# FINAL
# Preliminary Assessment Report
# Army Aviation Support Facility, West Bend, Wisconsin

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

October 2019

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# Acronyms and Abbreviations

| | |
|---|---|
| °F | degrees Fahrenheit |
| AASF | Army Aviation Support Facility |
| AECOM | AECOM Technical Services, Inc. |
| AFFF | aqueous film forming foam |
| AOI | Area of Interest |
| ARFF | Aircraft Rescue and Fire Fighting Facility |
| ARNG | Army National Guard |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| CSM | conceptual site model |
| FTA | fire training area |
| PA | Preliminary Assessment |
| PFAS | per- and poly-fluoroalkyl substances |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctanesulfonic acid |
| SI | Site Inspection |
| US | United States |
| USACE | United States Army Corps of Engineers |
| USEPA | United States Environmental Protection Agency |
| VSI | visual site inspection |
| WIARNG | Wisconsin Army National Guard |
| WIDNR | Wisconsin Department of Natural Resources |

# Executive Summary

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

AECOM completed a PA for PFAS at the Army Aviation Support Facility (AASF) in West Bend, Wisconsin, to assess potential PFAS release areas and exposure pathways to receptors. The AASF is constructed on a parcel of land owned by the City of West Bend and leased to the Wisconsin ARNG (WIARNG). The current lease agreement expires in 2075. The performance of this PA included the following tasks:

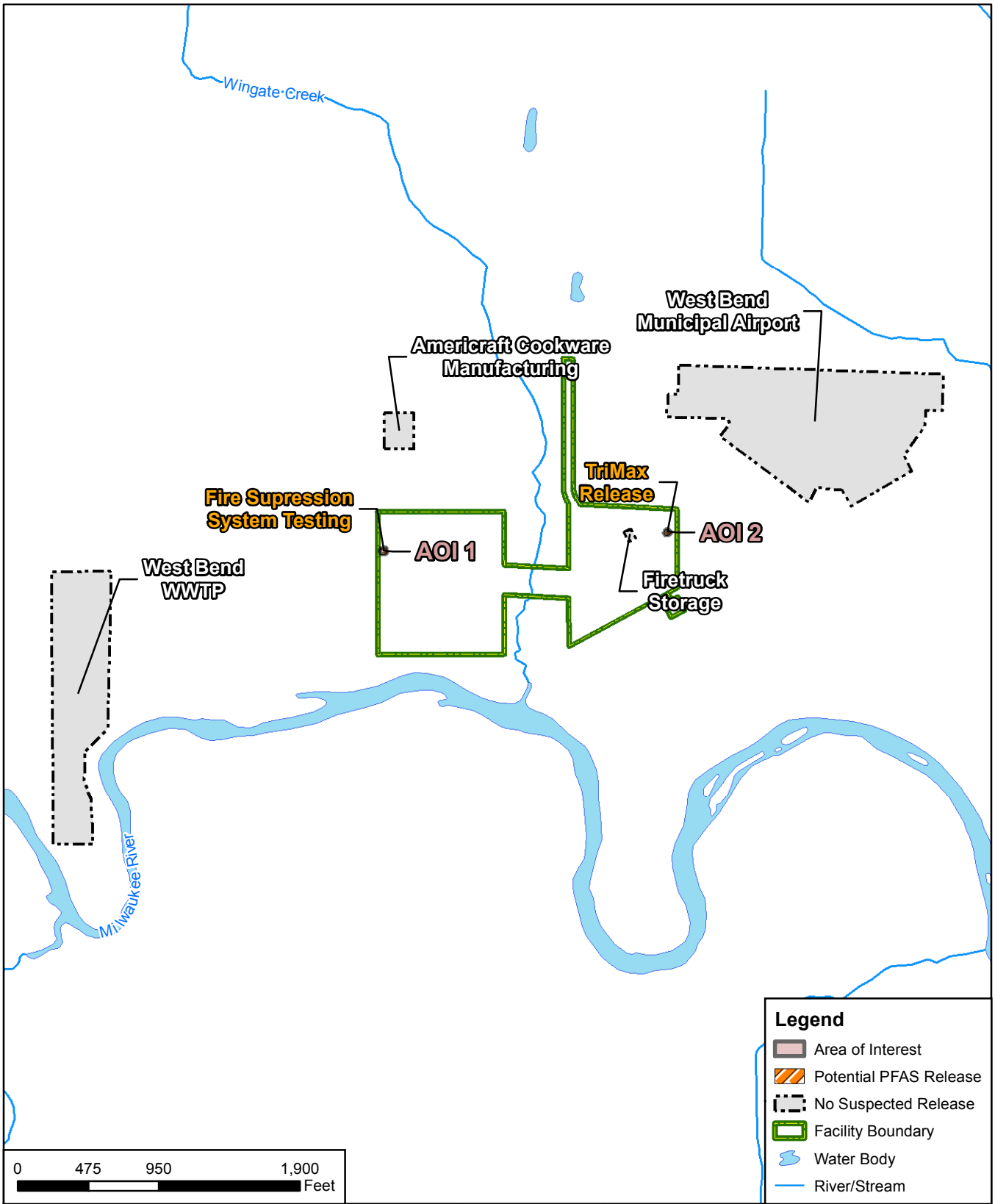
- Reviewed data resources to obtain information relevant to suspected PFAS releases
- Conducted a site visit 8 May 2019
- Interviewed current WIARNG personnel, WIARNG environmental managers, and operations staff
- Completed visual site inspections (VSIs) at known or suspected potential PFAS release locations and documented with photographs
- Developed a preliminary conceptual site model (CSM) to outline the potential release and pathway of PFAS for the area of interest (AOI) and the facility

Two AOIs related to potential PFAS releases was identified at the AASF during the PA. The AOIs are shown on **Figure ES-1** and described in **Table ES-1** below:

**Table ES-1 AOIs at West Bend AASF**

| Area of Interest | Name | Used by | Potential Release Date |
|---|---|---|---|
| AOI 1 | Fire Suppression System Testing | WIARNG | Annually from 2004-present |
| AOI 2 | TriMax Release | WIARNG | unknown |

Based on potential 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 AASF is shown on **Figure ES-2**, which presents the potential receptors and media impacted. Because the AASF was recently built (2004) and has always been operated by the WIARNG, the uncertainty associated with potential PFAS use at the facility is relatively low. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS were detected in a public water system above the United States Environmental Protection Agency Lifetime Health Advisory level within 20 miles of the facility.

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**Summary of Findings**

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**Figure ES-1**

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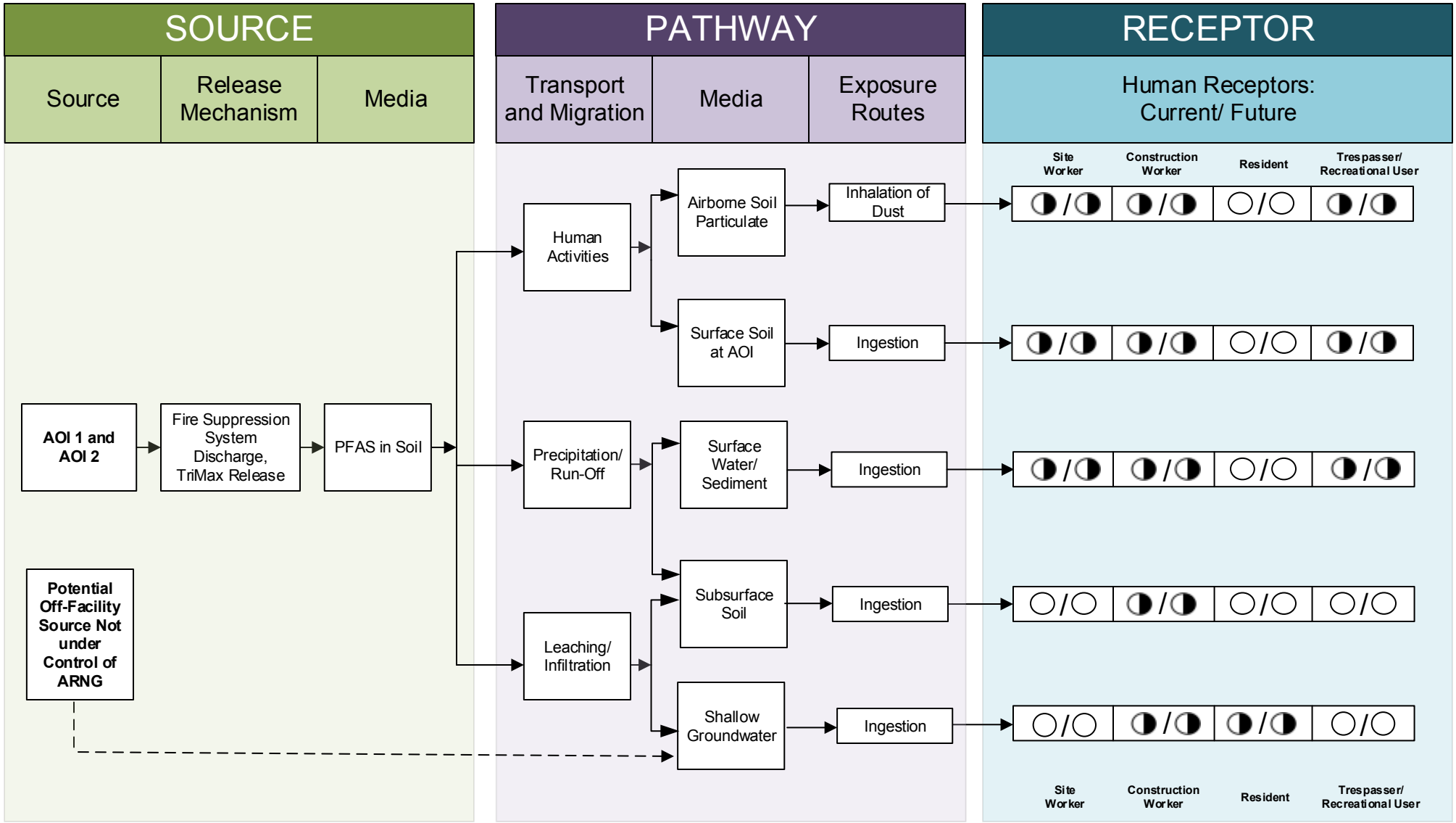



**LEGEND**

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

**Notes:**

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

**Figure ES-2**
Preliminary Conceptual Site Model
West Bend AASF #1

# 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, 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 facilities that used per- and poly-fluoroalkyl substances (PFAS), primarily in the form of aqueous film forming foam (AFFF) released as part of firefighting activities, although other PFAS sources are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of PFAS compounds in the environment varies. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued Drinking Water Health Advisories for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water. In the absence of federal maximum contaminant levels, some states have adopted their own drinking water standards for PFAS. The State of Wisconsin does not currently have drinking water standards for PFAS. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS was detected in a public water system above the USEPA Health Advisory level within 20 miles of the facility.

This report presents the findings of a PA for PFAS at the Army Aviation Support Facility (AASF) in West Bend, Wisconsin, 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 [CFR] Part 300), and USACE requirements and guidance.

This PA documents the known fire training areas (FTAs) as well as other locations where PFAS may have been released into the environment at the 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 8 May 2019
- Interviewed current Wisconsin Army National Guard (WIARNG) personnel, WIARNG environmental managers, and operations staff
- Completed visual site inspections (VSIs) at known or suspected potential PFAS release locations and documented with photographs
- Developed a preliminary conceptual site model (CSM) to outline the potential release and pathway of PFAS for the area of interest (AOI) and the facility

## 1.3 Report Organization

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

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

## 1.4 Facility Location and Description

The AASF (also referred to as the "facility") is in Washington County, Wisconsin (**Figure 1-1**), approximately 2 miles east of West Bend, 30 miles northwest of Milwaukee, and 75 miles northeast of Madison. The facility is accessible from East Washington Street by Chopper Drive and Trenton Road.

The AASF was constructed in 2004 on a parcel of land, approximately 35-acres, owned by the City of West Bend, and leased to the WIARNG. The current lease agreement expires September 2075. See **Appendix A** for real estate documents. The current AASF facilities include hangars for the operation, maintenance, and repair of WIARNG rotary-winged aircraft, administrative offices, and classrooms.

## 1.5 Facility Environmental Setting

The AASF lies within the Milwaukee River Basin, which encompasses several land tributaries to the Milwaukee River. The topography of the area is rolling hills and contains a number of drumlins. The elevation of the facility is approximately 896 feet above mean sea level. The surrounding area is covered by cropland, grasslands, wooded area, and wetlands (Wisconsin Department of Natural Resources [WIDNR, 2001]).

### 1.5.1 Geology

The AASF is situated in the Southeast Glacial Plains, as defined by the WIDNR Ecological Classification System. The Southeast Glacial Plains are characterized for having a rolling topography with silt loam soils, outstanding array of glacial landforms, and numerous wetlands (WIDNR, 2015). Bedrock in the area consists of layers of dolomite and shale that range in thickness from 200 feet to greater than 400 feet. The bedrock ranges in age from Cambrian sandstone to Silurian Age, including the Maquoketa. The bedrock is underlain by sedimentary rock formed by volcanism from the Precambrian Age to the Middle Proterozoic Age. During the Pleistocene Age, glaciers invaded Wisconsin from the north and modified the land surface by caving and gouging out soft bedrock, and depositing hills and ridges of sand and gravel, as well as flat lake beds of sand, silt, and clay (Wisconsin Geological and Natural Survey, 2005).

### 1.5.2 Hydrogeology

The AASF is within the Eastern Dolomite Aquifer, also known as the Silurian or Niagaran Aquifer. The aquifer lies above a fine-grained layer of shale and produces water from interconnected cracks and pores. The Eastern Dolomite Aquifer is thickest along the east side of Wisconsin and thins to the west. Below the Eastern Dolomite Aquifer lies the Cambrian or Cambrian-Ordovician Aquifer. This aquifer has sandstone and dolomite that yields water from the spaces or pore between the sand grains or from cracks and fractures (Wisconsin Geological and Natural History Survey, 2019). The AASF is within the Milwaukee River Basin, which includes six watersheds.

Groundwater is drawn from sand and gravel aquifers and from deeper fractured and weathered bedrock or sedimentary rock. Depth to groundwater in the area ranges from 20 to 30 feet below ground surface. The shallow groundwater is likely to flow to the east, towards the adjacent Milwaukee River (**Figure 1-2**). Groundwater in the bedrock aquifers are expected to flow generally east towards Lake Michigan. Aquifer recharge is predominantly through infiltration of precipitation, although some recharge occurs from open water sources (Stantect, 2018).

No potable water wells are located within the boundary of the AASF; however, unknown well types exist within 4 miles of the facility (**Figure 1-2**). The majority of the wells are upgradient of the AASF and are not likely to be impacted by potential PFAS releases. However, there are two wells side gradient and one well down gradient of the AASF that could be impacted. Drinking water for the AASF is supplied by the City of West Bend, which uses bedrock aquifer groundwater drinking water wells that are west and southwest of the AASF (WIDNR, 2001).

### 1.5.3 Hydrology

The AASF is located between the Silver Creek-Milwaukee River Watershed and the Village of Newburg-Milwaukee Watershed (**Figure 1-3**). The tributary that runs between the AASF and the Armory is Wingate Creek, which discharges to the Milwaukee River. The WIARNG armory is located on the east side of the AASF. The AASF is currently connected to the City of West Bend sanitary sewer system. At the AASF, the surface water flows to the south and east, discharging to the Milwaukee River.

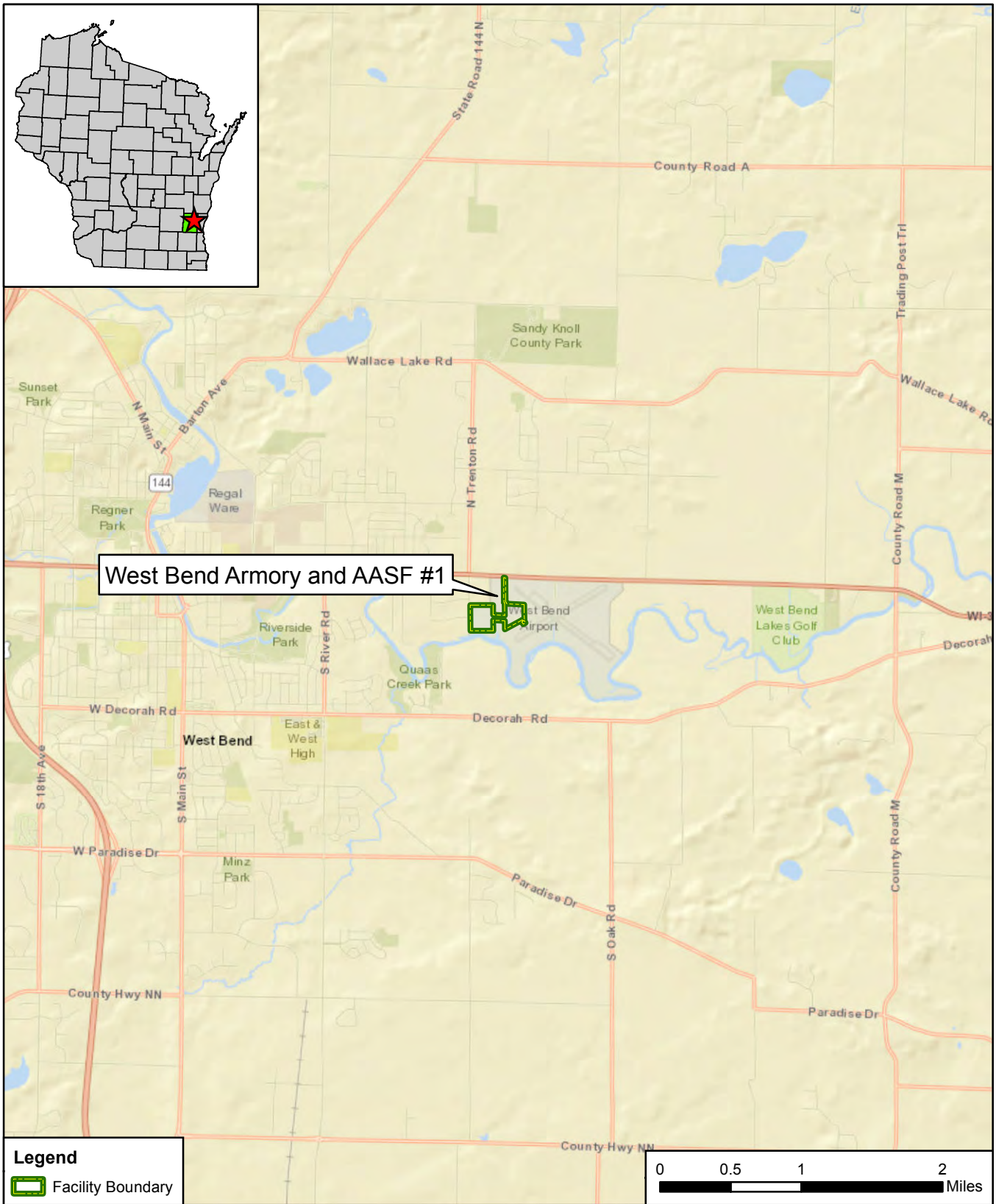
### 1.5.4 Climate

The climate of West Bend consists of warm summers, and winters with freezing, dry, and windy months. Seasonally, temperatures vary from summer highs of 81.5 degrees Fahrenheit (°F) to winter lows of 9.1 °F. The average temperature is 45.5 °F. Average precipitation is 31.2 inches of

rain, and the average snowfall is 43.3 inches (World Climate, 2019). The area is subject to severe storms in the winter.

### 1.5.5 Current and Future Land Use

The AASF is a controlled access facility with public roads and is adjacent to the West Bend Municipal Airport. The facility consists of a storage hangar, repair hangar, shops, and a two-story office area. Exterior features are vehicle parking areas, roads, aircraft parking, taxiways, and a 90 feet clear-span bridge. The West Bend Municipal Airport is owned and operated by the City of West Bend and provides private, commercial, corporate, cargo, and military air service. Future infrastructure improvements, land acquisitions, and land use controls are not anticipated to change.

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## Facility Location

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**Figure 1-1**

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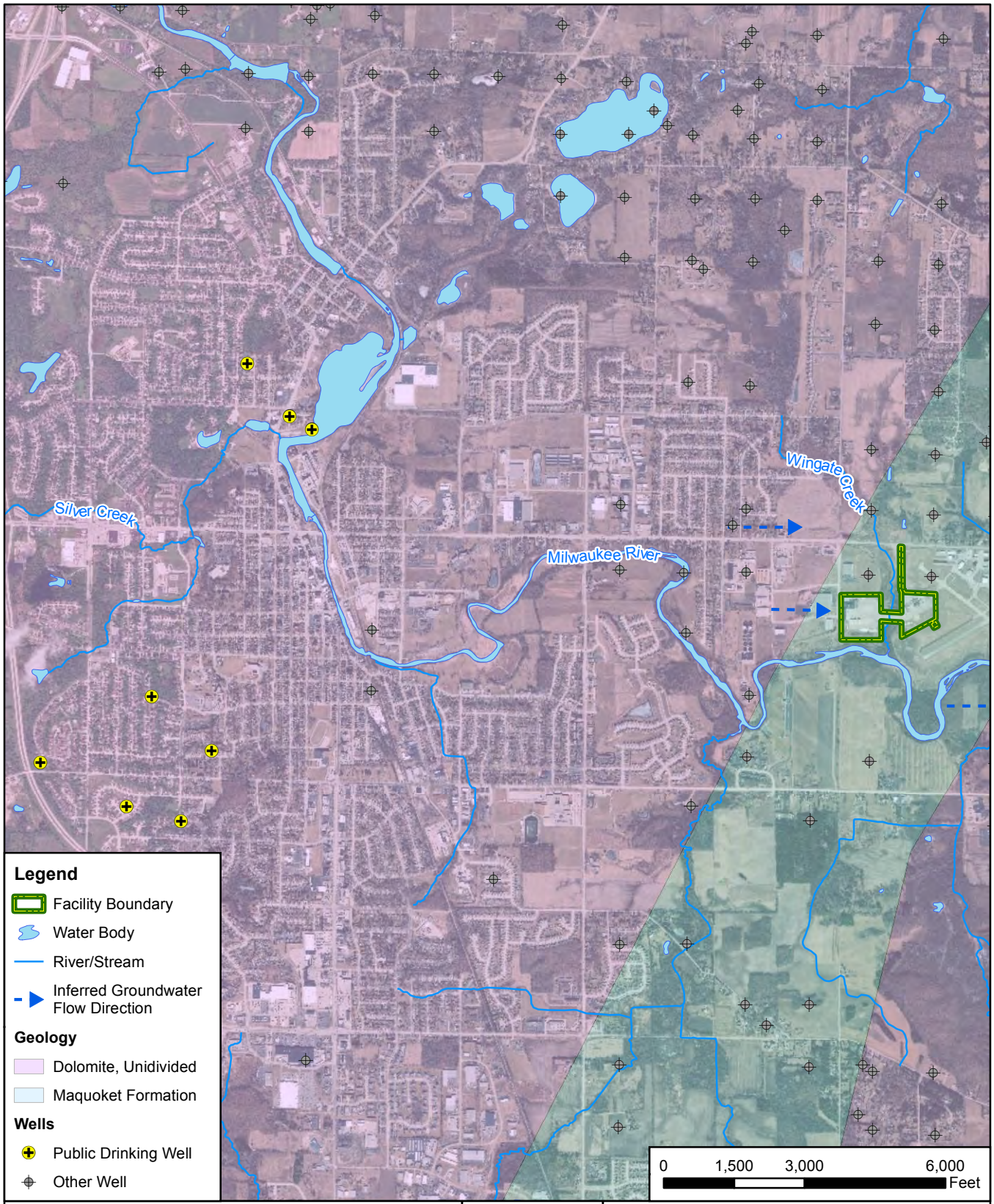


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# Groundwater Features

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**Figure 1-2**

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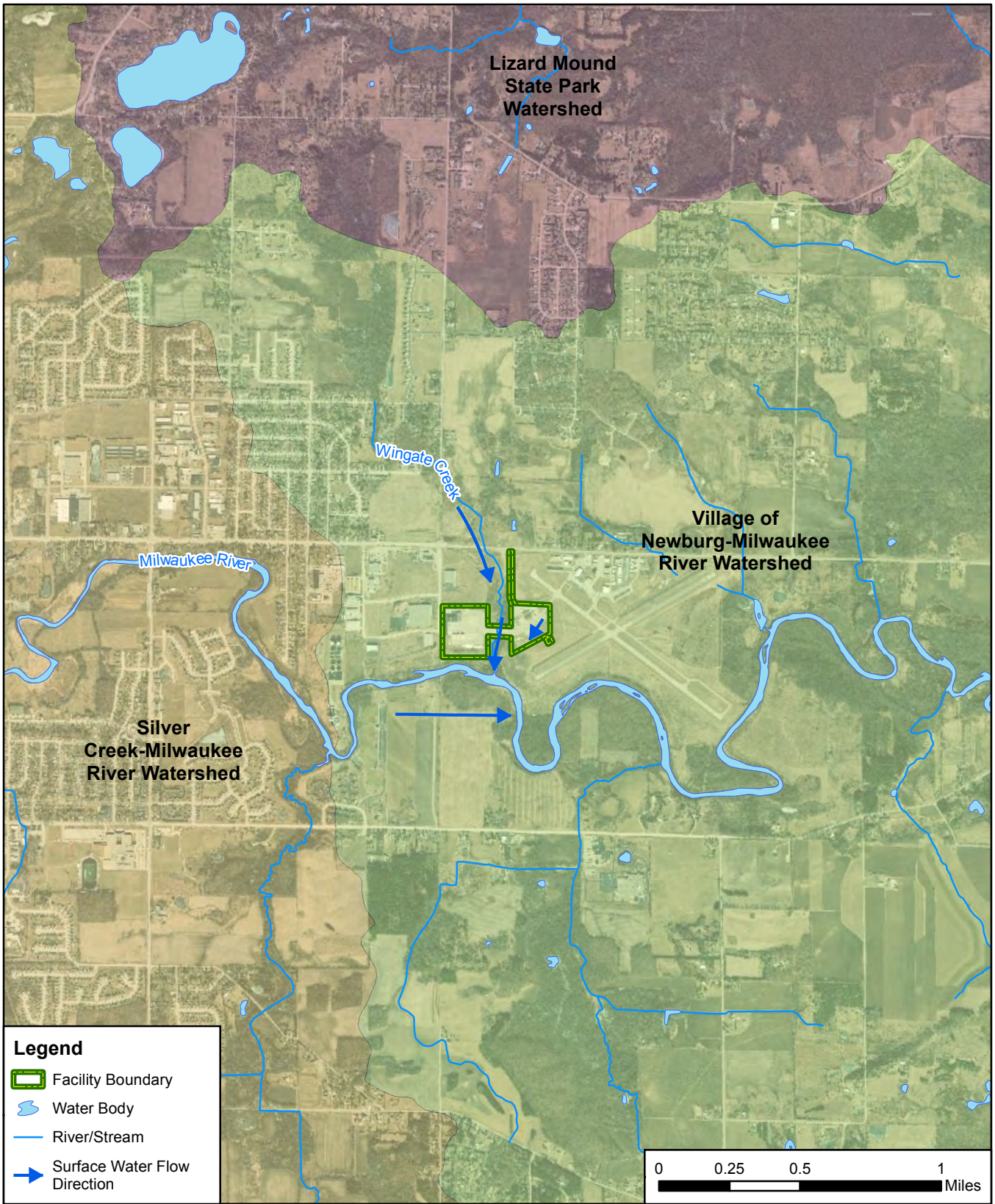


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**Surface Water Features**

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**Figure 1-3**

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# 2. Fire Training Areas

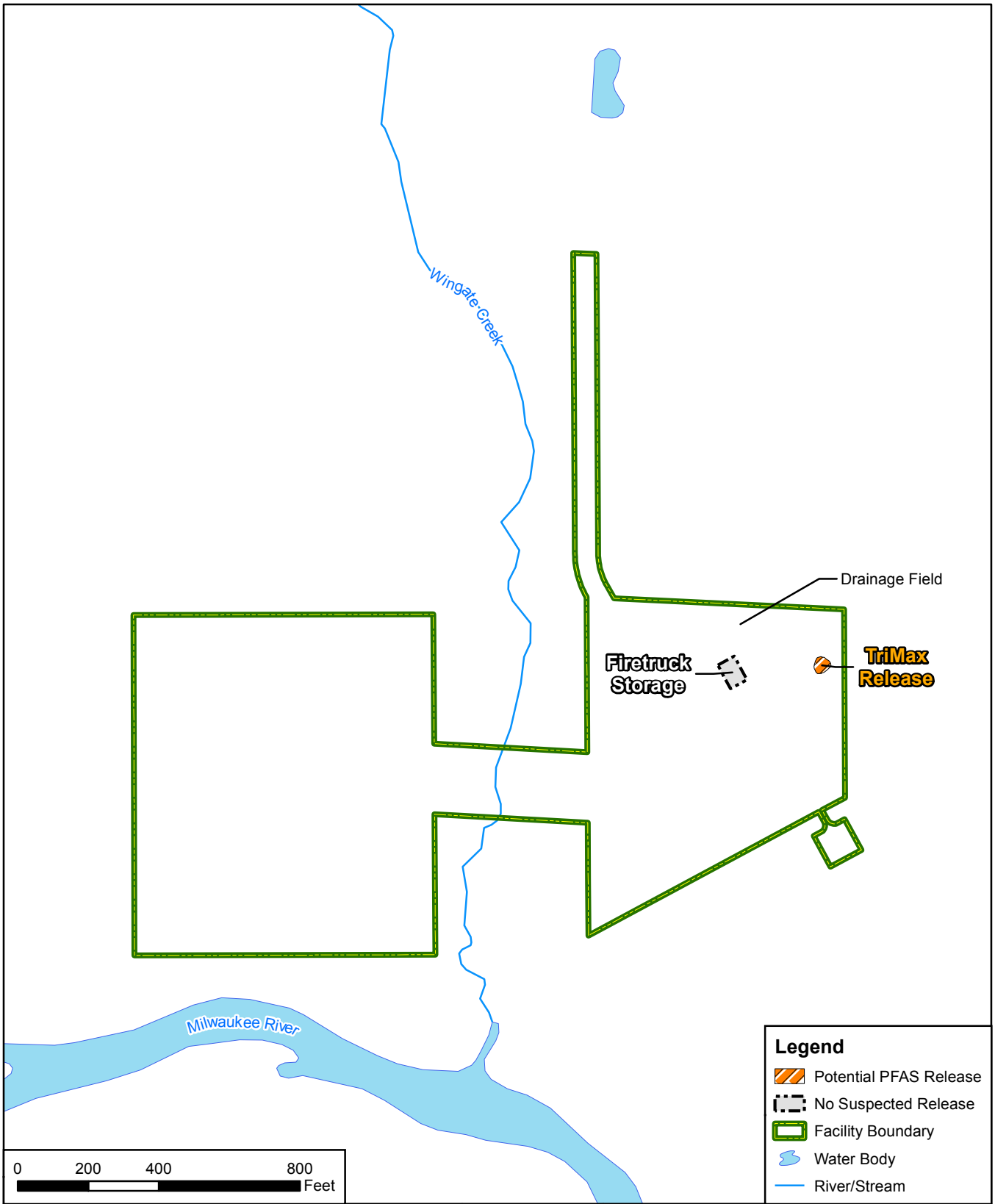
One FTA where PFAS were potentially released was identified during the PA. A description of the FTA is presented below and shown on **Figure 2-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**, respectively.

## 2.1 TriMax™ Release

There was a one-time training event with one TriMax™ fire extinguisher that occurred in a grassy area on the east side of the Armory. The geographic coordinates are 43°2523.94"N; 88°80.73"W (**Figure 2-1**). The exact date, amount, and concentration of AFFF used is unknown. From 1960-1998, there was a drain field to the north of the Armory. Currently, the drain field is paved and is used as a parking lot for the facility. The overlying surface water flow from the release area is north to the drain field, then west to Wingate Creek, which ultimately discharges to the Milwaukee River. In 2010, the TriMax™ fire extinguishers were replaced by Purple K and Dry Chemical fire extinguishers. The disposition of the TriMax™ fire extinguishers are unknown.

## 2.2 Firetruck Storage

Historically, a firetruck was stored in a building at the Armory. The geographic coordinates are 43°2523. 55"N; 88°8 4.15"W (**Figure 2-1**) The firetruck was equipped with a two-tank system that was filled with water only. There were no reports of the firetruck ever being used for firefighting activities or records documenting routine maintenance. The exact dates that the firetruck was present on the facility is unknown.

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**Fire Training Areas**

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**Figure 2-1**

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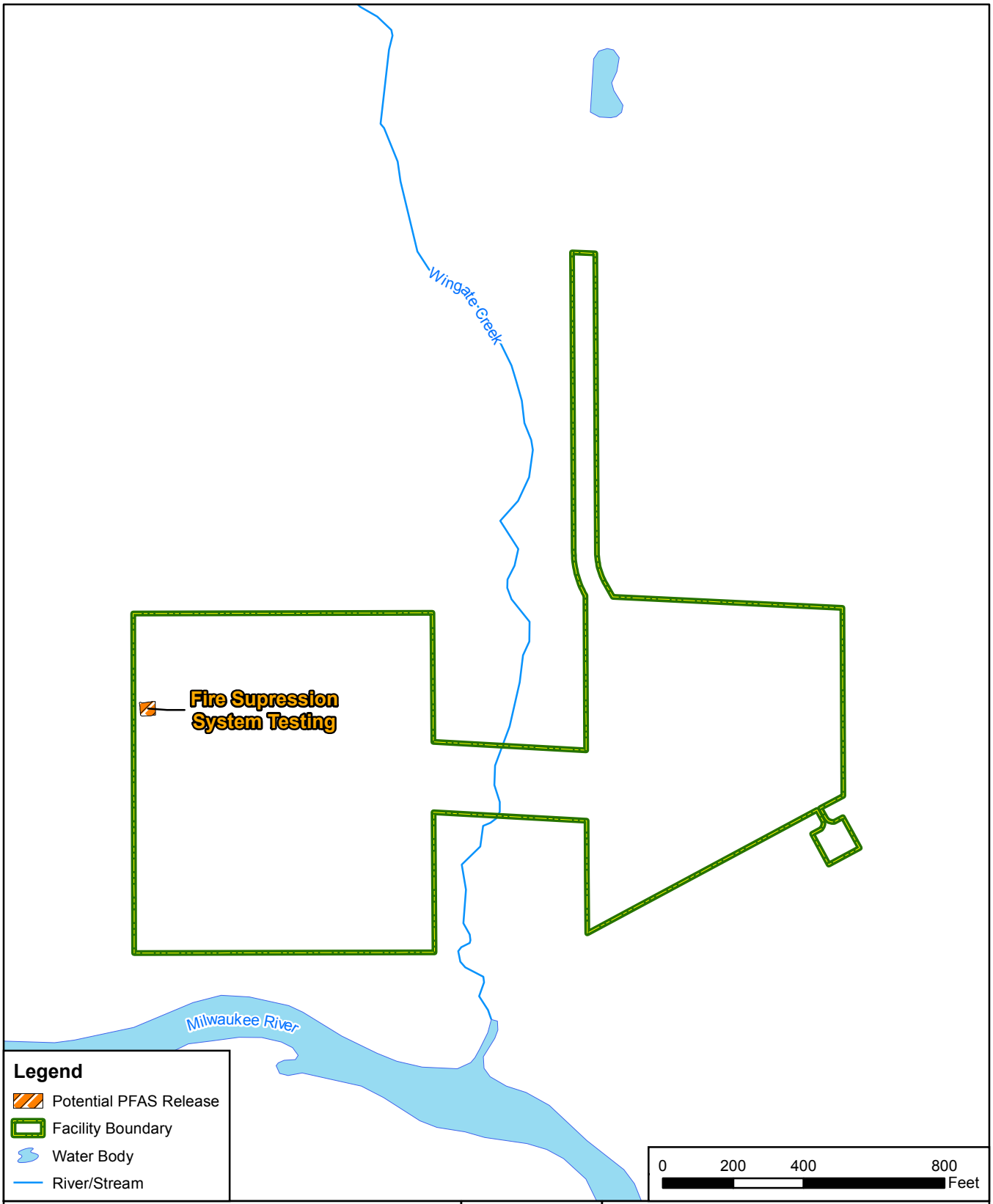
# 3. Non-Fire Training Areas

One Non-FTA where AFFF was stored and/or potentially released was identified during the PA. A description of the non-FTA is presented below and shown on **Figure 3-1**. Interview records and photographs are included in **Appendix B** and **Appendix C**, respectively.

## 3.1 Fire Suppression System Release

Prior to 2004, the main hangar was located at the Armory, on the east side of the facility. The Armory was constructed in the 1960s with no fire suppression system. The current AASF was built in 2004. The geographic coordinates of the hangar are 45°252 2.97"N; 88°82 5.08"W (**Figure 3-1**). The main hangar is equipped with a fire suppression system that is supplied by two 750 gallon tanks filled with 3 percent AFFF. Bulk 55-gallon drums of AFFF that supply the fire suppression system are housed in a building connected to the hangar. There is no information on initial testing upon installation of the fire suppression system. The fire suppression system is tested annually by dispensing 20-40 gallons of 3 percent AFFF. On numerous occasions, the AFFF was dispensed onto the grassy area behind the building. A stormwater drain that discharges to Wingate Creek, which then discharges to the Milwaukee River, is located at the edge of the grassy area. The annual system testing has taken place since 2004 and is conducted by a contractor.

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**Non-Fire Training Areas**

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**Figure 3-1**

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# 4. Emergency Response Areas

No emergency response areas were identified within the AASF facility during the PA through interviews or document review. The City of West Bend provides fire emergency services for the AASF.

# 5. Adjacent Sources

Two off-site PFAS sources adjacent to the AASF were identified during the PA through interviews (**Appendix B**), online research, and the Environmental Data Resource Report (**Appendix A**). **Figure 5-1** presents the location of potential adjacent source areas.

## 5.1 West Bend Municipal Airport

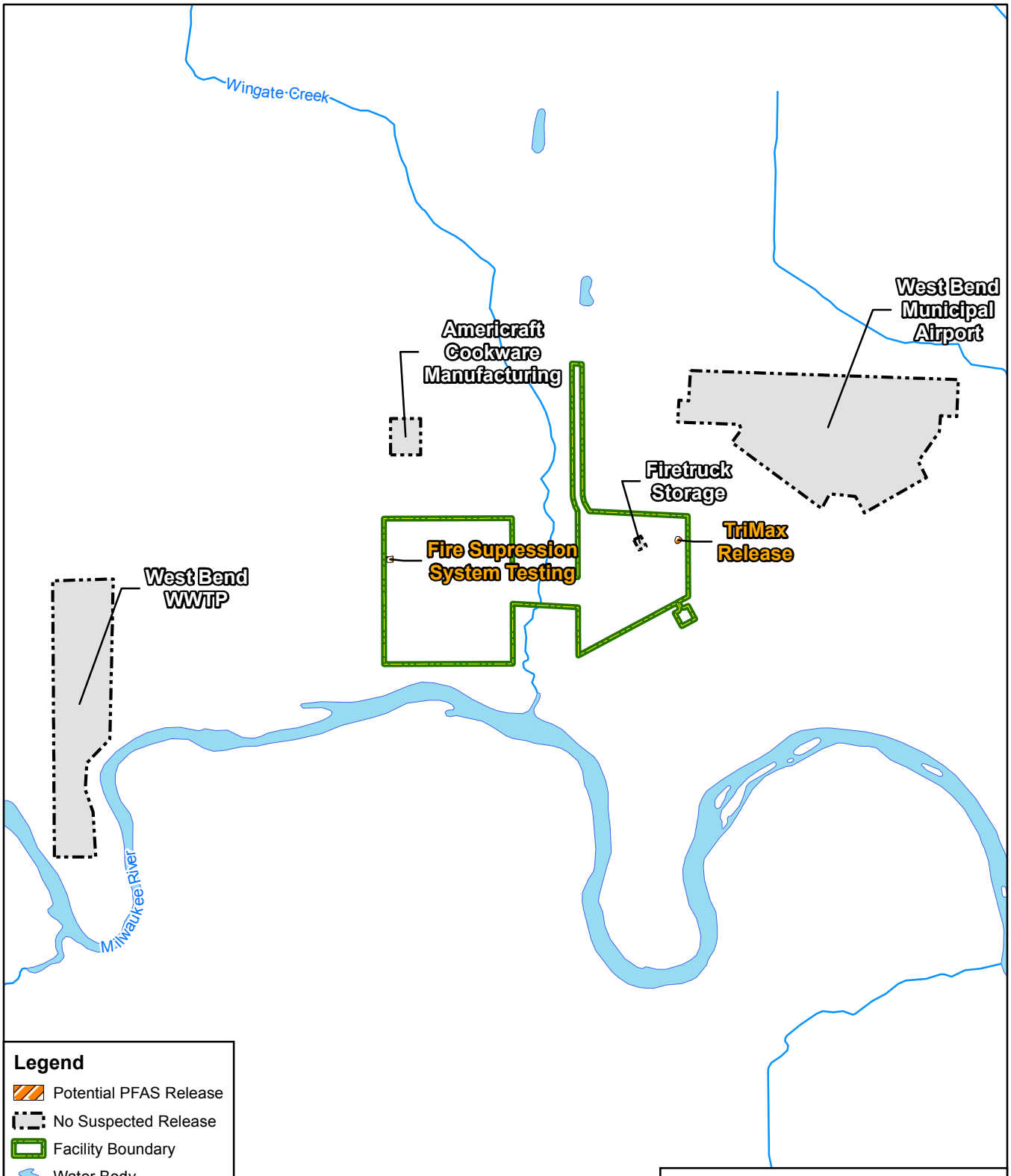
The West Bend Municipal Airport geographic coordinates are 43°25 32.21"N; 88°7 47.60"W. The St. Cloud Regional Airport was constructed in 1928 and is owned and operated by the City West Bend. The AASF is southwest and adjacent to the West Bend Municipal Airport. The City of West Bend Fire Department provides fire emergency services for the West Bend Municipal Airport.

## 5.2 Americraft CookWare Manufacturing

The Americraft Cookware Manufacturing building. The geographic coordinates of the building are 43°2530.35"N ; 88°825.44"W. Due to the nature of non-stick cookware containing Teflon® and other non-stick materials, this manufacturing plant was identified as a potential adjacent source. The Americraft Cookware Manufacturing building is upgradient of the AASF.

## 5.3 West Bend WWTP

The West Bend WWTP is approximately 0.5 mile west and upgradient of the AASF. It is unknown if waste water at the WWTP is tested or treated for PFAS. Due to the nature and lack of knowledge regarding the WWTP, this was identified as a potential adjacent source.

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**Adjacent Sources**

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**Figure 5-1**

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# 6. Preliminary Conceptual Site Model

Based on the PA findings, two AOIs were identified at the AASF: AOI 1 Fire Suppression System Testing and AOI 2 TriMax™ Release. The AOIs are shown on **Figure 6-1**. The following sections describe the CSM components and the specific CSMs developed for the AOIs. The CSM identifies the three components necessary for a potentially complete exposure pathway: (1) source, (2) pathway, (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

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

## 6.1 AOI 1 Fire Suppression System Testing

The current AASF was constructed in 2004. The main hangar is equipped with a fire suppression system that is supplied by two 750 gallon tanks filled with 3 percent AFFF. The AFFF tanks, pumps, and bulk 55-gallon drums of AFFF that supply the fire suppression system are housed in a building connected to the hangar. The fire suppression system is tested annually by dispensing 20-40 gallons of 3 percent AFFF. On numerous occasions, the AFFF was dispensed onto the grassy area behind the building

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

No surface water features flow through AOI 1; therefore, surface water and sediment exposure pathways are incomplete for the site worker, construction worker, and trespasser. The stormwater drain within AOI 1 discharges to Wingate Creek, which then discharges to the Milwaukee River; therefore, the exposure pathway for surface water and sediment via ingestion is potentially compete for the off-facility recreational user.

AOI 1 is located side gradient of two unknown well types and downgradient of one unknown well type. These wells could be potentially impacted by PFAS releases at AOI 1; therefore, the exposure pathway for ingestion via groundwater for construction workers and off-facility residents are potentially complete. The preliminary CSM for the AASF is shown on **Figure 6-2**.

## 6.2 AOI 2 TriMaxTM Release

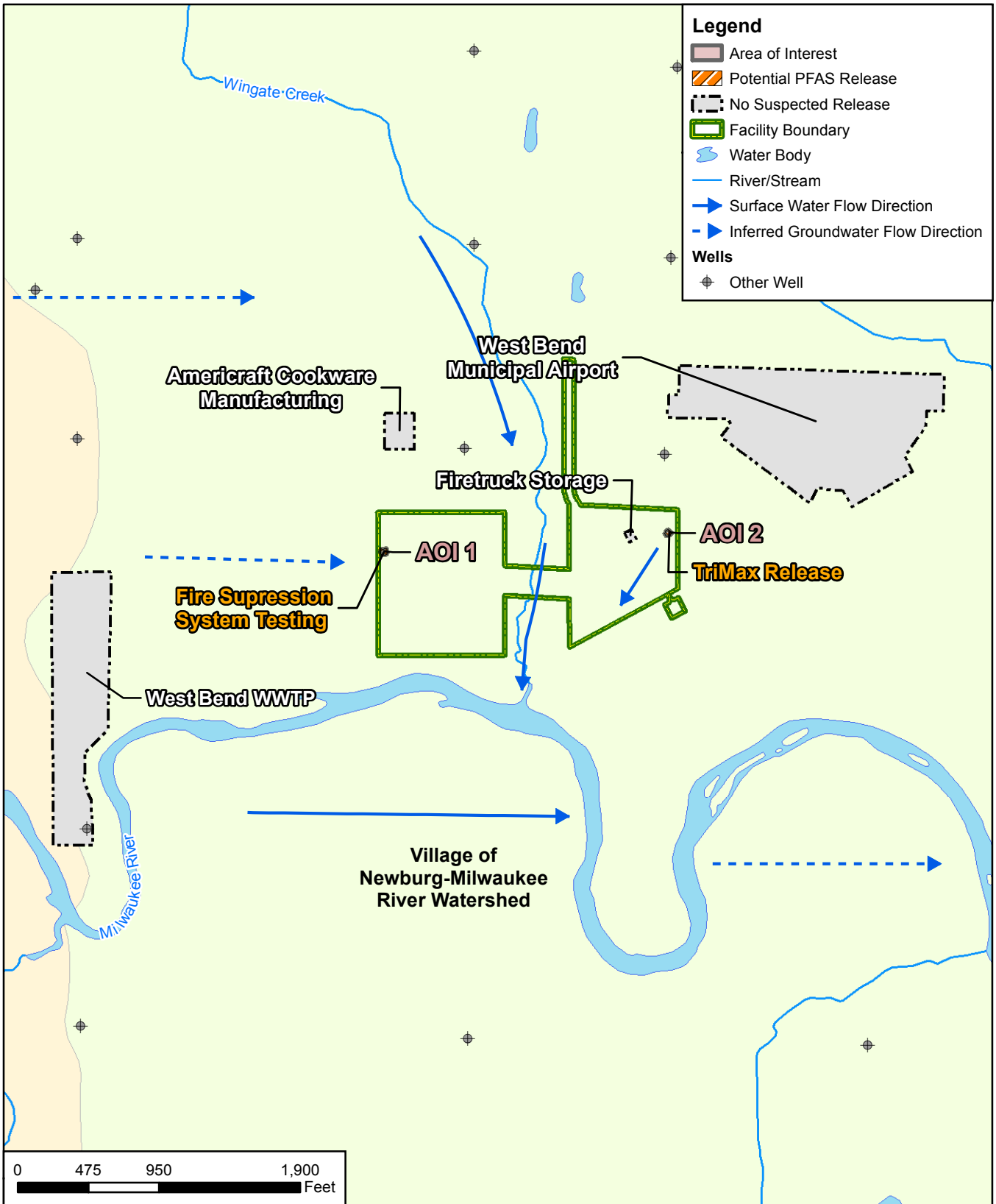
There was a one-time training event with one TriMax™ fire extinguisher that occurred in a grassy area located on the east side of the Armory. The exact date, amount, and concentration of AFFF used is unknown. The surface water flows northwest, towards the drain field, then discharges south to the Milwaukee River.

Ground-disturbing activities to surface soil at AOI 2 could result in site worker, construction worker, and trespasser exposure to potential PFAS contamination. Therefore, the exposure

pathways for inhalation of soil particles and ingestion of soil are potentially complete for these receptors. Ground-disturbing activities to subsurface soil could result in construction worker exposure via inhalation of soil particles and ingestion of subsurface soil. Therefore, the inhalation and ingestion pathways for this receptor are considered potentially complete.

Based on the overlying surface water flow at AOI 2, exposure pathways for ingestion via surface water/sediment for site workers, construction workers, and off-facility recreational users are potentially complete.

AOI 2 is located side gradient of two unknown well types and downgradient of one unknown well type. These wells could be potentially impacted by PFAS releases at AOI 2; therefore, the exposure pathway for ingestion via groundwater for construction workers and off-facility residents are potentially complete. The preliminary CSM for the AASF is shown on **Figure 6-3**.




| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| Preliminary Assessment for PFAS at West Bend, WI | | | | |
| REVISED | 10/25/2019 | GIS BY | MS | 10/25/2019 |
| SCALE | 1:11,400 | CHK BY | SI | 10/25/2019 |
| Base Map: | | PM | RG | 10/25/2019 |

**Areas of Interest**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 6-1**

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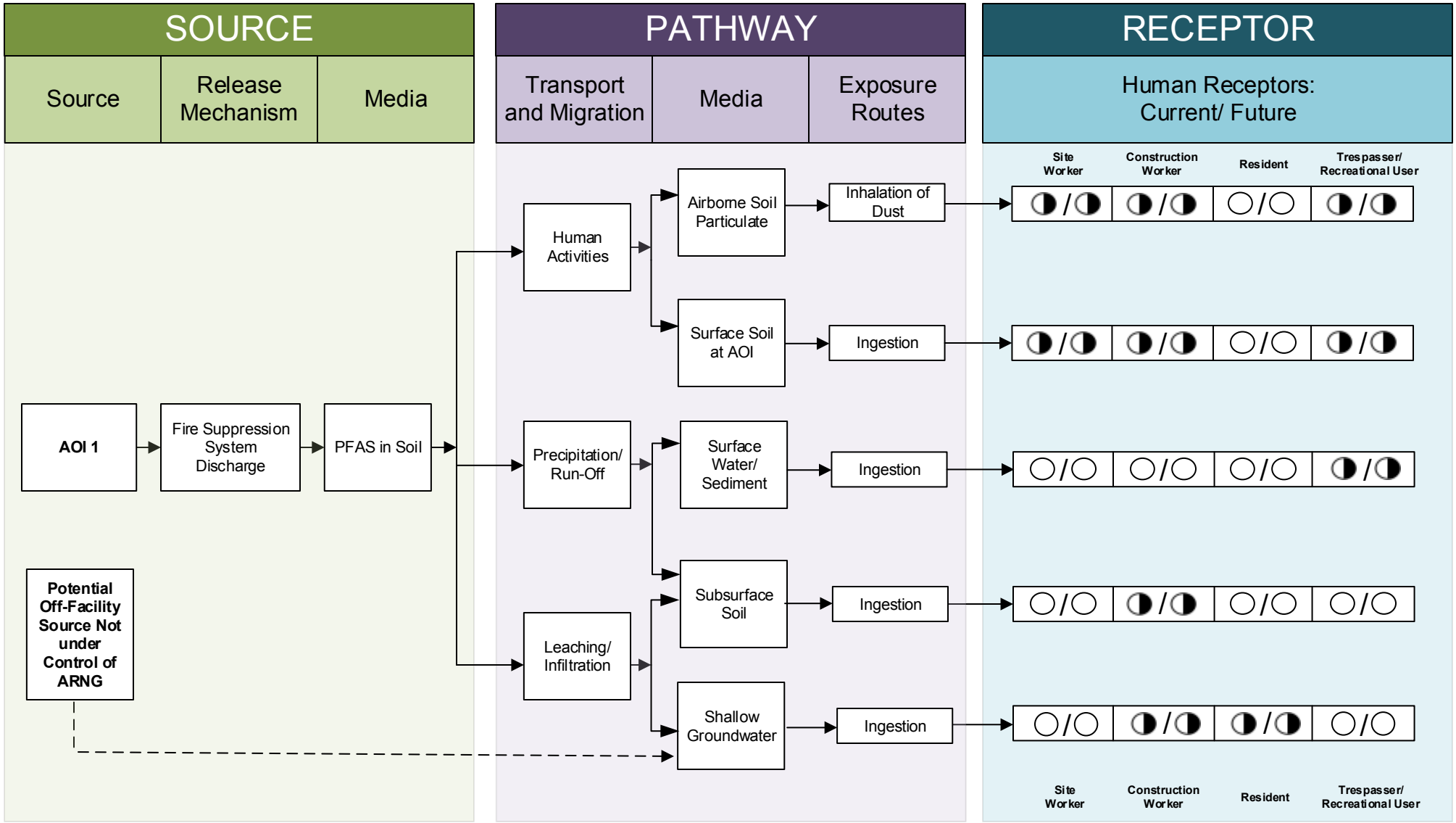


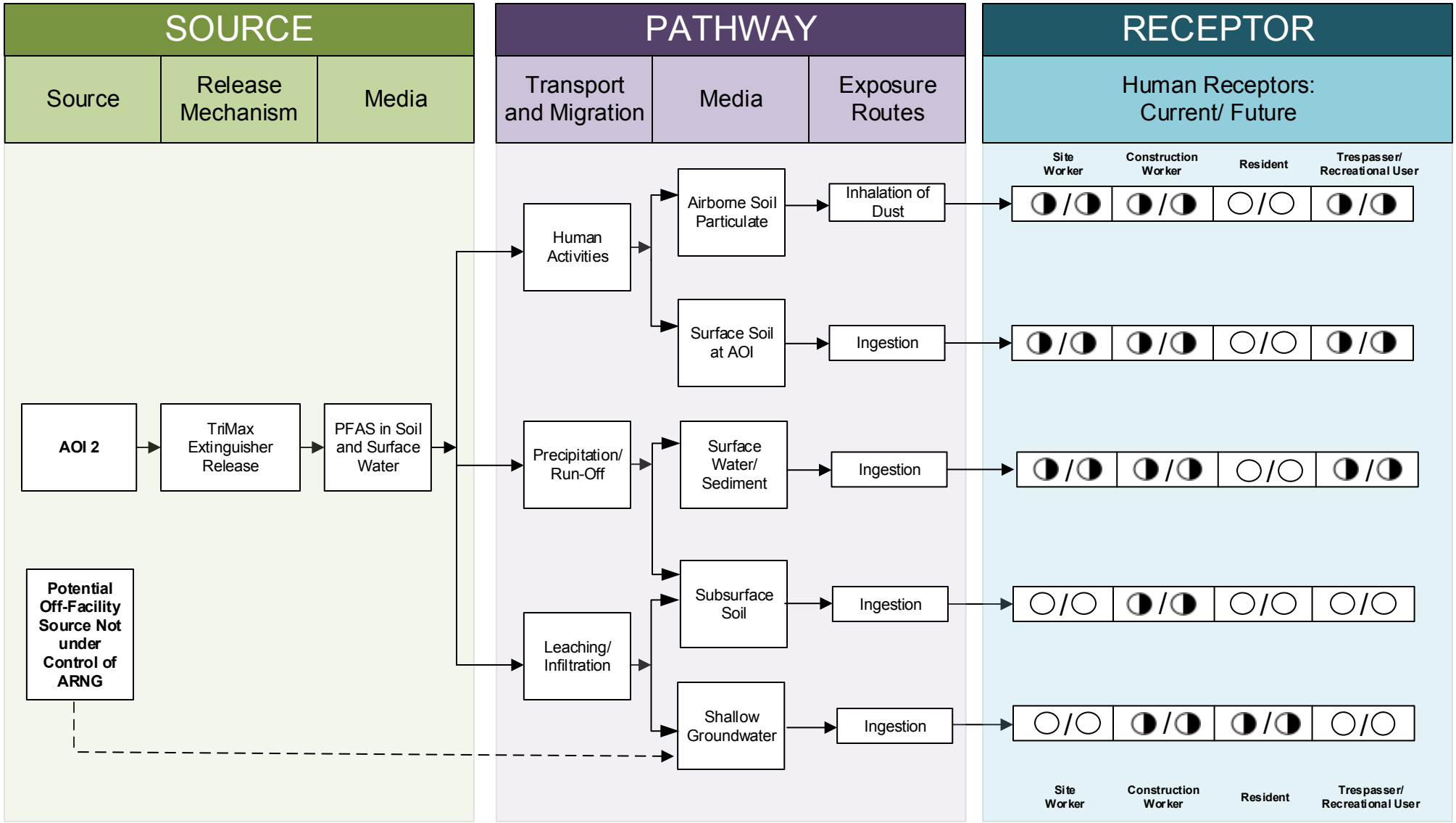

**LEGEND**

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

**Notes:**

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

**Figure 6-2**
Preliminary Conceptual Site Model
AOI 1 Fire Suppression System Testing Location




**LEGEND**

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

**Notes:**

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

**Figure 6-3**
Preliminary Conceptual Site Model
AOI 2 TriMax Release

# 7. Conclusions

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

## 7.1 Findings

Two AOI related to potential PFAS releases were identified (**Table 7-1**) at the AASF during the PA (**Figure 7-1**).

**Table 7-1 AOIs at West Bend AASF**

| Area of Interest | Name | Used by | Potential Release Dates |
|---|---|---|---|
| AOI 1 | Fire Suppression System Testing | WIARNG | Annually from 2004-present |
| AOI 2 | TriMax™ Release | WIARNG | unknown |

Based on potential PFAS releases at these AOIs, there is potential for exposure to PFAS contamination in media at or near the facility. The preliminary CSMs for the AOIs are shown on **Figure 6-2** and **Figure 6-3**, which presents the potential receptors and media impacted. Based on the USEPA Unregulated Contaminant Monitoring Rule 3 data, it was indicated that no PFAS were detected in a public water system above the United States Environmental Protection Agency Lifetime Health Advisory level within 20 miles of the facility.

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

**Table 7-2 No Suspected Release Areas**

| No Suspected Release Area | Used by | Rationale for No Suspected Release Determination |
|---|---|---|
| Firetruck Storage | WIARNG | The firetruck was only equipped with water tanks and there are no reports of AFFF on the firetruck. |

## 7.2 Uncertainties

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

The conclusions of this PA are predominantly based on the information provided during interviews with personnel who had direct knowledge of PFAS use at the facility. Sometimes the provided information was vague or conflicted with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (1989 to present), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of

AFFF used. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

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

**Table 7-3 Uncertainties**

| Area of Interest | Source of Uncertainty |
|---|---|
| All AOIs | Potential off-facility PFAS release areas exist adjacent to the AASF. Because these areas include property upgradient of the facility, it is unknown whether the off-facility sources affect the AASF. |
| AOI 2 | Historically, there was a drain field from 1960 to 1998 where surface water collected downgradient from AOI 2. The surface water ultimately discharged to Wingate Creek, then to the Milwaukee River. The area has since been paved and the fate of any excavated soil is unknown. |
| West Bend Waste Water Plant | It is unknown if the WWTP is treated or tested for PFAS. The WWTP is upgradient from the AASF. |

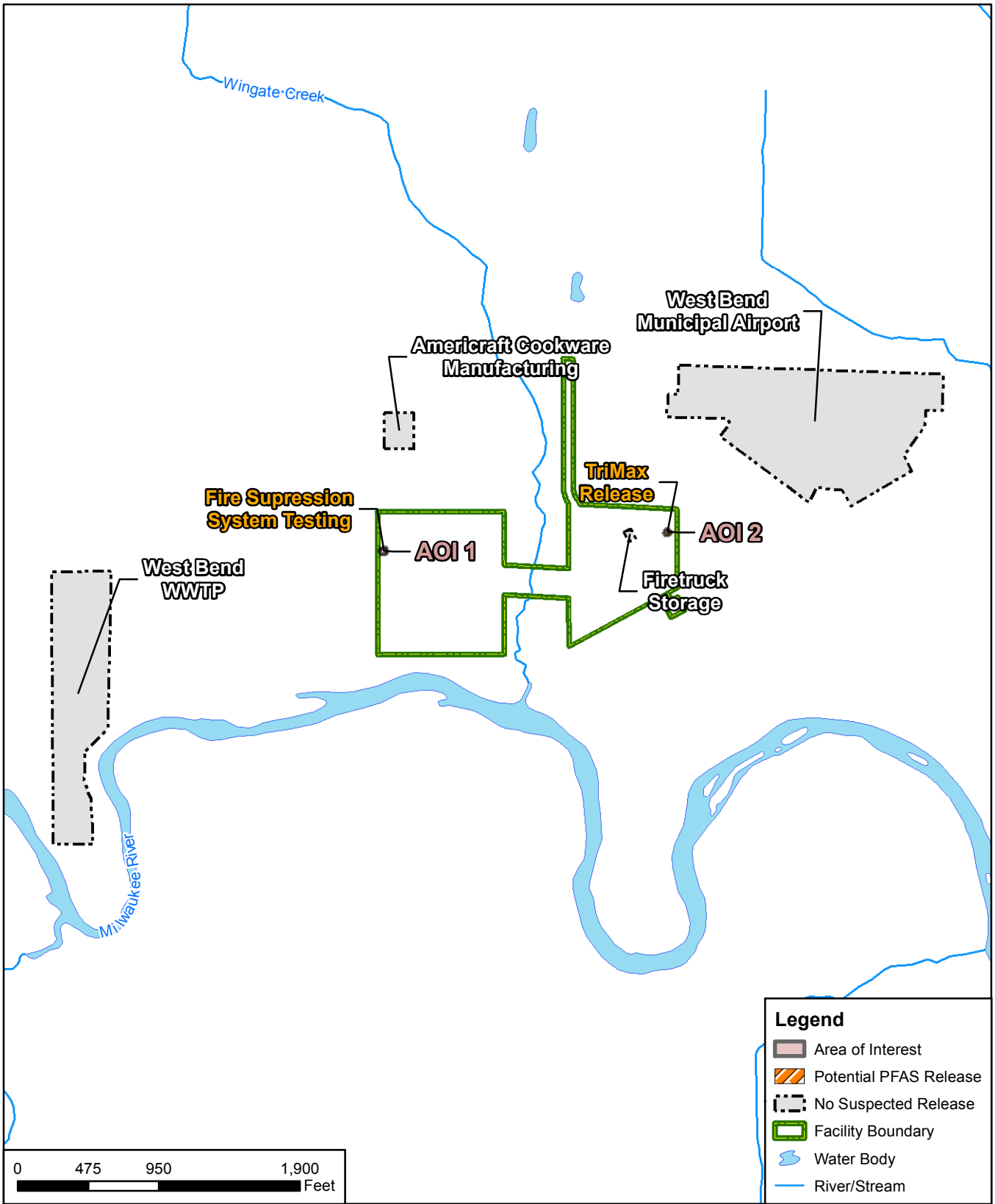
## 7.3 Potential Future Actions

Interviews and records (covering 2004 to present) indicate that ARNG activities may have resulted in potential PFAS releases at the AOI identified during the PA. Based on the CSM developed for the AOIs, there is potential for receptors to be exposed to PFAS contamination in soil, surface water, sediment, and groundwater. **Table 7-4** summarizes the rationale used to determine if the AOIs should be considered for further investigation under the CERCLA process and undergo an SI.

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

**Table 7-4 PA Findings Summary**

| Area of Interest | AOI Location | Rationale | Potential Future Action |
|---|---|---|---|
| AOI 1 Fire Suppression System Testing | 45°25 22.39"N; 88°8 26.59"W | Repeated release of AFFF annually from 2004-present. | Proceed to an SI for soil, surface water, sediment, and groundwater |
| AOI 2 TriMax Release | 45°2523.83"N ; 88°80.79"W | Release of AFFF to the grass area east of the ramp area. | Proceed to an SI for soil, surface water, sediment, and groundwater |




| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| Preliminary Assessment for PFAS at West Bend, WI | | | | |
| REVISED | 10/25/2019 | GIS BY | MS | 10/25/2019 |
| SCALE | 1:11,400 | CHK BY | SI | 10/25/2019 |
| Base Map: | | PM | RG | 10/25/2019 |

**Summary of Findings**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 7-1**

Q:\Projects\ENV\GEARS\GEO\ARNG PFAS\900-CAD-GIS\920-GIS or Graphics\MXD\WI\West_Bend_Figures\Fig_7-1_West_Bend_Summary.mxd

# 8. References

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World Climate. 2019. *Average Weather Data for West Bend, Wisconsin.* Available at http://www.worldclimate.com/climate/us/wisconsin/westbend(Accessed 20 July 2019)

# Appendix A
# Data Resources

Data Resources will be provided separately on CD. Data Resources for West Bend AASF #1.

## West Bend AASF #1 Leases, Licenses, and Permits

- 2001 Lease Agreement

## West Bend AASF #1 Documentation

- 1996 Underground Storage Tank Site Investigation Report
- 2000 Environmental Baseline Study for West Bend AASF
- 2002 Former 10,000-Gallon UST Groundwater Investigation
- 2002 Fire Equipment Room As-Builts
- 2004 Apparent Petroleum Release Investigation
- 2011 Storm Water Discharge Permit Coverage for West Bend Municipal Airport
- 2014 West Bend SPCC Plan

## EDR Report

- 2019 West Bend AASF #1 EDR Report

# Appendix B
# Preliminary Assessment Documentation

# Appendix B.1
# Interview Records

**PA Interview Questionnaire - Other**

**Facility: West Bend AASF**
**Interviewer:** [redacted]
**Date/Time: 5/8/2019 0800**

| | |
|---|---|
| **Interviewee:** [redacted]<br>**Title: Aircraft Mechanical Supervisor**<br>**Phone Number:** [redacted]<br>**Email:** [redacted] | Can your name/role be used in the PA Report? **Y** or N<br>Can you recommend anyone we can interview?<br>Y or **N** _____ |

**Roles or activities with the Facility/Years working at the Facility:**

[redacted] is an Aircraft Mechanical Supervisor and has been with the AASF for 30 years.

**PFAS Use:** Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

[redacted] remembers there being a firetruck at the old hangar building (currently called the Armory) in the mid 1980's. The firetruck only had water to his knowledge, however it was equipped with a two-tank system. [redacted] says there was no nozzle testing.

[redacted] stated that there are wash racks in the main hangar that lead to an oil/water separator, then to the sanitary WWTP. Also, he does not recall any fire response to the airport or AASF facility in the 30 years he has been at the facility.

| **Known Uses** |
|---|
| Use |
| Procurement |
| Disposition |
| Storage (Mixed) |
| Storage (Solution) |
| Inventory, Off-Spec |
| Containment |
| SOP on Filling |
| Leaking Vehicles |
| Nozzle and Suppression System Testing |
| Dining Facilities |
| Vehicle Washing |
| Ramp Washing |
| Fuel Spill Washing and Fueling Stations |
| Chrome Plating or Waterproofing |

**PA Interview Questionnaire - Other**

**Facility: Madison AASF #2 and West Bend AASF #1**
**Interviewer:** [redacted]
**Date/Time: 5/7/2019 0800**

| **Interviewee: Wisconsin Army National Guard personnel**<br>**Title:**<br>**Phone Number:**<br>**Email:** | Can your name/role be used in the PA Report? **Y** or N<br>Can you recommend anyone we can interview?<br>Y or **N** _____ |
|---|---|

**Roles or activities with the Facility/Years working at the Facility:**

The following WI ARNG personnel were present and contributed to the information brief that occurred at 0800 at the WI DMA HQ:

[redacted](WI ARNG Water Resources Manager, 4 years at facility)

[redacted](Buildings and grounds supervisor, 15 years at facility)

[redacted](Real Estate Specialist, 1 year at facility)

[redacted](Real Estate Specialist, 2 years at facility)

[redacted](Architect, 32 years at facility)

[redacted](Environmental Branch Chief, 10 years at facility)

[redacted](CFMO, 19 years at facility)

**PFAS Use:** Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

The following topics were discussed at the brief that occurred at 0800 on May 7, 2019. Both the Madison AASF #2 and the West Bend AASF #1 were discussed in this meeting.

Madison AASF #2:

Real estate information: The AASF land ownership is split into two different parcels of land. The ramps, hangars, and main AASF building are leased to the Wisconsin Air National Guard (WIANG) and is licensed to the WIARNG. The term of the license is from 1988 to 2041, and the parcel of land is approximately 14.74 acres. The southern ramp area and helicopter pad are leased from the Dane County Regional Airport. The term of the lease is from 2011 to 2045, and the parcel of land is approximately 5.36 acres.

Additionally, AFFF was never used or stored at the Madison AASF. Historically, they had halon mobile extinguishers. The Madison AASF was mainly used for the storage and maintenance of aircrafts for the WI ARNG.

West Bend AASF #1:

The West Bend AASF has two main buildings. The armory was built in 1960's on the east side of the facility and the AASF main hangars were built in late 1990's on the west side of the facility. The armory was mainly used for training

| **Known Uses** |
|---|
| Use |
| Procurement |
| Disposition |
| Storage (Mixed) |
| Storage (Solution) |
| Inventory, Off-Spec |
| Containment |
| SOP on Filling |
| Leaking Vehicles |
| Nozzle and Suppression System Testing |
| Dining Facilities |
| Vehicle Washing |
| Ramp Washing |
| Fuel Spill Washing and Fueling Stations |

| | |
|---|---|
| and storage purposes and has never had an AFFF fire suppression system. When the new AASF buildings were built, the main hangars were outfitted with trench drains that lead to an oil/water separator, then to the city sanitary waste water treatment plant. The main hangars also have an AFFF fire suppression system which is housed adjacent to the hangar in a small room outfitted with drains that ultimately lead to the sanitary waste water treatment plant. The fire suppression system consists of two vertical 750-gallon tanks. Also, when bulk AFFF is at the facility, it is stored in the fire suppression system room.<br><br>The surface water flow at the AASF is mainly to the south and east, towards the Milwaukee River. | Chrome Plating or Waterproofing |

**PA Interview Questionnaire - Other**

**Facility: West Bend AASF**
**Interviewer:** [redacted]
**Date/Time: 5/8/2019 0800**

| | |
|---|---|
| **Interviewee:** [redacted]<br>**Title: Aircraft Mechanical Supervisor**<br>**Phone Number:** [redacted]<br>**Email** [redacted] | Can your name/role be used in the PA Report? **Y** or N<br>Can you recommend anyone we can interview?<br>Y or **N** _____ |

**Roles or activities with the Facility/Years working at the Facility:**

[redacted] is an Aircraft Mechanical Supervisor and has been with the AASF for 27 years.

**PFAS Use:** Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

[redacted] stated that before the main hangar was built in 2004, the Armory served as the hangar for the AASF. There was no fire suppression system at the old hangar, just TriMax mobile fire extinguishers present. [redacted] said that contractors would service and test the fire extinguishers off-facility. He only remembers ones TriMax release which took place off of the east side of the ramp area. The year and amount of AFFF released is unknown. The TriMax units were replaced with Dry Chem and Purple K fire extinguishers in 2010. The fate of the removed TriMax units is unknown.

[redacted] also stated that there was a drain field present from 1960 to 1998 where water collected from the east side of the facility, and ultimately flowed to Wingate Creek, then to the Milwaukee River.

Other information collected from the interview includes that the West Bend Fire Department responds to the facility in an emergency, and there were no fires to his knowledge. Additionally, there are no oil refineries or carpet facilities in the region, however there is a cookware manufacturing warehouse to the north of the facility.

| **Known Uses** |
|---|
| Use |
| Procurement |
| Disposition |
| Storage (Mixed) |
| Storage (Solution) |
| Inventory, Off-Spec |
| Containment |
| SOP on Filling |
| Leaking Vehicles |
| Nozzle and Suppression System Testing |
| Dining Facilities |
| Vehicle Washing |
| Ramp Washing |
| Fuel Spill Washing and Fueling Stations |
| Chrome Plating or Waterproofing |

**PA Interview Questionnaire - Other**

**Facility: West Bend AASF**
**Interviewer:** [redacted]
**Date/Time: 5/8/2019 0800**

| | |
|---|---|
| **Interviewee:** [redacted]<br>**Title: Buildings/Ground Superintendent**<br>**Phone Number:** [redacted]<br>**Email** [redacted] | Can your name/role be used in the PA Report? **Y** or N<br>Can you recommend anyone we can interview?<br>Y or **N** |

**Roles or activities with the Facility/Years working at the Facility:**

[redacted] is the Buildings/Ground Superintendent for Area 6 and has been working at the AASF for 12 years.

**PFAS Use:** Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

The main AASF was built in 2004. The fire suppression system contains 3% AFFF and has two 750-gallon tanks that are stored in a room adjacent to the hangar. The room is outfitted with drains that lead to an oil/water separator then to the sanitary WWTP. Annual testing and maintenance were conducted by a contractor. The contractor would also fill the tanks when needed.

| **Known Uses** |
|---|
| Use |
| Procurement |
| Disposition |
| Storage (Mixed) |
| Storage (Solution) |
| Inventory, Off-Spec |
| Containment |
| SOP on Filling |
| Leaking Vehicles |
| Nozzle and Suppression System Testing |
| Dining Facilities |
| Vehicle Washing |
| Ramp Washing |
| Fuel Spill Washing and Fueling Stations |
| Chrome Plating or Waterproofing |

# Appendix B.2
# Visual Site Inspection Checklists

# Visual Site Inspection Checklist

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

**Recorded by:** [redacted]

**ARNG Contact:** [redacted]

**Date and Time:** 5/8/2019 8am

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

## *Source/Release Information*

**Site Name / Area Name / Unique ID:** West Bend AASF #1

**Site / Area Acreage:** approximately 39 acres

**Historic Site Use (Brief Description):** The original 38.88 acre property was acquired in 1958, and the Armory facility, which also held the shop, was built in 1960. In 2003 a new AASF shop facility was constructed. The facility consists of a storage hangar, repair hangar, shops, and a two story office area. Exterior features are vehicle parking areas, roads, aircraft parking and taxiways, and a 90 ft. clear-span bridge. A fire suppression system (3 AFFF systems and 1 water system) are present at the shop.

**Current Site Use (Brief Description):** The AASF supports the Wisconsin Army National Guard (WIARNG).

**Physical barriers or access restrictions:** Access to the area is restricted to WIARNG.

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

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

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

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

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

3a. Indicate what businesses are located near the site

West Bend Municipal Airport, and residental are adjacent.

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

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

West Bend Municipal Airport

# Visual Site Inspection Checklist

**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:

The fire suppression systems have 3% AFFF tanks.

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

Yearly maintance included nozzle testing on the grassy area behind the building.

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

The fire suppression systems have two 750 gallon tanks with 3% AFFF.

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

The floor drains lead to an oil/water separator then to the sanitary WWTP.

## *Transport / Pathway Information*

**Migration Potential:**

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

1a. If so, note observation and location:

Surface water flows to the south and east towards the Milwaukee River.

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

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

Yes, there is a creek inbetween the armory and AASF where water drains to the Milwaukee River.

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

3a. If so, please note the location:

There are unknown wells off-facility, within 2 miles.

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

4a. If so, please note the location:

On the west and east sides of the property.

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

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

N/A

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

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

Yes, Americraft Cookware Manufacturing and West Bend Municipal Airport are potential sources of PFAS ajacent to the AASF.

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

## Visual Site Inspection Checklist

**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):

In 2003 the new AASF hangars were built.

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

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

vegetated except for ramp and parking areas

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:

The facility has controlled access

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:

Residents to the north and west

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

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

There are 3 schools within 2 miles.

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

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

Wingate Creek that runs directly through the facility in-between the armory and AASF.

## Visual Site Inspection Checklist

*Additional Notes*

*Photographic Log*

| Photo ID/Name | Date & Location | Photograph Description |
|---|---|---|
| 1 | 5/8/19, fire suppression system room | The fire suppression system tanks, each hold 750 gallons of 3% AFFF concentrate. |
| 2 | 5/8/19, area directly west of the the fire suppression system room | The location where the annual maintenance/testing occurred. Approximately 20-40 gallons of 3% AFFF solution was dumped here then washed onto the grassy area, which eventually leads to a drain that discharges to the Milwaukee River. |
| 3 | 5/8/19, area directly west of the the fire suppression system room | The grassy area behind the fire suppression storage room. The AFFF from annual testing gets washed down this area, which discharges to a storm drain and ultimately leads to the Milwaukee River. |
| 4 | 5/8/19, area directly west of the the fire suppression system room | This is the storm drain on the western boundary of the facility, approximately 40 feet from the room that holds the fire suppression system. This grassy area is where annual fire suppression system testing was conducted. |

# Appendix B.3
# Conceptual Site Model Information

# Preliminary Assessment – Conceptual Site Model Information

**Site Name: West Bend Army Aviation Support Facility #1**

**Why has this location been identified as a site?**
*Facility is an aviation support site with aircraft hangars, high probability of release due to asset type and historical site usage.*

**Are there any other activities nearby that could also impact this location?**
Yes, the potential adjacent sources include the West Bend Municipal Airport and the Americraft Cookware Manufacturing.

**Training Events**

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

If so, how often? *A one-time training event with one TriMax unit.*

How much material was used? Is it documented*? The amount and concentration are unknown.*

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

**Surface Water:**

Surface water flow direction? *To the south and east towards the Milwaukee River*

Average rainfall? *31.2 inches*

Any flooding during rainy season? *unknown*

Direct or indirect pathway to ditches? *Direct*

Direct or indirect pathway to larger bodies of water? *Direct to Wingate Creek; both direct and indirect to the Milwaukee River.*

Does surface water pond any place on site? *Did not appear to be areas with ponded water.*

Any impoundment areas or retention ponds? *No*

Any NPDES location points near the site? *unknown*

How does surface water drain on and around the flight line? *Around the flight line, the surface water drains south to the Milwaukee River.*

**Groundwater:**

Groundwater flow direction? *To the south and east towards the Milwaukee River*

Depth to groundwater? *In most areas, 20 to 30 feet but around the Milwaukee River, the depth to groundwater could be smaller.*

Uses (agricultural, drinking water, irrigation)? *Not used.*

Any groundwater treatment systems? *unknown*

Any groundwater monitoring well locations near the site? *There are wells of an unknown purpose to the north and west of the facility*

# Preliminary Assessment – Conceptual Site Model Information

Is groundwater used for drinking water? *Drinking water is supplied by the City of West Bend, which receives water from groundwater sources.*

Are there drinking water supply wells on installation? *No*

Do they serve off-post populations? *No*

Are there off-post drinking water wells downgradient? *No potable water wells are located within the boundary of the AASF; however, wells exist within one mile of the facility.*

**Waste Water Treatment Plant:**

Has the installation ever had a WWTP, past or present? *No, however, there was a septic field at the Armory prior to the late 90's.*

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

Do we understand the fate of sludge waste? *N/A*

Is surface water from potential contaminated sites treated? *N/A*

**Equipment Rinse Water**

1. Is firefighting equipment washed? Where does the rinse water go?
*Historically, the AASF had a fire truck, however there is no information on where it was washed.*

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?
*There is no information on fire truck nozzle testing. It was stated that the fire truck primarily only used water.*

3. Other?
*Firefighting services for the AASF are provided by the City of West Bend.*

**Identify Potential Receptors:**

Site Worker *Yes*

Construction Worker *Yes*

Recreational User N*o*

Residential *No*

Child *No*

Ecological *No*

Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)?
*Residential area is within one mile of the facility. There are three schools within two miles of the facility*.

**Documentation**

Ask for Engineering drawings (if applicable). Has there been a reconstruction or changes to the drainage system? When did that occur? *The AASF has a drainage system, where surface water drains to Wingate Creek, then flows into the Milwaukee River. On the west side of the facility, surface water can flow directly to the Milwaukee River.*

# Appendix C
# Photographic Log

# APPENDIX C – Photographic Log

| Army National Guard, Preliminary Assessment for PFAS | West Bend AASF #1 | Wisconsin |
|---|---|---|

## Photograph No. 1

**Description:**

The fire suppression system tanks, each hold 750 gallons of 3% AFFF concentrate.


## Photograph No. 2

**Description:**

The location where the annual maintenance/testing occurred. Approximately 20-40 gallons of 3% AFFF solution was dumped here then washed onto the grassy area, which eventually leads to a drain that discharges to the Milwaukee River.

# APPENDIX C – Photographic Log

| Army National Guard, Preliminary Assessment for PFAS | West Bend AASF #1 | Wisconsin |
|---|---|---|

**Photograph No. 3**

**Description:**

The grassy area behind the fire suppression storage room. The AFFF from annual testing gets washed down this area, which discharges to a storm drain and ultimately leads to the Milwaukee River.

**Photograph No. 4**

**Description:**

This is the storm drain on the western boundary of the facility, approximately 40 feet from the room that holds the fire suppression system. This grassy area is where annual fire suppression system testing was conducted.