FINAL
Preliminary Assessment Report
Austin Bergstrom Army Aviation Support Facility
Austin, Texas

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

July 2020

Prepared for:

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

UNCLASSIFIED

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Acronyms and Abbreviations

AASF	Army Aviation Support Facility
ABIA	Austin-Bergstrom International Airport
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AFB	Air Force Base
AFRC	Armed Forces Reserve Center
amsl	above mean sea level
AOI	area of interest
ARNG	Army National Guard
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	conceptual site model
EDR™	Environmental Data Resources, Inc.™
ºF	degrees Fahrenheit
FAA	Federal Aviation Administration
FTA	fire training area
HA	Health Advisory
JVMF	Joint Vehicle Maintenance Facility
NOAA	National Oceanic and Atmospheric Administration
OWS	oil-water separator
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppt	parts per trillion
RCP	reinforced concrete pipe
SI	Site Inspection
TWDB SDR	Texas Water Development Board Submitted Drillers Reports
TXARNG	Texas Army National Guard
UCMR3	Unregulated Contaminant Monitoring Rule 3
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USPFO	United States Property & Fiscal Office
VSI	visual site inspection
WWTP	waste water treatment plant

Executive Summary

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

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 24 April 2019 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed personnel associated with Austin Bergstrom AASF activities during the site visit including Austin Bergstrom AASF Maintenance Officer (on site since 2001), Ground Support Shop Chief (on site since 2002) and Environmental Specialist (on site since 2017);
- Identified Area(s) of Interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential source-pathway-receptor linkages of potential PFAS in soil, groundwater, surface water, and sediment for each AOI.

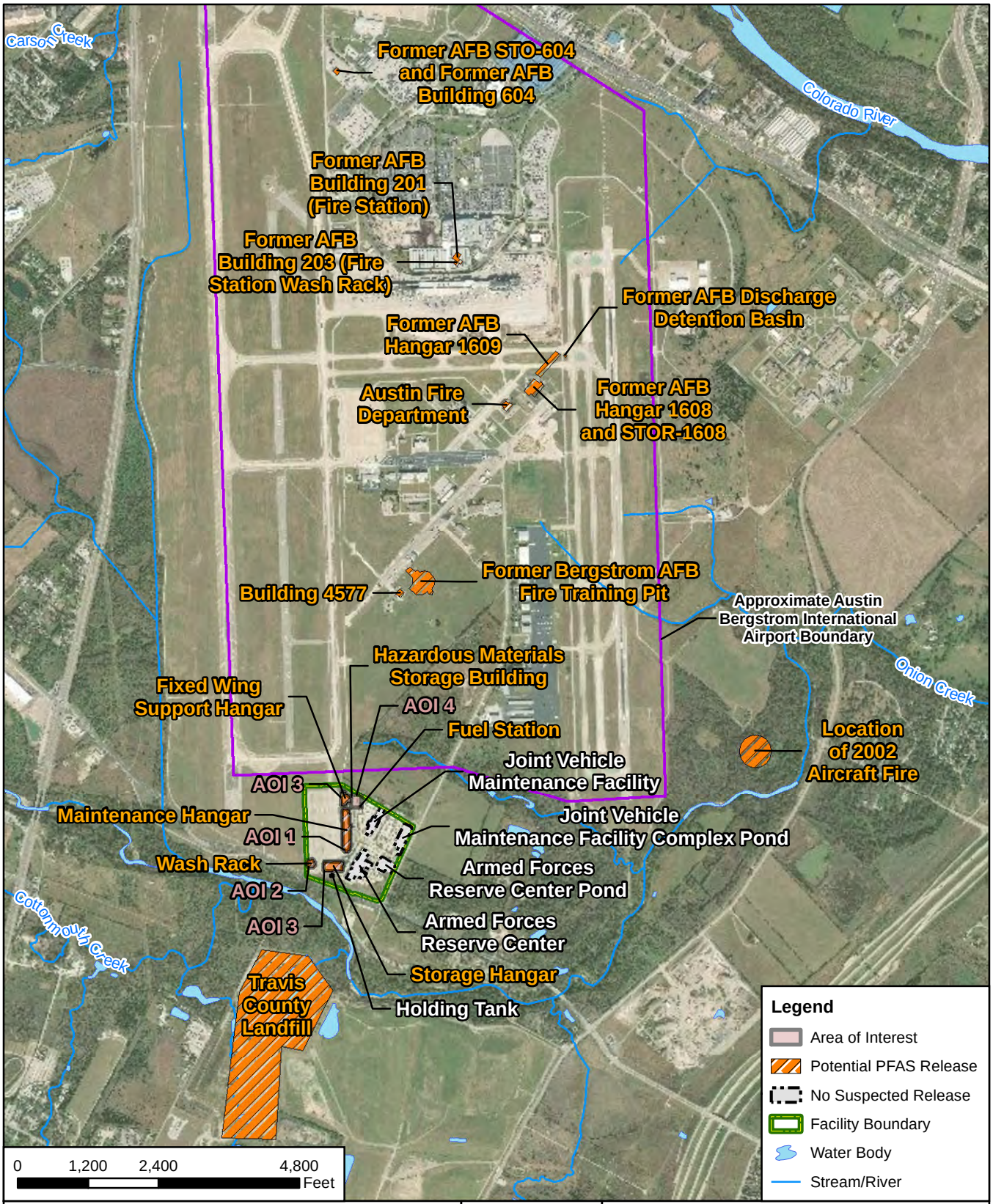
Four suspected PFAS releases were identified during the PA as described below. These releases constitute four AOIs identified at Austin Bergstrom AASF. The AOIs are shown in **Figure ES-1** and summarized in **Table ES-1** below.

Table ES-1: AOIs at Austin Bergstrom AASF

Area of Interest	Name	Used by	Release Dates
AOI 1	Two aqueous film forming foam (AFFF) fire suppression system releases occurred at the Maintenance Hangar. Releases discharged to trench drains in the hangar, which flowed to the below ground holding tank, then to the oil-water separator (OWS), and then either to the storm water drainage system (first test release) or to frac tanks for holding (second accidental release).	TXARNG	2005-2006
AOI 2	Releases occurred during AFFF fire extinguisher testing/training with mobile carts at the wash rack. AFFF travelled from the wash rack to either the holding tank, then to the OWS, then to the storm water drainage system, or from the wash rack to the oil/sand filter and then to the sanitary sewer system, depending on the positioning of a diverter valve. Water in	TXARNG	2009

Area of Interest	Name	Used by	Release Dates
	the storm water drainage system travelled to the retention ponds.		
AOI 3	The Fixed Wing Support Hangar and the Storage Hangar are both equipped with AFFF fire suppression systems. It is likely that both systems were tested in 2005, when the hangars were being commissioned, leading to a release of AFFF. The flow path for AFFF foam would have been from the hangar to the trench drain, then to the holding tank, then to the OWS, and finally to the storm water drainage system, which discharges to the retention ponds.	TXARNG	2005
AOI 4	The Hazardous Materials Storage Building and the Fuel Station both historically contained AFFF in 5-gallon containers and in Tri-Max™ units (respectively). These areas will be investigated for potential PFAS release.	TXARNG	2005-2014

Based on the reported AFFF releases at these AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSM for the Austin Bergstrom AASF is shown on **Figure ES-2**. Based on the United States Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the USEPA Health Advisory (HA) within 20 miles of the facility. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bergstrom AASF, TX			
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SCALE	1:28,800	CHK BY	MC	4/27/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	4/27/2020

Summary of Findings

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Figure ES-1

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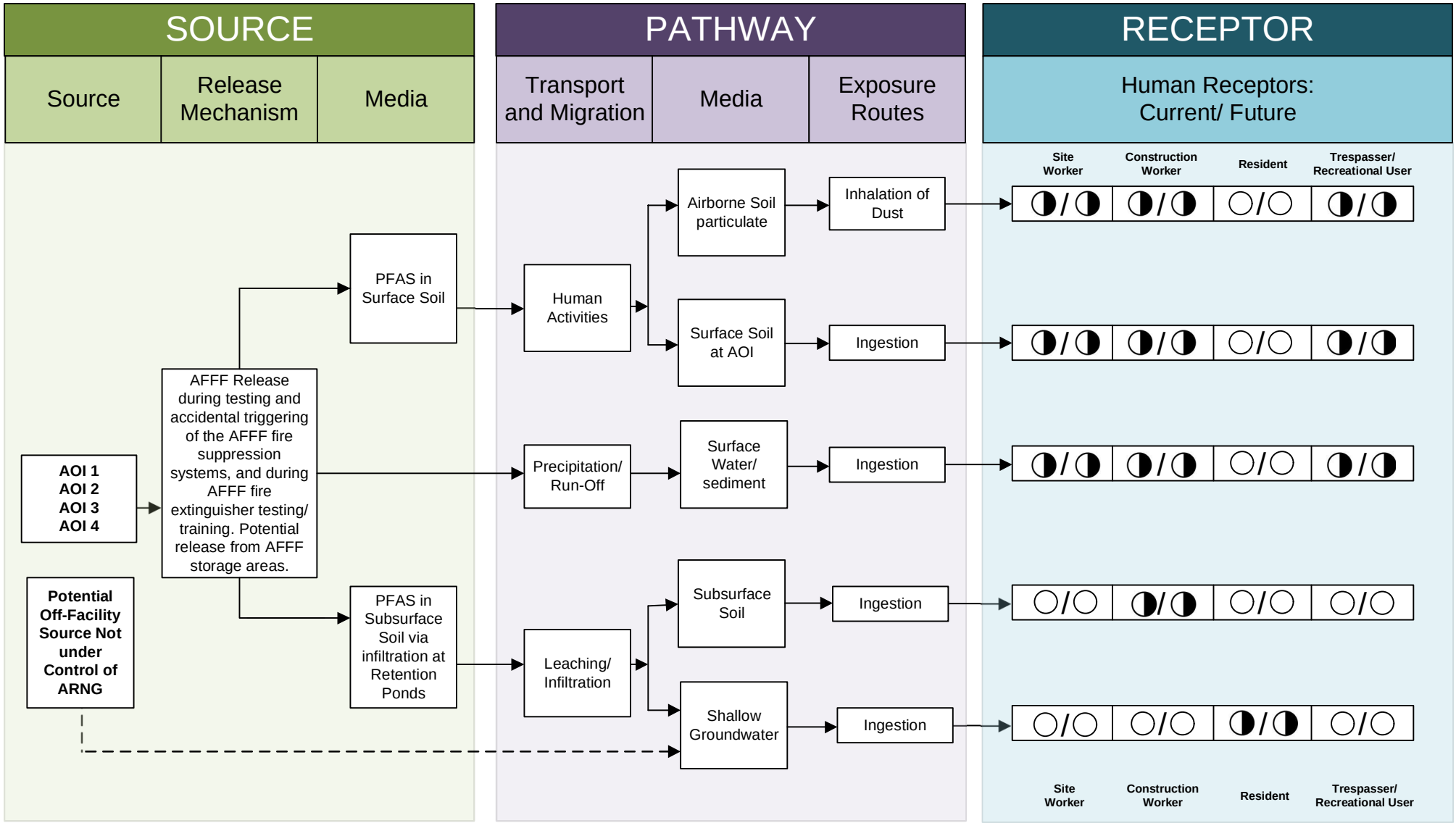


LEGEND

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

Note:
1. The residential receptor refers to an off-facility receptor.

Figure ES-2
Preliminary Conceptual Site Model
Austin Bergstrom AASF

1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG)-G9 is the lead agency in performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) at Impacted Sites at ARNG Facilities Nationwide*. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017.

The ARNG is assessing potential effects on human health related to processes at their facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily releases of aqueous film forming foam (AFFF) although other sources of PFAS are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued lifetime drinking water Health Advisories (HAs) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water.

This report presents findings of a PA for PFAS-containing materials at Austin Bergstrom Army Aviation Support Facility (AASF) (also referred to as “the facility”) in Austin, Texas, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300), and Army requirements and guidance.

This PA documents the locations where PFAS were historically stored and reportedly released into the environment at Austin Bergstrom 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 available administrative record documents and Environmental Data Resources, Inc. (EDR)™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 24 April 2019 and completed visual site inspections (VSIs) at locations where PFAS-containing materials were suspected of being stored, used, or disposed;
- Interviewed personnel associated with Austin Bergstrom AASF activities during the site visit including Austin Bergstrom AASF Maintenance Officer (on site since 2001), Ground Support Shop Chief (on site since 2002) and Environmental Specialist (on site since 2017);

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

1.3 Report Organization

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

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

Austin Bergstrom AASF, home to the Texas ARNG (TXARNG), is located within the southwest portion of the Austin-Bergstrom International Airport (ABIA) in Austin, Texas. The installation is located 8 miles southeast of downtown Austin and is situated at the intersection of Burleson Road and Emma Browning Avenue (**Figure 1-1**). As noted in the lease agreement (**Appendix A**), the TXARNG leases approximately 57 acres of land at ABIA. The facility consists of three hangars (a Fixed Wing Support Hangar, Maintenance Hangar, and a Storage Hangar), which were built in 2003-2004, as well as a Joint Vehicle Maintenance Facility and an Armed Forces Reserve Center, which were built in 2011-2012. The Austin Bergstrom AASF is tasked with providing hangar, administrative, and supply and maintenance shop spaces to service aircraft, serve peacetime missions, and perform the necessary tasks that improve the units' readiness.

1.5 Facility Environmental Setting

Austin Bergstrom AASF is located in central Texas, approximately 150 miles northwest of the Gulf of Mexico. The facility is situated approximately 2.8 miles southwest of the Colorado River, with Onion Creek running along the southern boundary. The facility is located at approximately 500

feet above sea level, and the soil on site is described as silty clay with moderate infiltration rates (Environmental Data Resources, Inc. [EDR^{TM}], 2019).

1.5.1 Geology

Austin is located along the Balcones Fault Zone, with the physiographic provinces of the Edwards Plateau to the west, and the Backland Prairie to the east. The regional geology consists of Quaternary terrace deposits over Cretaceous sedimentary bedrock (Young, 1977).

The facility lies entirely on the Late Pleistocene Lower Colorado River Terrace Deposits overlying the upper Cretaceous Taylor Group. The Lower Colorado Terrace Deposits are composed of sand silt, clay, and gravel up to 60 feet thick. The Taylor Group (Taylor Clay) is a greenish gray to brownish gray montmorillonitic clay that is highly expansive, makes a good aquiclude, and totals about 700 feet thick (Bureau of Economic Geology, 1976).

1.5.2 Hydrogeology

The primary aquifer in the Austin area and under the facility is the Edwards Aquifer, which is shown to be at about 500 feet below ground surface (bgs). The Trinity Aquifer is about 1500 feet bgs (Bureau of Economic Geology, 1976).

The Trinity Aquifer extends across much of the central and northeastern part of the state and is composed of several smaller aquifers contained within the Trinity Group. These aquifers consist of limestones, sands, clays, gravels, and conglomerates. The Trinity Aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its primary use is for municipalities, it is also used for irrigation, livestock, and other domestic purposes. The Trinity aquifer subcrop is a subsurface area (the part of the aquifer that lies or dips below other formations). Confined aquifers of this type are overlain by confining units, such as clay and shale layers that do not readily transmit groundwater and are typically well below the land surface (Texas Water Development Board, 2011).

The main concern at Austin Bergstrom AASF is the shallow unconfined aquifer in the terrace deposits. The wells near the facility are likely in shallow terrace or alluvial deposits. Groundwater in the shallow fluviatile terrace deposits aquifer is present at a depth of approximately 20 and 25 feet bgs, with recharge primarily occurring through percolation from the surface and through stream channels. Groundwater flow in the shallow aquifer has been measured to the east and southeast at FT023P, a fire training area operated by the former Bergstrom Air Force Base (AFB) and located approximately 1 mile north of the facility (Amec Foster Wheeler, 2016). A groundwater gradient determination was conducted at the former Bergstrom AFB in 1995 and found that groundwater flows to the south-southeast at the Austin Bergstrom AASF. The variation in flow direction in the vicinity of the facility is considered to be primarily related to the thickness of the terrace deposits above the Taylor marl (Law Environmental, Inc., 1995) (**Figure 1-2**).

The facility obtains its drinking water from the City of Austin. A query of the Texas Water Development Board Submitted Driller's Reports (TWDB SDR) Database identified 1 industrial water supply well, 4 domestic wells, and 27 monitoring wells within a 1-mile radius of the facility. The industrial water supply well is 35 feet deep and is located southeast of the facility. The four domestic wells are located between 0.3 and 0.6 miles northeast and southeast of the facility and range from 35 to 70 feet deep. The majority of the monitoring wells are located to the south of the facility, along the perimeter of the Travis County Landfill. Additionally, there are four monitoring wells to the northwest of the facility that are owned by Sunland Group. The monitoring wells are between 26 and 121.5 feet deep. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 (UCMR3) data, it was indicated that no PFAS were detected in a public water system above the HA within 20 miles of the facility. PFAS analyses performed in 2016 had method detection limits

that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

1.5.3 Hydrology

After reviewing the Site Topography and Storm Water Drainage System, Figure 4-2 from ABIA (ABIA, 2019) and the engineering drawings of the 24 inch and 30 inch reinforced concrete pipe (RCP) Discharge Outlet Plans (Jose I. Guerra, Inc., 2010), it was determined that surface water that collects on the paved area to the west of the Maintenance Hangar flows via large diameter underground piping south to the holding tank and oil-water separator (OWS) (**Figure 1-3**). Water then flows to the northeast, where it joins with other storm water from contributing portions of the north side of the facility. The comingled storm water then travels through underground piping to the Joint Vehicle Maintenance Facility (JVMF) Complex Pond. The JVMF Complex Pond consists of a water quality pond and a retention pond. After the storm water moves through the retention pond, it flows southwest through underground piping to the Armed Forces Reserve Center (AFRC) Pond. From the AFRC Pond, storm water from light rain events flowed to Outfall #2, which is located to the east of General Aviation Avenue. At Outfall #2, storm water was discharged and allowed to infiltrate into the subsurface. However, this outfall was capped and removed from service in 2018. During heavier rain events, water flows to Outfall #1, located south of Burleson Road, and is discharged to Onion Creek. Although rainwater may have carried contaminates to Outfalls #1 and #2, it is more likely that AFFF release events resulted in contaminants collecting in the JVMF Complex Pond and the AFRC Pond and penetrating into the subsurface in these two areas.

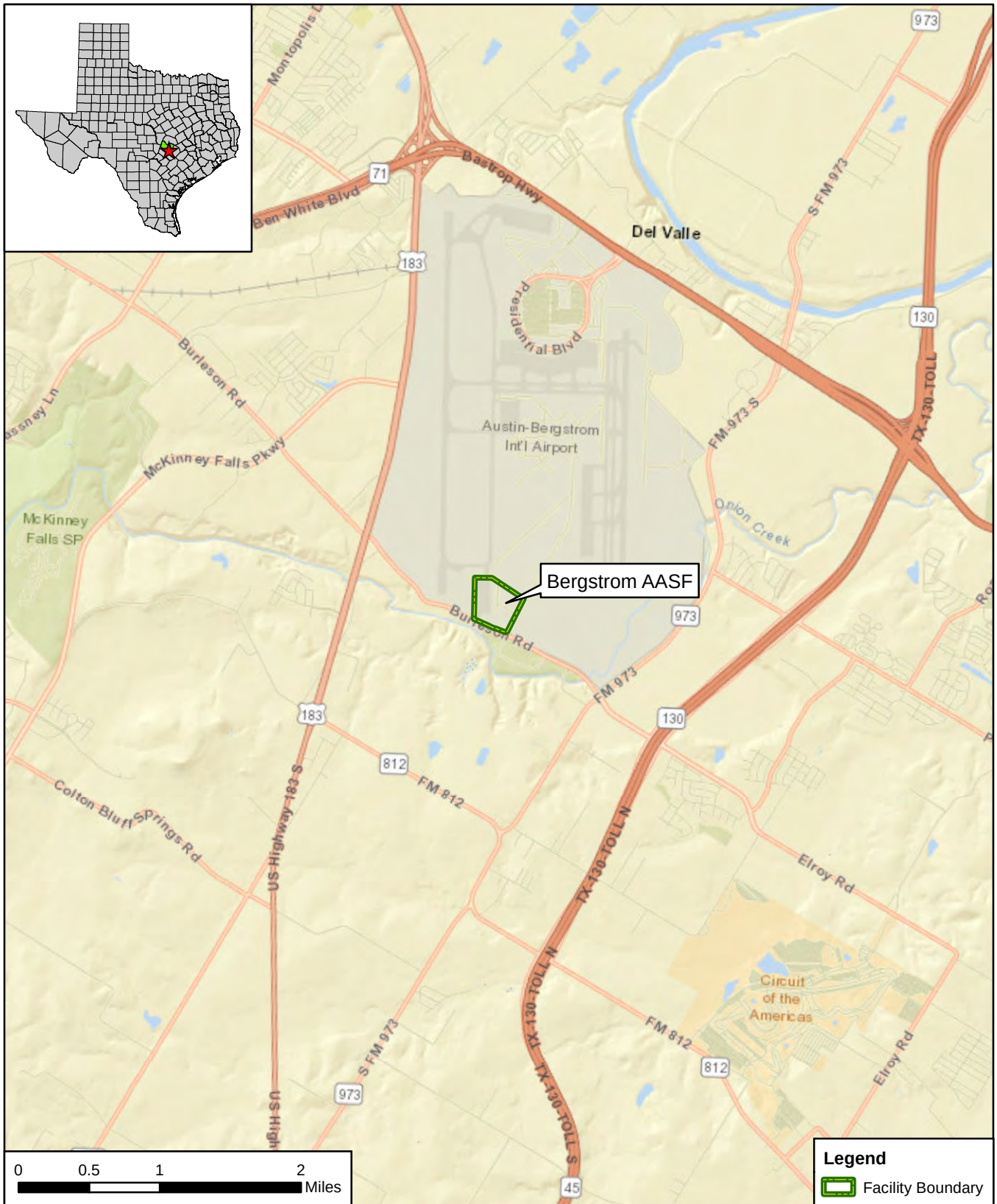
In addition, it was determined from on-site interviews that wastewater that collects in the wash rack either flows to the storm water drainage system (described above) or flows through an oil/sand filter and then discharges to the sanitary sewer system. The position of the diverter valve at the wash rack determines whether wastewater flow travels to the storm water drainage system or to the sanitary sewer.

1.5.4 Climate

The climate of Austin is humid subtropical, with hot summers and mild winters, and with warm spring and fall transitional periods. Temperatures reach their peak in August, with normal highs ranging from 93 degrees Fahrenheit (°F) to 102°F in 2019, and lows averaging 75°F. Austin experienced around 36 inches of rainfall in 2018, with March, September, and December being the wettest months of the year (National Weather Service Forecast Office, 2019). Precipitation in the spring and summer usually results from thunderstorms (National Oceanic and Atmospheric Administration [NOAA], 2017).

1.5.5 Current and Future Land Use

The Austin Bergstrom AASF currently includes three aircraft hangars. The facility also houses the JVMF and the AFRC. Current land use in the direct vicinity of the Austin Bergstrom AASF includes the ABIA to the north (formerly the Bergstrom AFB) and a park to the south, across Burleson Road. To the east and west is mostly undeveloped land. The Travis County Landfill is located approximately 0.5 miles southwest of the facility. No future changes to the current use were noted during personnel interviews.



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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	4/27/2020

Facility Location

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Figure 1-1

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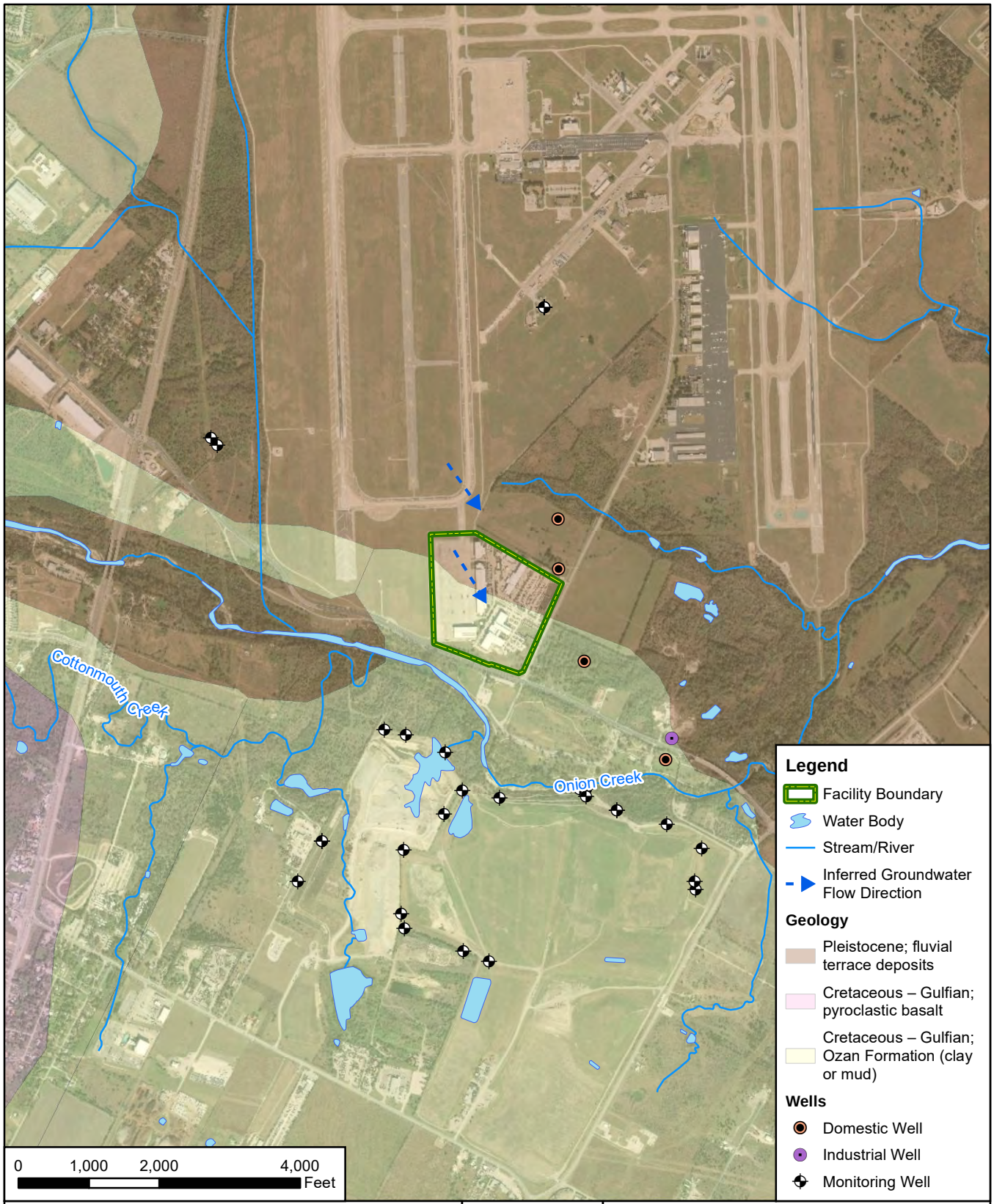

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Groundwater Features

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Figure 1-2

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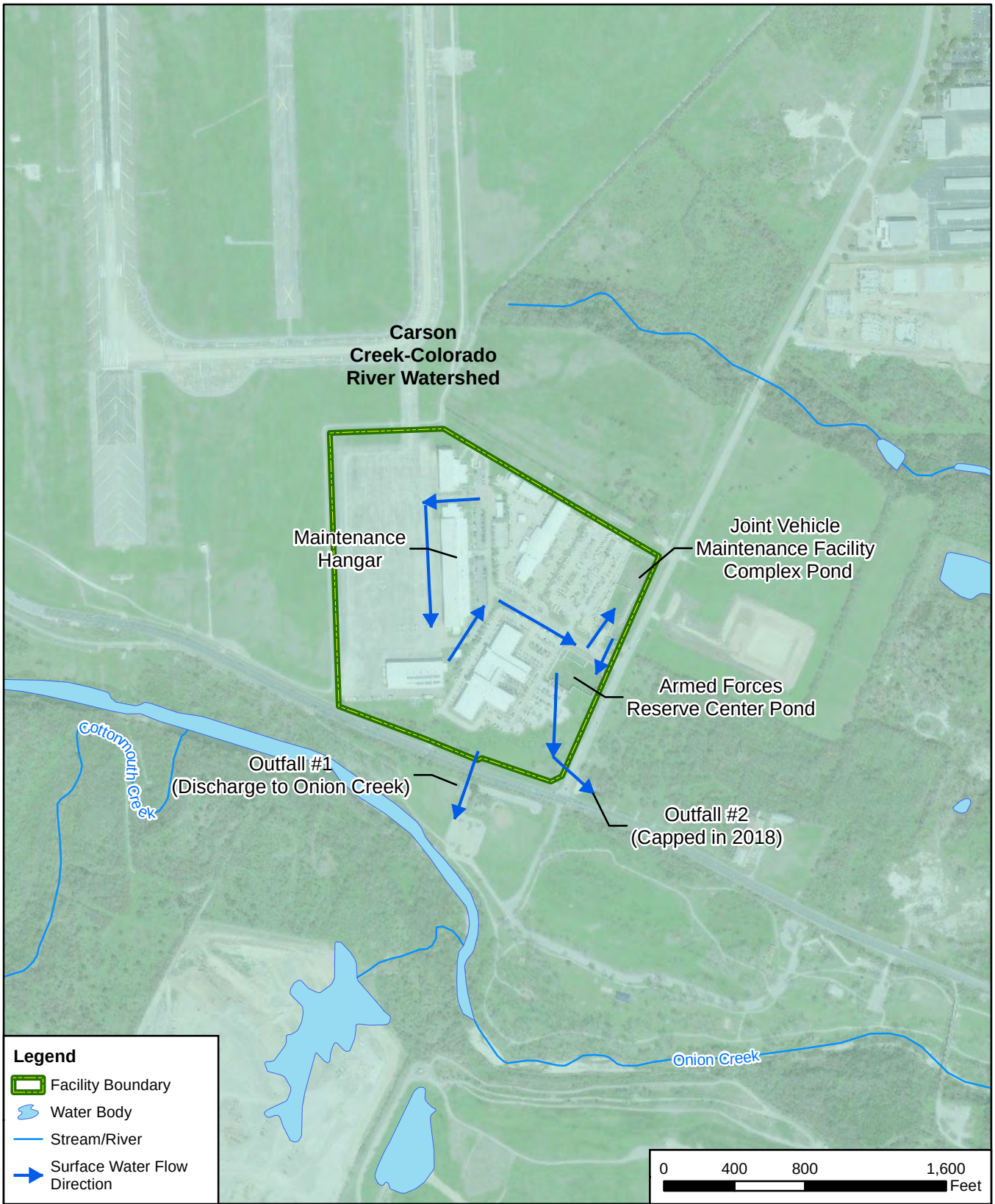

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Surface Water Features

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Figure 1-3

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2. Fire Training Areas

With the exception of mobile cart extinguisher testing/training at the wash rack area (described in **Section 3.3**), Austin Bergstrom AASF personnel confirmed there are no designated FTAs at the facility.

3. Non-Fire Training Areas

In addition to FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Information on these features obtained during the PA are included in **Appendices A** and **B**. The Austin Bergstrom AASF consists of three hangars (Maintenance, Storage, and Fixed Wing Support) that are equipped with AFFF fire suppression systems. Additional buildings housed at the facility are the JVMF and AFRC. To the west of the Storage Hangar is a wash rack, which was historically a location where an AFFF-containing mobile cart fire extinguisher was discharged. A hazardous materials storage building is located to the east of the Fixed Wing Support Hangar, and the fuel station is located nearby, to the southeast. These non-FTAs were investigated during the PA. Non-FTAs are described below and shown on **Figure 3-1,** with photographs provided in **Appendix C**.

3.1 Maintenance Hangar

The Maintenance Hangar, also known as the Rotary Wing Support Hangar, is located in the central portion of the facility and is used for helicopter maintenance. The hangar and its fire suppression system were built in 2005. During the site visit, two 800-gallon AFFF tanks and one 100-gallon AFFF tank were observed in the storage room of the Maintenance Hangar. Evidence of past AFFF spills on the sides of the two 800-gallon tanks were noticeable, but no floor drains were observed in the room. There have been two releases of AFFF at the Maintenance Hangar. One was a test release, and the other an accidental release. The test release occurred in approximately 2005, when the fire suppression system was installed, in order to ensure proper functioning of the system. After the release occurred, the foam was allowed to settle, then was pushed down the trench drain, where it travelled to the holding tank, then to the OWS, and then to the storm water drainage system.

The accidental release occurred on 13 February 2006, as a result of a faulty sensor triggering the fire suppression system to release. The hangar was filled with foam approximately 5 feet deep. Foam and water were directed to the holding tank on the south side of the complex. A third party was contracted to do the following tasks: pressure wash and clean-up the hangar; sample/analyze spill residue and the contents of the holding tank; pump out the holding tank and store the solution in frac tanks while waiting on lab results to prevent rain from increasing the volume of solution in the holding tank; and, dispose of the material. The material released in both incidents was Jet-X 2.75% AFFF. During both releases, an unknown quantity of AFFF was released to the storm water drainage system. The geographic coordinates for the Maintenance Hangar are 30°10'36.2"N; 97°40'21.0"W.

3.2 Other Hangars

Both the Fixed Wing Support Hangar and the Storage Hangar are equipped with AFFF fire suppression systems. During the site visit, one 100-gallon tank, two 300-gallon tanks, and four 55-gallon drums of 3% AFFF were observed in the storage room of the Fixed Wing Support Hangar. In the Storage Hangar, the AFFF fire suppression system consists of one 100-gallon tank and two 800-gallon tanks. The larger tanks in both hangars had evidence of spillage on the sides of the tank and ground, but no floor drains were observed in either storage room where bulk AFFF was stored. Although there were no known releases of AFFF at the Fixed Wing Support Hangar or the Storage Hangar, it is believed that the AFFF fire suppression systems in the hangars were likely tested during the commissioning of their installation in 2005. During commissioning, AFFF foam would have travelled from the hangar to the trench drain, then to the holding tank, OWS, and finally to the storm water drainage system.

3.3 Wash Rack Area

The wash rack area is located to the west of the Storage Hangar. From 2005 to 2010, mobile firefighting carts containing AFFF solution (Tri-Max™ units) were used on site. Approximately 15 units were in use during this time period. In 2009 or 2010, the Tri-Max™ units were replaced with Purple K units, which do not contain AFFF. The Tri-Max™ units were inspected by the Fire Marshall during use. When the Tri-Max™ units were being prepared for disposal, they were drained into 55-gallon drums, which were then removed from the facility by a contractor.

In 2009, TXARNG personnel recall training with one Tri-Max™ unit once or twice at the wash rack. Depending on the position of the diverter valve, liquid that reaches the wash rack either flows to the holding tank, then to the OWS, then through storm water system piping to the retention ponds or flows through an oil/sand filter and is discharged to the sanitary sewer. The wastewater treatment plant (WWTP) for the facility is the South Austin Regional WWTP, located 4.6 miles northeast of the facility at 13009 Fallwell Ln, Del Valle, Texas 78617.

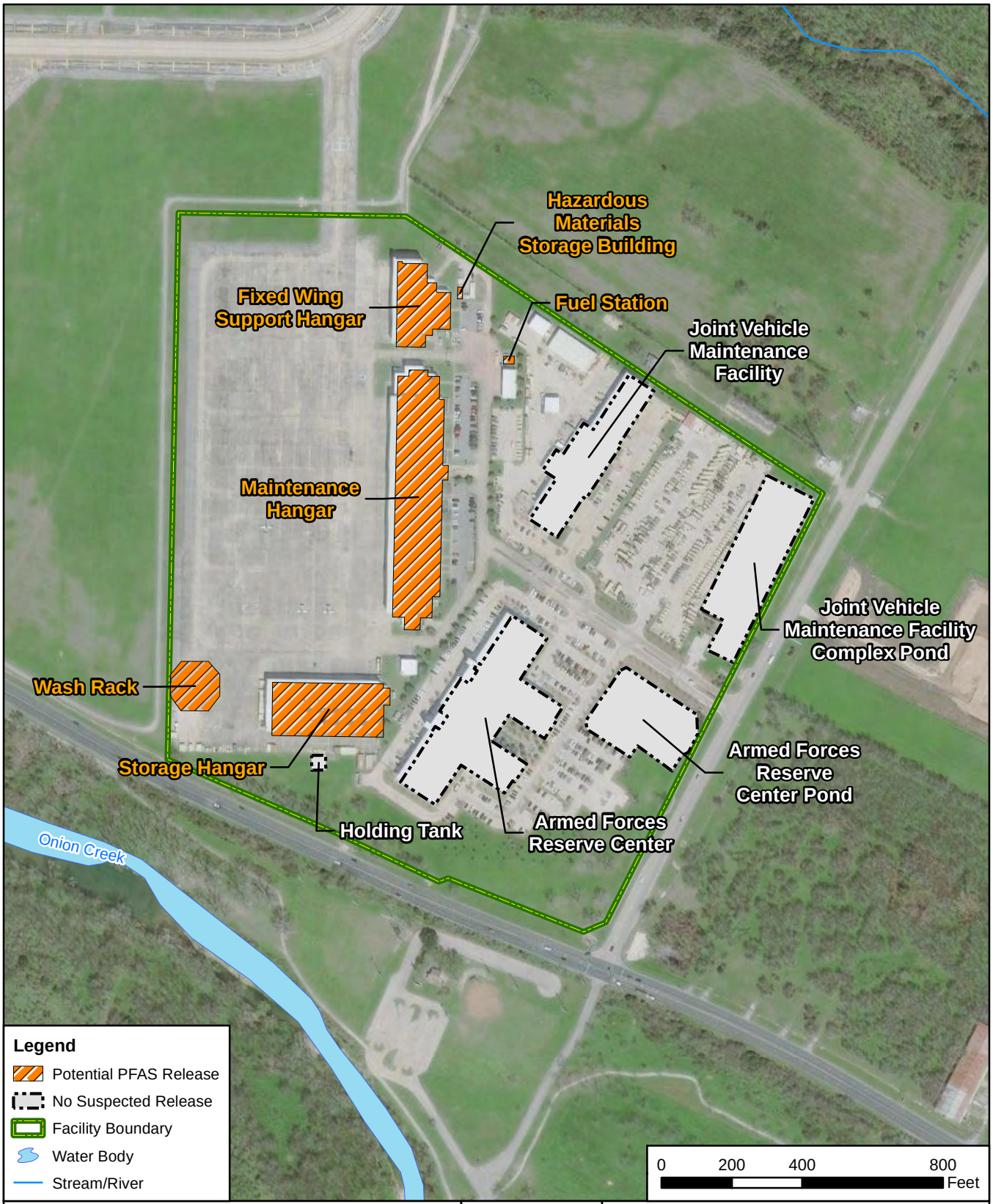
To the best of their knowledge, TXARNG staff who had been working on site since 2001 reported no other releases in this area. Geographic coordinates for the wash rack are 30°10'30.9"N; 97°40'27.6"W.

3.4 Hazardous Materials Storage Building

The hazardous materials storage building is located to the east of the Fixed Wing Support Hangar. Various hazardous materials are stored inside the building. Historically, 105 5-gallon sealed containers of AFFF were stored inside the building. The 5-gallon buckets were added to helicopter buckets for firefighting brushfires offsite. Around 2014, the 5-gallon buckets of AFFF were removed from the facility and sent to the Camp Mabry US Property & Fiscal Office (USPFO) in Austin, Texas. To the best of their knowledge, TXARNG staff who had been working on site since 2001 reported no releases of any materials in this area. No floor drain was observed in the hazardous materials storage building. Geographic coordinates for the hazardous materials storage building are 30°10'42.2"N; 97°40'19.5"W.

3.5 Fuel Station

Historically, AFFF-containing Tri-Max™ units were stationed at the Fuel Station on site. TXARNG staff who had been working on site since 2001 reported no releases of any materials in this area. Precipitation and wastewater in this area flows to the OWS. Geographic coordinates for the fuel station are 30°10'40.4"N; 97°40'17.8"W.



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Non-Fire Training Areas

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Figure 3-1

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4. Emergency Response Areas

To the best of their knowledge, TXARNG personnel who have been working on site since 2001 reported no past emergency responses. However, the Airport Fire Department conducted an emergency response southeast of the east runway at the ABIA, when an aircraft crashed in the fog. The crash occurred in 2002, and AFFF was used at the crash site to put out the aircraft fire. The National Transportation Safety Board Aviation Accident Data Summary can be found in **Appendix A**, and the location of crash can be found on **Figure 4-1**.

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bergstrom AASF, TX			
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Emergency Response Area

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Germantown, MD 20876

Figure 4-1

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5. Adjacent Sources

Adjacent sources of potential PFAS include the former Bergstrom AFB (now ABIA), the ABIA Fire Department, and Federal Aviation Administration (FAA) inspections conducted at ABIA. **Figure 5-1** shows the adjacent sources described in this section.

5.1 Former Bergstrom AFB

The former Bergstrom AFB is located directly north of the Austin Bergstrom AASF. A site investigation of potential PFAS release areas conducted at the former AFB revealed that firefighting training activities at the base were conducted from 1942 to 1991 at FT023P, located approximately one mile north of the facility. FT023P consisted of one fire training pit, approximately 200 feet in diameter, with a circular berm and limestone lining (Amec Foster Wheeler, 2016).

PFAS were tested in surface and subsurface soils at FT023P. The six PFAS constituents tested were detected above the reporting limits in all three soil locations. Based on these detections, PFAS constituents were present across the soil column in both shallow (0-2 feet bgs) and in deeper soil (greater than 2 feet to 35 feet bgs). No results were above the US Air Force Project Action Limits (Amec Foster Wheeler, 2016).

In groundwater, PFAS were detected above the USEPA Health Advisory levels for PFOA and PFOS at each of the five locations tested, indicating that PFAS have migrated through FTA soils into underlying groundwater. FT023P is underlain by terrace deposits consisting of clay from the surface to approximately 26 feet bgs, then approximately 5.5 feet of silty to clayey gravel. Clay potentially associated with the Upper Taylor Marl bedrock unit was interpreted as being present underneath the gravel sediment. However, Cretaceous bedrock in Austin is highly faulted and the bedrock unit underlying the FTA is uncertain. Local groundwater supply comes primarily from the regional groundwater aquifer (Edwards Aquifer – Balcones Fault Zone) which occurs at about 1,000 feet bgs at the FTA and is not likely to be affected by the fire training activities. Shallow groundwater occurs in the fluviatile terrace deposits and is not used at the facility for water supply, but it has domestic uses 1 mile to the south and southeast of the FTA (Amec Foster Wheeler, 2016).

A second PFAS PA was conducted by Amec Foster Wheeler in December 2015 to determine whether and where AFFF was stored, handled, used or released at the former Bergstrom AFB, in areas other than FT023P. The locations determined from that report and described below are shown on **Figure 5-1**. The locations identified include the following:

1) Former Building 201 (Fire Station): Facility stored and potentially used AFFF; however, no AFFF releases were documented.
2) Former Building 203 (Fire Station Vehicle Washrack): Facility was used to wash emergency vehicles and included a 400-gallon OWS, with effluent drainage to the sanitary sewer system.
3) STOR-604 (Base Supply Open Storage Area/Solid Waste Management Unit [SWMU]-153) and Former Building 604 (Base Hazardous Storage Facility): Open storage area with building that stored 55-gallon drums and five-gallon containers of AFFF, with a documented AFFF release inside the building in 1993.
4) Former Discharge Detention Basin (SWMU-223): Unlined basin constructed to contain a full discharge of AFFF from the fire suppression systems in Hangars 1608 and former Hangar 1609, with three documented AFFF releases.
5) Hangar 1608 (Regional Corrosion Control Facility) and STOR-1608 (Storage of Hazardous Waste): Hangar 1608 maintained an AFFF fire suppression system with two

documented releases. Storage facility STOR-1608 likely stored AFFF; however, no AFFF releases were documented at STOR-1608.

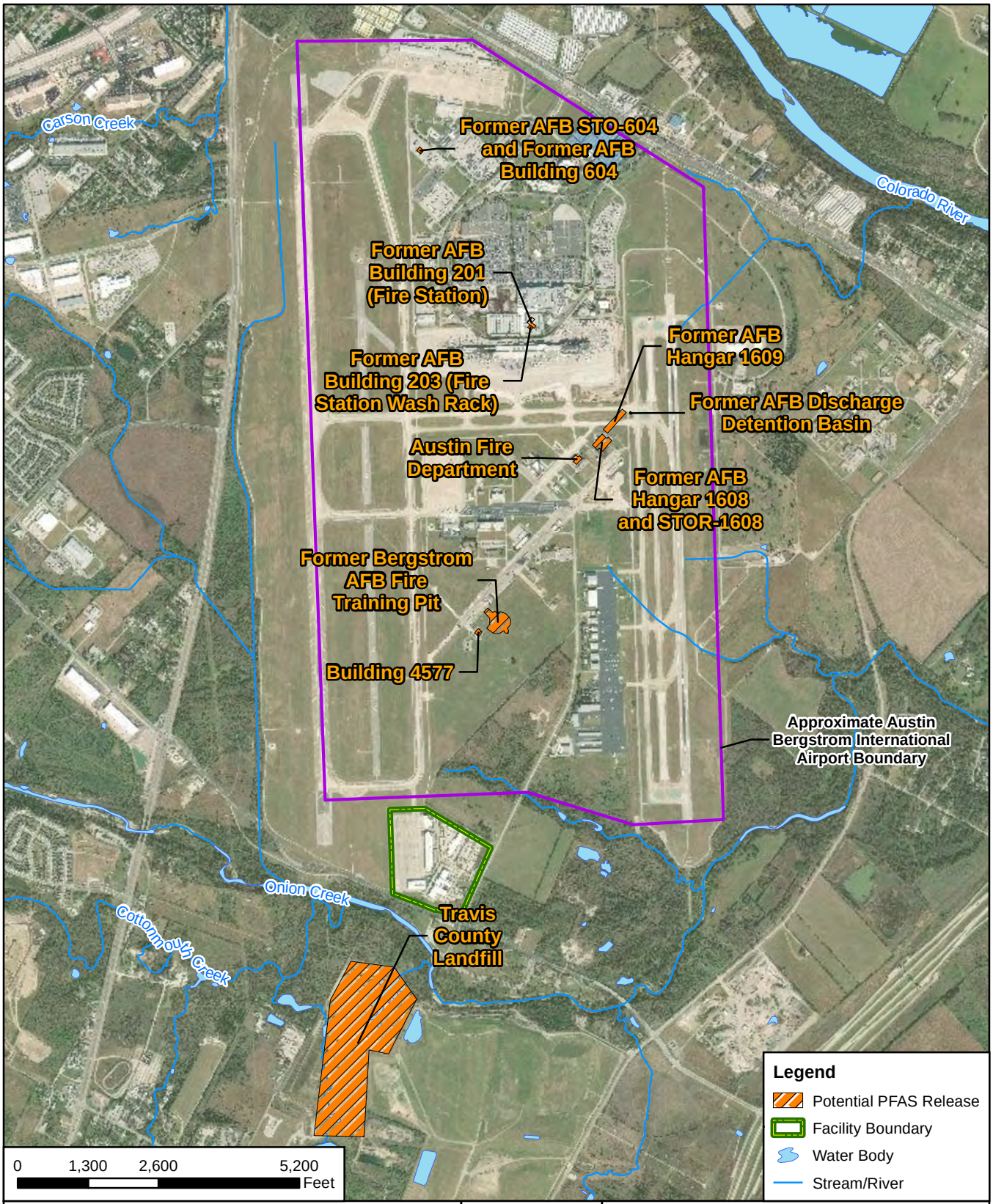
6) Former Hangar 1609 (Small Aircraft Maintenance Dock): Hangar maintained an AFFF fire suppression system with two documented releases.
7) Building 4577 (Crash Fire Station/Vehicle Maintenance Building): Facility may have been used as a crash fire station; however, no documentation of AFFF storage or use was found.

5.2 ABIA Fire Station

In 1999, the City of Austin was conveyed a deed notice for 942 acres of the former AFB for the development of the ABIA. The ABIA Fire Station, approximately 1.4 miles north-northeast of the facility (Austin Fire Department, 2019), stores AFFF and houses four fire trucks that all use AFFF. AFFF is tested at the Austin Fire Department training facility at 4800 Shaw Ln, approximately 2 miles west-northwest of the facility. Additionally, Federal Aviation Administration (FAA) inspections include the use of AFFF at unspecified locations around the airport. The last inspection occurred in 2019 and included the use of AFFF, although efforts were made to mitigate the foam.

5.3 Landfill

The Travis County Landfill is located approximately 0.6 miles southwest of the facility. Hazardous wastes in this landfill likely includes pesticides, paints, and paint thinners, solvents, and oils (EDR^{TM}, 2019). Landfills are not usually a primary release area of PFAS, but materials disposed in landfills may create a secondary source of contamination. Such materials may include sludge from a WWTP that processes PFAS-laden water, used AFFF storage containers, or products associated with waterproofing uniforms or boots.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bergstrom AASF, TX			
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SCALE	1:31,200	CHK BY	MC	4/27/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	4/27/2020

Adjacent Source

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings, the AFFF release areas associated with the Austin Bergstrom AASF Maintenance Hangar and the wash rack were identified as AOI 1 and AOI 2, respectively. The AFFF fire suppression systems at the Fixed Wing Support Hangar and the Storage Hangar are identified as AOI 3 and the Hazardous Materials Storage Building and Fuel Station are identified as AOI 4. This section describes the CSM components developed for these four AOIs. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, and (3) receptor. If any of these elements are missing, the pathway is considered incomplete. The AOIs are shown on **Figure 6-1**, and the preliminary CSM is presented on **Figure 6-2**.

6.1 Pathways

In general, the potential PFAS exposure pathways are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways is sparse and continues to be the subject of PFAS toxicological study.

PFAS contamination may have infiltrated to surface and subsurface soil in the vicinity of the wash rack and hangars. Under such a scenario, ground disturbing activities in these areas could result in site and construction worker exposure to PFAS via inhalation of dust or ingestion of exposed surface soil, and construction workers exposure to PFAS via inhalation of dust or ingestion of exposed subsurface soil. There is also potential for exposure to PFAS contamination in surface water/sediment in the retention ponds.

Potential PFAS contamination may have further infiltrated to shallow groundwater from infiltration at the retention ponds on-site. Four domestic wells are located between 0.3 and 0.6 miles northeast and southeast of the facility and range from 35 to 70 feet deep. Therefore, the ingestion exposure pathway for off-facility residents using groundwater is potentially complete.

6.2 Receptors

Receptors at Austin Bergstrom AASF include site workers, construction workers, and residents outside the facility boundary. These receptors, as they pertain to the facility are described below:

- Site workers typically work at or use the site and may come into contact with the surface soils. Site workers may also come into contact with surface water in the retention ponds at the facility.

- Construction workers are considered workers who represent a utility worker or other worker who would be exposed to surface and/or subsurface conditions through ground-disturbing activities.

- Off-facility recreational users typically identify a person who may recreationally use an off-facility area that may be affected by a PFAS release from the facility. Off-facility recreational users could be exposed to sediment and surface water during recreational use.

- Off-facility residents identify receptors who occupy properties outside of the facility. Off-facility residents may come into contact with groundwater using private, domestic, agricultural and/or public supply wells.

The preliminary CSM for the facility indicates which specific receptors could potentially be exposed to PFAS. The preliminary CSM for AOIs 1, 2, 3 and 4 is shown on **Figure 6-2**.

6.3 AOI 1 Maintenance Hangar

AFFF was released into the Maintenance Hangar during routine testing of the newly installed fire protection system in 2005, and during an accidental release in 2006. While there is a record of the handling of the AFFF produced during the accidental release, there is no record of the handling and disposal of the AFFF produced from the first release in 2005. It is assumed that some quantity of AFFF was released into the storm water drainage system during both releases.

Releases at the Maintenance Hangar would have been conveyed to the trench drains, then to the holding tank, and then to the OWS. The first test release was then conveyed to the storm water drainage system. During the second (accidental) release, AFFF solution was captured at the holding tank and then stored in frac tanks for analysis and disposal. However, an unknown quantity of AFFF solution most likely was released to the storm water drainage system before corrective measures were taken during the release.

6.4 AOI 2 Wash Rack

AFFF was used in Tri-Max™ units from 2005 to 2010. Fire training was conducted once or twice in 2009 at the wash rack (AOI 2). An unknown quantity of AFFF was released during these fire training events. Liquid that reaches the wash rack either travels to the holding tank, OWS, and storm water drainage system, or is diverted to the oil/sand filter and sanitary sewer system, depending on the positioning of a diverter valve. The position of the diverter valve at the time of AFFF training is unknown.

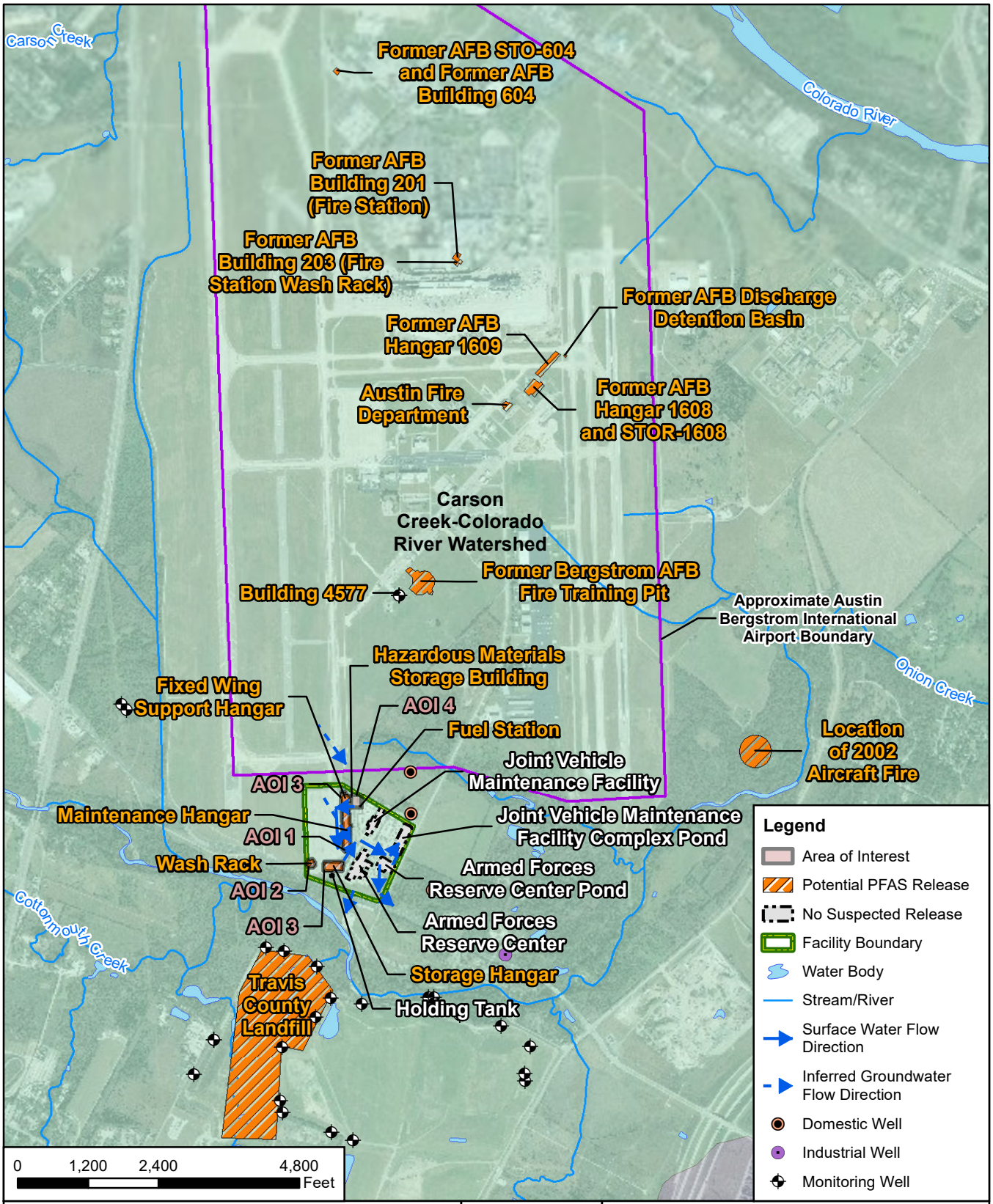
Based on the nature of the release (during testing/training), it appears unlikely AFFF would have been discharged to the ground surface outside of the wash rack, but AFFF foam may have migrated to the surrounding grassy area and infiltrated into the soil.

6.5 AOI 3 Fixed Wing Support Hangar and Storage Hangar

The Fixed Wing Support Hangar and the Storage Hangar are both equipped with AFFF fire suppression systems. It is likely that both systems were tested in 2005 when the hangars were being commissioned, leading to a release of AFFF. The flow pathway from the smaller hangers would have consisted of AFFF flowing from the hangar to the trench drain, then to the holding tank, OWS, and finally to the storm water drainage system.

6.6 AOI 4 Hazardous Materials Storage Building and Fuel Station

The Hazardous Materials Storage Building historically contained 105 5-gallon sealed containers of AFFF and the Fuel Station historically had AFFF-containing Tri-Max™ units stationed around the area. Although TXARNG reported no known releases of any PFAS-containing materials in either area, these areas should be investigated for potential release. Surface water in the vicinity of the Hazardous Materials Storage Building could potentially allow AFFF to infiltrate into nearby grassy areas, and surface water in the vicinity of the Fuel Station flows to the OWS.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bergstrom AASF, TX			
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SCALE	1:28,800	CHK BY	MC	4/29/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	4/29/2020

N

Areas of Interest

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Figure 6-1

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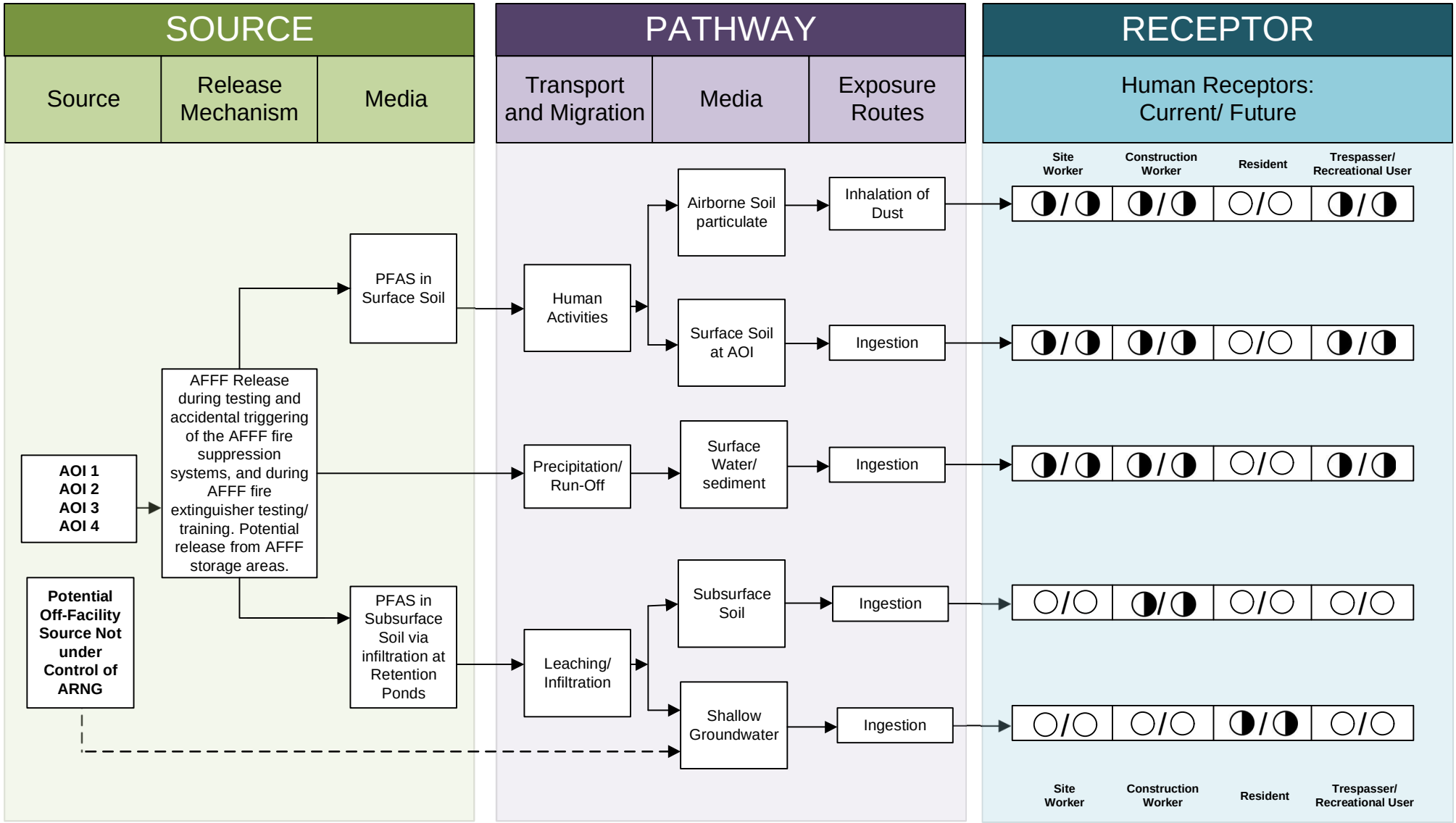


LEGEND

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

Note:
1. The residential receptor refers to an off-facility receptor.

Figure 6-2
Preliminary Conceptual Site Model
Austin Bergstrom AASF

7. Conclusions

Four AOIs were identified at Austin Bergstrom AASF during the PA (**Figure 7-1**).

7.1 Findings

Based on interviews with current facility personnel, reported historical AFFF releases are associated with the Maintenance Hangar AFFF releases, AFFF fire extinguisher testing/training at the wash rack, AFFF fire suppression systems at the Storage Hangar and Fixed Wing Support Hangar, and the storage of AFFF in the hazardous materials storage building and Tri-Max™ units at the Fuel Station. These releases indicate the potential for PFAS contamination in media at or near the facility. The preliminary CSM for the Austin Bergstrom AASF is shown on **Figure 6-2**, which presents the potential receptors and media impacted. No evidence of other accidental or incidental spills or leaks from AFFF storage containers/areas were identified during the site visit. The remaining buildings associated with the facility are not equipped with AFFF. The findings of potential AFFF release are summarized in **Table 7-1** below.

Table 7-1: AOIs at Austin Bergstrom AASF

Area of Interest	Name	Used by	Release Dates
AOI 1	Two AFFF fire suppression system releases occurred at the Maintenance Hangar. Releases discharged to trench drains in the hangar, which flowed to the below ground holding tank, then to the OWS and then either to the storm water drainage system (test release) or to frac tanks for holding (accidental release).	TXARNG	2005-2006
AOI 2	Releases occurred during AFFF fire extinguisher testing/training with mobile carts at the wash rack. Flow either travelled from the wash rack to the holding tank, OWS, then to the storm water drainage system or from the wash rack to an oil/sand filter, and then to the sanitary sewer, depending on the positioning of the diverter valve.	TXARNG	2009
AOI 3	The Fixed Wing Support Hangar and the Storage Hangar are both equipped with AFFF fire suppression systems. It is likely that both systems were tested in 2005, when the hangars were being commissioned, leading to a release of AFFF. The flow path for AFFF would have been from the hangars to the trench drain, the holding tank, OWS, and finally to the storm water drainage system.	TXARNG	2005

AOI 4	The Hazardous Materials Storage Building and the Fuel Station both historically contained AFFF in 5-gallon containers and in Tri-Max™ units (respectively). These areas will be investigated for potential PFAS release.	TXARNG	2005-2014

7.2 Uncertainties

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

The conclusions of this PA are based on all available information, including: previous environmental reports, EDRs™, observations made during the VSI, and interviews. Interviews of personnel with direct knowledge of a facility generally provided the most useful insights regarding a facility's historical and current PFAS-containing materials. Sometimes the provided information was incomplete. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS were first used (1969 to present), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and storage of PFAS were reviewed, current personnel were interviewed, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected.

Table 7-2 summarizes the uncertainties associated with the PA:

Table 7-2: Uncertainties

Area of Interest	Source of Uncertainty
AOI 1 Maintenance Hangar	The quantity of AFFF released at the Maintenance Hangar during the two releases is unknown, as well as how much AFFF was discharged to the storm water drainage system before the frac tanks were put in place during the second release.
AOI 2 Wash Rack	The quantity of AFFF used for fire training purposes is unknown, as well as the flow pathway of water entering the wash rack. Interviewees stated that a diverter valve exists that diverts water from the storm water drainage system to the sanitary sewer system. It is unknown at what setpoint the diverter is actuated.
AOI 3 Fixed Wing Support Hangar and Storage Hangar	It is unknown how the AFFF fire suppression systems in the Storage Hangar and the Fixed Wing Support Hangar were tested, and what quantity of AFFF was produced.

Emergency Response Area	An unknown quantity of AFFF was released during the emergency response at the aircraft crash site located to the southeast of the east runway at ABIA. The fire was extinguished by the Airport Fire Department.

7.3 Potential Future Actions

Based on the documented presence (2005-2009) of the release of PFAS-containing materials at the facility, evidence indicates that former TXARNG activities contributed PFAS contamination to soil and potentially groundwater at Austin Bergstrom AASF. The facility will move forward in the CERCLA process.

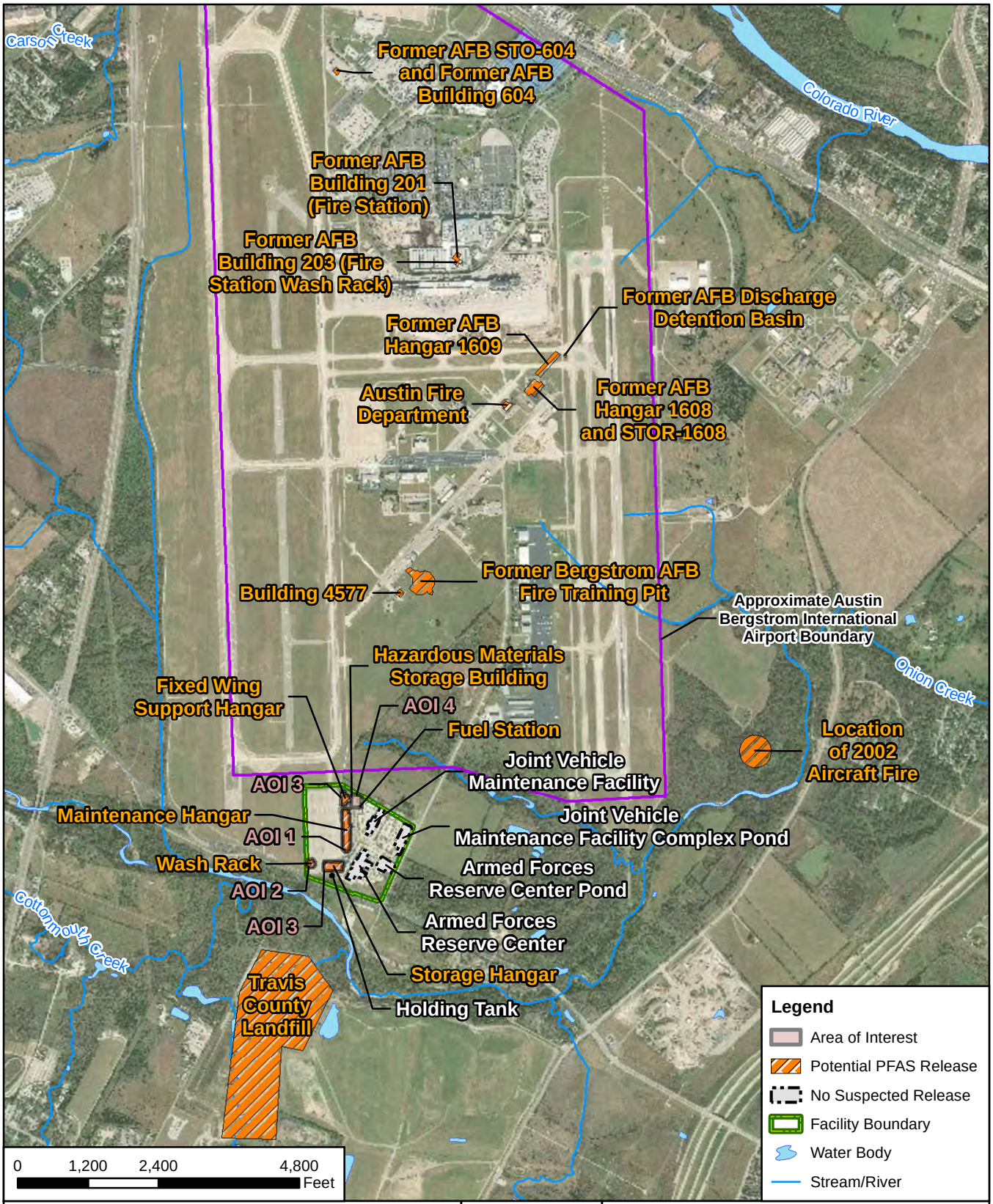
Interviews (covering 2001 to present) indicate that releases related to AFFF fire suppression systems in the hangars (AOIs 1 and 3) and fire extinguisher testing/training in the wash rack area (AOI 2) may have resulted in PFAS releases identified during the PA. Additionally, storage of AFFF in 5-gallon containers at the hazardous materials storage building and AFFF-containing Tri-Max™ units at the Fuel Station (AOI 4) may have led to a release as well. Based on the preliminary CSM developed for the AOIs, there is potential for receptors to be exposed to PFAS contamination in soil, surface water/sediment and groundwater at the AOIs. **Table 7-3** summarizes the rationale used to determine if the AOIs should be considered for further investigation under the CERCLA process and undergo an SI.

ARNG will evaluate the need for an SI at AOIs 1, 2, 3 and 4 at Austin Bergstrom AASF based on the presence of a PFAS release, possible receptors, the migration potential of PFAS contamination to receptors, and the availability of resources.

Table 7-3: Rationale

Area of Interest	AOI Location	Rationale	Potential Future Action
AOI 1: Maintenance Hangar	30°10'36.2"N; 97°40'21.0"W	Releases during AFFF fire suppression system test and accidental discharge; water flowed to holding tank, OWS, then to the storm water drainage system.	Proceed to an SI, focus on soil, surface water/ sediment and groundwater
AOI 2: Wash rack	30°10'30.9"N; 97°40'27.6"W	Releases during AFFF fire extinguisher testing/training with mobile carts at the wash rack. Flow either discharges to the holding tank, OWS, then to the storm water drainage, or is diverted to the sanitary sewer system.	Proceed to an SI, focus on soil, surface water/sediment and groundwater
AOI 3: Fixed Wing Support Hangar and Storage Hangar	30°10'41.9"N; 97°40'21.1"W and 30°10'30.5"N; 97°40'23.4"W	The two smaller hangars are both equipped with AFFF fire suppression systems. It is likely that both systems were tested in 2005, when the hangars were being commissioned, leading to a release of AFFF. The flow path for AFFF foam would have been from the hangar to the trench drain, holding tank, OWS, and finally to the storm water drainage system.	Proceed to an SI, focus on soil, surface water/ sediment and groundwater

AOI 4: Hazardous Materials Storage Building and Fuel Station	30°10'42.2"N; 97°40'19.5"W and 30°10'40.4"N; 97°40'17.8"W	AFFF was stored at the Hazardous Materials Storage Building and at the Fuel Station. Although there are no documented releases at either location, they should be investigated to determine if PFAS releases occurred.	Proceed to an SI, focus on soil and groundwater.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bergstrom AASF, TX			
REVISED	4/27/2020	GIS BY	MS	4/27/2020
SCALE	1:28,800	CHK BY	MC	4/27/2020
Base Map: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,		PM	RG	4/27/2020

Summary of Findings

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Figure 7-1

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8. References

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Appendix A
Data Resources

Data resources will be provided separately on CD. Data resources for Austin Bergstrom AASF include:

Previous Investigations Completed

- Amec Foster Wheeler. December 2015. Final Perfluorinated Compounds Preliminary Assessment, Former Bergstrom AFB, Texas. AR #469412. Prepared for Air Force Civil Engineer Center.
- Amec Foster Wheeler. June 2016. Final Site Investigation Report, Former Bergstrom AFB, TX. Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple United States Air Force Base Realignment and Closure Installations. AR #558322. Prepared for Air Force Civil Engineer Center.
- Law Environmental, Inc. October 1995. Installation Restoration Program (IRP) RCRA Facility Assessment/RCRA Facility Investigation, Ground-water Gradient Determination, Bergstrom Air Force Base, Austin, Texas.

Miscellaneous Data Resources

- 2006 AFFF Release Report and Photographs
- Austin-Bergstrom International Airport. February 2019. Site Topography and Storm Water Drainage System, Figure 4-2.
- Landrum & Brown. December 2018. Austin-Bergstrom International Airport (ABIA) Master Plan. Draft Chapter 2: Existing Conditions.
- Bergstrom Lease Agreement. 2002.
- Bureau of Economic Geology. 1976. Environmental Geology of the Austin Area. University of Texas at Austin.
- EDR™. December 2019. The EDR™ Aerial Photo Decade™ Package. Austin-Bergstrom AASF. Inquiry Number: 5900192.6.
- EDR™. December 2019. The EDR™ Radius Map™ Report with GeoCheck. Austin-Bergstrom AASF. Inquiry Number: 5900192.2s.
- EDR™. December 2019. Certified Sanborn® Map Report. Austin-Bergstrom AASF. Inquiry Number: 5900192.3.
- Jose I. Guerra, Inc. 2010. 24” and 30” reinforced concrete pipe (RCP) Discharge Outlet Plans. Engineering Drawings.
- National Transportation Safety Board Aviation Accident Data Summary. March 2002.

Appendix B

Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire – ~~Fire Station~~ Townhall

Facility: Bergstrom Hangar AASF
Interviewer: [redacted]
Date/Time: 4/24/19 @ 0800

Interviewee: Refer to sign-in sheet **Title:** NA **Phone Number:** NA **Email:** NA	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? Y or N [redacted] (TMD Fire Marshal)

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

Refer to sign-in sheet

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

Maintenance (e.g., ramp washing) No
Fire Training Areas Yes
Firefighting (Active Fire) No
Crash No
Fire Suppression Systems (Hangers/Dining Facilities) 3 hangars with fire suppression systems
Fire Protection at Fueling Stations Historically located there, but never used
Non-Technical/Recreational/ Pest Management No

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

There are 3 hangars that have AFFF (high expansion foam) fire suppression systems. At least one hangar was tested apon commissioning of the new system.

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

All fire suppresion systems were built in 2005 to use high expansion foam.

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

AFFF procured by Tim Leek. Most likely through state procurement system.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

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

Jet-X 2.75% high expansion foam (Ansul) is used in all 3 hangars, or AFFF (3%).

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

AFFF is mixed via the fire suppression system. It is stored as a concentrate. May have been mixed for other uses near haz mat storage area or by wash rack.

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

It was stored in the hazardous material storage container. 105 - 5 gallon buckets of AFFF used for brush fires was removed from the storage container in 2014. Additionally, the Maintenance Hangar and Storage Hangar both have 2 x 800 gallon tanks and 1 x 100 gallon AFFF tank. The Fixed Wing Hangar has 2 x 300 gal tanks, 1 x 100 gal tank, and 4 x 55 gal drums of 3% AFFF.

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

No specified area for transfers. May have added AFFF to bambi buckets during flight. Most likely cleaning took place at wash rack.

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

No fire trucks on-site.

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

No vehicles with AFFF.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

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

In 2009 personnel trained with 1 Tri-Max unit (once or twice) at wash rack.

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

No fuels used.

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

AFFF used at wash rack once or twice. From the wash rack, flow travels to an OWS. From OWS, flow either travels to sanitary sewer or storm water. The flow from the wash rack diverts to sanitary sewer when the pressure reachs a setpoint. flow may go to storm water retention pond where it is then used to irrigate site.

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

Airport fire ~~protection~~ department is responsible for AASF fire protection. Site trains with local fire department (ARF) with non-AFFF fire extinguishers.

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

Not known.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

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

Not known.

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

No emergency response on-site.

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

Not known if AFFF was used in this way.

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

AFFF was used in helicopters to help mitigate forest fires. These 5-gallon buckets were removed in 2014. Stopped using 5-gallon buckets in 2005.

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

1 accidental release in February 2006 at Maintenance Hangar. All liquid was stored in a holding tank, then transfered to frac tanks for chemical analysis.

PA Interview Questionnaire – Fire Station

Facility:_____
Interviewer:_____
Date/Time:_____

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

Not aware.

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

Fire Marshal inspected Tri-Max units and drained liquids into 55-gallon drums for disposal.

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

[redacted] (TMD Fire Marshal)

[redacted]

Bergstrom

Preliminary Assessment Sign-In Sheet

4/24/19

Name	Position	Years at the Facility	Phone Number/Email	May AECOM use your name in the PA Report?
[redacted]	Ground Support Shop Chief	17	[redacted]	Yes
	Ground Support	11		Yes
	Environmental Compliance Specialist, Sr. Dept of Aviation	3.5		yes
	Deputy Env. Prog. Mng	25		[redacted]
	Environmental SP	1.5		Yes
	Facilities Mgr	5		[redacted] Yes
	Aircraft Systems Supervisor	8		[redacted] Yes
	Maintenance Officer	18		Yes
	Site Safety Officer	9		Yes

Appendix B.2
Visual Site Inspection Checklists

Facility ST
Visual Survey Inspection Log

Recorded by: [redacted]
ARNG Contact:
Date: 4/24/19

Site Name / Area Name / Unique ID: Austin-Bergstrom Hangar AASF
Site / Area Acreage: ~60 acres
Historic Site Use (Brief Description): TX ARNG AASF

Current Site Use (Brief Description): TX ARNG AASF

1. Was AFFF used at the site/area? (Y)/N
   3a. If yes, document how AFFF was used and usage time (e.g., *fire fighting training 2001 to 2014*) 3 hangar suppression systems were tested in 2005. 1 accidental release in 1 hangar (2006). Trained with Tri-Max in 2 at wash-r
2. Has usage been documented? Y(N)
   2a. If yes, keep a record (place electronic files on a disk)

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? (Y)/N
   1a. If so, please describe change: (*ex. Structures structures longer exist.*) Joint Vehicle Maintenance Facility and Armed Forces Reserve Center were built in 2012, Hangars built in 2003
2. Is the site/area vegetated? (Y)/N
   2a. If not vegetated, briefly describe the site/area composition: Site is primarily impervious cover, but there are retention ponds and some treed and grassy areas on-site.
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 :

Migration Potential:

1. Does site/area drainage flow off installation? (Y)/N
   1a. If so, please note observation and location: Retention ponds discharge to Onion Creek at Ou 1 along Burleso
2. Is there standing water or drainage issues within the site/area? Y(N)
   2a. If so, please note observation and location: There are 2 retention ponds that collect water on-site. They discharge to Onion Creek or recharge the irrigation well on-s
3. Is there channelized flow within the site/area? (Y)/N
   3a. If so, please note observation and location: Channelized storm sewers carry flow to retention basins.
4. Have man-made drainage channels been constructed within the site/area? (Y)N
   4a. If so, please note the location of the channel: There are storm sewers throughout the site.

Additional Notes

Storm water enter the storm sewer through various inlets and the wash racks. Flow from wash racks goes through OWS and a 50,080 gal detention tank on south side of site. Storm water flow then travels to the JVMF Complex Pond or the AFRC Pond. Flow from the ponds is used for an irrigation wet well or flows to Onion Creek (south of Burleson Rd). Process water from wash racks can be diverted to sanitary sewer, depending on pressure setting.

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Austin Bergstrom ABIA AASF

Why has this location been identified as a site?

The City of Austin leased the ABIA to ARNG as of May 17, 2002. An AFFF release occurred on Feb 13, 2006.

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

ABIA activities, and Former Bergstrom AFB.

Training Events 1 or 2 training events with 1 Tri-Max units occurred in 2009.

Have any training events with AFFF occurred at this site? Yes, from 1942 to 1991 at FT023P (offsite)

If so, how often? 1 or 2 times with 1 Tri-Max.

How much material was used? Is it documented? Potentially 1 or 2 Tri-Max units worth.

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? Stormwater flows to Onion Creek (south of site)

Surface Water:

Surface water flow direction? ~70% of runoff drains to Onion Creek

Average rainfall? 33 in/year

Any flooding during rainy season? Flash flooding sometimes occurs

Direct or indirect pathway to ditches? All stormwater flows in underground pipes, not ditches

Direct or indirect pathway to larger bodies of water? Stormwater discharges to Onion Creek

Does surface water pond any place on site? 2 retention ponds

Any impoundment areas or retention ponds? 2 ~~retenits~~ retention ponds - JVMT & AFRC Pond

Any NPDES location points near the site? 1 outfall to Onion Creek

How does surface water drain on and around the flight line? Surface Water drains southward along flightline in storm water pipes, then travels along major road to the JVMT Complex Pond.

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? Generally from recharge areas in the north and west towards discharge areas To the east & SE in the south

Depth to groundwater? 25 ft bgs (shallow GW)

Uses (agricultural, drinking water, irrigation)? Shallow GW is not used on-site but has domestic & livestock uses ~~one mile to the south~~ southeast

Any groundwater treatment systems? No

Any groundwater monitoring well locations near the site? 3 monitoring wells north of site (AFCEC) east of site (close-by

Is groundwater used for drinking water? Nearest public water supply is ~2 miles east of site

Are there drinking water supply wells on installation? No

Do they serve off-post populations? No

Are there off-post drinking water wells downgradient Yes

Waste Water Treatment Plant:

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

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

Do we understand the fate of sludge waste? NA

Is surface water from potential contaminated sites treated? NA

Equipment Rinse Water

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

Most likely in wash rack. Travels to holding tank, then OWS, then retention pond. Eventually discharges to Onion Creek or used for irrigation.

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?

Unknown.

3. Other?

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker Yes

Construction Worker Yes

Recreational User No

Residential No

Child No

Ecological Yes

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

Agricultural and/or livestock nearby. Landfill south of site.

Documentation

Ask for Engineering drawings (if applicable). Stormwater plan is available.

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

Retention ponds built in 2012.

Appendix C
Photographic Log

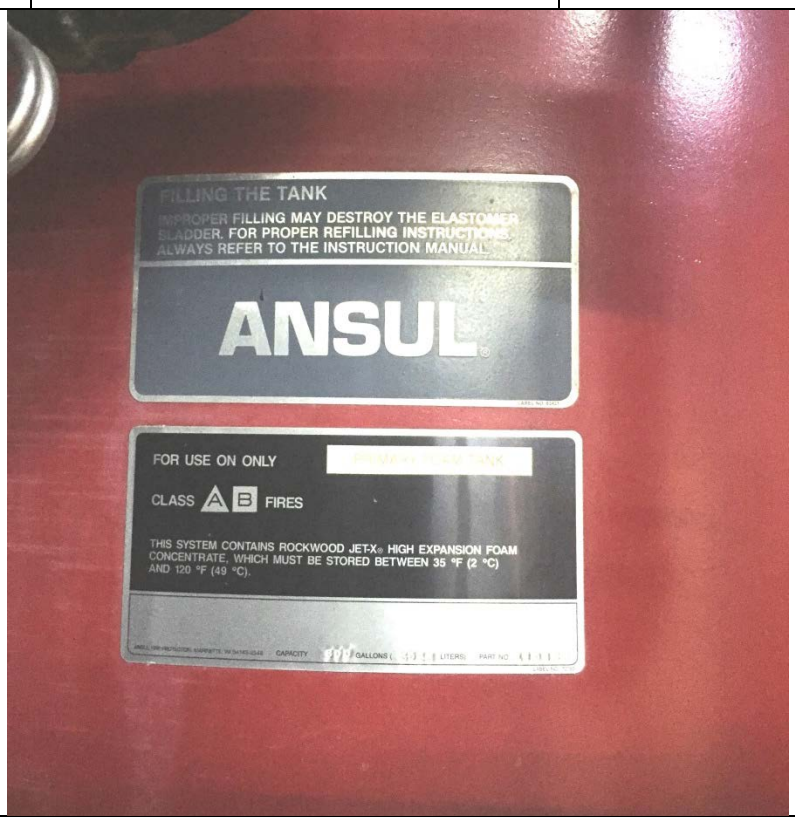
APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 1

Description:

1 of 2 - 800 gallon tanks located in the Maintenance Hangar. Tank contains 800 gallons of Rockwood Jet-X® High expansion foam concentrate.



Photograph No. 2

Description:

100 gallon tank of AFFF foam concentrate in Maintenance Hangar. Used to supply Hand Held Hoses with AFFF.

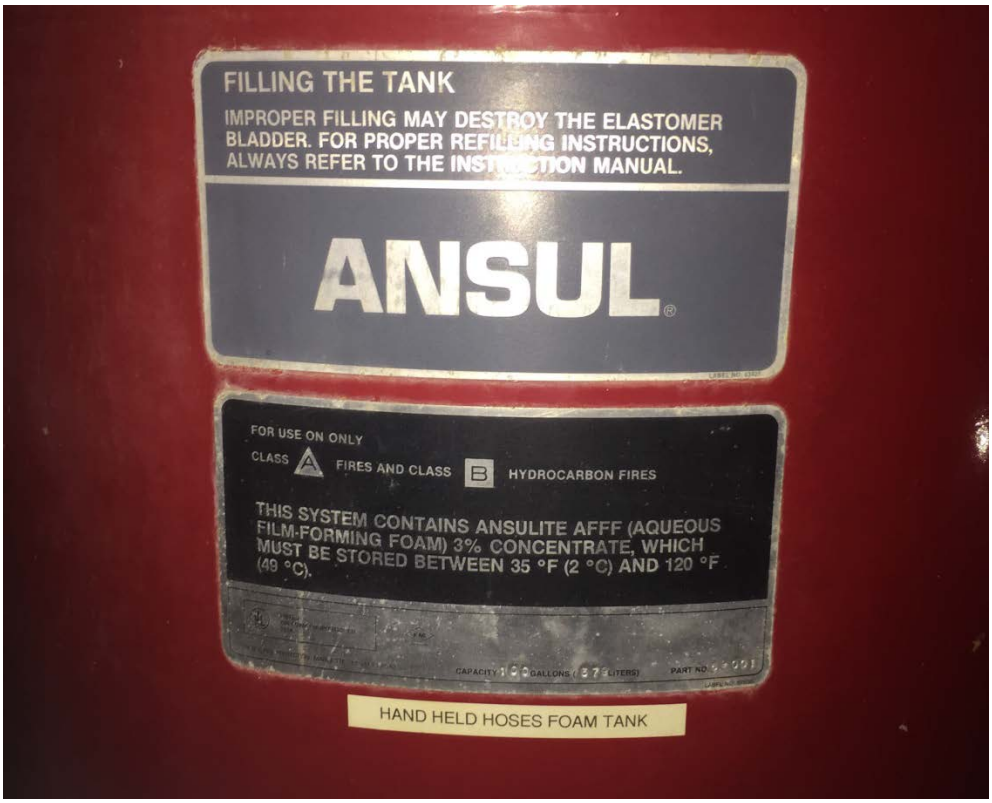
APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 3

Description:

Ansulite AFFF 3% concentrate stored in 100 gallon tank in Maintenance Hangar for use in Hand Held Hoses for emergency fire suppression.



Photograph No. 4

Description:

Photograph of 2 x 800 gallon tanks of Jet-X® High expansion foam concentrate for use in the Maintenance Hangar fire suppression system.

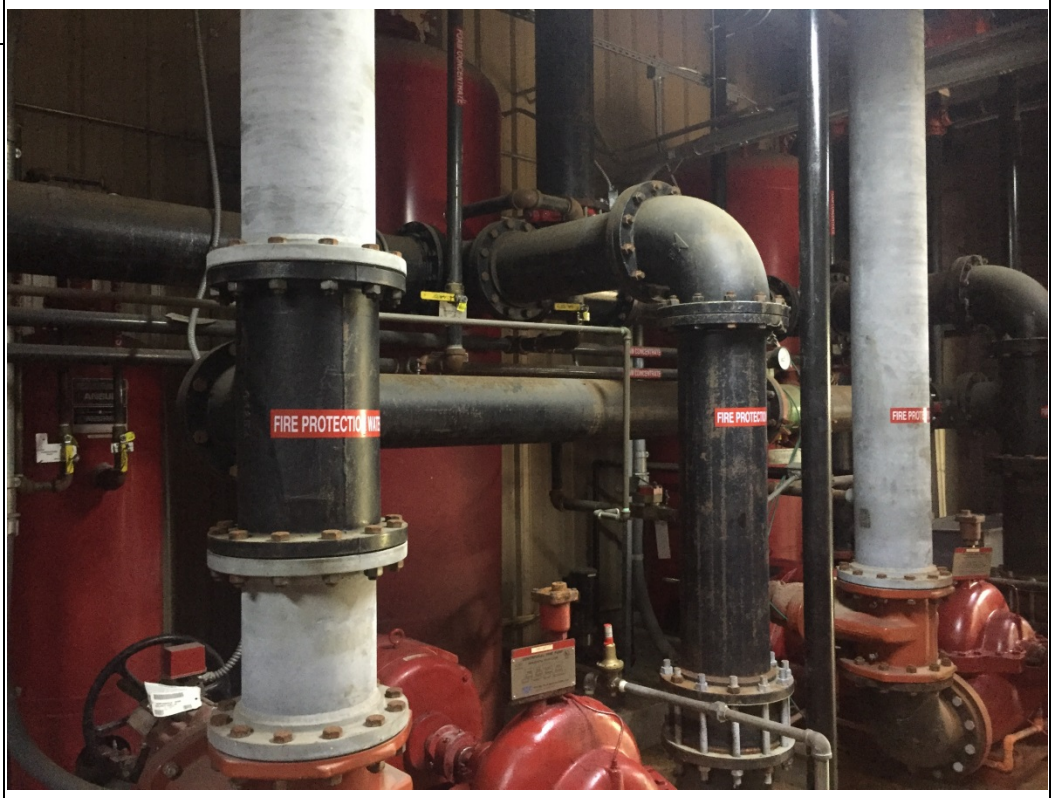
APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 5

Description:

Photograph of 2 x 800 gallon Jet-X High expansion foam tanks and 1 x 100 gallon AFFF foam tank in Maintenance Hangar for emergency fire suppression. System is currently offline, waiting for system repairs.



Photograph No. 6

Description:

Fire suppression nozzles in Storage Hangar.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 7

Description:

Facing west, looking at wash rack. Fire training activities took place in this area in 2009. One Tri-Max unit was used for training in 2009. Training occurred once or twice during 2009.

Photograph No. 8

Description:

Diverter valve near wash rack that diverts flow from storm sewer to sanitary sewer when pressure set point is reached.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 9

Description:

7 empty Tri-Max units stationed near wash rack, waiting for disposal offsite.

Photograph No. 10

Description:

Oil/sand filter near wash rack on southwest corner of site.

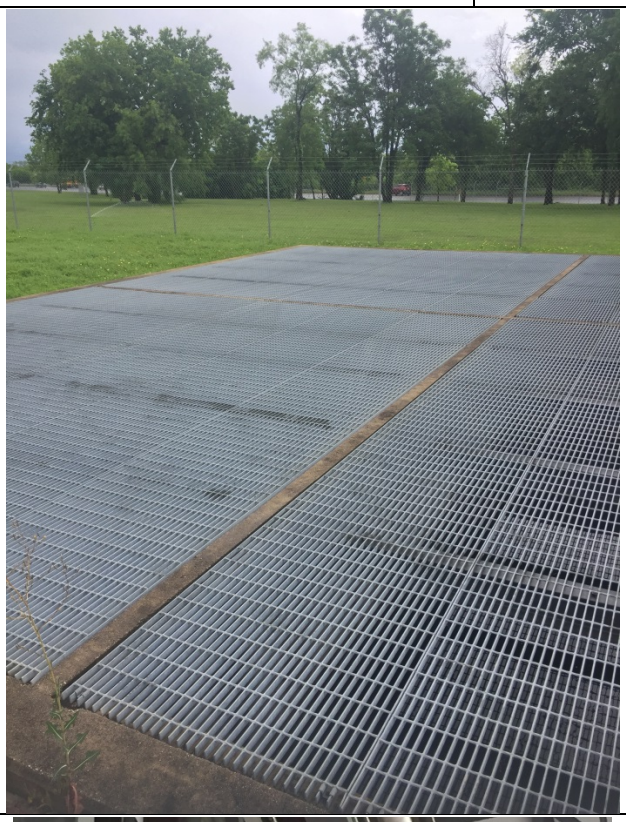
APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 11

Description:

50,000 gallon holding tank located along south side of site.



Photograph No. 12

Description:

Jet-X® High expansion foam nozzles used in Maintenance Hangar and Fixed Wing Hanger.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 13

Description:

Fixed Wing Hangar with 1 x 100 gallon tank of AFFF 3% concentrate, and 2 x 300 gallon tanks of Jet-X ® High expansion foam concentrate. All fire suppression systems are currently offline, waiting for maintenance.

Photograph No. 14

Description:

4 x 55 gallon totes of 3% AFFF foam concentrate stored in Fixed Wing Hangar.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 15

Description:

Hazardous Materials storage area. In 2014, 105 – 5 gallon buckets of AFFF were disposed of to a contractor. Buckets were previously stored in this container. Hazardous materials storage container is located directly east of the Fixed Wing Support Hangar.

Photograph No. 16

Description:

Fuel storage area. Historically had Tri-Max fire extinguisher at this location, although it was never deployed.

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Austin Bergstrom AASF (April 24, 2019)	Austin, Texas

Photograph No. 17

Description:

Facing northeast, looking out at the Joint Vehicle Maintenance Facility Complex Pond. Storm water collects in this pond before it is used for the irrigation well or discharges to Onion Creek.