FINAL
Preliminary Assessment Report
Joint Base McGuire-Dix-Lakehurst
Lakehurst, New Jersey

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

October 2019

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Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
amsl	above mean sea level
ARNG	Army National Guard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSM	conceptual site model
DWQI	Drinking Water Quality Institute
EDR	Environmental Data Resources, Inc.
FTA	fire training area
GWQS	Ground Water Quality Standard
IED	Installations and Environment Division
ISGWQC	Interim Specific Ground Water Quality Criteria
JBMDL	Joint Base McGuire-Dix-Lakehurst
LHA	Lifetime Health Advisory
MCL	Maximum Contaminant Level
NAES	Naval Air Engineering Station
NJARNG	New Jersey Army National Guard
NJDEP	New Jersey Department of Environmental Protection
NJDMAVA	New Jersey Department of Military and Veteran Affairs
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppb	parts per billion
ppt	parts per trillion
PWS	public water supply
SI	site inspection
UCMR	Unregulated Contaminant Monitoring Rule
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VSI	visual site inspection

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Executive Summary

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division (IED), 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 polyfluoroalkyl substances (PFAS) (a suite of related chemicals), primarily in the form of aqueous film forming foam (AFFF) released during firefighting activities or training, although other PFAS sources are possible.

AECOM completed a PA for PFAS at the New Jersey ARNG (NJARNG) Lakehurst Army Aviation Support Facility (AASF) in Lakehurst, New Jersey to assess potential PFAS release areas and exposure pathways to receptors. The performance of this PA includes the following tasks:

- Reviewed data resources to obtain information relevant to suspected PFAS releases;
- Conducted a site visit on 15 November 2018;
- Interviewed current NJARNG Lakehurst AASF and New Jersey Department of Military and Veteran Affairs (NJDMAVA) personnel during the site visit including the NJARNG Chief for Environmental Branch, and an Environmental Specialist with the NJDMAVA;
- Conducted a follow-up phone call on 28 November 2018 with an NJARNG Environmental Specialist, NJARNG Fire Inspector, and NJDMAVA Environmental Specialist;
- Completed visual site inspections (VSI) at known or suspected PFAS release locations and documented with photographs;
- Developed preliminary conceptual site models (CSMs) to outline the potential release and pathway of PFAS for the Area(s) of Interest (AOI) and the ARNG facility

One AOI (AOI 1) related to potential PFAS release was identified at the Lakehurst AASF during the PA. AOI 1 is shown on **Figure ES-1** and described in **Table ES-1** below.

Table ES-1: AOIs at Lakehurst AASF

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Building 780 and 790	NJARNG	Multiple AFFF spills in June, August, and September 2017

Based on actual AFFF releases at AOI 1, there is potential for exposure to PFAS contamination from subsurface soil through the inhalation of dust to site workers (e.g., Lakehurst AASF military, non-military, staff, and visitors), onsite construction workers, and trespassers. There are additional exposures to PFAS through ingestion of surface water/sediment and subsurface soil via leaching/infiltration to site workers, construction workers, and trespassers. Finally, there is a potential exposure pathway to construction workers, residents, and trespassers via shallow groundwater. The preliminary CSM for Lakehurst AASF is shown on **Figure ES-2**.

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CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Lakehurst AASF, NJ			
REVISED	10/21/2019	GIS BY	MS	10/21/2019
SCALE	1:22,800	CHK BY	AB	10/21/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	10/21/2019

- Area of Interest
- Potential PFAS Release
- Facility Boundary
- Water Body
- Wetland
- River/Stream
- Canal/Ditch
- Storm Drain
- Inferred Groundwater Flow Direction

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Summary of Findings

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Figure ES-1

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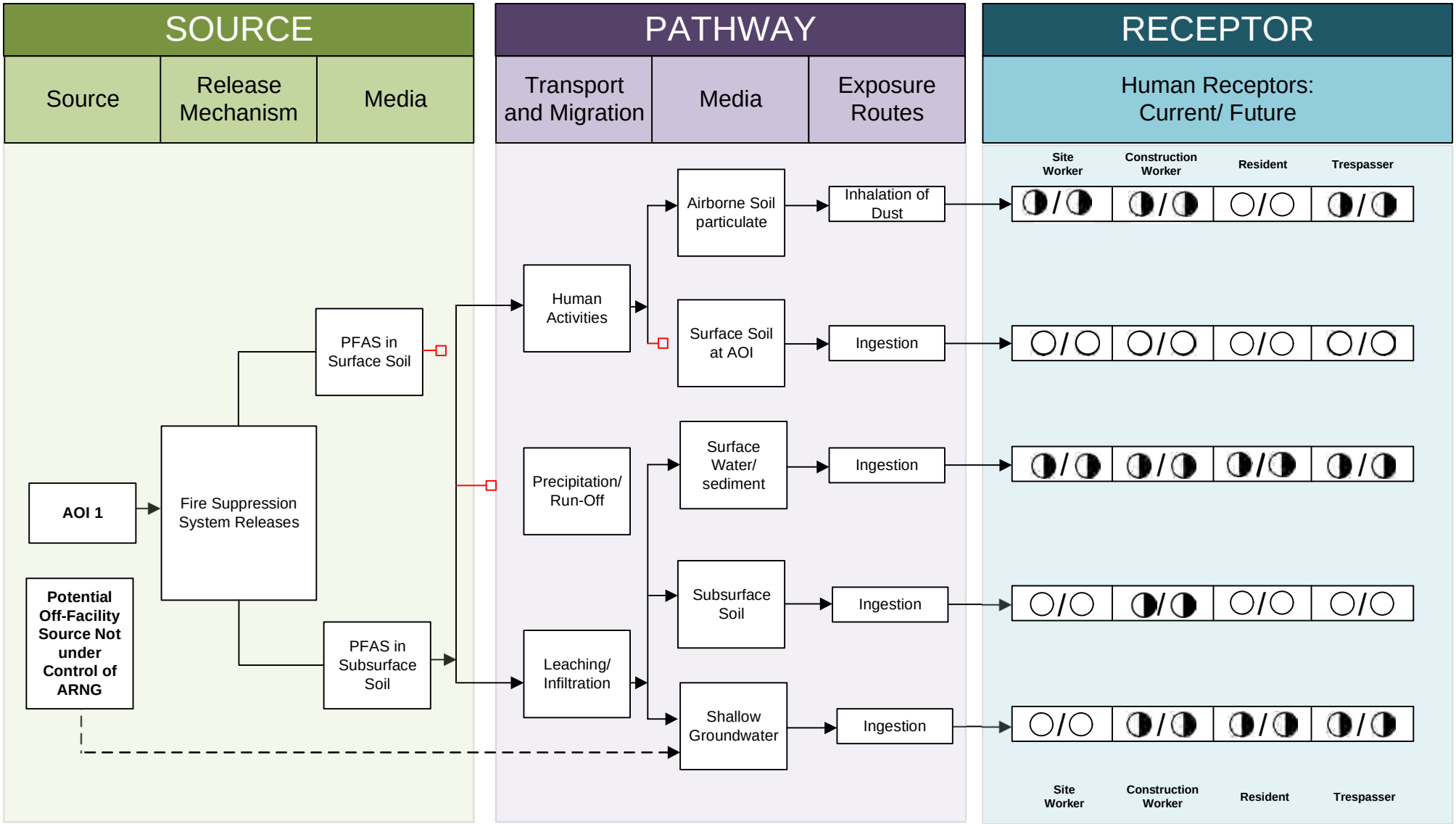


LEGEND

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

NOTES

1. The resident receptor refers to an off-site resident.
2. No surface water bodies were identified at the facility, but the surface water/sediment pathway is considered for off-site receptors because it is not known whether there are off-site groundwater discharges to surface water bodies.

Figure ES-2
Preliminary Conceptual Site Model
Lakehurst AASF, NJ

1. Introduction

1.1 Authority and Purpose

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division (IED), 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* 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) released during firefighting activities or training, 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 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 Lifetime Health Advisories (LHAs) of 70 parts per trillion (ppt), individually or combined, for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water (USEPA, 2016a; USEPA, 2016b).

In the absence of federal maximum contaminant levels (MCLs), some states, such as New Jersey, have adopted their own drinking water standards for PFAS. The New Jersey Drinking Water Quality Institute (DWQI), an advisory body to the New Jersey Department of Environmental Protection (NJDEP) that is responsible for recommending MCLs in drinking water, recommended an MCL for perfluorononanoic acid (PFNA) at 13 ppt in July 2015, PFOA at 14 ppt in March 2017, and PFOS at 13 ppt in November 2017. On 4 September 2018, the NJDEP adopted the proposed MCLs and concurrently amended the Ground Water Quality Standard (GWQS) for PFNA to 13 ppt (NJDEP, 2018). The NJDEP is in the process of finalizing and releasing MCLs for PFOA and PFOS. However, until those numbers are properly promulgated the USEPA LHA values will be used.

This report presents findings of a PA for PFAS at the New Jersey ARNG (NJARNG) Lakehurst Army Aviation Support Facility (AASF) in Lakehurst, New Jersey, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; USEPA, 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations [CFR] Part 300; USEPA, 1994), and USACE requirements and guidance. This PA Report documents the known locations where PFAS may have been released into the environment at the Lakehurst AASF. 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 15 November 2018;
- Interviewed current NJARNG Lakehurst AASF and New Jersey Department of Military and Veteran Affairs (NJDMAVA) personnel during the site visit including the NJARNG Chief for Environmental Branch, and an Environmental Specialist with the NJDMAVA;
- Conducted a follow-up phone call on 28 November 2018 with a NJARNG Environmental Specialist, NJARNG Fire Inspector, and NJDMAVA Environmental Specialist;
- Completed visual site inspections (VSI) at known or suspected PFAS release locations and documented with photographs;
- Developed preliminary conceptual site models (CSMs) to outline the potential release and pathway of PFAS for the Area(s) of Interest (AOIs) and the ARNG 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 ARNG facility location, environmental setting, and methods used to complete the PA.
- **Section 2** – **Fire Training Areas:** describes the fire training areas (FTAs) at the ARNG facility identified during the site visit.
- **Section 3** – **Non-Fire Training Areas:** describes other locations of PFAS releases at the ARNG facility identified during the site visit.
- **Section 4** – **Emergency Response Areas:** describes areas of AFFF release at the ARNG facility, specifically in response to emergency situations.
- **Section 5** – **Adjacent Sources:** describes sources of PFAS release adjacent to the ARNG facility that are not under the control of ARNG.
- **Section 6** – **Preliminary Conceptual Site Model:** describes the pathways of PFAS transport and receptors at each AOI.
- **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 Lakehurst AASF is located in Ocean County, New Jersey, in the borough of Lakehurst (**Figure 1-1**). The ARNG facility is approximately 2 miles north-northwest of the city of Lakehurst and 18 miles southeast of the city of Trenton, New Jersey. The approximate center of the ARNG facility property is located at geographic coordinates 40°1’59.45”N; 74°20’23.98”W, at 76 feet above mean sea level (amsl).

The ARNG facility was established in 1991 on Joint Base McGuire-Dix-Lakehurst (JBMDL). JBMDL is a 42,000 acre installation that resulted from the merger of the McGuire Air Force Base,

Fort Dix, and Naval Air Engineering Station Lakehurst. Lease information obtained during the PA confirmed rightful leasing by ARNG of Parcel 29 from the Naval Facilities Engineering Command, Mid-Atlantic. The terms of the lease include all 50 acres of Parcel 29 for a 50-year period from 30 September 2009 to 29 September 2059. Leasing documentation is available in **Appendix A**.

The Lakehurst AASF comprises 50 acres and is located in the northeastern section of the JBMDL. The Lakehurst AASF includes two hangers and a small helipad that used for light infantry tactical maneuvers and paramilitary training. Building 790 is approximately 37,645 square feet, and Building 790 is approximately 98,757 square feet of which approximately 50,000 square feet is office space. Prior to 2014, the Lakehurst AASF land was an extension of the Hangar 5 and Hangar 6 helipad, located 0.25 miles south of the current Lakehurst AASF. Today, Lakehurst AASF comprises one helipad and two hangars, Buildings 790 and 780, which are a cold storage hangar and a warm storage hangar, respectively.

1.5 Facility Environmental Setting

Lakehurst AASF is located in the Atlantic Coastal Plain Physiographic Province of southeastern New Jersey. This province can be divided into the Outer Coastal Plain and the Inner Coastal plain, and further divided into three subprovinces: the Lowlands, intermediate Uplands, and the Uplands (HydroGeoLogic, 2015). As a result of these divisions, the terrain is characterized by low relief coastal environment with many beaches. Ocean County is 628.78 square miles, of which 31% is covered by water (U.S. Census, 2010). Approximately 1.5 miles to the south-southeast of the ARNG facility is Lake Horicon, a 63-acre stream-fed lake used for recreational activities.

The following sections describe the environmental setting of the subject property and include information on geology, hydrogeology, hydrology, climate, and current and future land use.

1.5.1 Geology

The geology of the Coastal Plain around Lakehurst AASF is made up of unconsolidated gravel, sand, and clay deposits dipping gently to the southeast over Paleozoic crystalline bedrock. Sediments range in age from the upper Lower Cretaceous to the Miocene (90 to 10 million years old). Lakehurst AASF lies on the southern edge of the last glacial maximum. As a result, the majority of the surface and underlying unconsolidated materials are sequences of Pleistocene and Pliocene age sand, marginal-marine sediments, gravel, and clay. The most prominent depositional group at the Lakehurst AASF is the surficial Cohansey and Kirkwood Formation, which consists of unconsolidated sands (**Figure 1-2**). Underlying this unit is the Potomac-Raritan-Magothy Formation which is predominantly fluvial or fluvial deltaic in origin and contains discontinuous lenses of gravel, sand, silt, and clay (HydroGeoLogic, 2015). The thickness of the formations at the Lakehurst AASF ranges between 5 to 25 feet below ground surface (bgs) for the Cohansey and Kirkwood Formation and up to nearly 1000 feet bgs for the Potomac-Raritan-Magothy formation (HydroGeoLogic, 2015).

The deposition of these sediments was controlled by global sea level changes; they contain repetitive transgressive-regressive facies changes (HydroGeoLogic, 2015). These changes in depositional environment created a unique, repetitive accumulation of sediments followed by interstitial confining units. This led to the formation of nine aquifer systems and eight confining units that span the Coastal Plain and underlie the Lakehurst AASF (USGS 1989; USGS, 1998).

1.5.2 Hydrogeology

The principle aquifer systems are the surficial Kirkwood-Cohansey aquifer and the deeper Potomac-Raritan-Magothy aquifer system. The surficial aquifer generally exists under unconfined conditions, and recharge occurs primarily from direct precipitation on exposed portions of the

formation. Depth to groundwater typically ranges between 5 and 30 feet bgs in the Kirkwood-Cohansey aquifer (AECOM, 2010). Groundwater flow direction in the shallow aquifer is generally directed by topography and drainage conditions. At Lakehurst AASF, groundwater is flowing primarily east-northeast (**Figure 1-2**). The regional groundwater direction is generally east-southeast, towards the Atlantic Ocean.

Lakehurst AASF obtains its water from Naval Air Engineering Station (NAES) Lakehurst portion of JBMDL. NAES Lakehurst is served by 3 public water supplies (PWS): Hill, Helo, and Test. The Hill system has four wells screened in the Kirkwood-Cohansey aquifer, and one screened in the Potomac-Raritan-Magothy aquifer. The Helo system has one well screened in the Kirkwood-Cohansey aquifer. The Test system has two wells screened in the Potomac-Raritan-Magothy aquifer (HydroGeoLogic, 2015). It is likely PFAS have not impacted those wells screened in the Potomac-Raritan-Magothy aquifer system given the depth; however, the surficial Kirkwood-Cohansey aquifer could be subject to potential contamination. Information obtained during the site walk indicated that immediately downgradient of the Lakehurst AASF is a golf course which has an irrigation system. Specific information regarding these irrigation wells was not available at the time of PA report writing.

On 9 March 2017, the NJARNG collected a potable drinking water sample from the Lakehurst TS Naval Air Station pump house (Building 802), which is one of the PWSs serving the Lakehurst AASF. All samples were non-detect for PFAS within the PWS.

Third Unregulated Contaminant Monitoring Rule (UCMR 3) data were also reviewed as part of this PA. Samples were collected at three locations within the Manchester Township Water Utility (located approximately 4 south of Lakehurst AASF). All samples were non-detect for PFAS within the Manchester Township Water Utility (USEPA, 2017).

1.5.3 Hydrology

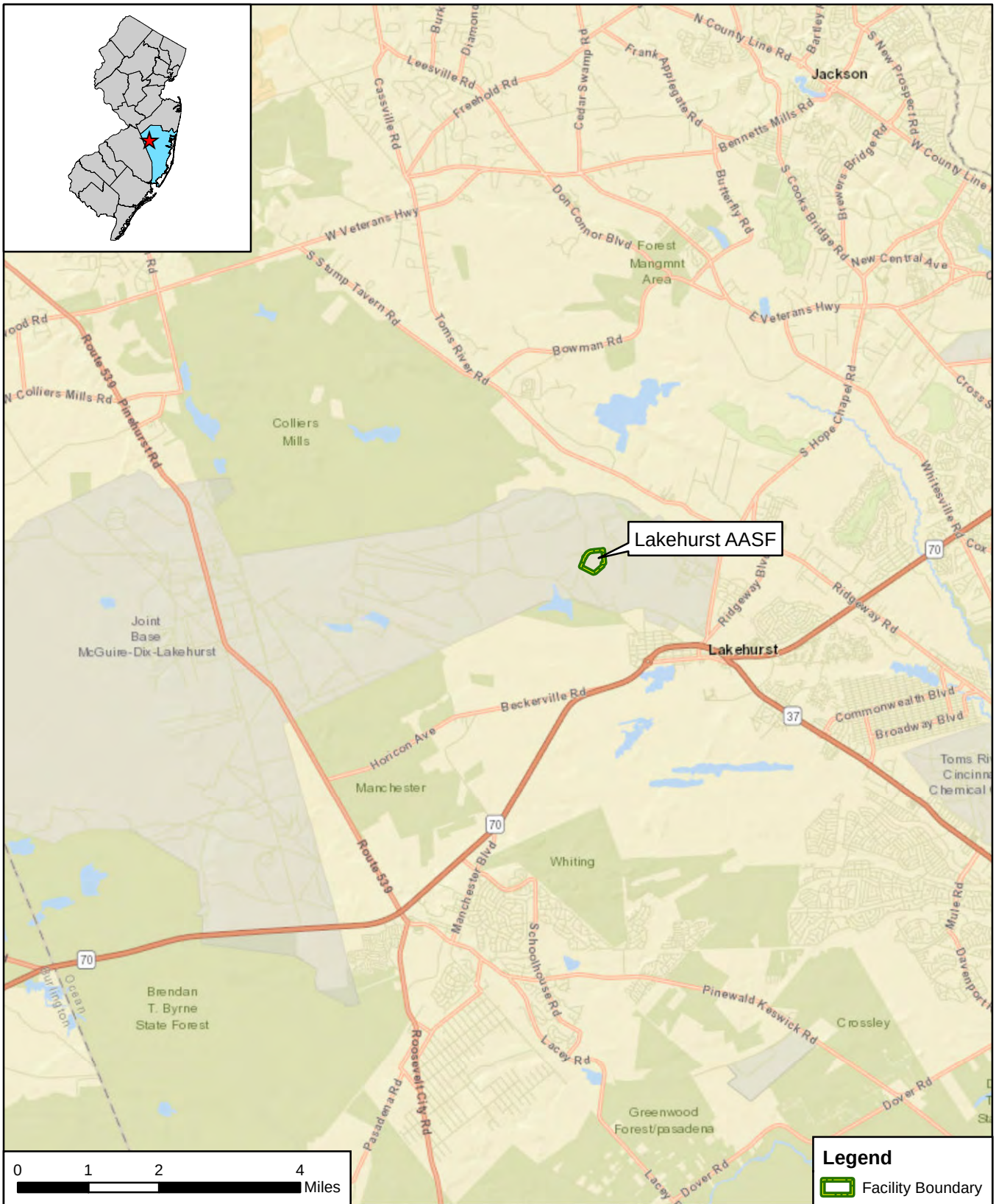
Lakehurst AASF is in the north portion of the Union Branch Watershed. The general surface water flow is to the east-southeast, as seen in **Figure 1-3**. The nearest surface water bodies are an unnamed drainage ditch, located approximately 0.15 miles southwest of the ARNG facility, and the Manapaqua Branch, located approximately 0.75 miles to the southwest.

1.5.4 Climate

The climate in the Lakehurst AASF area is characterized by moderately cold and occasionally snowy winters and warm, humid summers. The monthly average temperature ranges from a high of 86 degrees Fahrenheit (°F) in July to 40 °F in January. Average annual precipitation is 43.43 inches (US Climate Data, 2019).

1.5.5 Current and Future Land Use

Lakehurst AASF is a private ARNG facility that is accessible only through a guarded security gate. The property is an NJARNG installation that supports the NJARNG mission. As previously mentioned, the Lakehurst AASF is located within NAES Lakehurst, which is the Navy portion of the Air Force controlled JBMDL. Outside the boundaries of JBMDL, the surrounding area is generally used for residential and commercial space. There are no largescale agricultural areas near Lakehurst AASF, and there are no current expansion plans for the ARNG facility. The future use of the ARNG facility is not expected to change.



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SCALE	1:126,720	CHK BY	AB	8/12/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	8/12/2019

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-1

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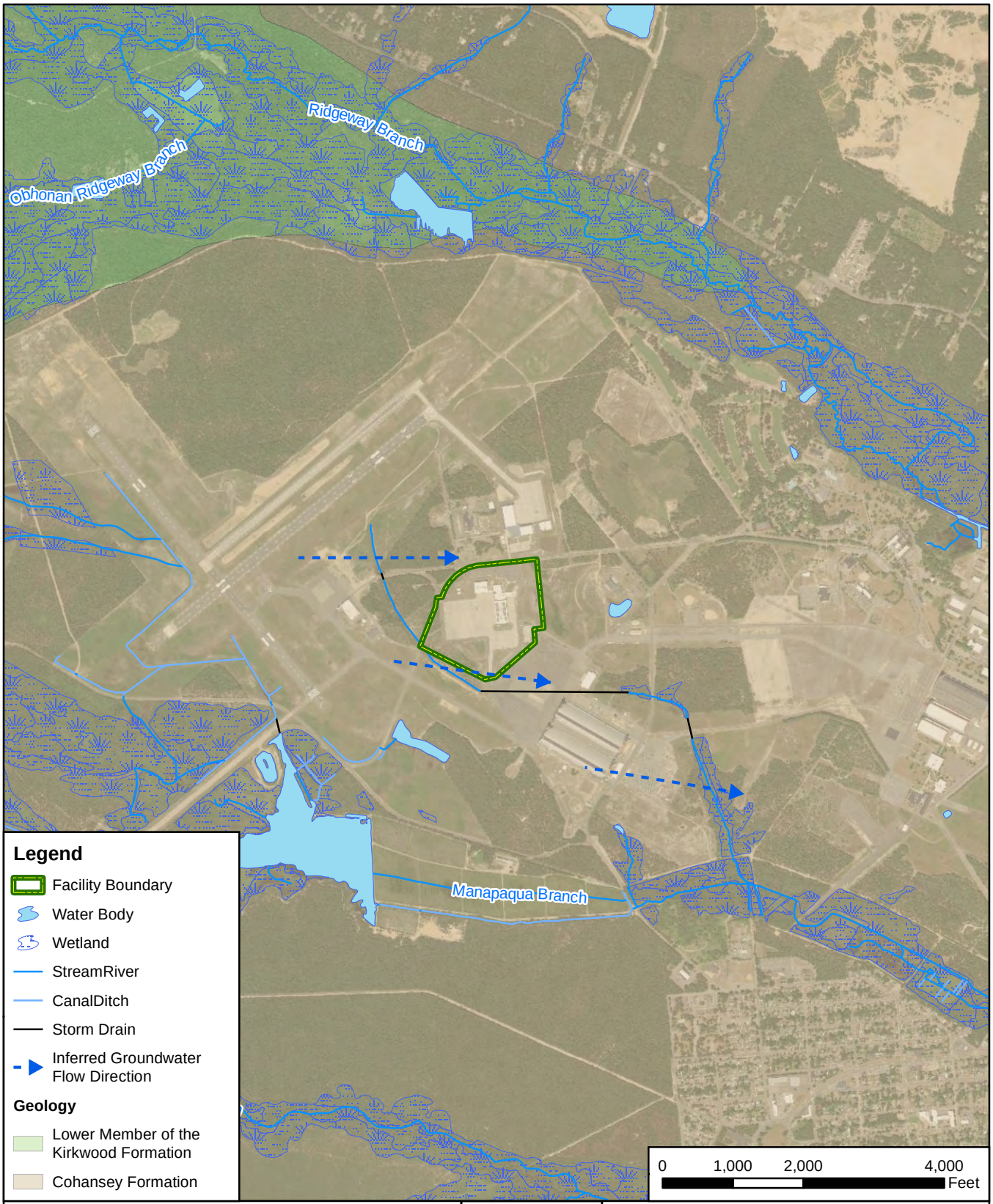

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SCALE	1:24,000	CHK BY	AB	10/19/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	10/19/2019

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-2

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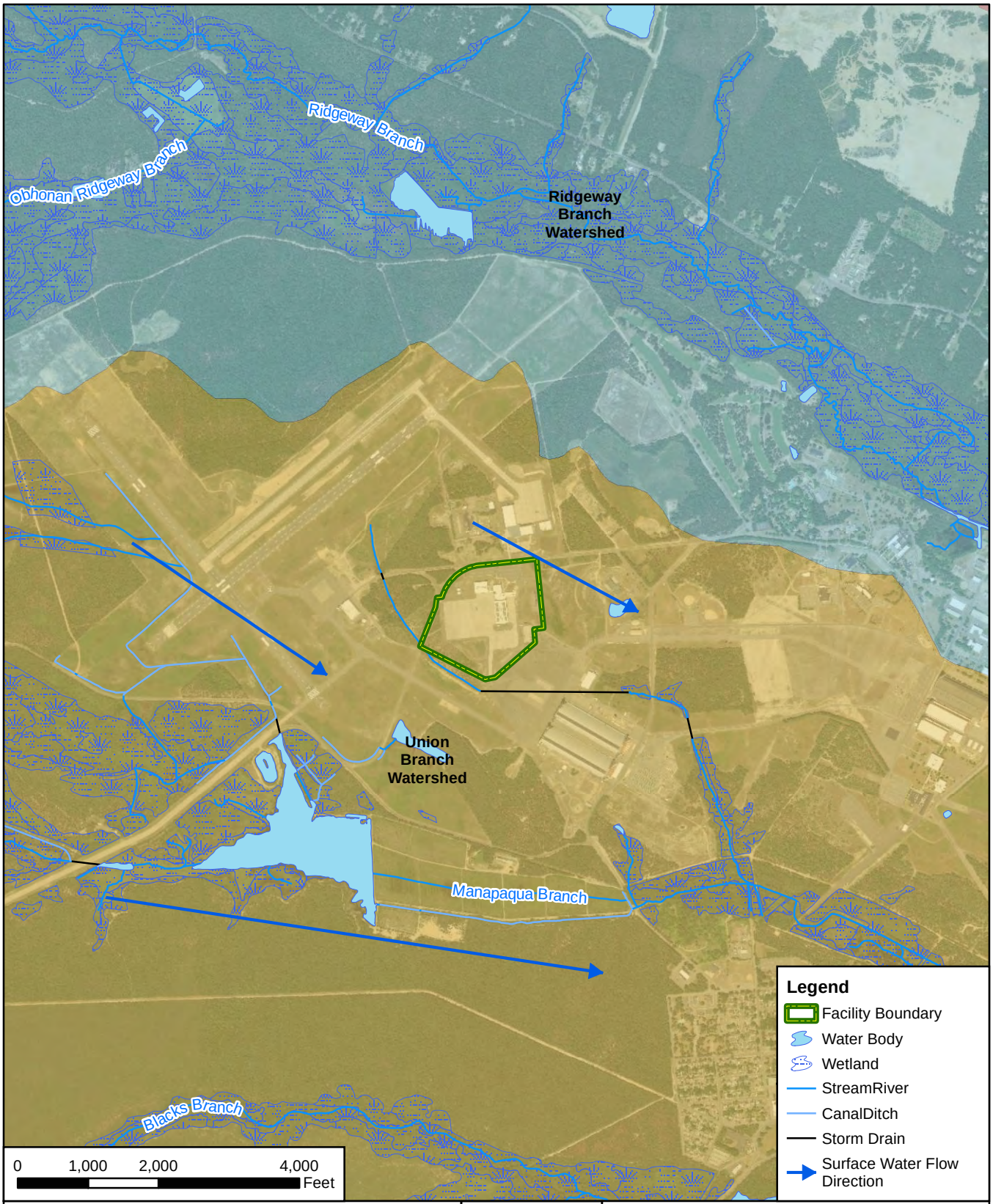

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SCALE	1:24,000	CHK BY	AB	9/10/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/10/2019

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Surface Water Features

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Figure 1-3

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2. Fire Training Areas

The Lakehurst AASF does not have a certified firefighting unit. Most of the fire training is conducted by the JBMDL Response Unit. Based on interviewee's knowledge of ARNG facility history since 2013, fire training did not occur on the ARNG facility's boundaries. No FTAs were identified during the PA based on these data (**Appendix B**).

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3. Non-Fire Training Areas

Two non-FTAs were identified during the PA and include the two AASF hangars: Buildings 790 and 780. Descriptions of the non-FTAs are presented below, and the non-FTA locations are shown on **Figure 3-1**. Photographs of the non-FTAs appear in **Appendix C**.

3.1 Building 790 Fire Suppression System Releases

The Cold Storage Hangar, Building 790, was constructed between 2014 and 2015, and it is located at the northern end of the Lakehurst AASF helipad, at geographic coordinates 40°1'59.81"N; 74°20'26.10"W (**Figure 3-1**). Building 790 contains a 1,000-gallon AFFF storage tank connected to a deluge system. Comunale Company, Inc. performed the installation and testing of the AFFF deluge system. For the initial testing in 2015, they used mock foam known as Planet Safe. No AFFF spills, leaks, or PFAS contamination are attributed to the initial testing of the deluge system. However, Building 790 was the source of two AFFF spill incidents which occurred on 12 June 2017 and 26 October 2017. Both incidents are described below.

On 12 June 2017, approximately 1,000 gallons of C8 3% AFFF were released in the maintenance room on the eastern side of the Building 790. The spill was caused by an incorrectly installed cap on the tank manifold system. Pressure built up within the tank and blew the cap off, releasing the C8 3% AFFF. The pressure of the AFFF filling the maintenance room cracked the sheetrock wall separating the maintenance room and the hangar bay, causing AFFF to spill west onto the concrete floor in the hangar bay of Building 790. The pressure also pushed open the doors on the east side of the maintenance room and spilled out into the grassy area between Buildings 790 and the Warm Storage Hangar (Building 780) (**Figure 3-1; Appendix C**).

A large amount of the AFFF spilled in the grassy area and entered a storm drain located between Buildings 790 and 780. The AFFF exited the storm drain from the outfall located approximately 100 feet south of the southern end of the helipad and a drain located on the west side of Building 780 (**Figure 3-1; Appendix C**). The drain on the west side of Building 780 runs approximately the entire length of the hangar bay from north to south and leads to the sanitary sewer system. During the spill, the drain acted as a conduit transporting a large amount of the AFFF inside the hangar bay. The AFFF that flowed west into the Building 790 hangar bay was pushed into the floor drain with brooms. Water containing AFFF was pulled from the lift station and put into a frac tank before containerization. In total, approximately 10,000 square feet of area were contaminated.

All-State Power Vac contractors (now ACV) performed a clean-up event on 13 June 2017, one day after the first spill event. The pump station that serviced the ARNG facility was emptied and cleaned to prevent any new foam from entering the sanitary sewer system, and the drain in the hangar bay was backfilled with cement. The storm water system was flushed and cleaned, and 9,000 gallons of contaminated water were contained in a frac tank. The C8 3% AFFF containment tank in the maintenance room was emptied, and the system/tank was cleaned. No cement that had AFFF spilled on it was removed. Contaminated soil was excavated from the outfall south of the helipad and from between Buildings 790 and 780. Approximately of 6 – 8 inches of soil was excavated based on the results of soil and water shake tests. No confirmation soil samples were collected from the excavation. The soil was containerized into sixteen lined and covered 20-cubic yard boxes called roll-offs totaling 294 tons (588,000 pounds) and taken to an area east of Building 780 (**Figure 3-1**). No confirmatory samples were collected for analysis; however, a real-time ‘shake test’ was performed with the excavated soil and water. No foaming was observed in the sample jar. AFFF spill forms can be found in **Appendix A**. No contaminated soil/water is thought to have been accidentally released during this clean-up event.

The second spill at Building 790 occurred on 26 October 2017. It is believed that the retrofill event performed by Absolute Fire in August 2017 on the 1,000-gallon AFFF tank in the maintenance

room was done incorrectly. A pressure build-up caused less than 25 gallons of residual C8 3% AFFF to leak into a pipe that leads to a down spout valve outside the building (**Figure 3-1**). This pipe releases rinse water from the tank. A bucket has since been staged in this area and catches very small amounts of residual leakage (**Appendix C**). The AFFF spill extended into the maintenance room and outside Building 790 in an unpaved, grassy area (approximately 100 square feet area) between Buildings 790 and 780, within the bounds of the first spill event from June 2017 (**Figure 3-1; Appendix C**). A 5-inch rubber drain plug was put into place in Building 790's maintenance room after this spill event.

The contaminated soil was excavated to a depth of 10 inches at the down spout and 3 inches in the area, between Buildings 790 and 780. Similar to the other spill, the depth of the excavation was delineated by soil and water shake test results. No confirmation soil samples were collected from the excavation. Excavated soil was placed in one 20-cubic yard roll-off and temporarily stored in the same area as the previous roll-offs from the 12 June 2017 spill event (**Figure 3-1**). No confirmatory samples were collected for analysis; however, a real-time 'shake test' was performed with the excavated soil and water. No foaming was observed in the sample jar. The maintenance room was cleaned by the Joint Base Response team, and no contaminated soil or liquid were spilled during the clean-up event.

The eighteen roll-offs were stored onsite, along with the 9,000 gallons of contaminated water from the June 2017 spill event, for approximately 15 months after the October 2017 release. The contaminated soil was sent to WHI Heritage facility for incineration, and the ashes were sent to a Class-C landfill. and water were then incinerated at temperatures greater than 1,100°F. After incineration, the ashes were sent to a Class-C landfill.

3.2 Building 780 Fire Suppression System Release

The Warm Storage Hangar, Building 780, was constructed between 2014 and 2015. Building 780 is located on the east side of the Lakehurst AASF helipad, approximately 100 feet to the southeast of Building 790, at geographic coordinates 40°1'59.92"N; 74°20'22.83"W. One 900-gallon AFFF storage tank connected to a deluge system exists in the maintenance room at Building 780 (**Figure 3-1; Appendix C**). Comunale Company, Inc. completed the installation and initial testing of the AFFF deluge system. The Planet Safe mock-foam was used for the initial testing in 2015. No AFFF spills, leaks, or PFAS contamination are attributed to the initial testing of the deluge system. Building 780 was the source for one AFFF spill incident that occurred in August 2017.

On 28 August 2017, Absolute Fire was hired to retrofill and replace the bladder of the 1,000-gallon tank in Building 790 and to replace the bladder in the 900-gallon AFFF tank in Building 780. The contractors were also tasked with exchanging the old C8 3% AFFF formula for 3% C306-MS-C (C6) formula in both tanks. During the installation of the new bladders, a small amount of AFFF leaked from the valve of the 900-gallon AFFF tank, creating a stain on the concrete floor (**Appendix C**). During the exchange, the hose connector for the vacuum system on the truck leaked, spilling C8 3% AFFF onto the concrete just east of Building 780 (**Figure 3-1**). A stain still exists at the location of the spill (**Appendix C**). The contractors switched over to a pump system due to the broken hose connector and proceeded to finish the AFFF exchange without incident. No subsequent clean-up event was performed because of the small volume released and confirmation from Lakehurst AASF personnel that no AFFF contacted the surrounding soil. Absolute Fire performs quarterly testing of the deluge systems in both hangars using a minimal amount of AFFF that is all contained. No spills are attributed to the quarterly testing.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Lakehurst AASF, NJ			
REVISED	9/10/2019	GIS BY	MS	9/10/2019
SCALE	1:3,600	CHK BY	AB	9/10/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	9/10/2019

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\NJ\Lakehurst_AASF_Figures\Lakehurst_AASF_PA_Figures\Fig_3-1_Lakehurst_AASF_Non-Fire_Training_Areas.mxd

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4. Emergency Response Areas

No instances of emergency response were identified at the Lakehurst AASF hangar during the PA based on interviews, online research, the Environmental Data Resources, Inc. (EDR) report, and previous JBMDL PA and SI reports (**Appendix A**). The Lakehurst AASF has never had a firefighting unit. The ARNG facility uses the Joint Base Response Unit and the municipal Lakehurst FD for emergency needs. There has been no need for emergency response as of the date of the PA interviews.

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5. Adjacent Sources

JBMDL was the subject of a PFAS PA performed in 2015 and an SI performed in 2016. The complete JBMDL PA and SI have been included in **Appendix A.** Results of the PA identified 51 specific sites where potential AFFF releases may have occurred (HydroGeoLogic, 2015). These sites included FTAs, non-FTAs, fire stations, emergency response areas, and other spill or release areas. None of these sites are owned by the ARNG. Of the 51 identified sites, twelve sites located on NAES Lakehurst represent the adjacent sources closest in proximity to the Lakehurst AASF and are shown in **Figure 5-1**. A brief description of each site, PA recommendation, and SI result are provided below:

- Historical FTA #1: FTA #1 was in operation from 1985 to 1997. During this time, approximately 3 to 4 gallons of AFFF per test per truck (unknown number) were discharged monthly for fire training activities at Historical FTA # 1 from 1985 to 1997.

  Six soil borings were advanced at both FTA #1 and FTA #2 during the JBMDL SI. Surface soil, subsurface soil, and groundwater samples were collected from each of the six borings. The analytical results indicated PFOS was present in one surface soil sample at a concentration exceeding the screening level. PFBS and PFOA concentrations in subsurface soil samples did not exceed the screening levels. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFOA, PFOS, and PFNA were in groundwater samples at concentrations exceeding screening levels for water. The combined concentrations of PFOA and PFOS also exceeded the screening levels in groundwater. Specific findings are available in the JBMDL SI.

- Historical FTA #2: FTA #2 used a mock aircraft for training from 1997 to 2010. Currently, a 400 square foot dumpster with concrete secondary containment is used for training with AFFF. It is estimated that 1,944-2,592 gallons of AFFF have been released.

  Six soil borings were advanced at both FTA #1 and FTA #2 during the JBMDL SI. Surface soil, subsurface soil, and groundwater samples were collected from each of the six borings. The analytical results indicated PFOS was present in one surface soil sample at a concentration exceeding the screening level. PFBS and PFOA concentrations in subsurface soil samples did not exceed the screening levels. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFOA, PFOS, and PFNA were in groundwater samples at concentrations exceeding screening levels for water. The combined concentrations of PFOA and PFOS also exceeded the screening levels in groundwater. Specific findings are available in the JBMDL SI.

- Site AT030: Site AT030 was used for airplane crash testing between 1978 and 1983. During that period, four tests were conducted that resulted in AFFF releases. The fire department had no records of the exact dates the tests were conducted, what vehicles responded to the test, or of the, volumes or type of AFFF used in during the test. Groundwater testing during the SI confirmed the presence of PFAS in exceedance of the USEPA LHA for groundwater.

  Three soil borings were advanced near the edges of AT030 during the JBMDL SI. Surface soil, subsurface soil, and groundwater samples were collected from each of the three borings. Additionally, four existing monitoring wells were sampled and one surface water and sediment sample was collected from a drainage ditch leading away from AT030.

The results of the surface and subsurface soil analyses indicated that the target compounds were not present in soil at concentrations above the screening levels for soil. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFOA, PFOS, and PFNA were in groundwater samples at concentrations that exceeded the screening levels for water. In addition, the combined concentrations of PFOA and PFOS exceeded the screening levels in groundwater. The results of the sediment analyses indicated that the target compounds were not present in sediment at concentrations above the screening levels for soil. The results of the surface water sample analyses indicated the target compounds were not present in the surface water at concentrations above the screening levels for water. However, the combined concentrations of PFOA and PFOS did not exceed the screening levels in surface water. Specific findings are available in the JBMDL SI.

- Former Naval Air Technical Training Center (FTA AT016) – Site AT016 was in operation from 1970 to 1986, during which approximately 7,680 to 11,520 gallons of AFFF were discharged during fire training activities at two separate fire pits. Groundwater testing during the SI confirmed the presence of PFAS in exceedance of the USEPA LHA for groundwater.

  Three borings were advanced within the former fire pits and immediately downgradient during the JBMDL SO. Surface soil, subsurface soil, and groundwater samples were collected from each of the three borings. Additionally, four existing monitoring wells were sampled for groundwater and one surface water and sediment sample was collected.

  The results of the surface soil and subsurface soil analyses indicated that neither PFBS nor PFOA was present in surface soil or subsurface soil at concentrations above the screening levels for soil. However, the results of the surface soil and subsurface soil analyses indicated PFOS was in surface soil and subsurface soil at concentrations above the screening levels for soil. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFNA, PFOA, and PFOS were in groundwater samples at concentrations exceeding screening levels for water. The combined concentrations of PFOA and PFOS in groundwater exceeded the screening levels for water. The results of the sediment analyses indicated that PFOS was present in sediment at concentrations above the screening levels for soil. PFBS and PFOA were not detected at concentrations above the screening levels in sediment samples. Surface water sample analyses indicated PFBS was not present in the surface water at concentrations above the screening levels for water. However, results of the surface water analyses indicated PFNA, PFOA, and PFOS were present in the surface water at concentrations above the screening levels for water. The combined concentrations of PFOA and PFOS in surface water exceeded the screening levels for water. Specific findings are available in the JBMDL SI.

- Old Firefighting School (AT014) – AT014 is a former firefighting school that was in operation from the 1920s to 1980. During this time, AFFF was used during fire training activities; however, it is unknown what volume or type of AFFF was used at the site.

  Two soil borings were advanced at AT014 for the collection of surface soil, subsurface soil and groundwater sample during the JBMDL SI. An additional four existing monitoring wells and one surface water sediment location was sampled. The results of the surface and subsurface soils analyses indicated that the target compounds (PFOS, PFOA, PFBS, and PFNA) were not present in soil. Groundwater sample analyses indicated PFBS and PFNA were not present in the groundwater at concentrations above the screening level for water. However, PFOA and PFOS were in groundwater samples at concentrations exceeding

screening levels for water. The combined concentrations of PFOA and PFOS exceeded the screening levels in groundwater. The results of the sediment analyses indicated that the target compounds were not present above soil screening levels. Specific findings are available in the JBMDL SI.

- Firetruck Vehicle Accident: A firetruck crashed and spilled 130 gallons of AFFF concentrate in 1991 after overturning due to icy road conditions. Groundwater testing during the SI confirmed the presence of PFAS in exceedance of the USEPA LHA for groundwater.

  Two borings were advanced at the Firetruck Vehicle Accident site for the collection of surface soil, subsurface soil, and groundwater samples during the JBMDL SI. Two additional borings were advanced for groundwater collection and one surface water and sediment samples was collected approximately 500 feet east of the site of the accident.

  The results of the subsurface soil and surface soil analyses indicated that the target compounds were not present in soil at concentrations above the screening levels for soil. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFOA, PFOS, and PFNA were in groundwater samples at concentrations exceeding screening levels for water. The results of the sediment sample analyses indicated PFOS was present in the sediment above the screening levels for soil. The results of the surface water sample analyses indicated PFBS was not present in the surface water at concentrations above the screening levels for water; however, PFOA, PFOS, and PFNA were present at concentrations above the screening levels for water. The combined concentrations of PFOA and PFOS exceeded the screening levels in groundwater and surface water. The results of the sediment sample analyses indicated PFBS and PFOA were not present in the sediment at concentrations above the screening levels; however, PFOS was detected above the screening level for soil. Specific findings are available in the JBMDL SI.

- Fire House (Building 687): Building 687 is a currently active fire station for NAES Lakehurst that houses seven trucks which all store AFFF (15-500 gallons). To date, there have been no documented releases or spills. The 2015 PFAS PA closed out this building with no additional investigation recommended.

- Old Fire Department (Building 335): Building 335 was in operation from 1959 to 2006, when it was demolished. Three crash trucks storing AFFF were housed in the building, but no documented release of AFFF was ever recorded. The 2015 PFAS PA closed out this building with no additional investigation recommended.

- Old Fire Station (Building 128): Building 128 was in operation from 1937 to 2010. At some time, Building 128 housed one truck that stored a small volume of AFFF. No documented released of AFFF were ever recorded. The 2015 PFAS PA closed out this building with no additional investigation recommended.

- Hangar 6 plane crash: Approximately 100 gallons of AFFF were used to extinguish an 8 July 1994 plane crash near Hangar 6. Groundwater testing during the SI confirmed the presence of PFAS in exceedance of the USEPA LHA for groundwater.

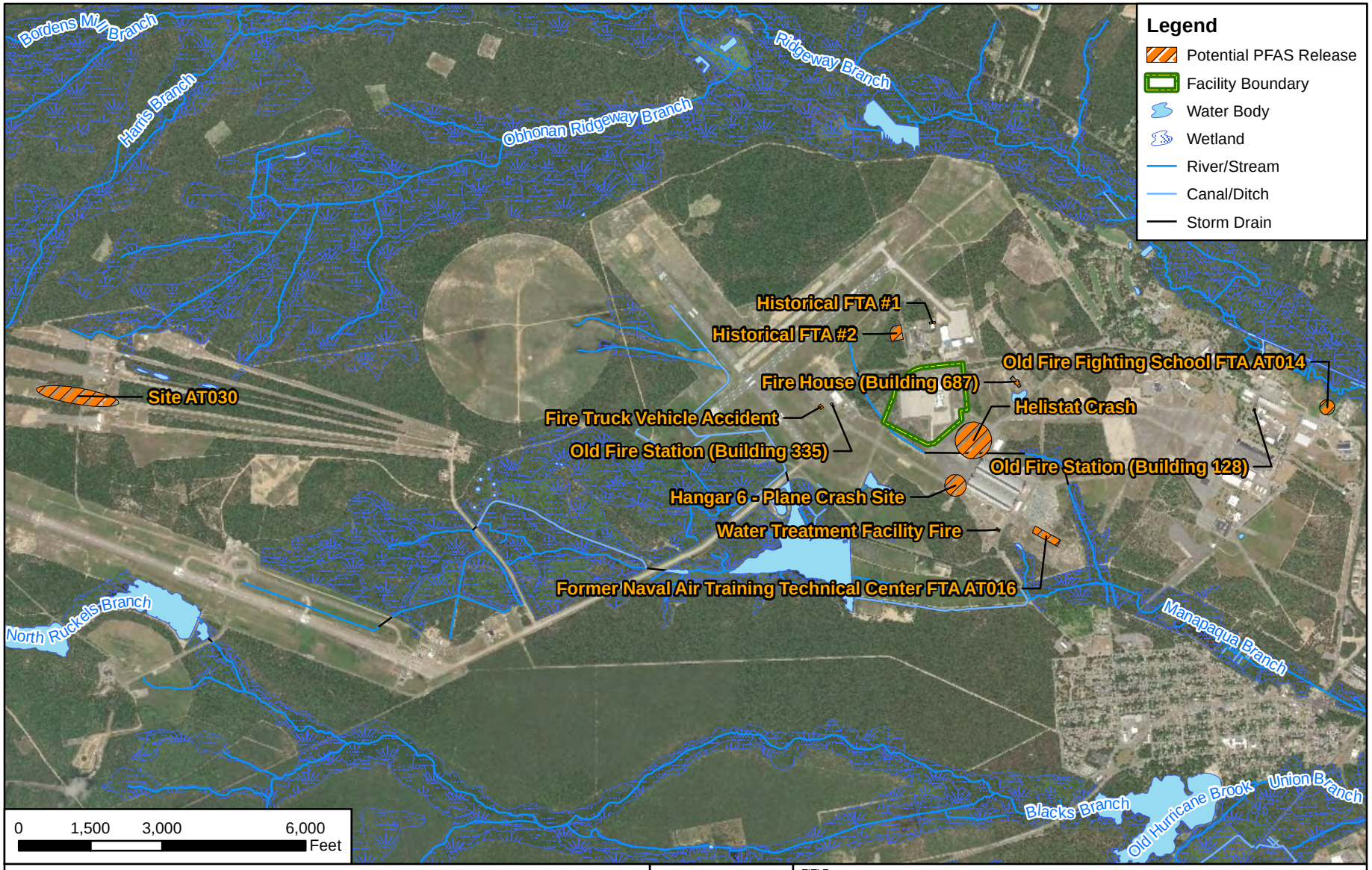
  Three borings were advanced within the plane crash site for collection of subsurface soil and groundwater samples during the JBMDL SI. Additionally, an existing monitoring well was sampled for groundwater. The results of the subsurface soil analyses indicated that the target compounds were not present in soil at concentrations above the screening levels for soil. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFOA,

PFOS, and PFNA were detected in groundwater samples at concentrations exceeding screening levels for water. The combined concentrations of PFOA and PFOS exceeded the screening levels in groundwater. Specific findings are available in the JBMDL SI.

- Water Treatment Facility Fire: According to information in the JCMDL PA, a fire occurred on 17 June 1993, where an estimated 4,000 gallons of AFFF and water were used to extinguish the fire. No AFFF escaped the treatment facility secondary containment, and there was no release to the environment. The 2015 PFAS PA closed out this building with no additional investigation recommended.

- Helistat crash: Approximately 200 gallons of AFFF were used to extinguish a Helistat crash on 1 July 1986 near Hangar 5. Groundwater testing during the SI confirmed the presence of PFAS in exceedance of the USEPA LHA for groundwater.

  Five borings were advanced within and around the Helistat crash site for collection of subsurface soil and groundwater samples during the JBMDL SI. Additionally, existing monitoring well was sampled for groundwater and one surface water and sediment sample was collected from a culvert in the Manapaqua Branch. The results of the subsurface soil analyses indicated that the target compounds were not present in soil at concentrations above the screening levels for soil. Groundwater sample analyses indicated PFBS was not present in the groundwater at concentrations above the screening level for water. However, PFOA, PFOS, and PFNA were detected in groundwater samples at concentrations exceeding screening levels for water. The combined concentrations of PFOA and PFOS exceeded the screening levels in groundwater. The results of the sediment analyses indicated that the target compounds were not present in sediment at concentrations above the screening levels for soil. The results of the surface water sample analyses indicated the target compounds were not present in the surface water at concentrations above the screening levels for water. The combined concentrations of PFOA and PFOS did not exceed the screening levels in surface water. Specific findings are available in the JBMDL SI.



CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Lakehurst AASF, NJ			
REVISED	9/10/2019	GIS BY	MS	9/10/2019
SCALE	1:36,000	CHK BY	AB	9/10/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/10/2019

TITLE

Adjacent Sources

AECOM

12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, AOI 1 was identified at the Lakehurst AASF as shown in **Figure 6-1**. The following section describes the CSM components and the specific preliminary CSM developed for AOI 1. 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. Receptors at the Lakehurst AASF include site workers, construction workers, and trespassers. Potential offsite receptors include nearby residents in the surrounding communities.

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. Therefore, only the ingestion and inhalation exposure pathways of PFAS are evaluated. The receptors for the Lakehurst AASF AOI 1 include site workers, construction workers, residents, and trespassers.

6.1 AOI 1: Building 790 and Building 780 Fire Suppression System Releases

AOI 1 includes three Fire Suppression System Releases from Buildings 790 and 780. Both buildings are equipped with AFFF fire suppression systems. Two releases have occurred at Building 790 since the building was constructed between 2014 and 2015. On 12 June 2017, an incorrectly installed cap blew off the tank manifold system due to a buildup of pressure. As a result, AFFF spilled west into the hangar bay of Building 790 and east into a grassy area between Buildings 790 and 780. It was documented that 1,000 gallons of C8 3% AFFF was released. A large amount of the spill went into a storm drain located in the grassy area between Buildings 790 and 780 and flowed to an outfall located approximately 100 feet south of the southern end of the helipad. The AFFF, which entered the hangar bay of Building 790, was pushed into a floor drain that leads to the sanitary sewer system. Impacted surface soil was excavated from the area between Buildings 790 and 780 and the outfall south of the helipad to a depth of 6 to 8 inches.

The second release at Building 790 occurred on 26 October 2017. During maintenance activities, less than 25 gallons of C8 3% AFFF were released from a leak in a pipe that leads to a down spout valve located outside Building 790. As a result, the AFFF spilled west, into the grassy area between Buildings 790 and 780, within the bounds of the spill event from 12 June 2017. The impacted soil was excavated to a depth of 10 inches immediately surrounding the down spout and 3 inches in the area between Buildings 790 and 780.

The third release occurred in Building 780 on 28 August 2017. During the installation of the new bladders, a small amount of AFFF leaked from the valve of the 900-gallon AFFF tank, creating a stain on the concrete floor. Additionally, during the exchange, the hose connector for the vacuum system on the truck leaked, spilling C8 3% AFFF onto the concrete just east of Building 780. No subsequent clean-up event was performed because of the small volume released and confirmation from Lakehurst AASF personnel that no AFFF contacted the surrounding soil.

Immediate clean-up and shallow excavation in the areas of direct contact of AFFF to the ground surface limit the potential PFAS exposures of site workers and construction workers in surface soil. However, there is the potential for PFAS to have migrated from surface soil to subsurface soil prior to the excavation activities. Therefore, ground-disturbing activities at AOI 1 could result in site worker, construction worker, and trespasser exposure to potential PFAS contamination via ingestion of subsurface soil. Ground-disturbing activities to subsurface soil could result in construction worker exposure via ingestion of soil. Therefore, the inhalation and ingestion pathways for these receptors are considered potentially complete for AOI 1.

PFAS are water soluble and can migrate readily from soil to groundwater, which is estimated to be 5 to 30 feet bgs. Due to the nature of PFAS and the shallow groundwater, potential PFAS releases to soil at AOI 1 may migrate from the subsurface soil to the groundwater via leaching. Therefore, the ingestion exposure pathway for groundwater is considered potentially complete for construction workers. Public water supply wells exist cross-gradient and downgradient of AOI 1. While most PWS are screened within the deeper Potomac-Raritan-Magothy aquifer, some offsite PWS wells at JBMDL and in the surrounding communities are screened within the shallow Kirkwood-Cohansey aquifer. As a result, the ingestion exposure pathway for groundwater is also potentially complete for offsite residents.

No surface water bodies were identified within the Lakehurst AASF property boundary; however, the nearest surface water bodies are a retention pond and unnamed drainage ditch located approximately 0.15 miles and 0.25 miles southwest of the ARNG facility, respectively. The retention pond is the location of the outfall where AFFF was released due to the 1,000-gallon release at Building 790. Stormwater was captured within AOI 1 and channeled towards the retention pond and drainage ditch to the southwest of the helipad. This ditch eventually joins the Manapaque Branch and flows east through JBMDL. Although surface water is not used as a source for drinking water, the ingestion exposure pathways for surface water and sediment are potentially complete for site workers, construction workers, and trespassers. The preliminary CSM for AOI 1 is shown on **Figure 6-2**.

CLIENT	ARNG
PROJECT	Preliminary Assessment for PFAS at Lakehurst AASF, NJ

REVISED	10/19/2019	GIS BY	MS	10/19/2019
SCALE	1:22,800	CHK BY	AB	10/19/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	10/19/2019

- Area of Interest
- Potential PFAS Release
- Facility Boundary
- Water Body
- Wetland
- River/Stream
- Canal/Ditch
- Storm Drain
- Surface Water Flow Direction
- Inferred Groundwater Flow Direction

N

Areas of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 6-1

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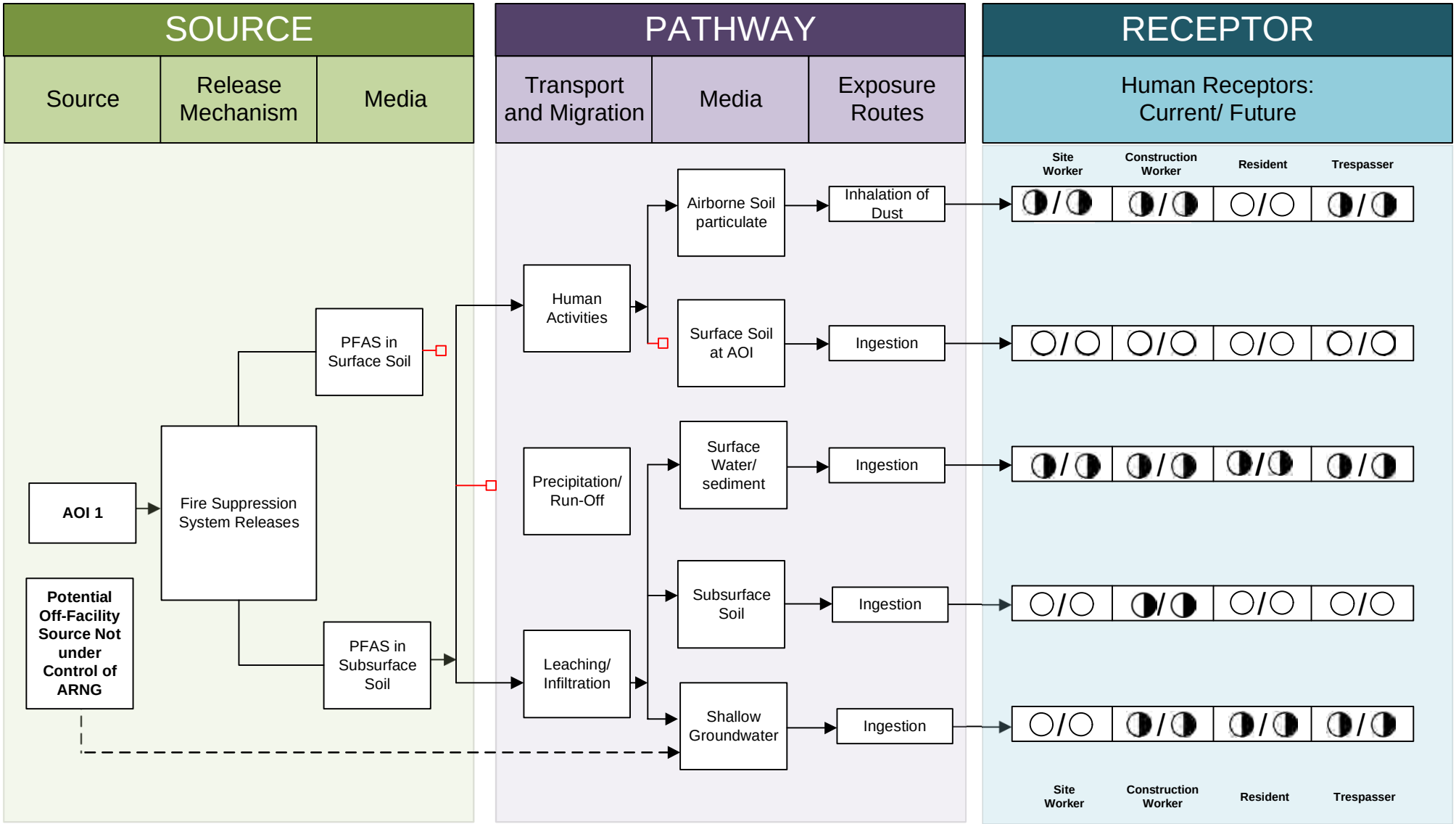

LEGEND

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

NOTES

1. The resident receptor refers to an off-site resident.
2. No surface water bodies were identified at the facility, but the surface water/sediment pathway is considered for off-site receptors because it is not known whether there are off-site groundwater discharges to surface water bodies.

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 Fire Suppression System Releases

7. Conclusions

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

7.1 Findings

AOI 1 was identified (**Table 7-1**) at Lakehurst AASF during the PA (**Figure 7-1**).

Table 7-1: AOIs at Lakehurst AASF

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Building 780 and 790	NJARNG	Multiple AFFF spills in June, August, and September 2017

Based on actual AFFF releases at AOI 1, there is potential for exposure to PFAS contamination from subsurface soil through the inhalation of dust to site workers (e.g., Lakehurst AASF military, non-military, staff, and visitors), onsite construction workers, and trespassers. There are additional exposures to PFAS through ingestion of surface water/sediment and subsurface soil via leaching/infiltration to site workers, construction workers, and trespassers. Finally, there is a potential exposure pathway to construction workers, residents, and trespassers via shallow groundwater.

7.2 Uncertainty

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 Lakehurst AASF. Historically, documentation of PFAS use was not required because PFAS were considered benign. Records were not typically kept by the ARNG facility or available during the PA on the use of AFFF or other PFAS containing material at the AASF.

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 ARNG facility. Sometimes, the provided information was vague. 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, and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations. 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, 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: Sources of Uncertainty

Location	Source of Uncertainty
AOI 1 Building 790 and 780	• The PA relied on the recollections of interviewed personnel, and some information gathered was in conflict to written record of the spill event.

Location	Source of Uncertainty
AOI 1 Building 790 and 780 (cont.)	• Specific volumes of AFFF released during the 28 August 2017 and 26 October 2017 releases were not recorded in the spill reports. • Records documenting the replacement of the AFFF bladders for tanks in Buildings 790 and 780 were not available during interviews for review. • Interviewees stated no AFFF was released into the environment during the spills on the outside concrete; however, factors such as cracks in the concrete, or weather (rain/wind) washing the foam away at a later point in time could have caused a release into the environment. • The full extent of the soil removal in the grassy area and outfall, cleaning of the hangar floor drain, and cleaning of the sanitary sewer catch was not fully documented. Without confirmation sampling, it is possible the full extent of impacts were not fully removed from the environment.

7.3 Potential Future Actions

Interviews and records indicate that current or former ARNG activities may have resulted in potential PFAS releases at AOI 1. Based on the preliminary CSM developed for AOI 1, there is potential for receptors to be exposed to PFAS contamination in subsurface soil and groundwater. In addition, there is potential for offsite receptors to be exposed in groundwater, drinking water, surface water and sediment. **Table 7-3** summarizes the rationale used to determine if AOI 1 should be considered for further investigation under the CERCLA process and undergo an SI.

It should be noted that results from the JBMDL PFAS PA and SI have identified adjacent sites and detail the investigation of these sites, which contain impacted groundwater greater than the USEPA LHA. As a result of activities from other stakeholders, it is possible that PFAS impacts may have migrated from these offsite sources to the AASF property boundary. Any further investigation at the Lakehurst AASF should focus, as much as possible, on the most likely transport methods and media impacted by the releases identified in this PA.

The ARNG evaluates the need for an SI based on the presence of a PFAS release, possible receptors, and the migration potential of PFAS contamination to receptors.

Table 7-3: PA Findings Summary

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1	40°1’59.45”N; 74°20’23.98”W	Several documented releases of AFFF from the fire suppression system at the Lakehurst AASF. AFFF was directly in contact with surface soil and entered a storm drain transporting it under the apron and into a retention basin.	Proceed to an SI, focus on subsurface soil and groundwater

CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Lakehurst AASF, NJ			
REVISED	9/10/2019	GIS BY	MS	9/10/2019
SCALE	1:22,800	CHK BY	AB	9/10/2019
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community		PM	RG	9/10/2019

- Area of Interest
- Potential PFAS Release
- Facility Boundary
- Water Body
- Wetland
- River/Stream
- Canal/Ditch
- Storm Drain

N

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 7-1

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8. References

AECOM, 2010. *Application of a Regional CSM for a Large Installation*. Ft Dix, Lakehurst, and McGuire Combined. Power Point Presentation. April 2010.

Aerostar SES LLC, 2018. Site Inspection Report of Fire Fighting Foam Usage at Joint base McGuire-Dix-Lakehurst, Burlington and Ocean Counties, New Jersey. April

HydroGeoLogic, 2015. *Final Preliminary Assessment Report for Perfluorinated Compounds at Joint Base McGuire-Dix-Lakehurst New Jersey*. Air Force Civil Engineer Center. August 2015.

NJDEP, 2018. *Notice of Administrative Change, Ground Water Quality Standards, N.J.A.C. 7:9C Appendix Table 1, Specific Ground Water Quality Criteria for 1,2,3- Trichloropropane (TCP) and Perfluorononanoic Acid (PFNA)*. Water Resource Management, Division of Water Monitoring and Standards. September 4, 2018.

United States Census Bureau, 2018. QuickFacts: Ocean County, New Jersey; United States. Accessed July 11 2019 at https://www.census.gov/quickfacts/fact/table/oceancountynewjersey,US/POP060210.

US Climate Data, 2019. *Climate New Jersey.* Accessed July 7 2019 at https://www.usclimatedata.com/climate/lakehurst/new-jersey/united-states/usnj0249.

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

USEPA, 1991. *Guidance for Performing Preliminary Assessments under CERCLA*. EPA/540/G-91/013. September 1991

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

USEPA, 2016a. *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA).* Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-005. May.

USEPA, 2016b. *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS).* Office of Water (4304T). Health and Ecological Criteria Division, Washington, DC 20460. EPA Document Number: 822-R-16-004. May.

USEPA, 2017. UCMR 3 (2013-2015) Occurrence Data by State. Occurrence Data for the Unregulated Contaminant Monitoring Rule. Accessed 9 July 2019 at https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule. January.

USGS, 1989. *Hydrogeologic Framework of the New Jersey Coastal Plain*. Regional Aquifer System Analysis. U.S. Geological Survey Professional Paper 1404-B. 1989.

USGS, 1998. *Ground-Water Flow in the New Jersey Coastal Plain*. Regional Aquifer-System Analysis – Northern Atlantic Coastal Plain. U.S. Geological Survey Professional Paper 1404-H. 1998.

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Appendix A
Data Resources

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Data resources will be provided separately on CD. Data resources for the Lakehurst AASF include:

Environmental Data Resources Report

- 2018 The EDR Summary Radius Map Report, Lakehurst Army Aviation Support Facility, Lakehurst, NJ 08733. December
- 2018 The EDR Radius Map™ Report with GeoCheck®; Lakehurst Army Aviation Support Facility, Lakehurst, NJ 08733. December

Previous Investigations

- HydroGeoLogic, 2015. Final Preliminary Assessment Report for Perfluorinated Compounds at Joint Base McGuire-Dix-Lakehurst New Jersey. Air Force Civil Engineer Center. August 2015.
- Aerostar SES LLC, 2018. Final Site Inspections Report of Fire Fighting Foam Usage at Joint Base McGuire-Dix-Lakehurst Burlington and Ocean Counties, New Jersey. Air Force Civil Engineer Center and U.S. Army Corps of Engineers. April 2018

Regulatory Advisories and Orders

- NJDEP, 2018. Notice of Administrative Change, Ground Water Quality Standards, N.J.A.C. 7:9C Appendix Table 1, Specific Ground Water Quality Criteria for 1,2,3- Trichloropropane (TCP) and Perfluorononanoic Acid (PFNA). Water Resource Management, Division of Water Monitoring and Standards. September 4, 2018.
- NJDEP, 2019a. Technical Support Document: Interim Specific Ground Water Criterion for Perfluorooctane Sulfonate (PFOS). Division of Science and Research. March 6, 2019.
- NJDEP, 2019b. Technical Support Document: Interim Specific Ground Water Criterion for Perfluorooctanoic Acid (PFOA). Division of Science and Research. March 6, 2019.

Real Estate Documents

- Host-Tenant Real Estate Agreement Between Department of the Navy and Department of the Army, 2009. Navy contract No N40085-09-RP-00221. September.
- Department of the Army License to the State of New Jersey, Department of Military and Veterans Affairs, New Jersey Army National Guard to use Real Property at Naval Air Engineering Station, Lakehurst, New Jersey, 2009. License No DACA51-3-09-139. October

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

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NJARNG Lakehurst
Route 547, Mail Stop 150-2
Joint Base MDL, NJ 08733-5000
November 14, 2018

11/14/2018 10:00- Interview with [redacted] NJARNG Lakehurst Facility Environmental Manager

[redacted] has been working at the site from 2013 to the present. [redacted] office is located in Lawrenceville, NJ as he manages more than one facility. In addition to the discharge events discussed on November 15th, [redacted] could not recall nor had any evidence to support any additional AFFF discharge on the Lakehurst Facility property.

AFFF Usage

Spill Event #1 (AFFF 3%)
Occurred on 06/12/2017 with a total of 1,000 gallons were spilled. [redacted] believes that the spill was due to an old cap on the system that [redacted] believes was installed improperly. "The pressure blew the cap off." He described the AFFF had filled the entire maintenance room in Building 790 and broke through the sheetrock leaking into the hangar floor (in the western direction) and broke through the doors (in the eastern direction) to pour outside. The AFFF flowed into the Cold Storage Hangar, covering a good section of the bay floor and entered the grate in the floor. During the site walk through the room where the AFFF container is held in the Maintenance Room in Building 790 there is a small drain on the floor. [redacted] explained that this drain leads to the sewer system. The joint base found foam in the sewer following the spill, and the drain was later filled with concrete.

Spill Event # 2 (AFFF 3%)
Occurred in the same area as the first (between building 780 and 790). [redacted] believes the contractor Absolute Fire that was fixing the system performed the task incorrectly. He described that the foam leaked out through the pipe that leads to a valve outside of the building.

Retrofitting Event/ Spill Event #3
Occurred on 8/28/2017. Spill event # 3 did not enter any of the storm drains. The retrofitting took a couple of days. Both of the bladders in the AFFF storage were replaced, one in the maintenance room in Building 780 and the same in Building 790.

The Cleanup Event
Occurred on 06/13/2017. The day following Spill Event #1, a cleanup event with the contractor's vac system occurred. According to [redacted] the contactor was All-State Power Vac, currently known as ACV. Approximately 6-8 inches below grade was excavated in the area where Spill Event #1 occurred, as well as the Outfall. No excavation was performed after Spill #2. The storm water was flushed and stored on-site. The excavated soil was also stored on-site in roll-offs for approximately 15 months, when they were transported to an incineration facility. Following incineration, the ashes were taken to a Class C landfill that was preapproved.

During the site tour, the first building visited was Building 780 that housed the regular Warm Storage Hangar. The AFFF system in this building did not malfunction. The bladder was replaced during the retrofitting event.

Site Walk and Visual Inspection
The area where the retrofitting contractor's truck spilled foam on the concrete was visited. The viewing of the site where the roll-offs were stored followed, where [redacted] pointed out that the roll-offs were fitted with caps to prevent the water from infiltrating the roll-offs. The next location visited was the main spill #1 area, between Building 780 and 790. The second spill entered from a drain that was outside of the maintenance room that is indicated by a white bucket underneath it. This area was also excavated. From the main spill # 1 area, the maintenance room of the Cold Storage Hangar (building 790) that houses the AFFF system was visited. During the first spill, the two adjacent doors to this room were blown open and needed to be repaired. The bottom foot of the opposite wall was (sheetrock from the floor to about 2 feet above it) crumbled during the first spill, allowing for the AFFF to leak onto the cold storage floor. [redacted] pointed out that a drain in the bottom of the maintenance room floor that leads to the sanitary sewer. The hole has since been filled in with concrete. On the cold storage hangar floor there is a grate in the floor that the employees had pushed the foam into.

Adjacent Property Influence:
[redacted] indicated that to the best of his knowledge flow of groundwater is in the northeastern direction. Directly to the east/northeast of the property is a golf course. [redacted] believes the golf course has an irrigation system.

Additional Personnel:
[redacted] provided the names of former employees [redacted] and [redacted] as personnel who would be able to provide information on an initial test of the AFFF deluge system in the Cold Storage Hangar.

Requests from [redacted] and [redacted]

1. Some personnel were not present for the meeting. [redacted] suggests that a WebEx be set up for Monday 11/26/18 with said personnel.
2. More specific information of the details from the second spill event (ex: date, extent, photos, etc.)
3. Information from the Lakehurst Fire Department, responses to any calls on the property where AFFF was discharged
4. GIS data from McGuire Airforce base
5. Manifest from soil incineration (once obtained)
6. Bills from the spill clean up

NJARNG Lakehurst AASF Facility
Route 547, Mail Stop 150-2
Joint Base MDL, NJ 08733-5000
November 14, 2018

11/14/2018 10:00- Interview with [redacted]

[redacted] has been working at the facility from 2016 to the present. [redacted] office is located in Lawrenceville, New Jersey as she manages more than one facility. Other than the events discussed below [redacted] could not recall, nor had evidence to support any additional AFFF discharge events on the Lakehurst Facility property.

AFFF Usage

Spill Event #1
(AFFF 3%) occurred on 06/12/2017. According to [redacted] and documentation provided by her, a total of 1,000 gallons were discharged. [redacted] indicated on a map where the storm drain outside of the maintenance room is located. The AFFF from the spill went into this storm drain (outside of the maintenance room) and came out of another storm drain (indicated on the map) and an outfall on the other side of the helipad area. [redacted] indicated on the map the North-South direction of the grate that runs almost the entire extent of the bay. [redacted] explained how the employees were pushing the AFFF into the grate on the floor of the Cold Storage Hangar with brooms to help clean it up. During the site walk, the small drain was seen on the floor in building 790, where the AFFF container was stored.

Spill Event #2
(AFFF 3%) was a much smaller spill and occurred in the same place as Spill Event #1. The retrofitting was after the second spill event, so this had to occur before August of 2017. She could not immediately recall the exact date.

The Retrofitting Event/Spill Event #3
Occurred on 08/28/2017. When the trucks came to retrofit the tanks, some of the AFFF spilled out onto the concrete. [redacted] could not recall nor provide information on the exact quantity of the spill. The contractor's vac truck removed the spill, but there is a stain on the cement where the spill occurred. The cement was not excavated [redacted] indicated the location on the map and the physical location during the Site Walk Visual Inspection).

The Cleanup Event
Occurred on 06/13/2017. This event was the excavation of the contaminated areas from Spill #1 and Spill #2. [redacted] indicated on the map where the roll-offs were located. During the site walk she indicated that there were roughly 17-18 roll-offs although the documentation she provided specified 14 roll-offs. [redacted] indicated that the roll-offs were removed roughly 15 months after the cleanup event but could not provide a specific date. None of the concrete or pavement or the land were the roll-offs were staged that had foam on it was removed or replaced.

Site Walk and Visual Inspection

During the site walk, the first building that was visited was 780 with the regular warm storage hangar. The AFFF system in this building did not malfunction. This bladder was replaced during the retrofitting event. [redacted] pointed out that during the installation of the new bladder, some of the AFFF leaked out of the valve in the tank. There are stains present on the concrete floor, which she pointed out.

The next area visited was outside where the retrofitting contractor's truck spilled foam on the concrete. [redacted] pointed out the approximate extent of the spill.

The inspection team then preceded to the site where the roll-offs was stored.

[redacted] and [redacted] escorted USACE and AECOM personnel through building 780 to the area between 780 and 790 where the first two spills occurred. The black tarps in the photos indicate where the storm drains are. The second spill came from a drain on the outside of the maintenance room that now has a white bucket underneath it. The next location visited was the maintenance room of the cold storage hangar (building 790) that houses the AFFF system. [redacted] indicated that this entire room filled with foam during Spill Event #1. [redacted] then pointed out where the grate in the floor was that the employees had pushed the AFFF into.

Adjacent Property Influence: [redacted] pointed out that there are a line of private residential homes along Ocean County RT 571 approximately 1.5 miles away in the NE direction.

Requests from [redacted] and [redacted]:

1. Some personnel were not present for the meeting. [redacted] suggests that a WebEx be set up for Monday 11/26/18 with said personnel.
2. More specific information of the details from the second spill event (ex: date, extent, photos, etc.)
3. Information from the Lakehurst Fire Department, responses to any calls on the property where AFFF was discharged
4. GIS data from McGuire Airforce base
5. Manifest from soil incineration (once obtained)
6. Bills from the spill clean up

NJARNG Lakehurst
Route 547, Mail Stop 150-2
Joint Base MDL, NJ 08733-5000
November 15, 2018

11/15/2018- Phone Interview with [redacted] and [redacted], AECOM

[redacted] is a retired NJARNG employee who oversaw the AFFF system installation and initial test.

[redacted] indicated that 2-2.5 years ago a dry test was done after installing the deluge system in the hangar. No AFFF was discharged during the test. He indicated they conducted tests on all of the systems and Lakehurst obtained copies of all of the certificated and records of testing. He believes these should still be in the basement of the AASF. [redacted] also confirmed that Lakehurst Fire Department oversaw all of the testing of fire prevention systems and indicated that everything was in compliance.

Appendix B.2
Visual Site Inspection Checklists

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Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG
Site / Area Acreage: Building 790
Historic Site Use (Brief Description): AASF; Cold Storage Hangar

Current Site Use (Brief Description): AASF

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

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

AFFF is stored in the maintenance room adjacent to the Cold Storage Hangar inside Building 790. AFFF 3% was discharged from the holding system on the morning of June 12th, 2018. The foam broke down the wall separating the maintenance room and the Cold Storage Hangar and leaked onto the hangar floor.

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

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

Usage has been documented by a spill incident form by the Lakehurst Personnel

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

3a. Indicate what businesses are located near the site

Many surrounding buildings in immediate area

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

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

ARNG

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 according to milspec, has since been retrofitted to 6%

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

no set schedule; documentation was visible on chemical labels on the tanks

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

_____; note, no consensus on the shelf life of AFFF (range 2-25 years)

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

Yes, trench drains lead

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

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

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

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:

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):

Visual Survey Inspection Log

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

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

The floor is concrete with epoxy sealant

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

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

Access is restricted to the airfield

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:

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:

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
Photograph No. 10	Outside Building 790	Outside south entrance of Building 790 (Cold Storage Hangar) where the AFFF spill originated from.
Photograph No. 11	Outside Building 790	Location of second spill directly east of Building 790 (Cold Storage Hangar).
Photograph No. 12	AFFF Valve outside of 790	Location of second spill directly east of Building 790 (Cold Storage Hangar). AFFF leaked out of valve (indicated by white bucket underneath).
Photograph No. 21	Trough drain in 790	Water line caps in the area of the First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar).
Photograph No. 22	Cold Storage Hangar in 790	Building 790 (Cold Storage Hangar) inside Hangar adjacent to AFFF maintenance room. During discharge event AFFF knocked the dry wall out and leaked onto the hangar floor. New sheetrock is indicated by different coloring from the floor up.
Photograph No. 23	Cold Storage Hangar in 790	Building 790 (Cold Storage Hangar) deluge system.
Photograph No. 24	Cold Storage Hangar in 790	Building 790 (Cold Storage Hangar) deluge system.

Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG
Site / Area Acreage: Between Building 790 and Building 780
Historic Site Use (Brief Description): Outdoor Courtyard

Current Site Use (Brief Description): AASF

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

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

AFFF is stored in the maintenance room adjacent to the Cold Storage Hangar inside Building 790. AFFF 3% was discharged from the holding system on the morning of June 12th, 2018. The foam broke down the doors separating the maintenance room and the outdoor area.

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

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

Usage has been documented by a spill incident form by the Lakehurst personnel

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

3a. Indicate what businesses are located near the site

Many surrounding buildings in immediate area

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

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

ARNG

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 according to milspec, has since been retrofitted to 6%

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

no set schedule; documentation was visible on chemical labels on the tanks

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

_____; note, no consensus on the shelf life of AFFF (range 2-25 years)

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

Yes, 2 stormwater drains that lead to an outfall and another storm drain appx 30 feet south.

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

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

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

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:

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):

This area has been excavated as part of the remediation. Contaminated soil was excavated to a depth of 6 inches.

Visual Survey Inspection Log

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:

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:

Access is restricted to the airfield

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:

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:

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
Photograph No. 8	Between Building 780 and 790	Area of First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar). Black tarp surrounds location of storm drain.
Photograph No. 9	Storm drain between Building 780 and 790	Location of AFFF discharge from spill area between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar). AFFF spilled out of storm drain.
Photograph No 13	First spill area between 780 and 790	Area of First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar).
Photograph No. 20	Water line in the area of Spill #1	Water line caps in the area of the First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar).

Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG

Site / Area Acreage: Building 790 Maintenance Room

Historic Site Use (Brief Description): AASF; Where AFFF storage tank is held. Directly adjacent to Building 790 Cold Storage Hangar. Also includes doors that lead outside.

Current Site Use (Brief Description): AASF

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

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

AFFF is stored in the maintenance room adjacent to the Cold Storage Hangar inside Building 790. AFFF 3% was discharged from the holding system on the morning of June 12th, 2018. The foam broke down the door and part of the wall in the room leaking it to the outside. According to facility personnel the AFFF filled the room from floor to ceiling.

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

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

Usage has been documented by a spill incident form by the Lakehurst Personnel

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

3a. Indicate what businesses are located near the site

Many surrounding buildings in immediate area

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

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

ARNG

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y / N** (Not at this particular location on FTIG)

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

3% AFFF according to milspec (has since been retrofitted to 6%)

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

no set schedule; documentation was visible on chemical labels on the tanks

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

_____; note, no consensus on the shelf life of AFFF (range 2-25 years)

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

Yes, drain in the floor leads to WWTP. The drain has since been backfilled with concrete.

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

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

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

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:

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):

Yes, drain in the floor leads to WWTP. The drain has since been backfilled with concrete. The wall that was knocked down by the foam has been replaced as well as the doors that lead to the outside.

Visual Survey Inspection Log

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

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

The floor is concrete with epoxy sealant

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

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

Access is restricted to the Lakehurst personnel only

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:

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:

Additional Notes

The bladder in this tank has since been replaced and the tank has been retrofitted with AFFF 6%

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
Photograph No. 14	Doors to maintenance room	Doors to the Maintenance Room of Building 790 where AFFF tank is stored. Doors had to be repaired after foam broke them open during discharge event.
Photograph No. 15	Cap of AFFF tank	Inside Building 790 (Cold Storage Hangar) maintenance room that holds AFFF tank. Cap featured is what malfunctioned causing the discharge. New sheetrock pictured after spill damaged original wall.
Photograph No. 16	New cap for AFFF tank	NJARNG Lakehurst Environmental Manager [redacted] with new cap in Building 790 (Cold Storage Hangar) maintenance room.
Photograph No. 17	AFFF Storage tank	Label of AFFF storage tank in Building 790 (Cold Storage Hangar) maintenance room.
Photograph No. 18	Drain (filled with concrete)	Grate on the floor of Building 790 (Cold Storage Hangar) maintenance room. The drain was filled with concrete following the AFFF spill that contaminated the drain.
Photograph No. 19	Pipe in 790 maintenance room	Building 790 (Cold Storage Hangar) maintenance room. The pipe that leaked AFFF during second spill event is pictured.

Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG
Site / Area Acreage: Storm drain on helipad
Historic Site Use (Brief Description): AASF; Concrete area on helipad in between Buildings 790 and 780

Current Site Use (Brief Description): AASF

1. Was AFFF used (or spilled) at the site/area? **Y / N**
   1a. If yes, document how AFFF was used and usage time (e.g., fire fighting training 2001 to 2014):
   AFFF that discharged during the June 12th, 2017 event entered storm drains in a grass area outside the Building 790 maintenance room and protruded from the storm drain on the helipad area. The extent wasn't measured. Approximately covered a 15 foot radius.

2. Has usage been documented? **Y / N**
   2a. If yes, keep a record (place electronic files on a disk):
   Spill incident form
3. What types of businesses are located near the site? **Industrial / Commercial / Plating / Waterproofing / Residential**
   3a. Indicate what businesses are located near the site

4. Is this site located at an airport/flight line? **Y / N**
   4a. If yes, provide a description of the airport/flight line tenants:
   AASF

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y / N** (Not at this particular location on Lakehurst)
   1a. If yes, indicate which type of AFFF has been used:

   1b. If yes, describe maintenance schedule/leaks:
   no set schedule; documentation was visible on chemical labels on the tanks
   1c. If yes, how often is the AFFF replaced:
   _____; note, no consensus on the shelf life of AFFF (range 2-25 years)

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? **Y / N**
   1a. If so, note observation and location:

2. Is there channelized flow within the site/area? **Y / N**
   2a. If so, please note observation and location:
   Yes, to the east and west of the MAAF ramp; an apex exists in the middle of the MAAF ramp
3. Are monitoring or drinking water wells located near the site? **Y / N**
   3a. If so, please note the location:
   Yes, wells are installed on the MAAF for a previous investigation and were left in place per [redacted]
4. Are surface water intakes located near the site? **Y / N**
   4a. If so, please note the location:

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):

Visual Survey Inspection Log

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

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

The floor is concrete with epoxy sealant

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

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

Access is restricted to the airfield

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:

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:

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
Photograph No. 25	Between Buildings 780 and 790	Helicopter flight pad.
Photograph No. 26	Between Buildings 780 and 790	Area southeast of the helicopter taxiway. New water tank pictured. Also pictured Tim Peck, USACE and [redacted], NJARNG.
Photograph No. 28	Southeast of Helicopter Taxiway	Area southeast of the helicopter taxiway.
Photograph No. 29	Southeast of Helicopter Taxiway	Area southeast of the helicopter taxiway.
Photograph No. 30	Southeast of Helicopter Taxiway	Area southeast of helicopter pad. Shown system used to wash helicopters.
Photograph No. 31	East of Building 791	Purple K tanks located along the flight line directly east of Warm Storage Hangar (Building 791).
Photograph No. 32	East of Building 791	Description of Fire Fighting systems on the property. Featuring description of Flight Line Purple K tanks previously pictured in Photograph 31.

Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG
Site / Area Acreage: Building 790
Historic Site Use (Brief Description): AASF; Cold Storage Hangar

Current Site Use (Brief Description): AASF

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

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

AFFF is stored in the maintenance room adjacent to the Cold Storage Hangar inside Building 790. AFFF 3% was discharged from the holding system on the morning of June 12th, 2018. The foam broke down the wall separating the maintenance room and the Cold Storage Hangar and leaked onto the hangar floor.

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

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

Usage has been documented by a spill incident form by the Lakehurst Personnel

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

3a. Indicate what businesses are located near the site

Many surrounding buildings in immediate area

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

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

ARNG

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y / N** (Not at this particular location on FTIG)

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

3% AFFF according to milspec, has since been retrofitted to 6%

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

no set schedule; documentation was visible on chemical labels on the tanks

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

_____; note, no consensus on the shelf life of AFFF (range 2-25 years)

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

Yes, trench drains lead

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

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

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

Yes, to the east and west of the MAAF ramp; an apex exists in the middle of the MAAF ramp

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

3a. If so, please note the location:

Yes, wells are installed on the MAAF for a previous investigation and were left in place per [redacted]

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

4a. If so, please note the location:

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):

Visual Survey Inspection Log

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

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

The floor is concrete with epoxy sealant

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

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

Access is restricted to the airfield

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:

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:

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
Photograph No. 27	South of Building 790	Outfall located south of Building 790 (Cold Storage Hangar). AFFF discharged from the Outfall during the first spill event and was later excavated.

Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG
Site / Area Acreage: Building 790
Historic Site Use (Brief Description): AASF; Cold Storage Hangar

Current Site Use (Brief Description): AASF

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

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

AFFF is stored in the maintenance room adjacent to the Cold Storage Hangar inside Building 790. AFFF 3% was discharged from the holding system on the morning of June 12th, 2018. The foam broke down the wall separating the maintenance room and the Cold Storage Hangar and leaked onto the hangar floor.

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

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

Usage has been documented by a spill incident form by the Lakehurst Personnell

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

3a. Indicate what businesses are located near the site

Many surrounding buildings in immediate area

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

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

ARNG

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y / N** (Not at this particular location on FTIG)

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

3% AFFF according to milspec, has since been retrofitted to 6%

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

no set schedule; documentation was visible on chemical labels on the tanks

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

_____; note, no consensus on the shelf life of AFFF (range 2-25 years)

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

Yes, trench drains lead

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

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

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

Yes, to the east and west of the MAAF ramp; an apex exists in the middle of the MAAF ramp

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

3a. If so, please note the location:

Yes, wells are installed on the MAAF for a previous investigation and were left in place per [redacted]

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

4a. If so, please note the location:

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):

Visual Survey Inspection Log

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

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

The floor is concrete with epoxy sealant

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

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

Access is restricted to the airfield

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:

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:

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Visual Survey Inspection Log

Recorded by: *AG*
ARNG Contact: [redacted]
Date: *11/14/2018*

Source/Release Information

Site Name / Area Name / Unique ID: Lakehurst AASG
Site / Area Acreage: Building 790
Historic Site Use (Brief Description): AASF; Cold Storage Hangar

Current Site Use (Brief Description): AASF

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

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

AFFF is stored in the maintenance room adjacent to the Cold Storage Hangar inside Building 790. AFFF 3% was discharged from the holding system on the morning of June 12th, 2018. The foam broke down the wall separating the maintenance room and the Cold Storage Hangar and leaked onto the hangar floor.

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

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

Usage has been documented by a spill incident form by the Lakehurst Personnell

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

3a. Indicate what businesses are located near the site

Many surrounding buildings in immediate area

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

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

ARNG

Other Significant Site Features:

1. Does the facility have a fire suppression system? **Y / N** (Not at this particular location on FTIG)

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

3% AFFF according to milspec, has since been retrofitted to 6%

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

no set schedule; documentation was visible on chemical labels on the tanks

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

_____; note, no consensus on the shelf life of AFFF (range 2-25 years)

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

Yes, trench drains lead

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

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

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

Yes, to the east and west of the MAAF ramp; an apex exists in the middle of the MAAF ramp

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

3a. If so, please note the location:

Yes, wells are installed on the MAAF for a previous investigation and were left in place per [redacted]

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

4a. If so, please note the location:

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):

Visual Survey Inspection Log

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

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

The floor is concrete with epoxy sealant

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

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

Access is restricted to the airfield

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:

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:

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
Photograph No. 1	AFFF Storage tank	Inside Building 780 (Warm Storage Hangar). The bladder inside the tank was pulled out and replaced during the retrofill event.
Photograph No. 2	AFFF Storage tank	Inside Building 780 (Warm Storage Hangar). The bladder inside the tank was pulled out and replaced during the retrofill event.
Photograph No. 3	Stains on Warm Storage Hangar Floor	Inside Building 780 (Warm Storage Hangar). AFFF stains are visible due to a valve leak during the replacement of the bladder.
Photograph No. 4	AFFF Storage tank	Inside Building 780 (Warm Storage Hangar), label on AFFF tank.
Photograph No. 5	Inside Building 780	East of Inside Building 780 (Warm Storage Hangar) location of spill from retrofitting truck carrying foam.
Photograph No. 6	Inside Building 780	East of Inside Building 780 (Warm Storage Hangar) location of spill from retrofitting truck carrying foam. Extent of foam was approximately the outline of two vehicles. Featuring [redacted], USACE
Photograph No. 7	East of Building 780	Roll-off staging area. Specific locations are apparent by patches of bare grass. Location is East of East of Building 780 (Warm Storage Hangar).

Appendix B.3
Conceptual Site Model Information

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Preliminary Assessment – Conceptual Site Model Information

Site Name: Lakehurst MASF

Why has this location been identified as a site? Multiple AFFF releases from fire suppression systems in two buildings

Are there any other activities nearby that could also impact this location?
Potential releases from training or emergency response at surrounding Navy facility

Training Events

Have any training events with AFFF occurred at this site? No

If so, how often? N/A

How much material was used? Is it documented? N/A

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?
storm drain to retention ditch and pond which leads to a stream

Surface Water:

Surface water flow direction? East / Southeast

Average rainfall? 48 in

Any flooding during rainy season? Unknown

Direct or indirect pathway to ditches? direct

Direct or indirect pathway to larger bodies of water? indirect

Does surface water pond any place on site? unknown

Any impoundment areas or retention ponds? not on site, but immediately adjacent

Any NPDES location points near the site? unknown

How does surface water drain on and around the flight line? unknown - likely into storm drains and then to retention pond

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? unknown, NJARNs indicate NE

Depth to groundwater? ~5-15 ft bgs

Uses (agricultural, drinking water, irrigation)? drinking

Any groundwater treatment systems? unknown

Any groundwater monitoring well locations near the site? yes

Is groundwater used for drinking water? yes

Are there drinking water supply wells on installation? no – on adjacent Navy facility

Do they serve off-post populations? unknown

Are there off-post drinking water wells downgradient unknown

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? yes – on Navy facility

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

Do we understand the fate of sludge waste? unknown

Is surface water from potential contaminated sites treated? unknown

Equipment Rinse Water

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

N/A

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?

N/A

3. Other? N/A

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker Yes

Construction Worker Yes

Recreational User No

Residential No

Child No

Ecological unknown

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?

unknown

Documentation

Ask for Engineering drawings (if applicable).

Has there been a reconstruction or changes to the drainage system? When did that occur?

NO – buildings new as of 2015

Appendix C
Photographic Log

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Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 1

Description:

Inside Building 780 (Warm Storage Hangar). The bladder inside the tank was pulled out and replaced during the retrofill event.

15 November 2018

Photograph No. 2

Description:

Inside Building 780 (Warm Storage Hangar). The bladder inside the tank was pulled out and replaced during the retrofill event.

15 November 2018

Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 3

Description:

Inside Building 780 (Warm Storage Hangar). AFFF stains are visible due to a valve leak during the replacement of the bladder.

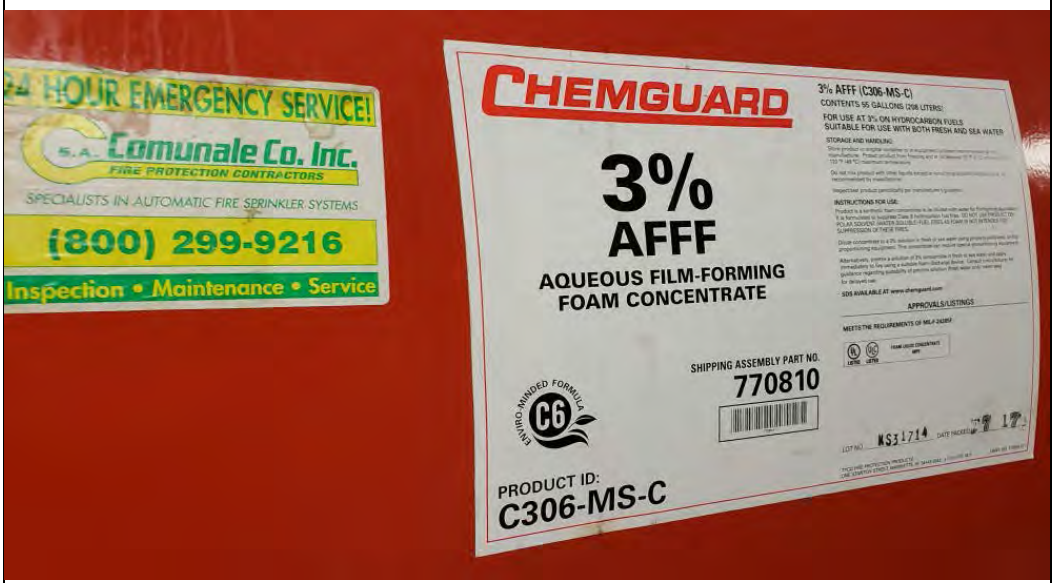
15 November 2018

Photograph No. 4

Description:

Inside Building 780 (Warm Storage Hangar), label on AFFF tank.

15 November 2018



Appendix C – Photographic Log

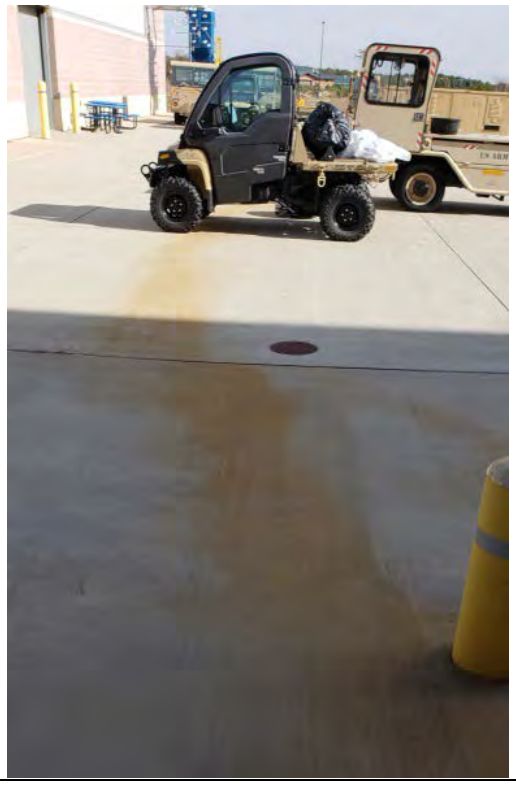
Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 5

Description:

East of Inside Building 780 (Warm Storage Hangar) location of spill from retrofitting truck carrying foam.

15 November 2018



Photograph No. 6

Description:

East of Inside Building 780 (Warm Storage Hangar) location of spill from retrofitting truck carrying foam. Extent of foam was approximately the outline of two vehicles.

15 November 2018

Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 7

Description:

Roll-off staging area. Specific locations are apparent by patches of bare grass. Location is East of East of Building 780 (Warm Storage Hangar).

15 November 2018

Photograph No. 8

Description:

Area of First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar). Black tarp surrounds location of storm drain.

15 November 2018

Appendix C – Photographic Log

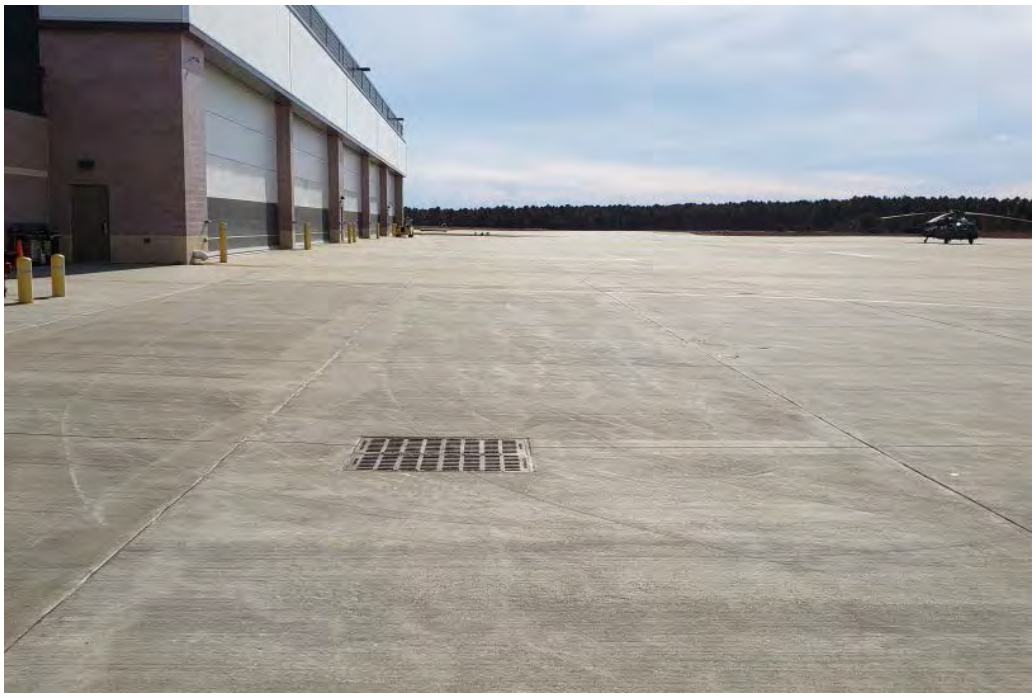
Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 9

Description:

Location of AFFF discharge from spill area between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar). AFFF spilled out of storm drain.

15 November 2018



Photograph No. 10

Description:

Outside south entrance of Building 790 (Cold Storage Hangar) where the AFFF spill originated from.

15 November 2018

Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 11

Description:

Location of second spill directly east of Building 790 (Cold Storage Hangar).

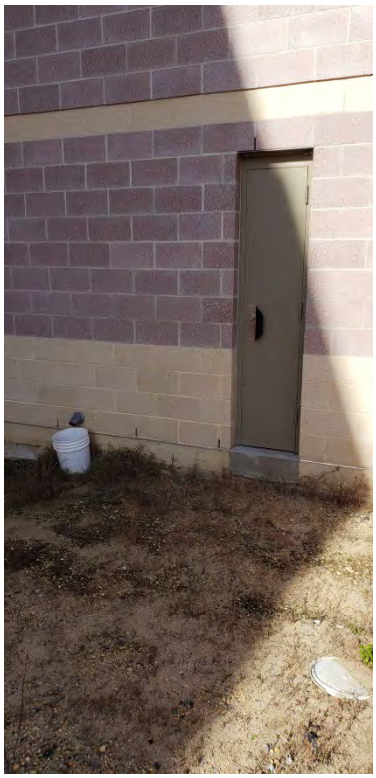
15 November 2018

Photograph No. 12

Description:

Location of second spill directly east of Building 790 (Cold Storage Hangar). AFFF leaked out of valve (indicated by white bucket underneath).

15 November 2018



Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 13

Description:

Area of First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar).

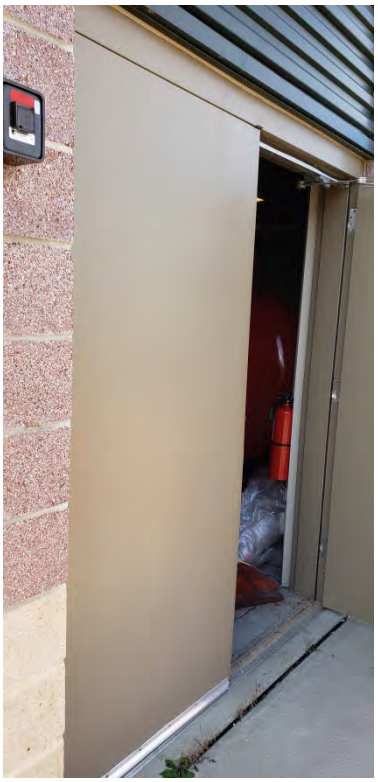
15 November 2018

Photograph No. 14

Description:

Doors to the Maintenance Room of Building 790 where AFFF tank is stored. Doors had to be repaired after foam broke them open during discharge event.

15 November 2018



Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 15

Description:

Inside Building 790 (Cold Storage Hangar) maintenance room that holds AFFF tank. Cap featured is what malfunctioned causing the discharge. New sheetrock pictured after spill damaged original wall.

15 November 2018

Photograph No. 16

Description:

NJARNG Lakehurst Environmental Manager [redacted] with new cap in Building 790 (Cold Storage Hangar) maintenance room.

15 November 2018

Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 17

Description:

Label of AFFF storage tank in Building 790 (Cold Storage Hangar) maintenance room.

15 November 2018

Photograph No. 18

Description:

Grate on the floor of Building 790 (Cold Storage Hangar) maintenance room. The drain was filled with concrete following the AFFF spill that contaminated the drain.

15 November 2018

Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 19

Description:

Building 790 (Cold Storage Hangar) maintenance room. The pipe that leaked AFFF during second spill event is pictured.

15 November 2018

Photograph No. 20

Description:

Water line caps in the area of the First Spill between Building 780 (Warm Storage Hangar) and Building 790 (Cold Storage Hangar).

15 November 2018

Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 21

Description

[redacted], USACE, pictured with trough drain on the Cold Storage Hangar Floor (Building 790). Lakehurst NJARNG personnel pushed some of the foam into the drain after spill event.

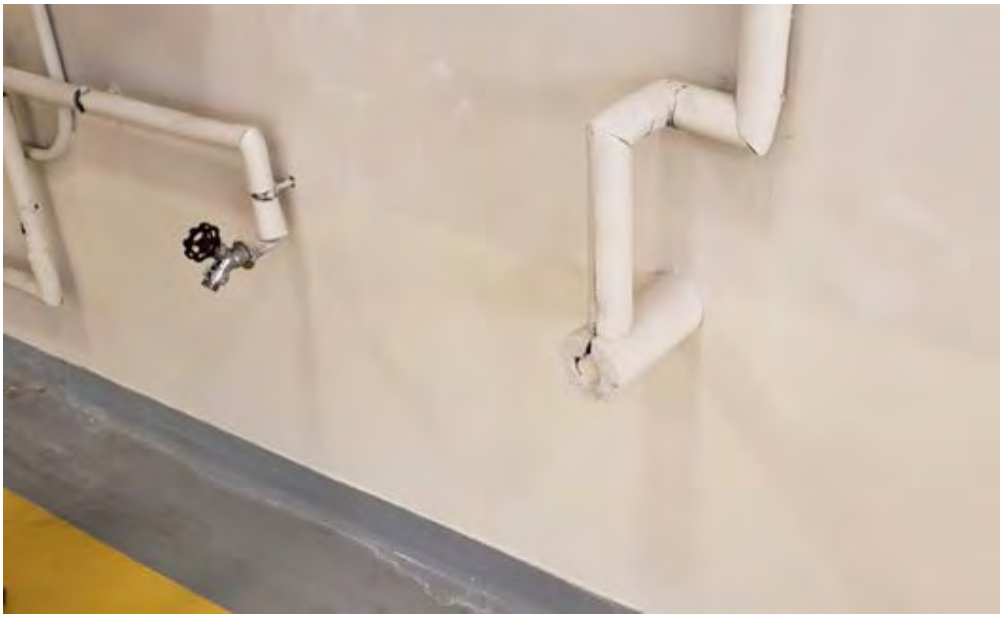
15 November 2018

Photograph No. 22

Description:

Building 790 (Cold Storage Hangar) inside Hangar adjacent to AFFF maintenance room. During discharge event AFFF knocked the dry wall out and leaked onto the hangar floor. New sheetrock is indicated by different coloring from the floor up.

15 November 2018



Appendix C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 23

Description:

Building 790 (Cold Storage Hangar) deluge system.

15 November 2018

Photograph No. 24

Description:

Building 790 (Cold Storage Hangar) deluge system.

15 November 2018

APPENDIX C – Photographic Log

Lakehurst NJ National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 25

Description:
Helicopter flightpad.

15 November 2018

Photograph No. 26

Description:
Area southeast of Helicopter taxiway. New water tank pictured. Also picture [redacted] USACE and [redacted] NJARNG.

15 November 2018

APPENDIX C – Photographic Log

Lakehurst NJ National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 27

Description:
Outfall located south of Building 790 (Cold Storage Hangar). AFFF discharged from the Outfall during the first spill event and was later excavated.

15 November 2018

Photograph No. 28

Description:
Area southeast of the helicopter taxiway.

15 November 2018

APPENDIX C – Photographic Log

Lakehurst NJ National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 29

Description:
Area southeast of the helicopter taxiway.

15 November 2018

Photograph No. 30

Description:
Area southeast of helicopter pad. Shown system used to wash helicopters.

15 November 2018

APPENDIX C – Photographic Log

Lakehurst NJ National Guard, Preliminary Assessment for PFAS	Lakehurst AASF	Lakehurst, New Jersey

Photograph No. 31

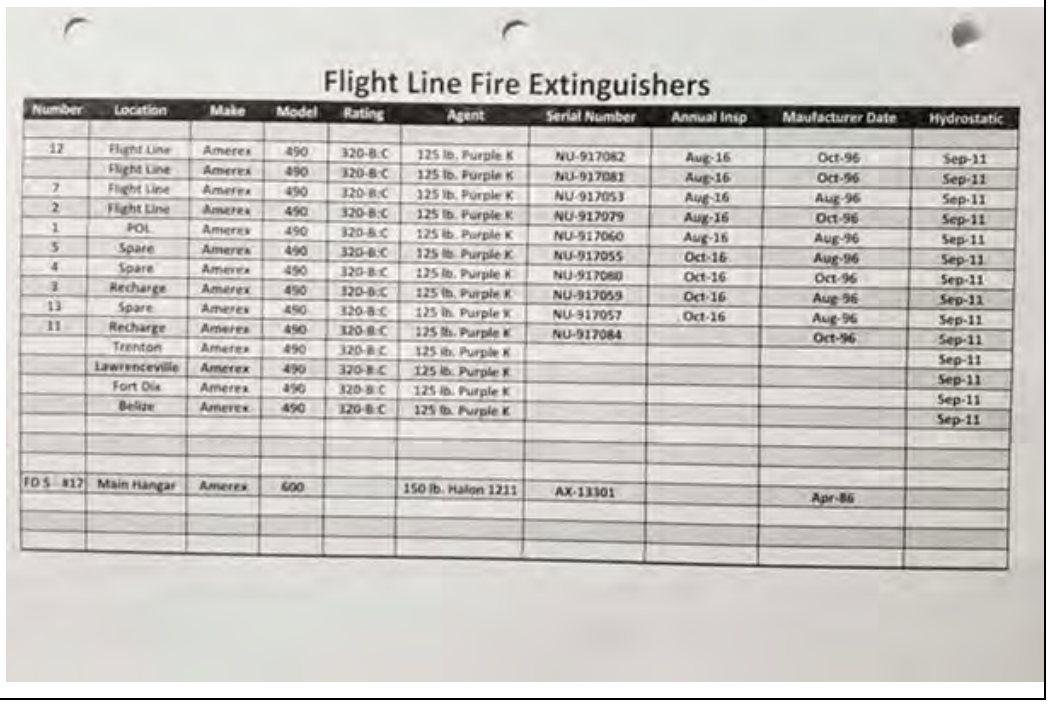
Description:
Purple K tanks located along the flight line directly east of Warm Storage Hangar (Building 791).

15 November 2018

Photograph No. 32

Description:
Description of Fire Fighting systems on the property. Featuring description of Flight Line Purple K tanks previously pictured in Photograph 31.

15 November 2018



Flight Line Fire Extinguishers

Number	Location	Make	Model	Rating	Agent	Serial Number	Annual Insp	Maufacturer Date	Hydrostatic
12	Flight Line	Amerex	490	320-B:C	125 lb. Purple K	NU-917082	Aug-16	Oct-96	Sep-11
	Flight Line	Amerex	490	320-B:C	125 lb. Purple K	NU-917081	Aug-16	Oct-96	Sep-11
7	Flight Line	Amerex	490	320-B:C	125 lb. Purple K	NU-917053	Aug-16	Aug-96	Sep-11
2	Flight Line	Amerex	490	320-B:C	125 lb. Purple K	NU-917079	Aug-16	Oct-96	Sep-11
1	POL	Amerex	490	320-B:C	125 lb. Purple K	NU-917060	Aug-16	Aug-96	Sep-11
5	Spare	Amerex	490	320-B:C	125 lb. Purple K	NU-917055	Oct-16	Aug-96	Sep-11
4	Spare	Amerex	490	320-B:C	125 lb. Purple K	NU-917080	Oct-16	Oct-96	Sep-11
3	Recharge	Amerex	490	320-B:C	125 lb. Purple K	NU-917059	Oct-16	Aug-96	Sep-11
13	Spare	Amerex	490	320-B:C	125 lb. Purple K	NU-917057	Oct-16	Aug-96	Sep-11
11	Recharge	Amerex	490	320-B:C	125 lb. Purple K	NU-917084		Oct-96	Sep-11
	Trenton	Amerex	490	320-B:C	125 lb. Purple K				Sep-11
	Lawrenceville	Amerex	490	320-B:C	125 lb. Purple K				Sep-11
	Fort Dix	Amerex	490	320-B:C	125 lb. Purple K				Sep-11
	Belize	Amerex	490	320-B:C	125 lb. Purple K				Sep-11
FD S #17	Main Hangar	Amerex	600		150 lb. Halon 1211	AX-13301		Apr-86	