biosolids at the NCWRF are transported via truck to the South Cary Water Reclamation Facility, where they are dried and processed into Class A biosolids pellets using a thermal dryer (Town of Cary, 2019). The biosolids pellets are sold to the public and registered with the North Carolina Department of Agriculture and Consumer Services under the trade name Enviro Gems.

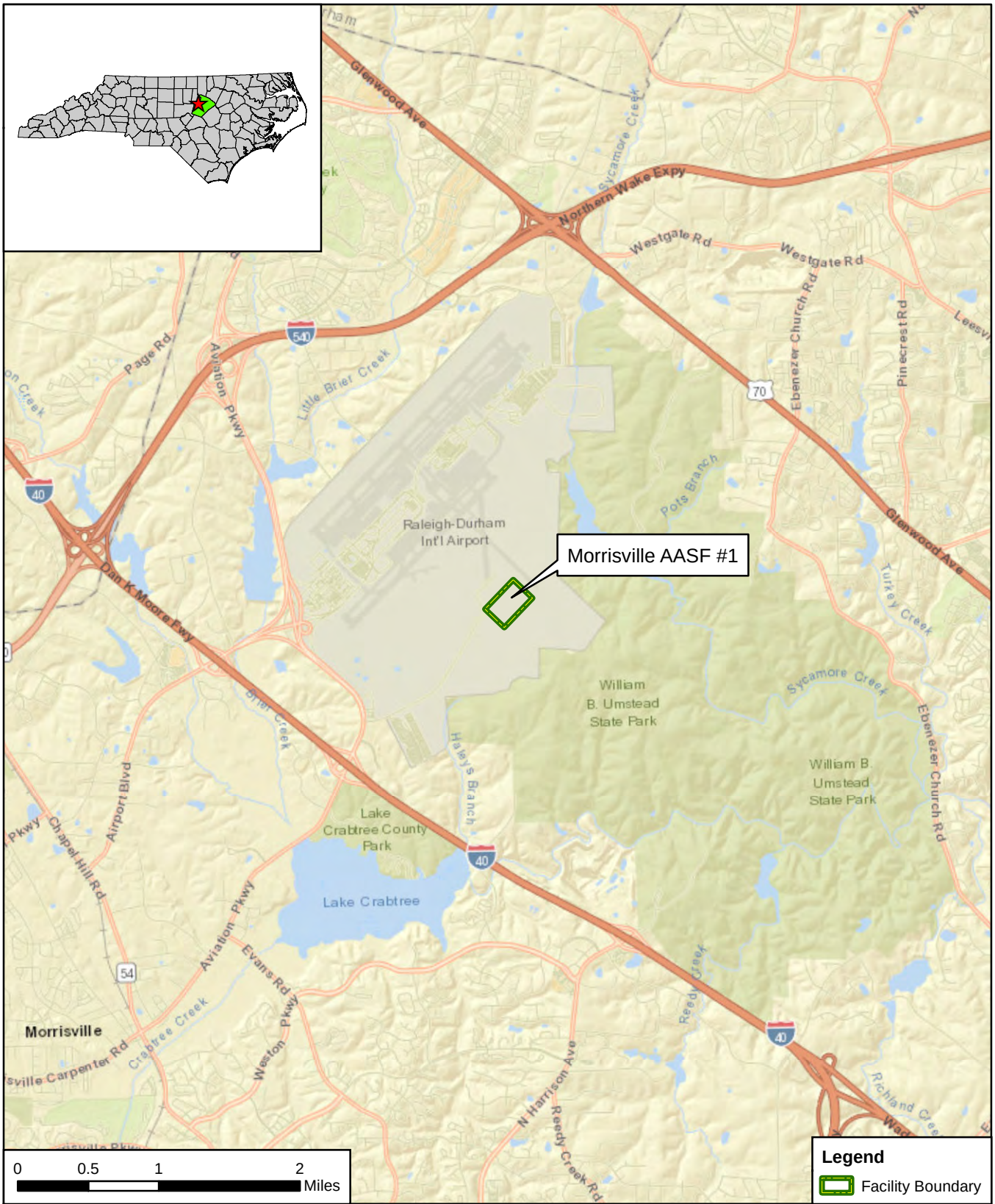
1.5.4 Climate

The location within the center part of North Carolina being between the mountains to the west and Atlantic Ocean to the east, helps protect it from climate extremes (Cawthorn, 1970). Winters are mild and summers are hot and humid with plentiful rainfall throughout the year. Average temperatures range from 41.4 degrees Fahrenheit (°F) in January to 80.1°F in July. Average

annual precipitation is 46.1 inches with 5.11 inches falling in August and 2.72 falling in February. Raleigh averages 6.2 inches of snowfall per winter with 3.3 inches accumulating in January (National Oceanic and Atmospheric Administration [NOAA], 2020).

1.5.5 Current and Future Land Use

Morrisville AASF #1 is currently a controlled access facility and is adjacent to RDU. The facility supports rotary aircraft operations and is an Armory Readiness Center for the NCARNG. The facility is on North Carolina state property, which is controlled and operated by the DPS. Reasonably anticipated future land use is not expected to change from the current land use described here.



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SCALE	1:63,360	CHK BY	ZN	5/14/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	5/14/2020

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Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-1

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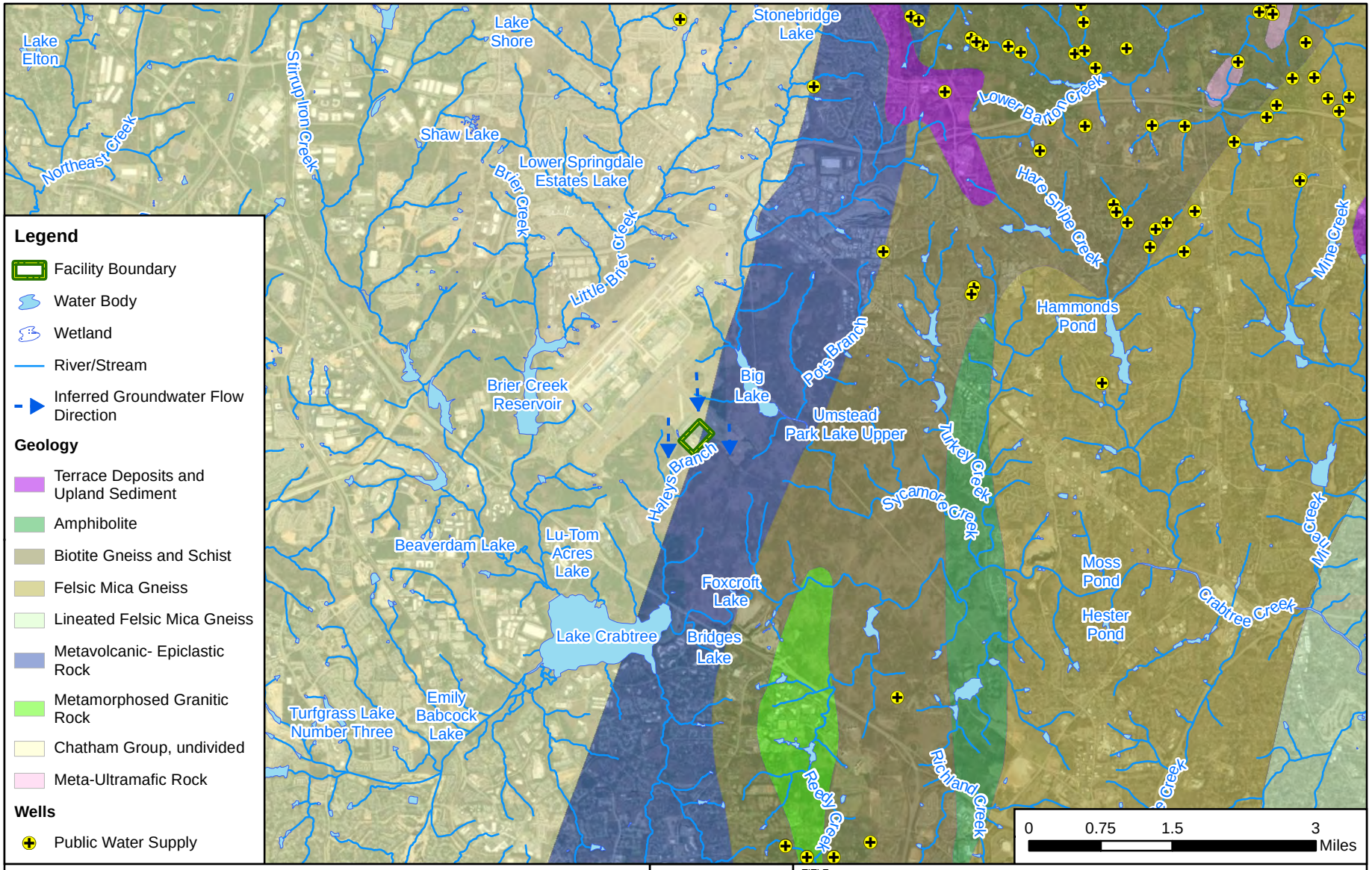

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PROJECT	Preliminary Assessment for PFAS at Morrisville AASF #1, NC			
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SCALE	1:95,040	CHK BY	ZN	8/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	8/28/2020

TITLE

Groundwater Features

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-2

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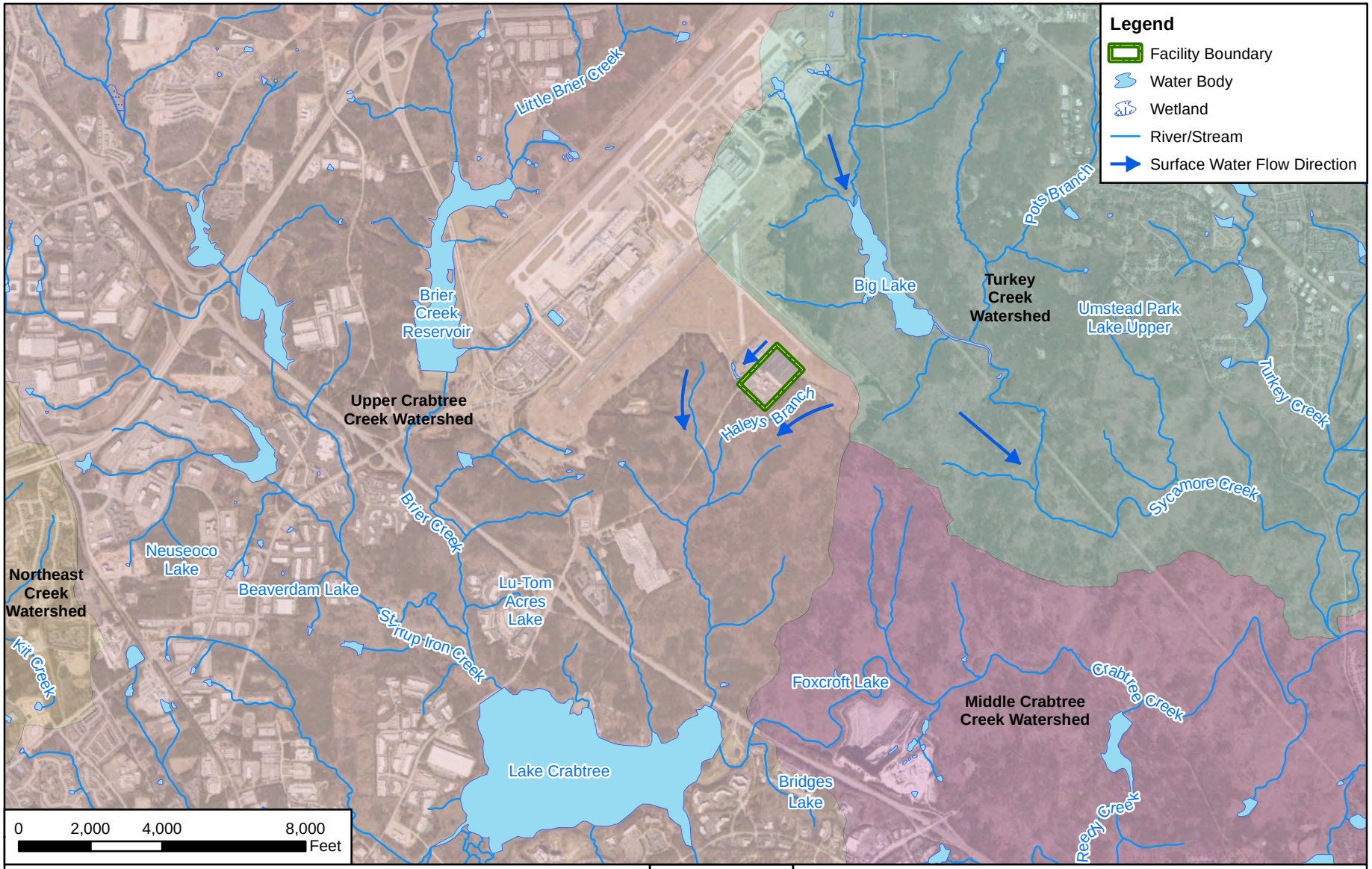

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Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	5/14/2020

TITLE

Surface Water Features

AECOM

12420 Milestone Center Drive
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Figure 1-3

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2. Fire Training Areas

Two FTAs were identified at Morrisville AASF #1 during the PA. Descriptions of the FTAs are presented below, and their locations are shown on **Figure 2-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**; respectively.

2.1 Wash Rack FTA

Based on PA interviews, the AFFF fire training activities at the facility were divided between two areas. The wash rack was one of the two FTAs at the facility, and it was used approximately once every two years from 1988 until sometime before 2010. It is unknown specifically how many times the Wash Rack FTA was used, as both FTAs were used on an as-available basis. During each training event, one Tri-Max 30™ was completely emptied by allowing each trainee to perform a brief AFFF discharge from the extinguisher. The releases occurred under the roof and were directed to the center drain in the wash rack. The drainage flows through an oil-water separator to the south of the wash rack before entering the Town of Cary sanitary sewer. The nearest stormwater drain is located approximately 50 feet to the north of the wash rack entrance. During training activities, it is possible for AFFF to have escaped the wash rack area and entered this storm drain. The geographic coordinates of the FTA are 35°51'57.27"N; 78°46'41.60"W.

2.2 Delta Row FTA

Based on PA interviews, the grassy area along the easternmost row of helicopter parking pads on the apron, known as Delta Row, was the second FTA at the facility, and it was used approximately once every two years from 1988 until sometime before 2010. It is unknown specifically how many times the FTA was used, as both FTAs were used on an as-available basis. During each training event, one Tri-Max 30™ was completely emptied by allowing each trainee to perform a brief AFFF discharge from the extinguisher. Discharges at the FTA were allowed to drain through one of the stormwater inlets along the grassy ditch, which runs parallel to the edge of Delta Row. According to the as-built drawings, a series of four stormwater inlets are located throughout the length of the ditch. As identified during the VSI, the southernmost stormwater inlet in the ditch is anticipated to have been the most impacted by fire training activities. All stormwater inlets draining the Delta Row FTA are connected and divert flow in a southwestern direction. The stormwater is discharged from Outfall SDO-001 to Haleys Branch which then flows to Lake Crabtree, Crabtree Creek, and the Neuse River. The approximate geographic coordinates of the FTA are 35°51'56.32"N; 78°46'35.48"W.

CLIENT	ARNG			
Preliminary Assessment for PFAS at Morrisville AASF #1, NC				
REVISED	8/28/2020	GIS BY	MS	8/28/2020
SCALE	1:3,600	CHK BY	ZN	8/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	8/28/2020

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Fire Training Areas

AECOM
12420 Milestone Center Drive
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Figure 2-1

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3. Non-Fire Training Areas

In addition to FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Information on these features obtained during the PA are included in **Appendices A** and **B**. Five non-FTAs where AFFF may have been released were identified during the PA. A description of each non-FTA is presented below, and the non-FTAs are shown on **Figure 3-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**, respectively.

3.1 Hangar

The rotary aircraft hangar is located in the western portion of AASF #1; approximate geographic coordinates are 35°51'58.85"N; 78°46'44.92"W. The hangar is equipped with an AFFF dispensing system that is currently charged with 3% AFFF.

The AFFF dispensing system in the hangar consists of three identical Ansul pumps connected to the facility's water service line, each with their own handline hose reel and nozzle. Each pump holds 35 gallons of Ansulite AFFF 3% concentrate. The three pumps are located on the floor in the center of the northwestern, southwestern, and southeastern walls of the hangar, respectively. To the knowledge of the interviewees, the dispensing systems have never been discharged or commissioned for testing. The initial testing of the deluge system to certify construction did not result in an AFFF discharge.

Sometime around 2016 or 2017, a small AFFF leak developed near the proportioner of the pump located along the southwestern wall of the hangar, at approximate geographic coordinates are 35°51'58.33"N; 78°46'45.44"W. The leak was described as a small puddle confined to the area immediately surrounding the pump, with a total volume of less than 5 gallons. The puddle was mopped up and emptied into a receptable in the janitorial storage room that is connected to the sanitary sewer. The pump was turned off and subsequently serviced by a contractor. No leaks or seeps have been observed since the repair. During the VSI, the Ansul pump located along the southeastern wall of the hangar was marked as "Out of Order" and was reportedly left unrepaired to avoid replacing the foam. No leaks or other issues with this pump were known; however, the contractor for the AFFF dispensing system performs periodic inspections, and it is suspected that the contractor identified a maintenance issue during a recent inspection.

3.2 GSE Building (Storage, Tank, and Pump Location)

The Ground Support Equipment (GSE) Building is located near the center of AASF #1, along the southwestern corner of the wash rack. The approximate geographic coordinates of the GSE building are 35°51'57.40"N; 78°46'42.71"W. The building contains a utility room with an AFFF dispensing system and a separate storage room with AFFF in 5-gallon buckets. The AFFF dispensing system underwent an initial testing to certify construction, but this event did not result in an AFFF discharge and no testing has been performed since.

Inside the GSE storage room, there are 20 5-gallon buckets of Ansulite 3% AFFF concentrate. No leaks or spills are known to have occurred in the storage room. Inside the utility room, the AFFF dispensing system consists of three pumps (primary, reserve and jockey pumps) and one 550-gallon poly tank of AFFF connected to the water service line. The system is connected to a hose reel and nozzle requiring manual activation.

There is evidence of several leaks around the AFFF dispensing system in the GSE Building. Interviewees confirmed that two of the jockey pumps began leaking around the same time in 2018. The leak is described as a slow seep coming from each pump. The valve to each pump

was shutoff immediately when the leak was discovered; however, small damp areas of corrosion were visible around the pumps during the VSI. Additionally, a vertical trail of corrosion originates from the top of the poly tank. All leaks and spills that have occurred in the utility room of the GSE Building would have drained into the single floor drain located about 2 feet from the AFFF storage tank. The floor drain is connected to an oil-water separator before flowing to the Town of Cary sanitary sewer.

3.3 Firehouse

The Firehouse is located in the southeastern portion of the facility, at approximate geographic coordinates are 35°51'55.66"N; 78°46'42.20"W. The Firehouse was built in 2005 to establish the 677th Engineer Firefighting Team, which currently consists of eleven firefighters.

Morrisville AASF #1 has had only two firetrucks, which are stored in the Firehouse vehicle bay. The primary firetruck is a 2007 Tactical Firefighting Truck (TFFT), equipped with 120 gallons of 3% AFFF concentrate. The secondary firetruck is a 2009 tanker that holds 240 gallons of 3% AFFF concentrate. The vehicle bay also contains 42 5-gallons buckets of Ansul 3% AFFF concentrate along the eastern wall. During the PA interviews, the NCARNG fire chief reported that nozzle testing is not performed on either of the firetrucks.

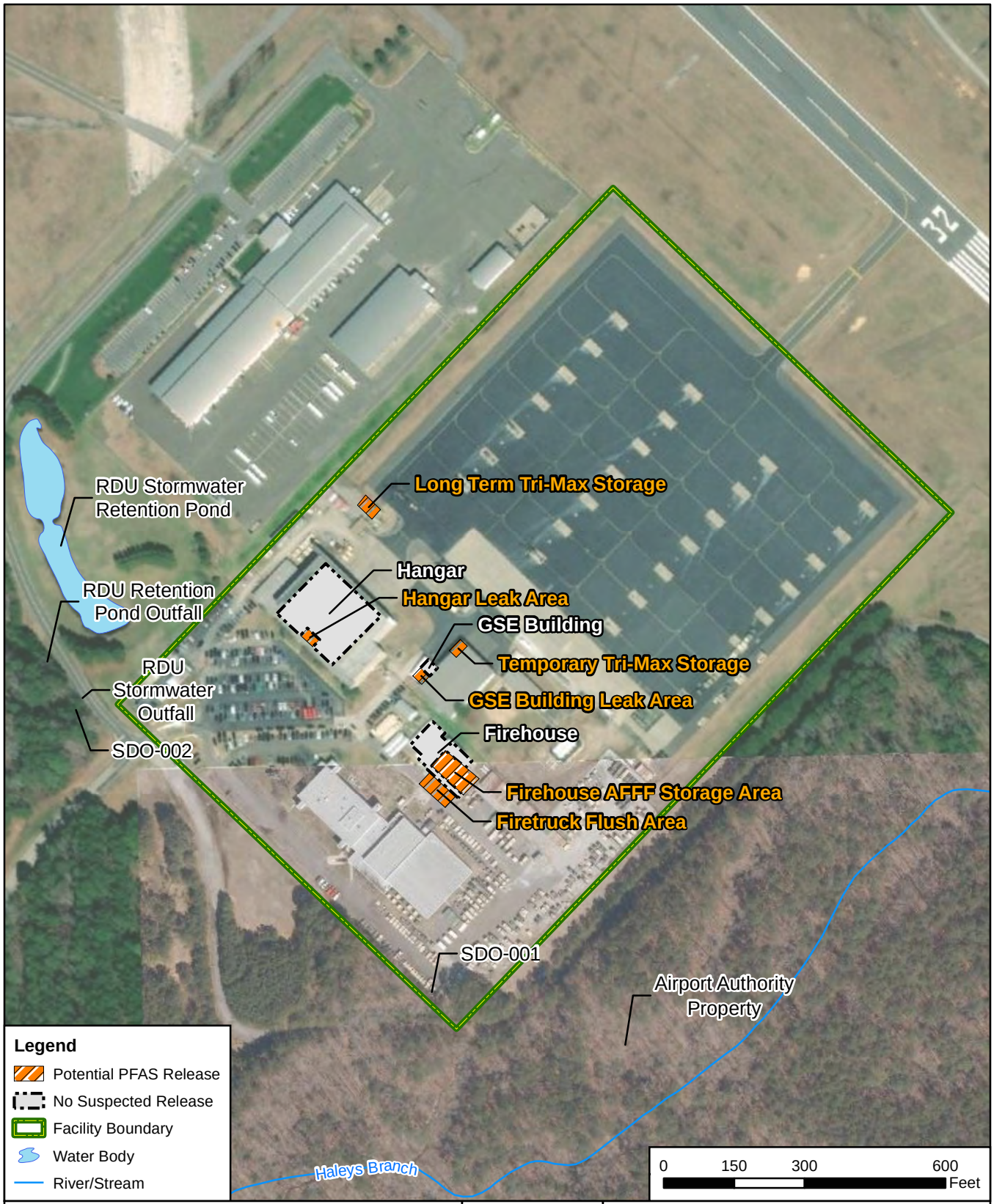
The 2007 TFFT experienced an internal leak sometime around 2014 that caused AFFF to seep from the AFFF tank into the main water tank. A nozzle check was performed with the foam nozzle when the leak was suspected. The interviewee indicated that this was the only time a nozzle check had been performed on either of the firetrucks. This check was performed on the parking pad directly outside the Firehouse bay doors. The water tank was then flushed outside the Firehouse, in the same location. The flushed water and dilute AFFF solution was most likely captured by storm drains outside the Firehouse and conveyed to the outfall located at Haleys Branch. The firetruck was sent offsite for repairs by Atlantic Emergency Solutions in Fayetteville, North Carolina.

3.4 Long-Term Tri-Max Storage Area

The primary storage area for empty Tri-Max 30™ carts is outside on a gravel lot near the southwestern corner of the apron. The approximate geographic coordinates are 35°52'0.88"N; 78°46'44.15"W. The general vicinity has always been used to store Tri-Max 30™ carts. Twelve empty Tri-Max 30™ carts are currently located there and have been stored is this area since 2009.

3.5 Temporary Tri-Max Storage Area

A temporary storage area for Tri-Max 30™ carts is just outside the western edge of the wash rack. The approximate geographic coordinates of the storage area are 35°51'57.87"N; 78°46'41.95"W; eight Tri-Max 30™ carts are currently located there. The carts were full at the time of the VSI and were scheduled to be emptied into the 55-gallon drums that were staged in the storage area. The planned AFFF transfer will take place in the wash rack. The empty Tri-Max 30™ carts will then likely be moved to the long-term gravel storage area near the aircraft apron. All Tri-Max 30™ carts will eventually be turned in to the NCARNG Construction Facilities Management Office (CFMO).



CLIENT	ARNG			
Preliminary Assessment for PFAS at Morrisville AASF #1, NC				
REVISED	8/28/2020	GIS BY	MS	8/28/2020
SCALE	1:3,600	CHK BY	ZN	8/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	8/28/2020

N

Non-Fire Training Areas

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 3-1

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4. Emergency Response Areas

No emergency response areas were identified within the current facility during the PA through interviews. Morrisville AASF #1 operations officers, with tenure from 1988 to present, confirmed that no emergencies were historically responded to with AFFF. Furthermore, the EDR™ report did not indicate any major emergency responses. Emergency services for Morrisville AASF #1 are provided by the AASF #1 fire unit, the City of Morrisville, and the RDU Crash Rescue Unit.

5. Adjacent Sources

One potential off-facility PFAS source was identified adjacent to Morrisville AASF #1 during the PA. The location of potential off-facility source areas are shown on **Figure 5-1**.

5.1 RDU Airport

The RDU property completely surrounds the facility. The geographical coordinates of the main terminal are 35°52'36.39"N; 78°47'35.67"W. The RDU Fire Station is located northeast of the main airport terminal, approximately 1-mile northwest of Morrisville AASF #1. The geographical coordinates of the Fire Station are 35°52'50.73"N; 78°47'13.87"W. AASF #1 personnel have never responded to any emergencies at RDU. Additionally, the RDU Crash Rescue Unit has never responded to any emergencies with AFFF on Runway 32, which is connected to the AASF #1 aircraft apron. Based on the Federal Aviation Administration Part 139 Airports for testing equipment and or systems that use AFFF, it is suspected that AFFF releases have occurred on the RDU property; however, it is unknown where potential releases occurred or if they were near the facility.

The RDU Maintenance Shop shares its eastern boundary with Morrisville AASF #1. The geographical coordinates of the building are 35°52'4.03"N; 78°46'47.77"W. The maintenance shop was built in 2003 and is used to provide maintenance services on RDU vehicles. It is unknown if the RDU Maintenance Shop has conducted maintenance on emergency vehicles.

The RDU retention pond outfall is located approximately 100 feet north of the AASF #1 stormwater outfall, SDO-002. Both the RDU retention pond outfall and SDO-002 outfall release to Haleys Branch via the same route but do not combine stormwater prior to the release. However, the facility also receives minimal overland flow from the RDU Airport property that does not directly release into the stormwater outfalls (NCDEQ, 2017).

CLIENT	ARNG			
Preliminary Assessment for PFAS at Morrisville AASF #1, NC				
REVISED	7/28/2020	GIS BY	MS	7/28/2020
SCALE	1:12,000	CHK BY	ZN	7/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	7/28/2020

N

Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, five AOIs were identified at Morrisville AASF #1. Locations of the AOIs are shown on **Figure 6-1**. The preliminary CSMs for the AOIs at Morrisville AASF #1 are shown on **Figure 6-2** and **Figure 6-3**. The following sections describe the CSM components and the specific preliminary CSMs developed for each AOI. 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.

6.1 Pathways

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 are sparse and continue to be the subject of PFAS toxicological study (National Ground Water Association, 2018).

Known and potential AFFF releases identified at Morrisville AASF #1 occurred on both surface soil and paved surfaces. Releases to the paved surfaces could have migrated a short distance onto the surrounding surface soil. Ground-disturbing activities in these grassy areas as well as beneath the pavement may result in potential exposure to surface soils via ingestion and inhalation of dust particles. AFFF releases to the paved surfaces could have infiltrated the subsurface via cracks in the pavement or joints between areas that are paved with different materials. Ground-disturbing activities may result in potential exposure to subsurface soils and groundwater via ingestion.

PFAS are water soluble and can migrate readily from soil to groundwater via leaching; however, drinking water at Morrisville AASF #1 is provided by the Town of Cary. The Town of Cary sources all of its water from the Jordan Lake. The Jordan Lake water intake is located approximately 16 miles southwest of the Morrisville AASF #1 facility (Town of Cary, 2018). Based on the NCDEQ several public supply wells exist within 4 miles of the facility to the east, northeast, and southeast. These wells are cross-gradient and upgradient of the facility and not likely to be influenced by potential PFAS releases at Morrisville AASF #1.

Surface water runoff at the facility drains south and southwest toward Haleys Branch which flows into Lake Crabtree, Crabtree Creek, and eventually the Neuse River (DOA, 2018). It is possible PFAS could migrate to nearby tributaries and larger bodies of water, which may result in potential exposure via ingestion of surface water and sediment.

Sanitary sewer drains are located within several of the identified AOIs. The sanitary sewer drainage is treated at the NCWRF before either being discharged into Crabtree Creek, which is a tributary of the Neuse River, or reclaimed as non-potable water and biosolids. As a result of AFFF releases at the identified AOIs, it is possible for PFAS to have been transported in treated effluent to the NCWRF, Crabtree Creek, and the Neuse River. Since the NCWRF also provides reclaimed water and biosolids, secondary PFAS exposure pathways could exist where the water and biosolids were applied.

6.2 Receptors

Receptors at the Morrisville AASF #1 facility include site workers, construction workers, and off-facility recreational users. These receptors, as they pertain to the facility, are described below:

- Site workers typically work at or use the site and may come into contact with the surface soils.

- Construction workers are considered workers who represent a utility worker or other worker who would be exposed to surface and/or subsurface conditions through ground-disturbing activities.
- Off-facility recreational users typically identify a person who may recreationally use an off-facility area that may be affected by a PFAS release from the facility. Off-facility recreational users could be exposed to sediment and surface water during recreational use.
- The preliminary CSM for Morrisville AASF #1 indicates which specific receptors could potentially be exposed to PFAS. The preliminary CSM for AOIs 1, 2, 3, and 5 is shown on **Figure 6-2**.

6.3 AOI 1: Wash Rack Area and GSE Building

AOI1 encompasses the Wash Rack Area, Temporary Storage Tri-Max 30™ Storage Area, and GSE Building. The Wash Rack Area was an active FTA from the 1990s until 2010. AFFF-related training was conducted approximately once every two years. The wash rack was also used as the designated area for filling and maintaining the Tri-Max 30™ carts. A single grated inlet in the center captures surface drainage which flows through the oil-water separator. The oil-water separator is then diverted to the Airport Authority's force main before transitioning to the sanitary sewer operated by the Town of Cary. During the AFFF-related activities within the AOI, it is possible that AFFF was inadvertently released outside of the wash rack structure where it would have drained into a stormwater inlet and discharged to Haleys Branch or infiltrated the surface soil near the Wash Rack Area.

The GSE Building located to the west of the wash rack contains a utility room housing a manual AFFF dispensing system, which has never been activated from testing or servicing of the system. However, leaks and seepage have been observed from two of the system's pumps. The leaks were confined to the GSE Building utility room. In a separate room in the GSE Building, approximately 20 5-gallon buckets of Ansulite 3% AFFF are stored. The storage room and utility room both contain floor drains that flow to an oil-water separator before flowing to the sanitary sewer system of the Town of Cary. Migration of PFAS from the floor of the GSE building to the grass outside the door is possible. Surface runoff at AOI 1 drains via sheet flow toward the southwest. Potential PFAS exposure pathways resulting from releases at AOI 1 are described in **Table 6-1**.

Table 6-1: Exposure Pathways at AOI 1, AOI 2, AOI 3, and AOI 5

Pathway	Receptor
Surface Soil	Considered a potentially complete pathway to site workers and construction workers via ingestion or inhalation of dust
Subsurface Soil	Considered a potentially complete pathway to construction workers via ingestion or inhalation of dust
Surface Water and Sediment	Considered a potentially complete pathway to site workers, construction workers, and off-facility recreational users via ingestion
Groundwater	Considered a potentially complete pathway to construction workers via ingestion

6.4 AOI 2: Delta Row FTA

AOI 2 encompasses the long grassy area along Delta Row was the targeted area for AFFF training with Tri-Max 30™ carts. The Delta Row FTA was an active from the 1988 to 2010, with regular training occurring approximately once every two years. The grassy area of the Delta Row FTA is

also part of the facility's stormwater drainage system, with a series of inlet grates running parallel to the edge of the apron.

Surface water runoff at AOI 2 is captured by storm drains that channel flow southwest to several other stormwater conveyance pipes and is ultimately discharged to Haleys Branch through outfall SDO-001, which flows into Lake Crabtree and Crabtree Creek about 2 miles south before entering the Neuse River several miles downstream. As a result of AFFF releases at the Delta Row FTA, it is possible PFAS has been transported to Haleys Branch, Lake Crabtree, Crabtree Creek, and the Neuse River. Potential PFAS exposure pathways resulting from releases at AOI 2 are described in **Table 6-1**.

6.5 AOI 3: Firehouse Storage and Flush Area

AOI 3 encompasses the area inside the vehicle bay of the Firehouse where AFFF is currently stored and the adjacent area to the south where one firetruck was flushed after an internal AFFF leak was discovered. At the time of the VSI, 42 5-gallon buckets of 3% AFFF were stored along the eastern wall of the vehicle bay. The TFFT developed an internal backflow leak between the AFFF tank and the water tank. The AFFF leak was contained to the truck's water tank, but prior to its repair, the water tank was completely emptied onto the parking area located immediately outside the Firehouse vehicle bay.

Floor drains inside the Firehouse are routed to the oil/water separator before discharging to the sanitary sewer system of the Town of Cary. The water emptied from the leaking firetruck would have been conveyed to drains outside the vehicle bay that are part of the same stormwater drainage system associated with AOI 2. It is possible that the flushed water, containing dilute concentrations of AFFF, also migrated to the surrounding surface soil to the south beyond the impervious surfaces of the parking area. Potential PFAS exposure pathways resulting from releases at AOI 3 are described in **Table 6-1**.

6.6 AOI 4: Hangar

AOI 4 encompasses the AASF #1 Hangar, which contains an actively-charged AFFF dispensing system. Located on the floor in the center of each wall of the Hangar, Ansul AFFF pumps are connected to hand-reels and are currently charged with 35-gallons of 3% AFFF. The Ansul pump in the center of the southwestern wall developed a leak overnight in 2018. The volume of the leak was approximately 5 gallons and was confined to the area immediately surrounding the pump. Floor drains in the Hangar are routed to the oil/water separator before discharging to the sanitary sewer operated by the Town of Cary. It is possible, however, that AFFF also leached through the concrete floor and into the subsurface soil and groundwater. Potential PFAS exposure pathways resulting from releases at AOI 4 are described in **Table 6-2**.

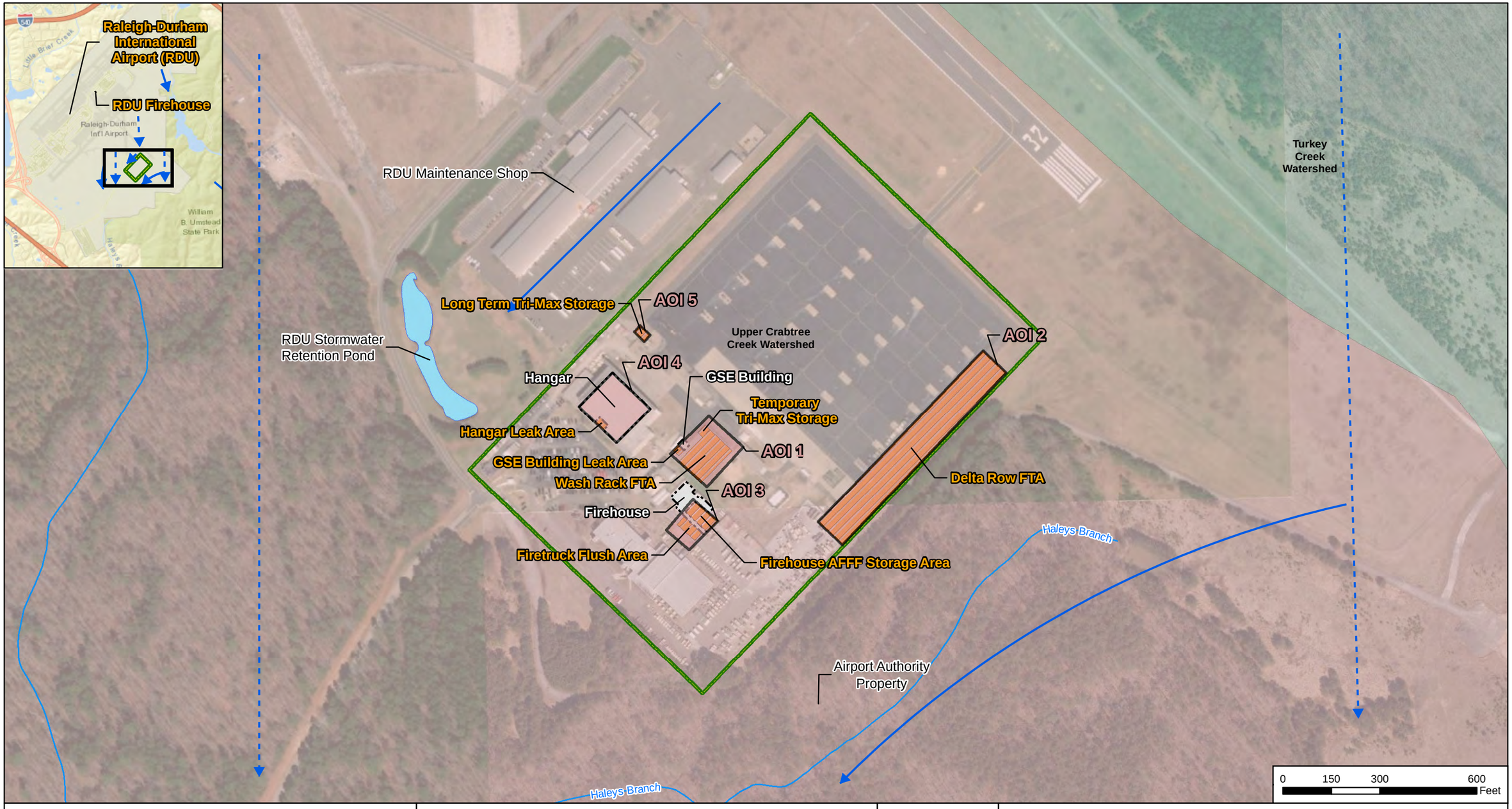
Table 6-2: Exposure Pathways at AOI 4

Pathway	Receptor
Subsurface Soil	Considered a potentially complete pathway to construction workers via ingestion or inhalation of dust
Groundwater	Considered a potentially complete pathway to construction workers via ingestion

6.7 AOI 5: Long-Term Tri-Max 30™ Storage Area

AOI 5 encompasses the Long-Term Tri-Max-30™ Storage Area on the gravel north of the AASF #1 Hangar where Tri-Max 30™ carts are permanently stored. At the time of the VSI, 12 empty Tri-Max 30™ carts were located in this storage area. The Tri-Max 30™ carts have been stored in their current location since 2009 with no known AFFF leaks or releases.

Surface water in the Long-Term Tri-Max 30™ Storage Area drains to the south, a stormwater inlet grate is located immediately south of the Tri-Max 30™ carts. This stormwater grate is connected to the stormwater outfall near the western boundary of the facility, which drains to an unnamed tributary of Haleys Branch. Potential PFAS exposure pathways resulting from releases at AOI 5 are described in **Table 6-1**.



CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Morrisville AASF #1, NC			
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SCALE	1:3,600	CHK BY	ZN	8/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	8/28/2020

- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- Water Body
- River/Stream
- Surface Water Flow Direction
- Inferred Groundwater Flow Direction

N

Areas of Interest

AECOM
12420 Milestone Center Drive
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Figure 6-1

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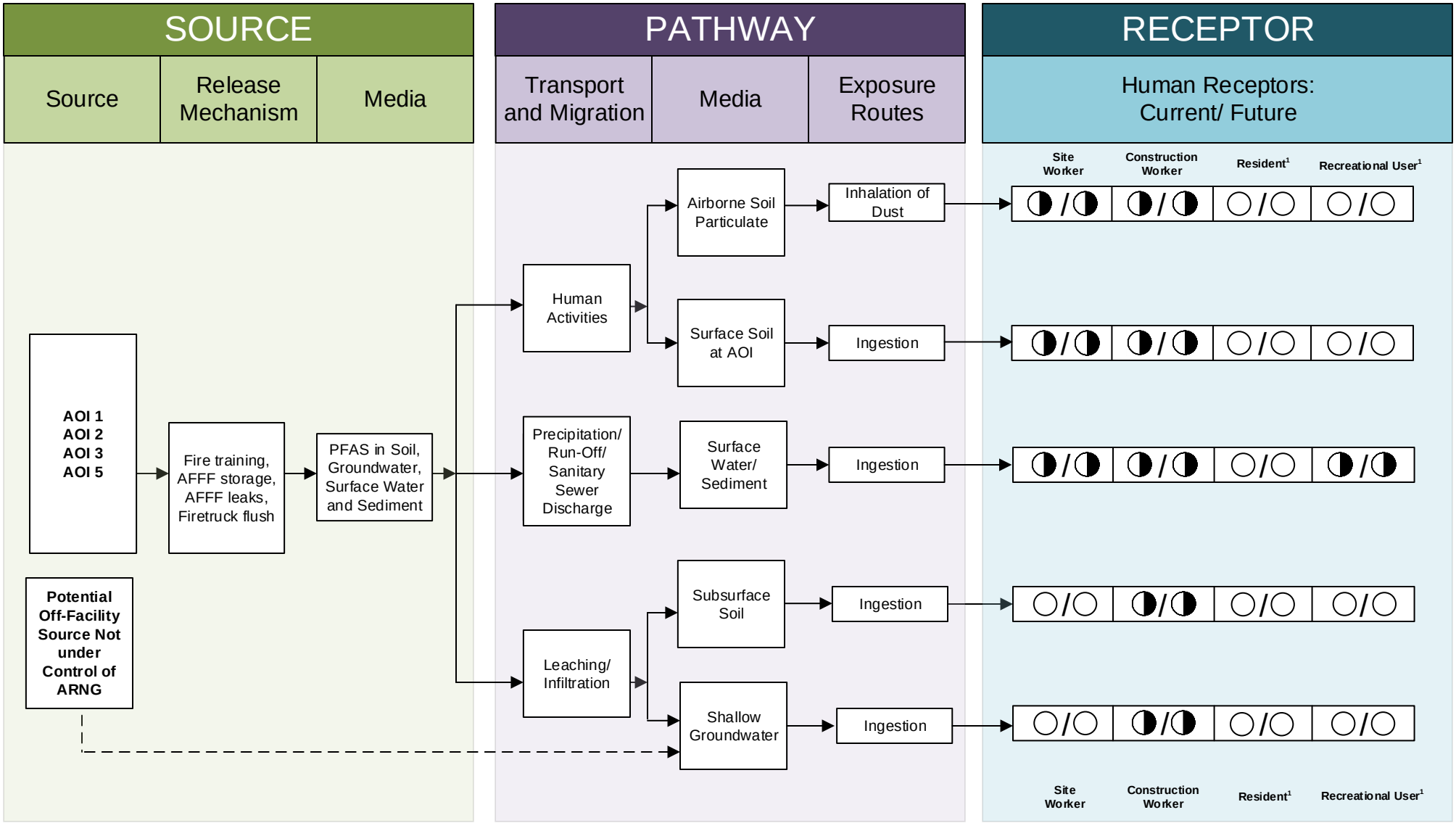


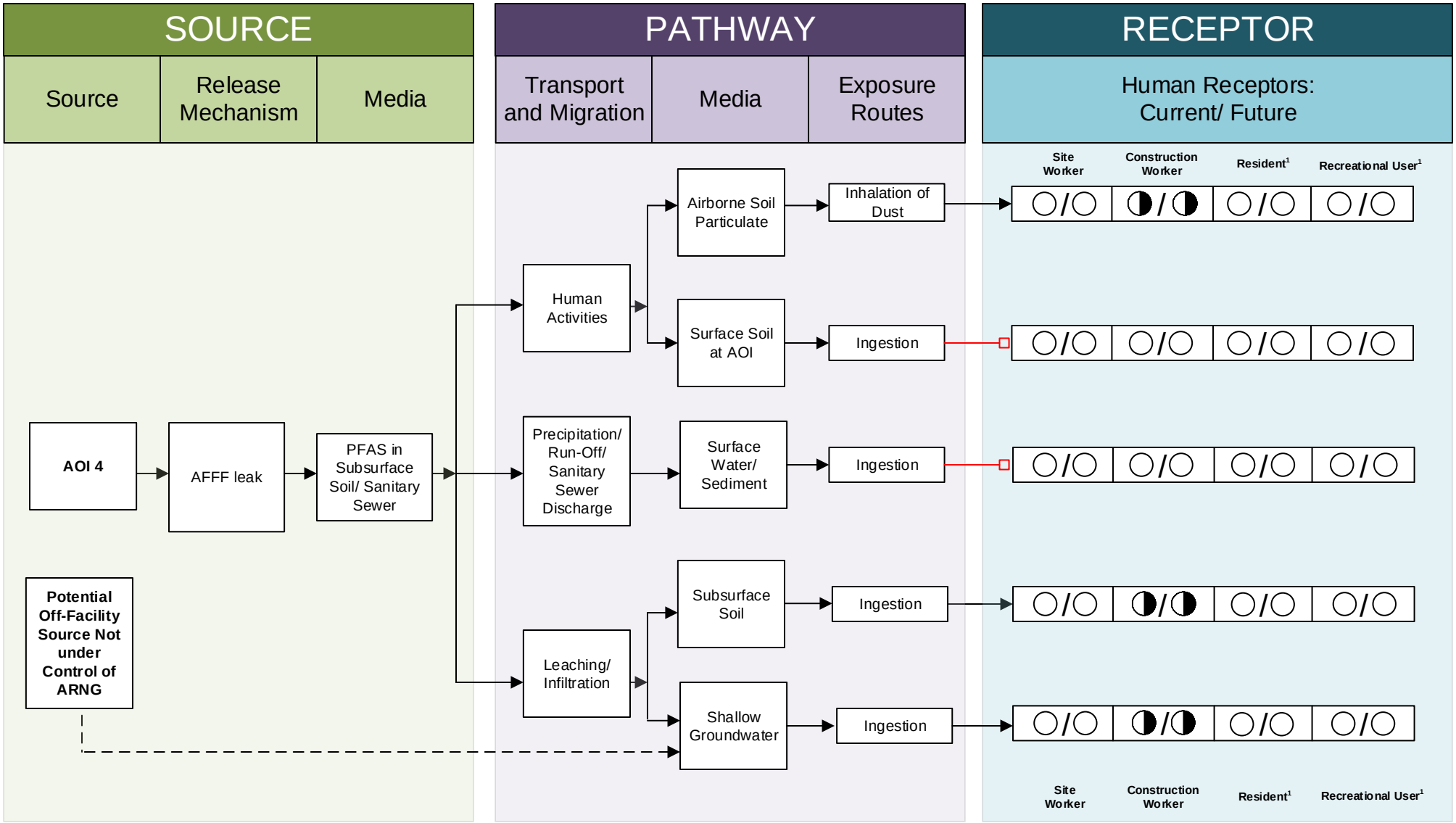
LEGEND

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

Notes:

1. The resident and recreational user receptors refer to an off-site resident and recreational user.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1, AOI 2, AOI 3, and AOI 5



LEGEND

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

Notes:

1. The resident and recreational user receptors refer to an off-site resident and recreational user.
2. Dermal contact exposure pathway is incomplete for PFAS.

Figure 6-3
Preliminary Conceptual Site Model
AOI 4

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 Morrisville AASF #1. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

Five AOIs related to potential PFAS releases were identified (**Table 7-1**) at Morrisville AASF #1 during the PA (**Figure 7-1**):

Table 7-1: AOIs at Morrisville AASF #1

Area of Interest	Name	Used by	Release Date
AOI 1	Wash Rack Area and GSE Building	NCARNG	1988-2009
AOI 2	Delta Row FTA	NCARNG	1988-2009
AOI 3	Firehouse Storage and Flush Area	NCARNG	2014
AOI 4	Hangar Leak Area	NCARNG	2015
AOI 5	Long-Term Tri-Max 30™ Storage Area	NCARNG	2009-Present

Based on potential PFAS releases at these AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for Morrisville AASF #1 are shown on **Figure 6-2**, which presents the potential receptors and media impacted.

Potential off-facility PFAS release areas exist adjacent to Morrisville AASF #1. Because this area includes property upgradient of the facility, it is unknown whether the off-facility sources affect the facility.

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 based on all available information, including: previous environmental reports, EDRs™, observations made during the VSI, and interviews. Interviews of personnel with direct knowledge of a facility generally provided the most useful insights regarding a facility's historical and current PFAS-containing materials. 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, 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, current personnel were interviewed, multiple persons were interviewed

for the same potential source area, and potential source areas were visually inspected. **Table 7-2** summarizes the uncertainties associated with the PA:

Table 7-2: Summary of Uncertainties

Area of Interest	Source of Uncertainty
AOI 1: Wash Rack Area and GSE Building	The exact frequency of AFFF use at the Wash Rack FTA is unclear, due to the concurrent use of the Delta Row FTA. The total amount of AFFF mixture that leaked in the GSE Building is unknown. It is also unknown if AFFF has leaked through the floor into the subsurface.
AOI 2: Delta Row FTA	The exact frequency of AFFF use at the Delta Row FTA is unclear, due to the concurrent use of the Wash Rack FTA.
AOI 3: Firehouse Storage and Flush Area	It is unclear how long the TFFT had leaked AFFF into the water tank before the leak was discovered. It is possible that water was discharged elsewhere before the leak was discovered. It also unknown if AFFF has leaked through the floor into the subsurface.
AOI 4: Hangar Leak Area	It is unknown if AFFF has leaked through the floor into the subsurface.
AOI 5: Long-Term Tri-Max 30™ Storage Area	The full extent of past Tri-Max 30™ storage areas is based on the current storage location of the empty Tri-Max 30™ carts and knowledge of the interviewees. It is possible that they were stored elsewhere throughout the facility in the past.

7.3 Potential Future Actions

Interviews with personnel whose knowledge of the facility date back to 1988 indicate that NCARNG activity may have resulted in potential PFAS releases at the AASF #1. Based on the preliminary CSMs developed for the AOIs, there is potential for receptors to be exposed to PFAS contamination in soil, groundwater, surface water, and sediment at these AOIs. **Table 7-3** summarizes the rationale used to determine if the AOI should be considered for further investigation under the CERCLA process and undergo an SI.

ARNG evaluates the need for an SI at Morrisville AASF #1 based on the potential receptors, the potential migration of PFAS contamination off the facility, and the availability of resources.

Table 7-3: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1: Wash Rack Area and GSE Building	35°51'57.27"N; 78°46'41.85"W	Active FTA for Tri-Max 30™ training from 1988 to 2009. It was also the area where AFFF transfers were performed with the Tri-Max 30™ carts. The AFFF dispensing system in the GSE Building has a history of leaks and spills.	Proceed to an SI, focus on soil, sediment, groundwater, and surface water
AOI 2: Delta Row FTA	35°51'56.29"N; 78°46'35.13"W	Active FTA for Tri-Max 30™ training from 1988 to 2009.	Proceed to an SI, focus on soil, sediment, groundwater, and surface water
AOI 3: Firehouse	35°51'54.92"N; 78°46'42.58"W	The Firehouse stores AFFF and AFFF-equipped firetrucks. In 2014, AFFF leaked into the water tank of the TFFT and the water tank was flushed outside the Firehouse.	Proceed to an SI, focus on soil, sediment, groundwater, and surface water
AOI 4: Hangar Leak Area	35°51'58.73"N; 78°46'44.96"W	Pump leaked approximately five gallons of AFFF inside the hangar in 2015.	Proceed to an SI, focus on subsurface soil and groundwater
AOI 5: Long-Term Tri-Max Storage	35°52'0.76"N; 78°46'44.24"W	12 Tri-Max 30™ carts have been stored here since 2009.	Proceed to an SI, focus on soil, sediment, groundwater, and surface water

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Morrisville AASF #1, NC			
REVISED	8/28/2020	GIS BY	HO	8/28/2020
SCALE	1:3,600	CHK BY	ZN	8/28/2020
Base Map: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	8/28/2020

Area of Interest
Potential PFAS Release
No Suspected Release
Facility Boundary
Water Body
River/Stream

N

Summary of Findings

AECOM
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Germantown, MD 20876

Figure 7-1

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Appendix A
Data Resources

Data resources will be provided separately on CD. Data resources for Morrisville AASF #1 include:

Environmental Data Resources, Inc.™ Geocheck Report

- 2019 Environmental Data Resources, Inc.™ Geocheck Report for Morrisville AASF #1, North Carolina

Miscellaneous Information

- North Cary Water Reclamation Facility: Map of Reclaimed Water System Service

Morrisville AASF #1 Engineering As-Built Drawings

- Relevant as-built drawings for fire suppression system, sewer connections, and site drainage.

NCARNG Leasing Information

- 2011 Airport Joint Services Agreement
- 2002 Army National Guard Maintenance and Operations Agreement
- 1987 Raleigh-Durham Airport Authority Deed
- 1961 Agreement between RDU and State of North Carolina
- 1961 Raleigh-Durham Airport Authority Deed

Appendix B

Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Environmental Manager

Facility:_Morrisville AASF_
Interviewer:_[redacted]_____
Date/Time:__10/22/19__0900___

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

1. Roles or activities with the Facility/years working at the Facility.
   - SSG [redacted], Facility Fire Prevention – 2009 to present
   - SFC [redacted], Allied Shops Supervisor – 1998 to present
   - SGT [redacted], Power Support Equipment Repairer – 2015 to present
   - CSM [redacted], Aircraft Mechanic Supervisor – 1988 to present
   - ISG [redacted], Aircraft Mechanic Supervisor – 2000 to present

2. Where can I find previous facility ownership information?

   Lease has been provided by NCARNG Headquarters. Facility was built in 1988, firehouse was built in 2005.

3. What can you tell us about the history of PFAS including aqueous film forming foam (AFFF) at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.

   Maintenance – None.
   Fire Training Areas – Two FTAs: Delta Row and Washrack
   Firefighting (Active Fire) – None.
   Crash – None.
   Fire Suppression Systems – Handline Ansuls (3) in hangar. One small leak/spill
   Fire Protection at Fueling Stations – None.
   Non-Technical/Recreational/ Pest Management – None.
   Metals Plating Facility – N/A.
   Waterproofing Uniforms (Laundry Facilities) – N/A
   Other – AFFF currently stored in GSE building and Firehouse. Leaking pig pump in GSE building. 12 Tri-Max carts stored onsite in gravel storage yard.

4. Fill out CSM Information worksheet with the Environmental Manager.

5. Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing the AFFF/suppression system? Do you have "As Built" drawings for the buildings?

   The hangar was constructed with an AFFF dispensing system consisting of 3 Ansul pumps with handlines, fed by the municipal water line. A contractor (Pye Barker Fire and Safety) services the hangar suppression system and performs annual inspections. No discharges were caused by testing. No commissioning testing that they know of.
   One Ansul had a small leak overnight, less than five gallons seeped onto the floor. The contractor came out and emptied the remaining AFFF in the pump, mopped up the leak, and poured the mop-water down the drain to the sanitary sewer.

PA Interview Questionnaire - Environmental Manager

Facility: Morrisville AASF
Interviewer: [redacted]
Date/Time: 10/22/19 0900

6. Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam? If retrofitted, when was that done?

Currently charged with 3% AFFF.

7. How is AFFF procured? Do you have an inventory/procurement system that tracks use?

No tracking system. Procurement is done through the state.

8. What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)?

   Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?

All AFFF is 3%, but brands vary. Ansul and Chemguard onsite currently.

9. Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?

AFFF is stored in the GSE building, in the storage room adjacent to the pump room. The storage room contains 20 five-gallon buckets of Ansulite 3% AFFF. The pump room of the GSE building contains three “pig pumps” and a large 500 gallon AFFF storage tank (3% AFFF). 2 of the pumps have been leaking/seeping very slowly for about the past year. The valves to those pumps have been closed.

10. How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?

Two FTAs exist at the facility. The Washrack and Delta Row of the airfield. The washrack discharges were conveyed through two drains, one in the center of the washrack and the drain spanning the entrance to the washrack. Fate of drain is unknown. The Delta Row discharges occurred in the grass, mostly near the southernmost aircraft parking pad. Stormwater drains captured the discharges and conveyed them to Haley’s Branch.

The last training was done in the washrack in 2009 (one Tri-Max emptied). From 1988 to 2009 AFFF fire training occurred one about every 3 years emptying one Tri-Max 30 during each event.

PA Interview Questionnaire - Environmental Manager

Facility: Morrisville AASF
Interviewer: [redacted]
Date/Time: 10/22/19 0900

11. When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

It was allowed to drain into the inlets identified previously and during the VSI.

12. Can you recall specific times when city, county, and/or state personnel came on-post for training? If so, please state which state/county agency or military entity? Do you have any records, including photographs to share with us?

Outside agencies come to the facility during hurricane relief efforts, but no fire training occurs here with outside units to their knowledge.

13. Did military routinely or occasionally fire train off-post? List the units that you can recall used/trained at various areas.

Training has occurred with the battalion at Ft. Butner, Ft Bragg, and Ft AP Hill. Recalled bringing Tri-Max along to Ft Butner training, but do not recall using them.

14. Did individual units come with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?

The units that come to the facility don't bring their own fire fighting equipment. No AFFF training with outside units or fire training of any kind.

15. Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?

No emergency responses with fire fighting at the AASF. The two large aircraft crashes at RDU (1988 and 1994), National Guard may have responded/assisted but probably did not bring AFFF or firefighting equipment.

PA Interview Questionnaire - Environmental Manager

Facility: Morrisville AASF
Interviewer: [redacted]
Date/Time: 10/22/19 0900

16. Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?

AFFF was never applied to fuel spills to their knowledge. There were several small fuel spills on the tarmac. One large fuel spill from the fuel farm

17. Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?

N/A.

18. Are there mutual aid/use agreements between county, city, and local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement?

Mutual Aid with Morrisville FD and RDU Airport FD. The AASF has a direct line to the RDU Crash Unit.

19. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste treatment plants, and AFFF ponds)?
    - Hangar (Ansul Pumps)
    - GSE (Tank and Buckets)
    - Washrack (Tri-Max)
    - Gravel Pad (Tri-Max)
    - Fire Station (Truck and Buckets)

20. Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?

No creative uses.

PA Interview Questionnaire - Environmental Manager

Facility: Morrisville AASF
Interviewer: [redacted]
Date/Time: 10/22/19 0900

21. Are there past studies you are aware of with environmental information on plants/animals/ groundwater/soil types, etc., such as Integrated Cultural Resources Management Plans or Integrated Natural Resources Management Plans?

Not aware of any, maybe after the DLA fuel spill. NCARNG JFHQ will look into documentation.

22. What other records might be helpful to us (environmental compliance, investigation records, admin record) and where can we find them?

SWPPP has been provided. Other documents may be found by NCARNG JFHQ.

23. Do you have or did you have a chrome plating shop on base? What were/are the years of operation of that chrome plating shop?

No chrome plating or related activities.

24. Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control? If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?

N/A

25. How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?

Formerly it was disposed of at one of the two FTAs (Washrack and Delta Row). They are planning to empty the remaining 8 full Tri-Max carts in the near future and turn all the carts in to the state. They have staged several empty 55 gallon poly drums to contain the AFFF in the Tri-Max carts. This transfer will be done in the washrack.

PA Interview Questionnaire - Environmental Manager

Facility: Morrisville AASF
Interviewer: [redacted]
Date/Time: 10/22/19 0900

26. Do you recommend anyone else we can interview? If so, do you have contact information for them?

The fire station. Interviewees later escorted us to the fire station during the VSI.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

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

1. Roles or activities with the Facility/years working at the Facility.

Firefighter in the Focus Readiness Unit at AASF since 2009. The firefighting unit has existed at the AASF since 2005.

2. What can you tell us about the history of AFFF at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.

Maintenance (e.g., ramp washing) – Flushed water out of truck once when the AFFF leaked into it. Sometime around 2014.
Fire Training Areas - None
Firefighting (Active Fire) - None
Crash - None
Fire Suppression Systems (Hangers/Dining Facilities) - None
Fire Protection at Fueling Stations - None
Non-Technical/Recreational/ Pest Management - None

3. Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing at the AFFF/suppression systems?

The hangar has a dispensing system, the firefighters don't do anything with those. No suppression systems at the firehouse.

4. Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?

N/A

5. How is AFFF procured? Do you have an inventory/procurement system that tracks use?

Cannot recall the last procurement of AFFF. Have not gotten rid of any yet, it hasn't expired.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

6. What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?

3% Ansul AFFF

7. Is AFFF formulated on base? If so, where is the solution mixed, contained, transferred, etc.?

Not formulated/mixed. It is transferred to the trucks inside the firehouse bay.

8. Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?

The AFFF is stored in the firehouse bay, along the easternmost wall. Stored in 5-gallon buckets as concentrate for 3% proportioning.

9. How is the AFFF transferred to emergency response vehicles, suppression systems, flightline extinguishers? Is/was there a specified area on the facility where vehicles are filled with AFFF and does this area have secondary containment in case of spills? How and where are vehicles storing AFFF cleaned/decontaminated?

Only AFFF equipment is 2 firetrucks. All transfers occurred in the vehicle bay. No secondary containment. They are cleaned right outside the bay doors.

10. Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located?

Two firetrucks:

- 2007 TFFT (primary firetruck), carries 120 gallons of 3% AFFF
- 2009 Tanker. Carries 240 gallons of 3% AFFF

They are typically parked in the firehouse vehicle bay. Both trucks were offsite during the VSI. These are the only firetrucks they have had since the unit was established in 2005.

11. Any vehicles have a history of leaking AFFF? Do you/did you test the vehicles spray patterns to make sure equipment is working properly? How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?

The TFFT had developed a leak from the AFFF tank into the water tank about 5-6 years ago (sometime around 2014). Nozzle was tested due to the suspected leak, discharged to parking pad in front of the vehicle bay. The water tank (with leaked dilute AFFF mixture) was flushed out at the same location. The truck was sent out for repairs to Atlantic Emergency Solutions in Fayetteville, NC.

To their knowledge the truck had not been used during the time that the leak was active, but it is hard to say exactly when the leak started.

12. How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?

The AASF fire department does not do any fire training at the site, other than ABC extinguisher classes with the AASF staff.
The AASF fire department does all of their training at Stanley County Air National Guard facility at the Stanly County Airport in New London, NC. No AFFF was used during training, so no AFFF was run through their equipment during training.

13. What types of fuels/flammables were used at the FTAs?

N/A

14. What was the frequency of AFFF use at each location? When a release of AFFF occurs during a fire training exercise, now and in the past, how is/was the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?

N/A

15. Are there mutual aid/use agreements between county, city, local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement? Can you recall specific times when city, county, state personnel came on-post for training? If so, please state which state/county agency, military entity? Do you have any records, including photographs to share with us?

Mutual aid with RDU Airport and City of Morrisville.

16. Did individual units come on-post with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?

No units came on-post with AFFF. No training conducted at the AASF with external entities.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

17. Did military routinely or occasionally fire train off-post? List units that you can recall used/trained at various areas.

The AASF fire department does all of their training at Stanley County Air National Guard facility at the Stanly County Airport in New London, NC. No AFFF was used during training, so no AFFF was run through their equipment during training.

18. Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?

No emergency response with AFFF from the AASF fire dept.

19. Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?

No fuel spills were washed with AFFF to their knowledge.

20. Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?

No.

21. Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?

At the AASF, there are systems with AFFF in the hangar and in the GSE building.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

22. Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?

No creative uses.

23. How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?

They have not had to dispose of any yet. They have not gotten rid of any AFFF, and it has not yet expired.

24. Do you recommend anyone else we can interview? If so, do you have contact information for them?

Contact info for Truck Mantenance:
Atlantic Emergency Solutions
4201 Distribution Dr.
Fayetteville, NC 28311

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

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

Recorded by: [redacted]

ARNG Contact: [redacted]

Date and Time: 10/22/2019 9:00

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

Source/Release Information

Site Name / Area Name / Unique ID: Morrisville AASF

Site / Area Acreage: Site: 35 acres

Historic Site Use (Brief Description): Part of RDU airport. Site use has not changed since 1988. Adjacent to a large State Park, surrounded by residential and commercial land use.

Current Site Use (Brief Description): The current AASF was constructed in 1988 and services/maintains military helicopters

Physical barriers or access restrictions: Access to the area is restricted to AASF personnel. Access gates and fences

1. Was PFAS used (or spilled) at the site/area? **Y / N**

1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):

Yes. Two FTAs used from 1988 to 2009. Two AFFF dispensing systems (Hangar and GSE building). AFFF stored at various locations throughout the facility including the firehouse. Firetruck water flushed after internal AFFF leak discovered.

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

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

No documented usage.

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

3a. Indicate what businesses are located near the site

RDU Airport, Commercial and Industrial facilities, Residential areas

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

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

Raleigh-Durham International Airport

Visual Survey Inspection Log

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y** / N

1a. If yes, indicate which type of AFFF has been used:

3% AFFF Ansul

1b. If yes, describe maintenance schedule/leaks:

One leak in the Hangar AFFF dispensing system (2015). Leaks/Seepage in GSE building in 2018. Contractor inspects hangar system annually.

1c. If yes, how often is the AFFF replaced:

Unknown

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

As builts were obtained. Floor drains lead to Oil/Water Separator and Sanitary Sewer operated by the Town of Cary

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

Two stormwater outfalls as indicated on SWPPP. One southeast of the facility, and another southwest of the f

2. Is there channelized flow within the site/area? **Y** / N

2a. If so, please note observation and location:

Only for stormwater; drainage ditches around aircraft apron

3. Are monitoring or drinking water wells located near the site? Y / **N**

3a. If so, please note the location:

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

4a. If so, please note the location:

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

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

RDU Airport may be able to provide this information

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

6a. If so, please note the source and location.

Potential NFPA testing at RDU firehouse

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

Visual Survey Inspection Log

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? Y / **N**

1a. If so, please describe change (ex. Structures no longer exist):

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

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

3. Does the site or area exhibit evidence of erosion? **Y** / N

3a. If yes, describe the location and extent of the erosion:

The southernmost stormwater inlet grate in the Delta Row FTA shows significant erosion.

4. Does the site/area exhibit any areas of ponding or standing water? Y / **N**

4a. If yes, describe the location and extent of the ponding:

Receptor Information

1. Is access to the site restricted? **Y / N**

1a. If so, please note to what extent:

The site is fenced in, separately from the RDU airport, and has a controlled access point.

2. Who can access the site? **Site Workers / Construction Workers / Trespassers / Residential / Recreational Users / Ecological**

2a. Circle all that apply, note any not covered above:

3. Are residential areas located near the site? **Y / N**

3a. If so, please note the location/distance:

Most of the area near the AASF is residential and commercial.

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

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

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

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

Wetlands located within the William B Umstead State Park. Adjacent to the AASF.

Visual Survey Inspection Log

Additional Notes

William B Umstead State Park is located directly to the northeast of the facility, upgradient and crossgradient in relation to the direction of groundwater and surface flow at the facility.

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Morrisville AASF

Why has this location been identified as a site?

The Hangar and GSE building contain AFFF dispensing systems. Past Tri-Max use at the facility. The firehouse at the facility has AFFF-equipped trucks.

Are there any other activities nearby that could also impact this location?

Yes, Raleigh-Durham International Airport

Training Events

Have any training events with AFFF occurred at this site? Yes

If so, how often? Divided between two areas, approximately once every two years

How much material was used? Is it documented? One Tri-Max 30 (30 gallons)

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

Surface Water:

Surface water flow direction? South and Southwest

Average rainfall? 38 inches per year

Any flooding during rainy season? Not since AASF has been here. Stormwater discharges to ditches and is conveyed to outfalls

Direct or indirect pathway to ditches? Direct

Direct or indirect pathway to larger bodies of water? Surface water drains to Haleys Branch, connected to Lake Crabtree, Crabtree Creek, and the Neuse River downstream

Does surface water pond any place on site? Not onsite.

Any impoundment areas or retention ponds? No.

Any NPDES location points near the site? Yes, two stormwater outfalls listed in SWPPP and NPDES permit

How does surface water drain on and around the flight line?

To drainage ditches that surround the flight line. Stormwater inlets in the ditches are connected to the outfalls.

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? South

Depth to groundwater? 5 to 15 feet

Uses (agricultural, drinking water, irrigation)? Several PWS wells within 4 miles of the facility; all are upgradient or cross-gradient in relation to the facility groundwater

Any groundwater treatment systems? No known treatment systems.

Any groundwater monitoring well locations near the site? No monitoring wells identified.

Is groundwater used for drinking water? No

Are there drinking water supply wells on installation? No

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient? No

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? No

If so, do we understand the process and which water is/was treated at the plant? N/A

Do we understand the fate of sludge waste? Biosolids are reused at North Cary Water Reclamation Facility (NCWRF)

Is surface water from potential contaminated sites treated? Drainage from the wash rack goes to the sanitary sewer and is treated at the NCWRF

Equipment Rinse Water

1. Is firefighting equipment washed? Where does the rinse water go?

Rise water at the wash rack goes to the sanitary sewer. Rinse water outside the firehouse goes to the storm drain.

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

Nozzle testing is not performed at the AASF. However, a nozzle check was performed after an internal AFFF leak/malfunction was discovered sometime around 2014. The truck was repaired after the water tank was flushed outside the firehouse.

3. Other? N/A

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker: Y

Construction Worker : Y

Recreational User: Y (offsite surface water/sediment)

Residential: Y (for surface water only)

Child: N

Ecological: N

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?
RDU airport and William B Umstead State Park.

Documentation

Ask for Engineering drawings (if applicable).

Has there been a reconstruction or changes to the drainage system? When did that occur?
No known changes affecting the drainage system.

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 1

Description:

Ansul unit that leaked in 2015. Less than 5 gallons leaked. Pump located along Southwestern wall of the hangar. All Ansul pumps in the hangar have a 35 gal AFFF capacity

Date Taken:

22 October 2019

Photograph No. 2

Description:

Second Ansul pump, located along northwestern wall of the hangar. No history of leaking.

Date Taken:

22 October 2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 3

Description:

Third Ansul pump located along the southeastern wall of the hangar. Not operational, reason unknown. No history of leaking.

Date Taken:

22 October 2019

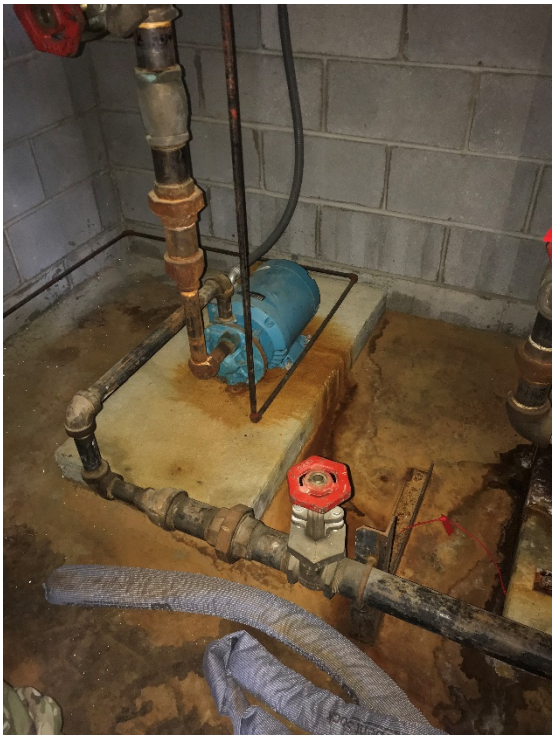
Photograph No. 4

Description:

GSE Building, looking at first pump in AFFF dispensing system. Evidence of leaking around the base of the pump. Valve to the AFFF tank has been closed.

Date Taken:

22 October 2019



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

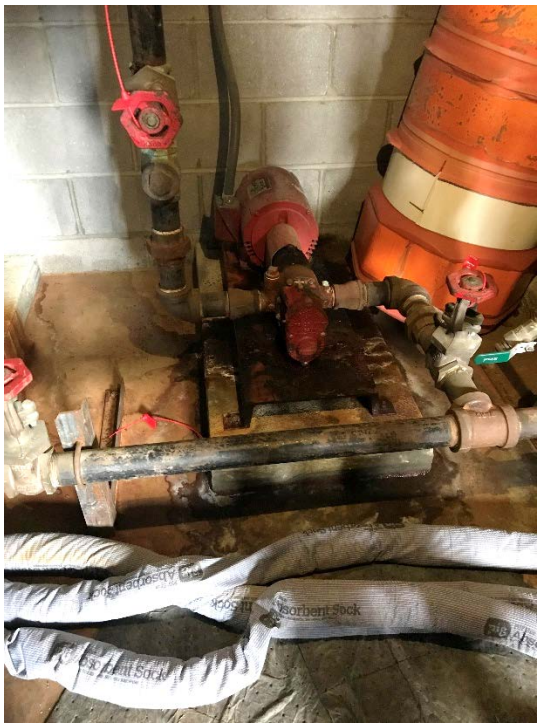
Photograph No. 5

Description:

GSE Building, looking at second pump in AFFF dispensing system. Evidence of leaking around the base of the pump. Valve to the AFFF tank has been closed. Booms present from initial leak incident.

Date Taken:

22 October 2019



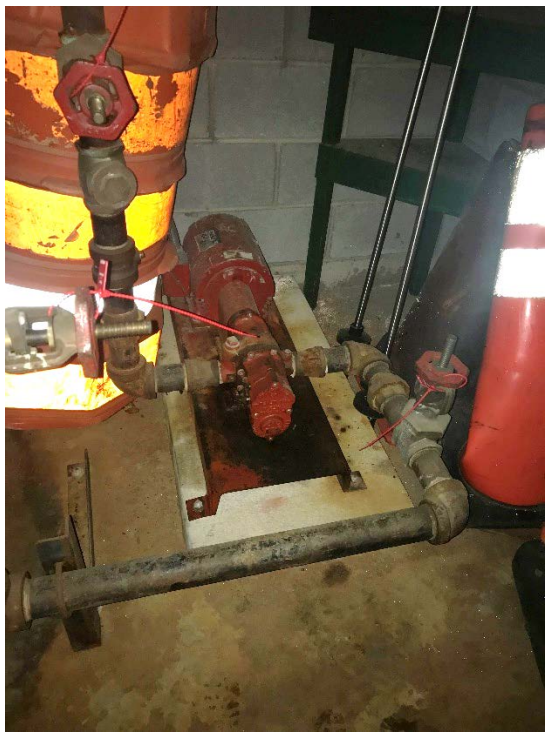
Photograph No. 6

Description:

GSE Building, looking at third pump in AFFF dispensing system. No evidence of leaking, the pump is considered to be operational.

Date Taken:

22 October 2019



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 7

Description:

AFFF tank located in the GSE building, supplying the AFFF dispensing system in the building. The tank has a 550 gallon capacity and is assumed to be full. Evidence of leaks/spills visible near the top of the tank and the pressure valve.

Date Taken:

22 October 2019

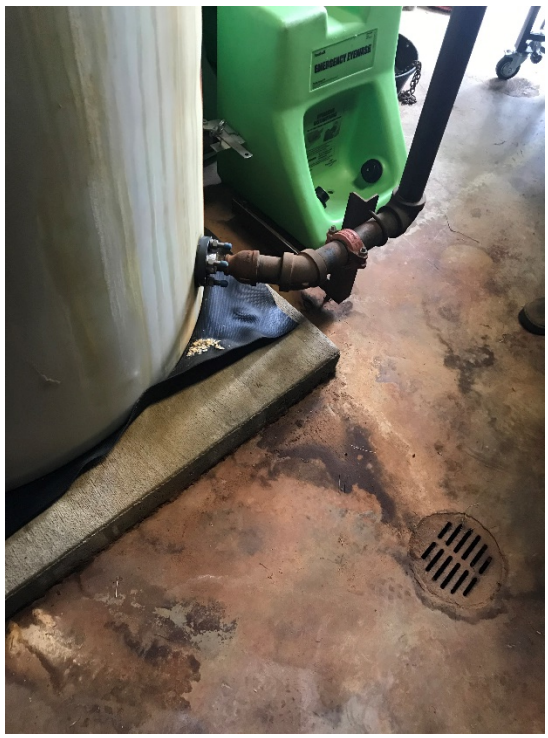
Photograph No. 8

Description:

Floor drain located near the AFFF tank in the GSE building. Evidence of leaks and drainage can be seen on the floor.

Date Taken:

22 October 2019



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 9

Description:

The GSE storage room, containing 20 five-gallon buckets of 3% AFFF (Ansulite).

Date Taken:

22 October 2019

Photograph No. 10

Description:

TriMax30™ carts stored outside the wash rack. Seven carts visible in the foreground, with one additional cart in the background under the wash rack pavilion.

Date Taken:

22 October 2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 11

Description:

Drain located in the center, and lowest point, of the wash rack

Date Taken:

22 October 2019

Photograph No. 12

Description:

Pictured on left: nearest storm drain to the wash rack, visible in upper righthand corner with concrete conveyance toward the southeast.

Pictured on right: the southeasternmost end of the same stormwater drainage structure

Date Taken:

22 October 2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 13

Description:

Looking Northeast from the southern end of the Delta Row Fire Training Area

Date Taken:

22 October 2019

Photograph No. 14

Description:

Looking south at the Delta Row FTA stormwater inlet. Erosion is visible around the structure.

Date Taken:

22 October 2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Morrisville AASF	Morrisville, North Carolina

Photograph No. 15

Description:

12 TriMax30™ carts in long term storage yard. Storm drain pictured in the foreground, while the RDU Maintenance Shop is visible in the background.

Date Taken:

22 October 2019

Photograph No. 16

Description:

AFFF storage area inside the Fire Station. In total 42 five-gallon buckets of 3% AFFF are stored here.

Date Taken:

22 October 2019