# FINAL
# Site Inspection Report
# Former Chicago Midway Army Aviation Support Facility
# Chicago, Illinois

Site Inspection for Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), Perfluorohexanesulfonic acid (PFHxS), Perfluorononanoic acid (PFNA), Hexafluoropropylene oxide dimer acid (HFPO-DA), and Perfluorobutanesulfonic acid (PFBS) at ARNG Installations, Nationwide

July 2023

Prepared for:

Army National Guard Bureau
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Arlington, VA 22204

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# Acronyms and Abbreviations

| | |
|---|---|
| % | percent |
| °C | degrees Celsius |
| °F | degrees Fahrenheit |
| µg/kg | micrograms per kilogram |
| AASF | Army Aviation Support Facility |
| AECOM | AECOM Technical Services, Inc. |
| AFFF | aqueous film-forming foam |
| AOI | Area of Interest |
| ARNG | Army National Guard |
| bgs | below ground surface |
| CAWS | Chicago Area Waterway System |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CoC | chain of custody |
| CSM | conceptual site model |
| DA | Department of the Army |
| DoD | Department of Defense |
| DPT | direct push technology |
| DQO | data quality objective |
| DUA | data usability assessment |
| ELAP | Environmental Laboratory Accreditation Program |
| EM | Engineer Manual |
| FAA | Federal Aviation Administration |
| FBO | Fixed Base Operator |
| FTA | Fire Training Area |
| GPRS | Ground Penetrating Radar Systems, LLC. |
| GPS | Global positioning system |
| HDPE | high-density polyethylene |
| HFPO-DA | hexafluoropropylene oxide dimer acid |
| IDW | investigation-derived waste |
| ILARNG | Illinois Army National Guard |
| ITRC | Interstate Technology Regulatory Council |
| ILWATER | State of Illinois' well database |
| LC/MS/MS | liquid chromatography with tandem mass spectrometry |
| MIL-SPEC | military specification |
| NELAP | National Environmental Laboratory Accreditation Program |
| ng/L | nanograms per liter |
| OWS | Oil/Water Separator |
| OSD | Office of the Secretary of Defense |
| PA | Preliminary Assessment |
| PFAS | per- and polyfluoroalkyl substances |
| PFBS | perfluorobutanesulfonic acid |
| PFHxS | perfluorohexanesulfonic acid |
| PFNA | perfluorononanoic acid |

| | |
|---|---|
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctanesulfonic acid |
| PID | photoionization detector |
| PQAPP | Programmatic UFP-QAPP |
| PVC | polyvinyl chloride |
| QA | quality assurance |
| QAPP | Quality Assurance Project Plan |
| QC | quality control |
| QSM | Quality Systems Manual |
| RI | Remedial Investigation |
| SI | Site Inspection |
| SL | screening level |
| SOP | standard operating procedure |
| TARP | Tunnel and Reservoir Plan |
| TOC | total organic carbon |
| TPP | Technical Project Planning |
| UFP | Uniform Federal Policy |
| US | United States |
| USACE | United States Army Corps of Engineers |
| USCS | Unified Soil Classification System |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| WWTP | Wastewater Treatment Plant |

# Executive Summary

The Army National Guard (ARNG) G-9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum from the Office of the Secretary of Defense (OSD) dated 6 July 2022 (Assistant Secretary of Defense, 2022). The six compounds listed in the OSD memorandum include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), hexafluoropropylene oxide dimer acid (HFPO-DA)[1], and perfluorobutanesulfonic acid (PFBS). These compounds are collectively referred to as "relevant compounds" throughout the document and the applicable screening levels (SLs) are provided in **Table ES-1**.

The PA identified an Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically (see **Table ES-2**). The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on screening levels (SLs) for relevant compounds. This SI was completed at the Former Chicago Midway Army Aviation Support Facility (Former AASF) in Chicago, Illinois and determined further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted for AOI 1. The Former AASF is also referred to as the "facility" throughout this document.

The Former AASF is in Cook County and is located directly adjacent to the Chicago Midway International Airport. The Former AASF was active from 1939 to 2017 and became inactive when the size and condition of the hangar at the Former AASF could no longer support the Illinois Army National Guard (ILARNG) for the maintenance and storage of the necessary aircrafts. Currently, the ILARNG does not use the Former AASF, and the hangar is vacant.

The PA identified one AOI for investigation during the SI phase. SI sampling results from the one AOI was compared to OSD SLs. **Table ES-2** summarizes the SI results for the AOI. Based on the results of this SI, further evaluation under CERCLA is warranted in a Remedial Investigation for AOI 1.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

## Table ES-1: Screening Levels (Soil and Groundwater)

| Analyte[b] | Residential (Soil) (µg/kg)[a] 0-2 feet bgs | Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a] 2-15 feet bgs | Tap Water (Groundwater) (ng/L)[a] |
|---|---|---|---|
| **PFOA** | 19 | 250 | 6 |
| **PFOS** | 13 | 160 | 4 |
| **PFBS** | 1,900 | 25,000 | 601 |
| **PFHxS** | 130 | 1,600 | 39 |
| **PFNA** | 19 | 250 | 6 |

**Notes:**
bgs = below ground surface; µg/kg = micrograms per kilogram; ng/L = nanograms per liter

a.) Assistant Secretary of Defense, 2022. Risk Based Screening Levels in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ) = 0.1. 6 July 2022.

b.) Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

## Table ES-2: Summary of Site Inspection Findings and Recommendations

| AOI | Potential Release Area | Soil – Source Area | Groundwater – Source Area | Groundwater – Facility Boundary | Future Action |
|---|---|---|---|---|---|
| 1 | Fire Extinguisher FTA & Ramp Area | ◐ | ● | ● | Proceed to RI |

**Legend:**
● = detected; exceedance of the screening levels
◐ = detected; no exceedance of the screening levels
○ = not detected

# 1. Introduction

## 1.1 Project Authorization

The Army National Guard (ARNG) G-9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum from the Office of the Secretary of Defense (OSD) dated 6 July 2022 (Assistant Secretary of Defense, 2022). The six compounds listed in the OSD memorandum will be referred to as "relevant compounds" throughout this document and include perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA)[1], and perfluorobutanesulfonic acid (PFBS) at ARNG facilities nationwide. The ARNG performed this SI at the Former Chicago Midway Army Aviation Support Facility (Former AASF) in Chicago. The Former AASF is also referred to as the "facility" throughout this document.

The SI project elements were performed in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; United States [US] Environmental Protection Agency [USEPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300; USEPA, 1994), and in compliance with US Department of the Army (DA) requirements and guidance for field investigations.

## 1.2 SI Purpose

A PA was performed at Former AASF (AECOM Technical Services, Inc. [AECOM], 2020) that identified one Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically. The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on screening levels (SLs) for the relevant compounds.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

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# 2. Facility Background

## 2.1 Facility Location and Description

The Former AASF is in Cook County, in northeastern Illinois (**Figure 2-1**). The cities of Oak Park, Oak Lawn, and Chicago are within 6 miles of the facility. The facility is adjacent to the Chicago Midway International Airport and is accessible from the south via West 63rd Street.

The Former AASF was active from 1939 to 2017. By 2017, the size and condition of the hangar at the Former AASF could no longer support the Illinois ARNG (ILARNG) for the maintenance and storage of the necessary aircrafts. As a result, the construction of the Kankakee AASF #2 was completed, and all assets at the Former AASF were transferred to the Kankakee AASF #2 in 2017. Currently, the ILARNG does not use the Former AASF and the hangar is vacant. The facility occupies about 5 acres. This land was first owned by the Illinois State Armory Board in 1946 and was transferred to the current owners, the State of Illinois, in the early 1970s.

## 2.2 Facility Environmental Setting

Cook County is in northeast Illinois, within in the Chicago Lake Plain physiographic division, which is a division characterized by a flat surface (**Figure 2-2**) with a till base that slopes towards Lake Michigan. The slope is separated by low beach ridges, morainic headlands and islands, and large glacial drainageways along the Des Plaines River and Sag Channel. Parallel to the lake shores, well-developed spits and bars funnel flow to the south and out towards the mouth of the Des Plaines River. The Chicago, Calumet, and Des Plaines River pathways are determined by these beach ridges due to their lack of valley nature. The Chicago Lake Plain is characterized by poorly drained land that can cause the area to become swampy (Leighton et al., 1949).

### 2.2.1 Geology

The Former AASF is underlain by glacial tills deposited during the Wisconsin glaciation. The uppermost formations are comprised of the Wedron Group. The Wadsworth Formation, which consists mostly of clay, silt, and fine-grained sand, is the youngest and stratigraphically highest formation within this group in the area of the facility. The Wadsworth Formation is underlain by the Lemont Formation, which is characterized by three members and consists of gravelly silt loam to loam diamiction (Hansel and Johnson, 1996). The uppermost tills at the facility have also been described as wave-scoured lake-bottom glacial till (Schneider and Keller, 1970).

Shallow bedrock units underly the unconsolidated sediments. The uppermost unit, comprised of predominantly of dolomitic rocks, cherty limestone, and some shale, is the Silurian Niagaran Series (Schneider and Keller, 1970). Previous investigations completed directly to the east and northeast of Chicago Midway Airport indicate the depth to the Niagaran Series Dolomite can be as shallow as 80 feet (Carnow Conibear, 2010; 2013).

During the SI, soil borings were completed at depths between 1.2 and 10 feet below ground surface (bgs). Fill material (fractured concrete/gravel) from prior construction was observed at each boring location at depths of up to 5 feet bgs. Because groundwater was deeper at AOI01-01 than other borings, it was the only boring advanced below the fill. The dominant lithology observed beneath the fill at AOI01-01, described as fine- to coarse-grained sand and lean, medium plasticity fines (clays and silts), is consistent with a glacial till depositional environment. Boring logs are presented in **Appendix E**.

### 2.2.2 Hydrogeology

Groundwater at the Former AASF was first encountered in the surficial glacial till deposits that underlie the facility. Monitoring wells were installed within the till to depths less than 10 feet during previous investigations at the facility (Wight & Company, 2001). Based on previous results, the hydraulic conductivity is estimated to be approximately $5.08x10^{-4}$ feet per minute (Wight & Company, 2001). Many of the sewers in the Chicago area are old, brick-lined, and susceptible to infiltration and possible inflow of groundwater (Duncker and Johnson, 2015). However, the materials used to construct the sewers underlying the facility are not known, meaning brick-lined sewers may not be applicable to the Former AASF.

The shallow Silurian dolomite aquifer underlies the water table aquifer and resides within the dolomitic bedrock of the Niagaran and Alexandrian Series. Groundwater in this aquifer is sourced from dissolution cavities, fractures, and bedding planes within the rock (Roadcap et al., 1993). Beneath the Silurian dolomite aquifer is the Maquoketa Shale, which is an aquitard and confines the deeper Cambrian-Ordovician aquifer (Roadcap et al., 1993).

There are no wells located within the boundary of the Former AASF; however, there are several unknown wells within a 2-mile radius surrounding the facility (**Figure 2-3**). The State of Illinois' well database (ILWATER) does not provide specific well type information (i.e., monitoring well, domestic well, industrial well, etc.). Wells near the airport are reported to range from a depth of 13 to >1,900 feet bgs, with 31 wells installed to depths less than 100 feet bgs. Drinking water for the Former AASF (and presumably the surrounding area) is supplied by the City of Chicago, which sources water from Lake Michigan (Chicago Department of Water Management, 2018).

Depths to water measured in March 2022 during the SI ranged from 0.64 to 7.57 feet bgs. Groundwater elevation contours from the SI are presented on **Figure 2-4** and indicate the groundwater flow direction at the Former AASF is primarily from north to south.

### 2.2.3 Hydrology

Floor and trench drains in the hangar drain to the oil/water separator (OWS), which is also located in the hangar. The OWS flows to the city sanitary sewer system, which eventually discharges to the Stickney Wastewater Treatment Plant (WWTP) in Cicero, Illinois.

Off-facility storm sewer drain inlets are present on the adjacent aircraft washing area (just north of the Ramp Area) and on 63rd street to the south (SCS Engineers, 2014). It is unknown if these sewer inlets lead to the OWS. Stormwater in the vicinity of the Former AASF is conveyed to the Chicago Area Waterway System (CAWS), which adopted the Tunnel and Reservoir Plan (TARP) in order to comply with water quality standards and help with the flow of water throughout the City of Chicago. There is a large network of deep tunnels in the TARP; these underground tunnels span from 11 to 33 feet in diameter and connect to massive storage reservoirs. The tunnels help with flood control, routing of stormwater sewer runoff, and a have a major impact on regional hydrology. The tunnels can also be used as a storage area for sewer runoff but are mostly used to direct flow to the storage tanks. Since the City of Chicago is a primarily flat urban area, most of the hydrology in the city is engineering-designed rather than a natural surface flow. Without the engineered drainage system, there would be no way to remove excess water quickly, which would create overland flooding, sewer overflow, and flooded basements. Any natural drainage flow that exists in Chicago flows towards Lake Michigan through small, low-sloped, sluggish streams, along with the major waterways in the Chicago and Calumet Rivers. During the dry season, the CAWS can be found in a low-velocity setting, while during heavy periods of precipitation, they will open the gates into the tanks and Lake Michigan to prevent any flooding in the tunnels. These drawdowns are important and have no noticeable effect on Lake Michigan (Duncker and Johnson, 2015). Surface water features and drainage pathways are presented on **Figure 2-5**.

### 2.2.4 Climate

The climate at the facility has four defined seasons with a variation in temperatures. The summers at the facility are warm and often humid. The winters are freezing and extremely windy. Cloud cover can be found all times of the year. Temperatures vary from average highs of 59.3 degrees Fahrenheit (°F) to average lows of 43.3 °F. The average annual temperature is 51.3 °F. Average precipitation is 39.04 inches of rain. April to September is the wet season, while October to March is the dry season. Chicago's warm months are from May to October, with an average temperature above 60.0 °F. Cold months in Chicago are from November to April (World Climate, 2022).

### 2.2.5 Current and Future Land Use

The Former AASF is a controlled access facility and is adjacent to the Chicago Midway International Airport. At present, the ILARNG no longer uses the Former AASF, and the land is anticipated to be transferred to Chicago Midway International Airport. The ILARNG has no intentions of using or occupying this land in the future.

### 2.2.6 Sensitive Habitat and Threatened/ Endangered Species

The following mammals, insects, birds, reptiles, shellfish, and plants are federally endangered, threatened, proposed, and/ or are listed as candidate species in Cook County, Illinois (US Fish and Wildlife Service [USFWS], 2022).

- **Mammals:** Tricolored bat (*Perimyotis subflavus*) – proposed endangered; and Northern long-eared bat (*Myotis septentrionalis*) - threatened
- **Insects:** Monarch butterfly (*Danaus plexippus)* – candidate; Hine's emerald dragonfly (*Somatochlora hineana*) – endangered; Rusty patched bumble bee (*Bombus affinis*) – endangered
- **Birds:** Piping plover (*Charadrius melodus*) – endangered; Red knot (*Calidris canutus rufa*) – endangered
- **Reptiles:** Eastern Massasauga (*Sistrurus catenatus*) – threatened
- **Shellfish:** Snuffbox mussel (*Epioblasma triquetra*) – endangered
- **Plants:** Mead's milkweed (*Asclepias meadii*) - threatened; Eastern prairie fringed orchid (*Platanthera leucophaea)* - threatened*;* Leafy prairie-clover (*Dalea foliosa*) – endangered

## 2.3 History of PFAS Use

Two potential release areas were identified in the PA where AFFF may have been used during fire training exercises and/ or storage (AECOM, 2020). These release areas were grouped into one AOI based on preliminary data and assumed groundwater flow directions. A description of the AOI is presented in **Section 3**.

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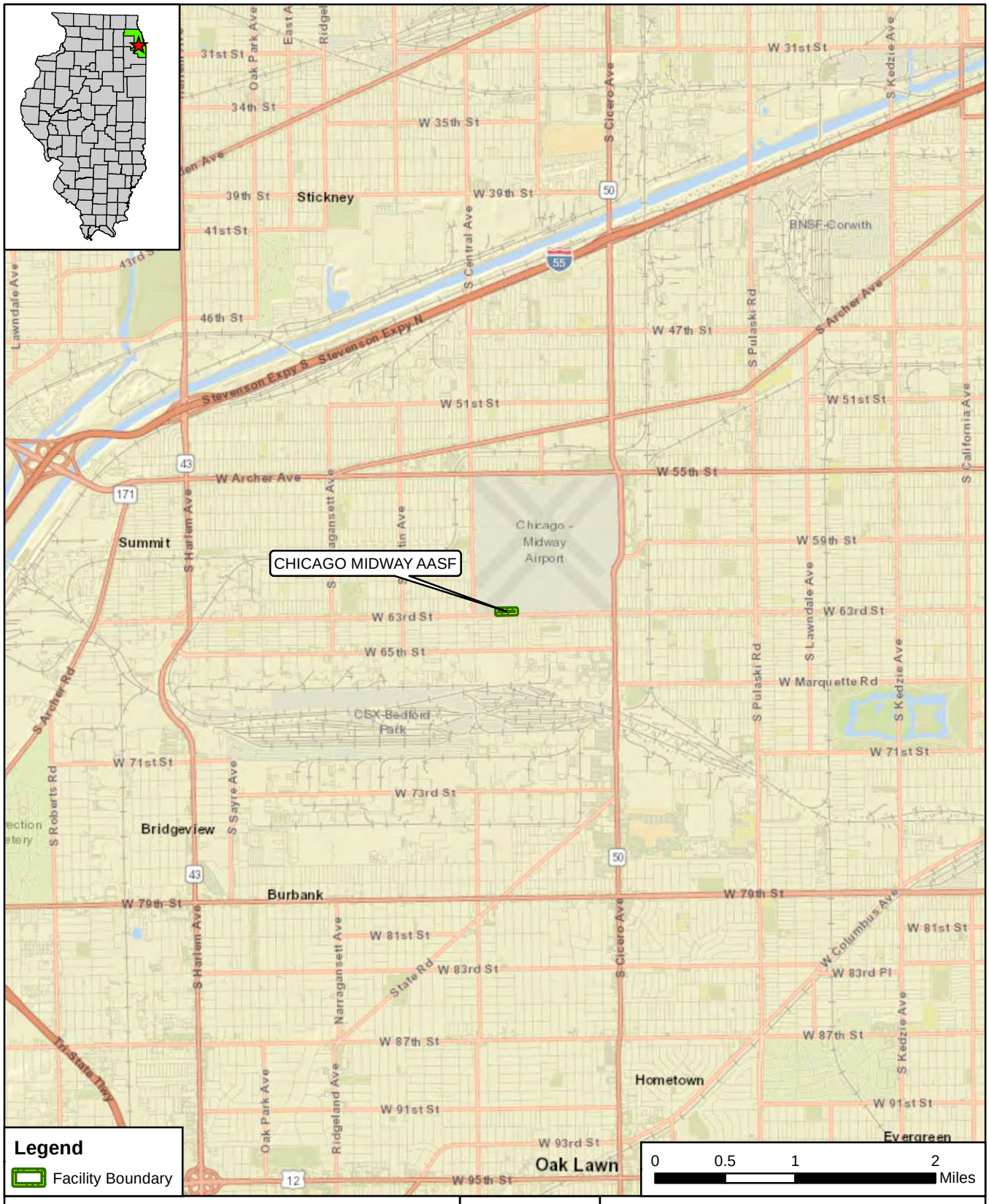


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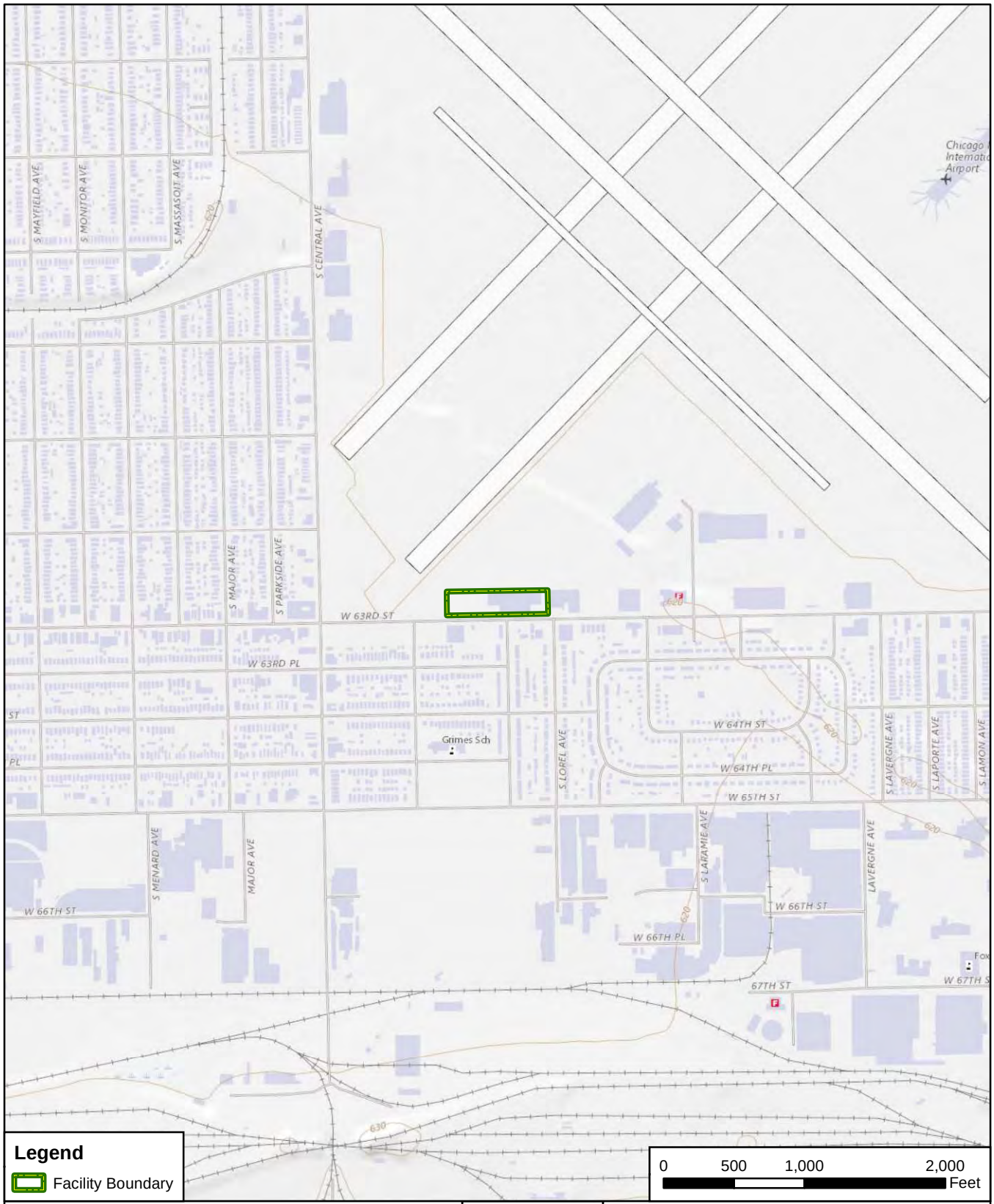
| SCALE | 1:63,360 | CHK BY | SS | 8/30/2022 |
| Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, | | PM | CM | 8/30/2022 |

**Facility Location**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 2-1**

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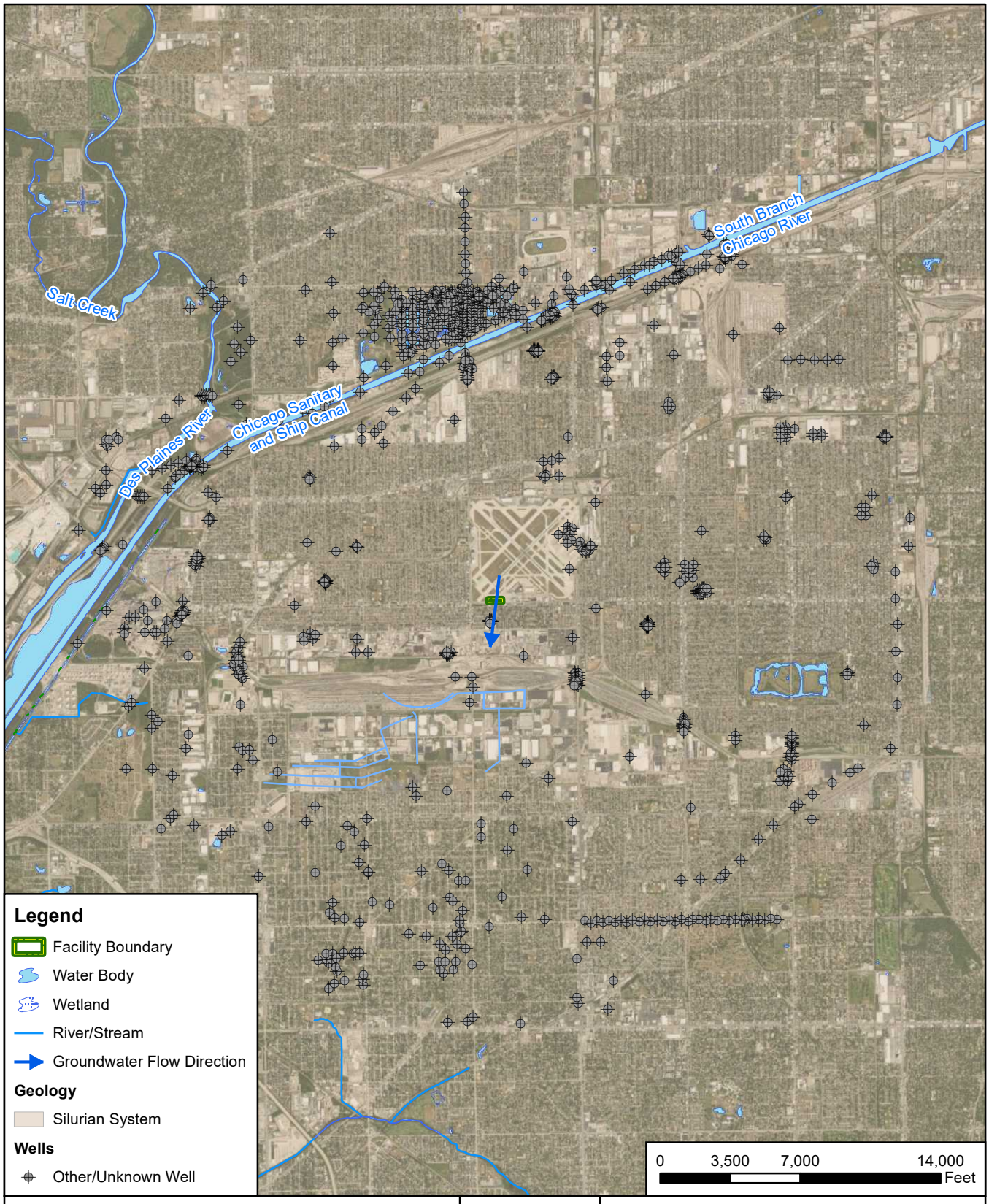
| SCALE | 1:12,000 | CHK BY | SS | 8/30/2022 |
| Base Map: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, | | PM | CM | 8/30/2022 |

**Facility Topography**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 2-2**

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| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 10/7/2022 |

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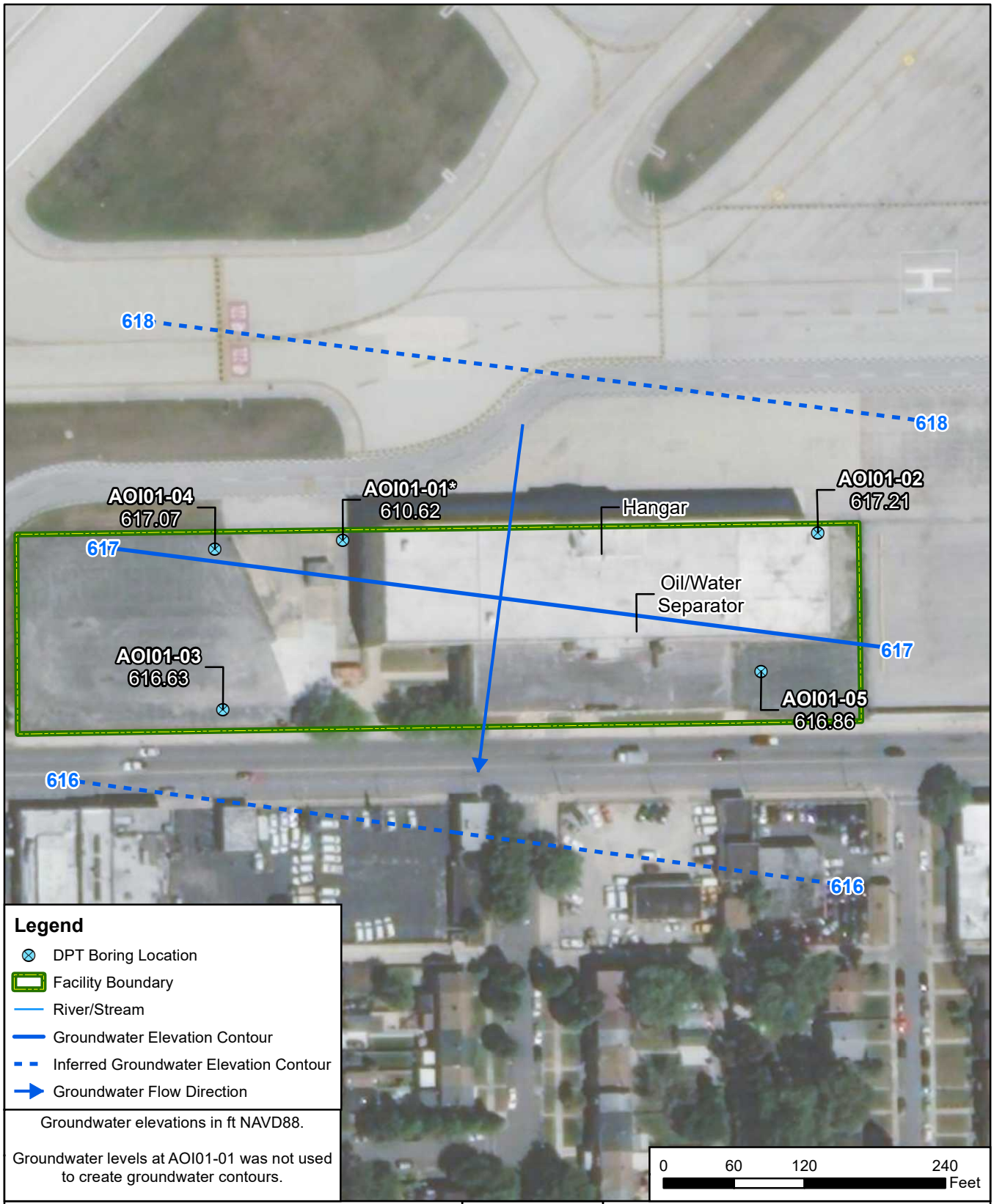
**Groundwater Features**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 2-3**

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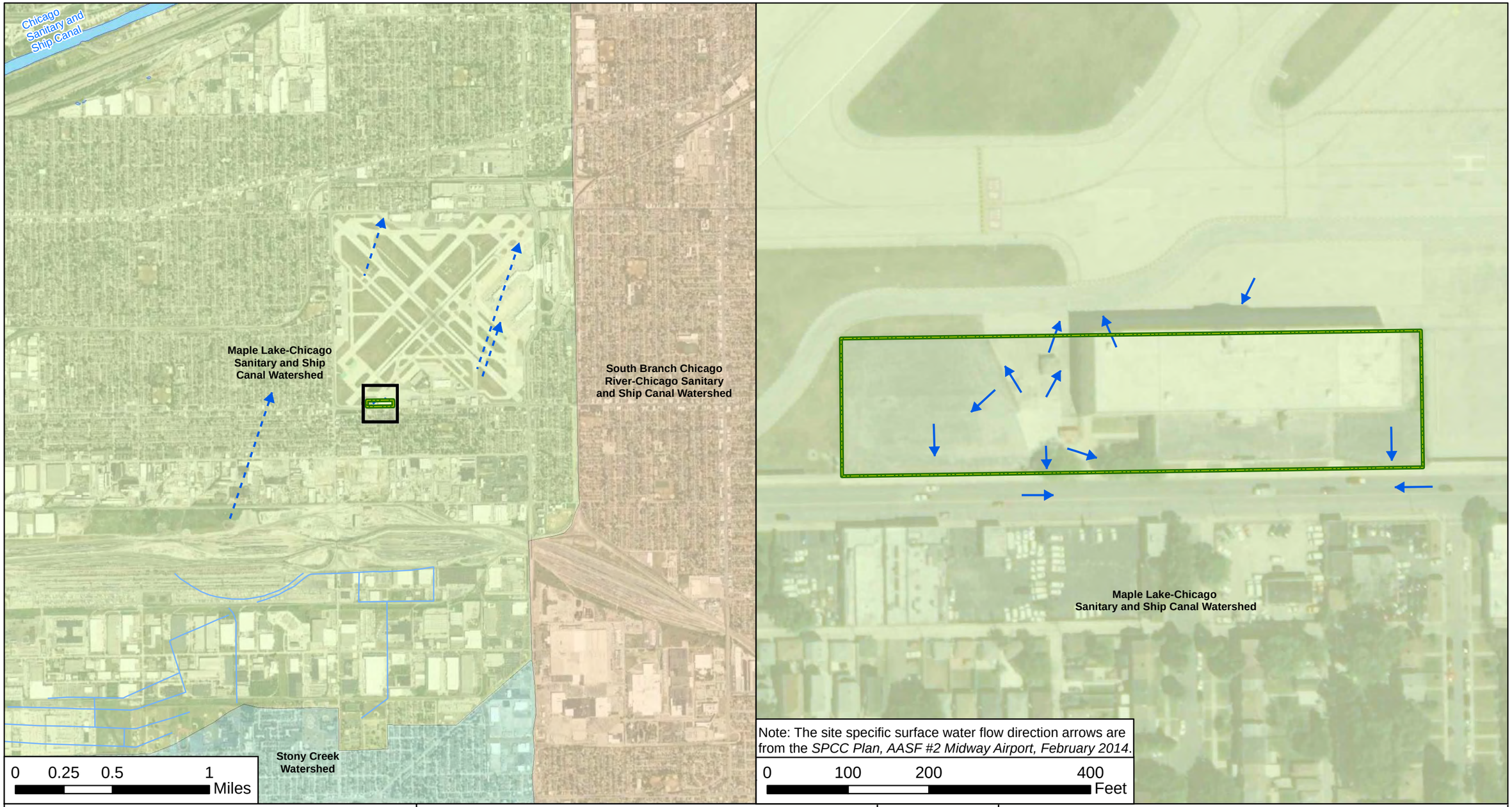
**Groundwater Elevations, March 2022**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 2-4**

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| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/30/2022 |

**Legend**

- Facility Boundary
- Surface Water Flow Direction
- Water Body
- Canal/Ditch

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## Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 2-5**

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# 3. Summary of Areas of Interest

The PA evaluated areas where PFAS-containing materials may have been used, stored, disposed, or released historically. Based on the PA findings, two potential release areas were identified at Former AASF and combined into one AOI (AECOM, 2020). Additionally, adjacent potential release areas were identified during the PA (AECOM, 2020), including: The Airport Crash, Fixed Base Operator (FBO) Hangars, and the Chicago Fire Department. The potential release areas and adjacent potential release areas are shown on **Figure 3-1**.

## 3.1 AOI 1

AOI 1 consists of two potential release areas. These release areas are described below

### 3.1.1 Fire Extinguisher FTA

In approximately 2004, a one-time fire training event occurred inside the hangar, where a Tri-Max™ 30 unit was filled with a soap and water mixture and was used to practice putting out a small pan fire. After the training exercise was completed, the mixture was washed down floor drains to the OWS. The OWS discharges to the city sewer system, which leads to the Stickney WWTP.

It is possible that releases within the hangar may have also flowed out the north-facing hangar doors and onto the Ramp Area. The Ramp Area flows to drains on the off-facility, adjacent aircraft washing area. These drains are designated as storm sewer drain inlets on the *Spill Prevention Control and Countermeasure Plan* (SCS Engineers, 2014). It is unknown if these off-facility drains connect to the OWS. It is possible that AFFF may have infiltrated into the subsurface soil via joints in the floor slab or cracks in the pavement.

### 3.1.2 Ramp Area

Between 2000 and 2005, five Tri-Max™ 30 fire extinguishers were located at the facility. Three of the extinguishers were located by the hangar doors, one was located on the ramp, and one unit was located in the hangar. The AFFF from the Tri-Max™ 30 extinguisher located in the hangar was drained into a bucket and filled with a soap and water mixture for training purposes. During the winter months, AFFF in the Tri-Max™ 30 extinguishers was emptied into buckets and replaced with cold-weather-approved AFFF to avoid freezing. Releases at the Ramp Area would likely flow to nearby grassy areas or to the storm sewer drains, as described in **Section 3.1.1**.

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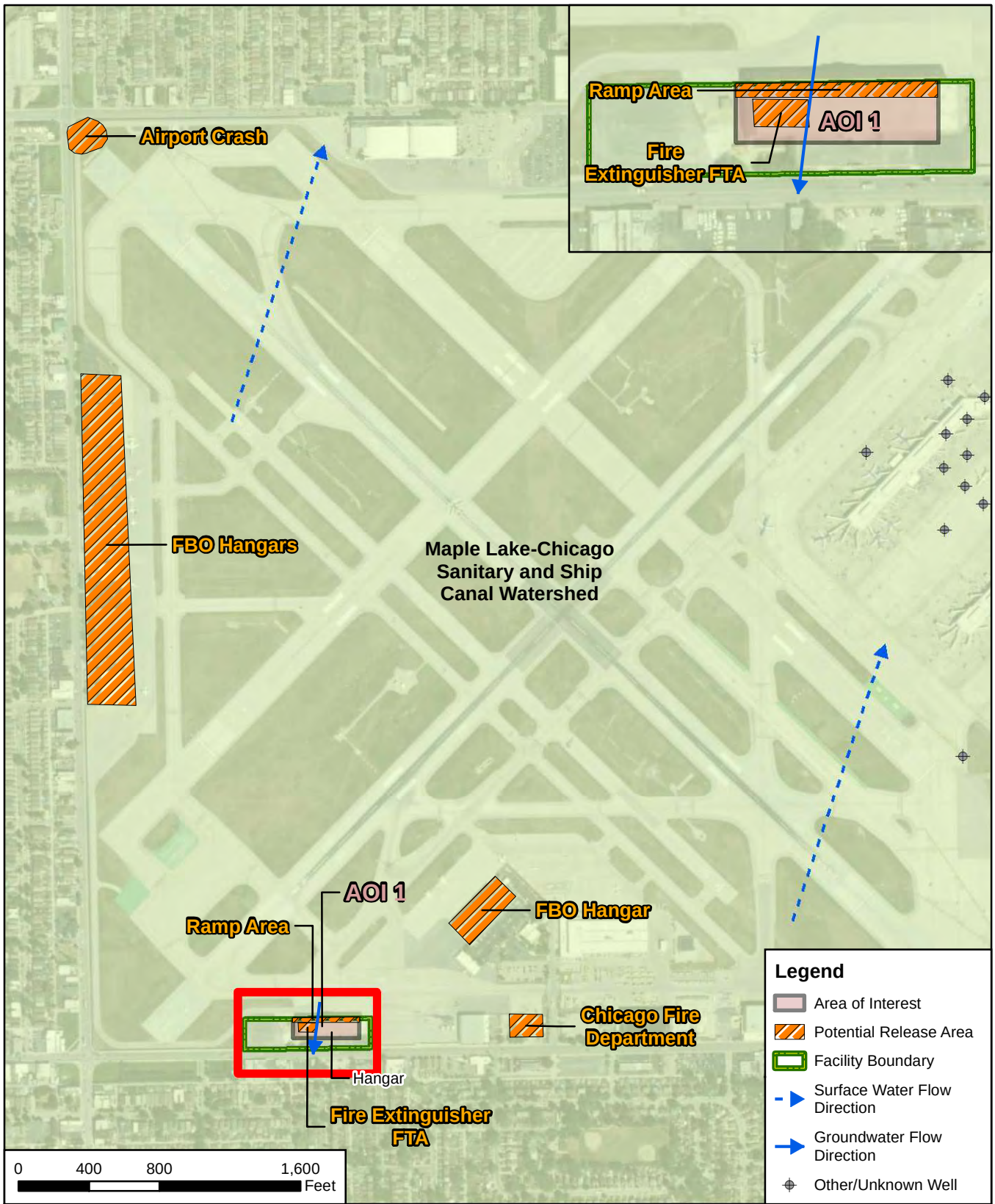


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| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/31/2022 |

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# Areas of Interest

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 3-1**

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# 4. Project Data Quality Objectives

As identified during the Data Quality Objective (DQO) process and outlined in the SI Quality Assurance Project Plan (QAPP) Addendum (AECOM, 2021a), the objective of the SI is to identify whether there has been a release to the environment at the AOI identified in the PA. For the AOI, ARNG determines if further investigation is warranted, a removal action is required to address immediate threats, or whether no further action is warranted. This SI evaluated groundwater and soil for presence or absence of relevant compounds at each of the sampled AOIs.

## 4.1 Problem Statement

ARNG will recommend an AOI for Remedial Investigation (RI) if related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based SLs. The SLs are presented in **Section 6.1** of this report.

## 4.2 Information Inputs

Primary information inputs included:

- The PA for Former AASF (AECOM, 2020);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific Uniform Federal Policy (UFP)-QAPP Addendum (AECOM, 2021a); and
- Field data collected during the SI, including groundwater elevation and water quality parameters measured at the time of sampling.

## 4.3 Study Boundaries

The scope of the SI was bounded by the property limits of the facility (**Figure 2-2**). Off-facility sampling was not included in the scope of this SI. If future off-facility sampling is required, the proper stakeholders will be notified, and necessary rights of entry will be obtained by ARNG with property owner(s). The scope of the SI was bounded vertically by the top 5 feet of the groundwater table. Temporal boundaries were limited to the spring, summer, and fall months.

## 4.4 Analytical Approach

Samples were analyzed by Pace Analytical Gulf Coast, accredited under the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP; Accreditation Number 74960) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 01955). Data were compared to applicable SLs within this document and decision rules as defined in the SI QAPP Addendum (AECOM, 2021a).

## 4.5 Data Usability Assessment

The Data Usability Assessment (DUA), which is provided in **Appendix A**, is an evaluation at the conclusion of data collection activities that uses the results of both data verification and validation in the context of the overall project decisions or objectives. Using both quantitative and qualitative methods, the assessment determines whether project execution and the resulting data have met installation-specific DQOs. Both sampling and analytical activities are considered to assess whether the collected data are of the right type, quality, and quantity to support the decision-making (DoD, 2019a; DoD, 2019b; USEPA, 2017).

Based on the DUA, the environmental data collected during the SI were found to be acceptable and usable for this SI evaluation with the qualifications documented in the DUA and its associated data validation reports. These data are of sufficient quality to meet the objectives and requirements of the SI QAPP Addendum (AECOM, 2021a).

# 5. Site Inspection Activities

This section describes the environmental investigation and sampling activities that occurred as part of the SI. The SI sampling approach was based on the findings of the PA and implemented in accordance with the following approved documents:

- *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP)* dated March 2018 (AECOM, 2018a);
- *Final Programmatic Accident Prevention Plan* dated July 2018 (AECOM, 2018b);
- *Final Preliminary Assessment Report, Former Chicago Midway Army Aviation Support Facility, Chicago, Illinois* dated August 2020 (AECOM, 2020);
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Former Chicago Midway Army Aviation Support Facility, Chicago, Illinois* dated November 2021 (AECOM, 2021a); and
- *Final Site Safety and Health Plan, Former Chicago Midway Army Aviation Support Facility, Chicago, Illinois* dated November 2021 (AECOM, 2021b).

The SI field activities consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Two rounds of utility clearance occurred on 21 October 2021 and 21 March 2022. The remaining field activities were conducted from 24 to 25 March 2022 in accordance with the SI QAPP Addendum (AECOM, 2021a), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for a subset of 18 compounds by liquid chromatography with tandem mass spectrometry (LC/MS/MS) compliant with Quality Systems Manual (QSM) 5.3 Table B-15 to fulfill the project DQOs:

- Seven soil samples from five boring locations;
- Five grab groundwater samples from five temporary wells;
- Eleven (11) quality assurance (QA)/quality control (QC) samples.

**Figure 5-1** provides the sample locations for all media across the facility. **Table 5-1** presents the list of samples collected for each media. Field documentation is provided in **Appendix B**. A Log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix B1**. Sampling forms are provided in **Appendix B2**, a Field Change Request Form is provided in **Appendix B3**, land survey data are provided in **Appendix B4**, and investigation-derived waste (IDW) polygons are provided in **Appendix B5**. Additionally, a photographic log of field activities is provided in **Appendix C**.

## 5.1 Pre-Investigation Activities

In preparation for the SI field activities, project team members participated in Technical Project Planning (TPP) meetings, performed utility clearance, and sampled decontamination source water. Details for each of these activities are presented below.

### 5.1.1 Technical Project Planning

The US Army Corps of Engineers (USACE) TPP Process, Engineer Manual (EM) 200-1-2 (USACE, 2016) defines four phases to project planning: 1.) defining the project phase; 2.) determining data needs; 3.) developing data collection strategies; and 4.) finalizing the data

collection plan. The process encourages stakeholder involvement in the SI, beginning with defining overall project objectives, including DQOs, and formulating a sampling approach to address the AOIs identified in the PA.

A combined TPP Meeting 1 and 2 was held on 15 September 2021, prior to SI field activities. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2. The stakeholders for this SI included the ARNG, ILARNG, USACE, and Illinois Environmental Protection Agency. Stakeholders were provided the opportunity to make comments on the technical sampling approach and methods at the combined TPP Meeting 1 and 2. The outcome of the combined TPP Meeting 1 and 2 was memorialized in the SI QAPP Addendum (AECOM, 2021a).

A TPP Meeting 3 will be held after the field event to discuss the results of the SI. Meeting minutes for TPP 3 will be included in **Appendix D** of this report. Future TPP meetings will provide an opportunity to discuss the results and findings, and future actions, where warranted.

### 5.1.2 Utility Clearance

AECOM's drilling subcontractor, Cascade Technical Services, LLC. placed a ticket with the Chicago 811 "Call Before You Dig" utility clearance provider to notify them of intrusive work in March 2022. Additionally, AECOM contracted Ground Penetrating Radar Systems, LLC. (GPRS), a private utility location service, to perform utility clearance. GPRS performed utility clearance of the proposed boring locations in March 2022 with input from the AECOM field team and the Former AASF facility staff. General locating services and ground-penetrating radar were used to complete the clearance. Additionally, the first 5 feet of each boring were pre-cleared using a hand auger to verify utility clearance in shallow subsurface where utilities would typically be encountered.

### 5.1.3 Source Water and Sampling Equipment Acceptability

One potable water source at the Former AASF was sampled from a spigot on the south side of the hangar on 12 August 2021 to assess usability for decontamination of drilling equipment. Results of the sample collected (CM-DECON-01) confirmed this source to be acceptable for use in this investigation; therefore, it was used throughout the field activities. Specifically, the sample was analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15. A second decontamination sample (CM-DECON-02) was collected from Cascade's pressure washer to ensure cross-contamination did not occur during the decontamination process. The results of the decontamination water samples are provided in **Appendix F**. A discussion of the results is presented in the DUA (**Appendix A**).

Materials that were used within the sampling zone were confirmed as acceptable for use in the sampling environment. The checklist of acceptable materials for use in the sampling environment was provided in the Standard Operating Procedures (SOPs) appendix to the SI QAPP Addendum (AECOM, 2021a). Prior to the start of field work each day, a Sampling Checklist was completed as an additional layer of control. The checklist served as a daily reminder to each field team member regarding the allowable materials within the sampling environment.

## 5.2 Soil Borings and Soil Sampling

Soil samples were collected via direct push technology (DPT), in accordance with the SI QAPP Addendum (AECOM, 2021a). A GeoProbe® 7220DT macrocore sampling system was used to collect continuous soil cores where able. A hand auger was used to collect soil from the top five feet of the boring, in accordance with AECOM utility clearance procedures. The soil boring locations are shown on **Figure 5-1**, and depths are provided in **Table 5-1**.

Due to shallow depth to groundwater observed at most boring locations, only one discrete surface soil sample was collected from the vadose zone for chemical analysis from soil borings AOI01-02 to AOI01-05. Deeper groundwater was encountered at boring AOI01-01, and three soil samples were collected: one surface soil sample, one subsurface soil sample approximately 2 feet above the groundwater table, and one subsurface soil sample at the mid-point between the surface and the groundwater table. The surface soil sample at boring AOI01-01 was collected at 2 to 3 feet bgs due to the top 2 feet consisting mostly of fractured concrete and gravel that was unsuitable to be sampled.

The soil cores were continuously logged for lithological descriptions by an AECOM field geologist using the Unified Soil Classification System (USCS). A photoionization detector (PID) was used to screen the breathing zone during boring activities as part of personal safety requirements. Observations and measurements were recorded on sampling forms (**Appendix B2**) and in a non-treated field logbook (i.e., composition notebook). Depth interval, recovery thickness, PID concentrations, moisture, relative density, color (using a Munsell soil color chart), and texture (using the USCS) were recorded. The boring logs are provided in **Appendix E**.

Soil borings completed during the SI observed gravel fill from prior construction work directly beneath ground surface at each boring location. At AOI01-01, fine- to coarse-grained sand and lean, medium plasticity fines were observed below the gravel fill. The borings were completed at depths between 1.2 and 10 feet bgs. The lithology results and facility observations are consistent with glacial deposition reported in the region, as discussed in **Section 2.2.1**.

Each soil sample was collected into laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via Federal Express (FedEx) under standard chain of custody (CoC) procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15, total organic carbon (TOC) (USEPA Method 9060A) and pH (USEPA Method 9045D), in accordance with the SI QAPP Addendum (AECOM, 2021a). Grain size analysis was not performed, in accordance with the SI QAPP Addendum, because extensive horizontal and vertical clay units were not encountered in the field (AECOM, 2021).

Field duplicate samples were collected at a rate of 10 percent (%) and analyzed for the same parameters as the accompanying samples. MS/MSDs were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. In instances when non-dedicated sampling equipment was used, such as a hand auger for the shallow soil samples, equipment rinsate blanks were collected at a rate of 5% and analyzed for the same parameters as the soil samples. A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6 degrees Celsius (°C) during shipment.

Four of the borings were drilled in asphalt- or concrete-covered areas. The borings were converted to temporary wells, which were sampled, surveyed and subsequently abandoned in accordance with the SI QAPP Addendum (AECOM, 2021a). Boreholes drilled in asphalt or concrete were patched upon abandonment to match existing ground conditions.

## 5.3 Temporary Well Installation and Groundwater Grab Sampling

Temporary wells were installed using a GeoProbe® 7220DT macrocore sampling system. Once the borehole was advanced to the desired depth, a temporary well was constructed of a 5-foot section of 1-inch Schedule 40 poly-vinyl chloride (PVC) screen with sufficient casing to reach ground surface. New PVC pipe and screen were used to avoid cross contamination between locations. The screen intervals for the temporary wells are provided in **Table 5-2**.

Groundwater samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well screen intervals. After the recharge

period, groundwater samples were collected using a peristaltic pump with PFAS-free HDPE tubing. The temporary wells were purged at a rate determined in the field to reduce turbidity and draw down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen, turbidity, and oxidation-reduction potential) were measured using a water quality meter and recorded on the field sampling form (**Appendix B2**) before each grab sample was collected. Several temporary wells did not have sufficient recharge to collect a groundwater sample and measure water quality parameters; therefore, grab samples were collected in accordance with the SI QAPP Addendum (AECOM, 2021a) without collecting water quality data. Additionally, a subsample of each groundwater sample was collected in a separate container, and a shaker test was completed to identify if there were any foaming. No foaming was noted in any of the groundwater samples.

Each sample was collected into laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard CoC procedures to the laboratory and analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15 in accordance with the SI QAPP Addendum (AECOM, 2021a).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike (MS)/ MS duplicates/(MSDs) were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. One field reagent blank was collected in accordance with the PQAPP (AECOM, 2018a). A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6°C during shipment.

Following well surveying (described below in **Section 5.5**), temporary wells were abandoned in accordance with the SI QAPP Addendum (AECOM, 2021a) by removing the PVC and backfilling the hole with bentonite chips. Upon completion of well abandonment, the ground surface at each location was patched to match existing surrounding conditions.

## 5.4 Synoptic Water Level Measurements

A synoptic groundwater gauging event was performed on 24 March 2022. Groundwater elevation measurements were collected from the five new temporary monitoring wells. A groundwater flow contour map is provided in **Figure 2-4**. Groundwater elevation data are provided in **Table 5-2**.

## 5.5 Surveying

The northern side of each well casing was surveyed by Illinois-licensed land surveyors following guidelines provided in the SOPs found in the SI QAPP Addendum (AECOM, 2021a). Survey data from the newly installed wells on the facility were collected on 24 March 2022 in the applicable North American Datum 1983 State Plane Illinois East (US Survey Feet) (horizontal) and North American Vertical Datum 1988 (vertical). The surveyed well data are provided in **Appendix B4**.

## 5.6 Investigation-Derived Waste

As of the date of this report, the disposal of investigation-derived waste (IDW) is not regulated federally. IDW generated during the SI is considered non-hazardous waste and was managed in accordance with the SI QAPP Addendum (AECOM, 2021a) and with the DA Guidance for Addressing Releases of PFAS, Q18 (DA, 2018).

Solid IDW (i.e., soil cuttings and cored material) generated during SI activities were left in place at the point of the source (i.e., downhole) or placed in the gravel-covered area to the east of the hangar. The solid IDW was not sampled and assumes the characteristics of the associated soil samples collected from that source location. Geographic coordinates were collected using a

global positioning system (GPS) around each location where IDW was placed (i.e., an IDW polygon). The IDW polygons are displayed on the figure in **Appendix B5**.

Liquid IDW generated during SI activities (i.e., purge water and decontamination fluids) was containerized in a properly labeled 55-gallon drum and stored on the facility at a location designated by the ILARNG Environmental Manager. The liquid IDW was not sampled and assumes the characteristics of the associated groundwater samples collected from that source location. The liquid IDW will be further managed under separate ARNG contract in accordance with the Army Guidance for Addressing Releases of PFAS, Q18 (DA, 2018).

Other solids such as spent personal protective equipment, plastic sheeting, tubing, rope, unused monitoring well construction materials, and other environmental media generated during the field activities were disposed of at a licensed solid waste landfill.

## 5.7 Laboratory Analytical Methods

Samples were analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15 at Pace Analytical Gulf Coast in Baton Rouge, Louisiana, a DoD ELAP and NELAP certified laboratory. Soil samples were also analyzed for TOC using USEPA Method 9060A and pH by USEPA Method 9045D.

## 5.8 Deviations from SI QAPP Addendum

One deviation from the SI QAPP Addendum was identified prior to mobilization due to the Federal Aviation Administration's (FAA) Final Determination. The deviation is noted below and is documented in Field Change Request Form (**Appendix B3**):

- The Final Determination submitted by the Federal Aviation Administration (FAA) prohibited drilling at boring location CM-01 without closing the Chicago Midway International Airport runway during drilling operation because the location penetrates the Runway 4R/22L Runway Object Free Area. At the client's direction, CM-01 was removed from the scope prior to mobilization. CM-01 is a boundary location with the purpose of determining whether off-facility adjacent sources of PFAS are migrating onto the northwestern portion of the facility property. Due to the nature of the FAA Final Determination and the FAA restrictions of moving drilling locations without resubmitting a new case submission, no additional boring locations could be substituted for CM-01.

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**Table 5-1**
**Site Inspection Samples by Medium**
**Site Inspection Report, Former Chicago Midway Army Aviation Support Facility, Illinois**

| Sample Identification | Sample Collection Date/Time | Sample Depth (feet bgs) | LC/MS/MS compliant with QSM 5.3 Table B-15 | TOC (USEPA Method 9060A) | pH (USEPA Method 9045D) | Comments |
|---|---|---|---|---|---|---|
| **Soil Samples** | | | | | | |
| AOI01-01-SB-2-3 | 3/24/2022 11:10 | 2 - 3 | x | | | |
| AOI01-01-SB-4-5 | 3/24/2022 11:15 | 4 - 5 | x | | | |
| AOI01-01-SB-5-7 | 3/24/2022 11:20 | 5 - 7 | x | x | x | |
| AOI01-01-SB-5-7-D | 3/24/2022 11:20 | 5 - 7 | x | x | x | FD |
| AOI01-01-SB-5-7-MS | 3/24/2022 11:20 | 5 - 7 | x | x | x | MS |
| AOI01-01-SB-5-7-MSD | 3/24/2022 11:20 | 5 - 7 | x | x | x | MSD |
| AOI01-02-SB-0-2 | 3/24/2022 9:25 | 0 - 1.2 | x | | | |
| AOI01-03-SB-0-1 | 3/24/2022 10:25 | 0 - 1 | x | | | |
| AOI01-04-SB-0-2 | 3/24/2022 10:50 | 0 - 2 | x | | | |
| AOI01-05-SB-0-2 | 3/24/2022 9:40 | 0 - 2 | x | | | |
| **Groundwater Samples** | | | | | | |
| AOI01-01-GW | 3/25/2022 15:45 | NA | x | | | |
| AOI01-02-GW | 3/24/2022 13:50 | NA | x | | | |
| AOI01-03-GW | 3/24/2022 15:00 | NA | x | | | |
| AOI01-04-GW | 3/24/2022 15:30 | NA | x | | | |
| AOI01-05-GW | 3/24/2022 14:25 | NA | x | | | |
| AOI01-05-GW-D | 3/24/2022 14:25 | NA | x | | | FD |
| AOI01-05-GW-MS | 3/24/2022 14:25 | NA | x | | | MS |
| AOI01-05-GW-MSD | 3/24/2022 14:25 | NA | x | | | MSD |
| **Quality Control Samples** | | | | | | |
| CM-FRB-01 | 3/24/2022 14:15 | NA | x | | | |
| CM-ERB-01 | 3/24/2022 12:20 | NA | x | | | from rig |
| CM-ERB-02 | 3/24/2022 12:30 | NA | x | | | from hand auger |
| CM-DECON-01 | 8/12/2021 7:15 | NA | x | | | from spigot |
| CM-DECON-02 | 3/24/2022 12:10 | NA | x | | | from washer |
| | | | | | | |

**Notes:**
ASTM = American Society for Testing and Materials
bgs = below ground surface
DECON = decontamination water sample
ERB = equipment rinsate blank
FD = field duplicate
FRB = field reagent blank
LC/MS/MS = Liquid Chromatography Mass Spectrometry
MS/MSD = matrix spike/ matrix spike duplicate
QSM = Quality Systems Manual
TOC = total organic carbon
USEPA = United States Environmental Protection Agency

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**Table 5-2**
**Soil Boring Depths, Temporary Well Screen Intervals, and Groundwater Elevations**
**Site Inspection Report, Former Chicago Midway Army Aviation Support Facility, Illinois**

| Area of Interest | Boring Location | Soil Boring Depth (feet bgs) | Temporary Well Screen Interval (feet bgs) | Top of Casing Elevation (feet NAVD88) | Ground Surface Elevation (feet NAVD88) | Depth to Water (feet btoc) | Depth to Water (feet bgs) | Groundwater Elevation (feet NAVD88) |
|---|---|---|---|---|---|---|---|---|
| 1 | AOI01-01 | 10 | 5 - 10 | 618.51 | 618.19 | 7.89 | 7.57 | 610.62 |
| | AOI01-02 | 1.2 | 0 - 1.2 | 619.11 | 617.85 | 1.90 | 0.64 | 617.21 |
| | AOI01-03 | 3 | 0 - 3 | 619.58 | 617.52 | 2.95 | 0.89 | 616.63 |
| | AOI01-04 | 3 | 0 - 3 | 620.07 | 618.05 | 3.00 | 0.98 | 617.07 |
| | AOI01-05 | 3 | 0 - 3 | 620.27 | 618.19 | 3.41 | 1.33 | 616.86 |

**Notes:**
bgs = below ground surface
btoc = below top of casing
NAVD88 = North American Vertical Datum 1988

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| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/31/2022 | GIS BY | MS | 8/31/2022 |
| SCALE | 1:1,440 | CHK BY | SS | 8/31/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/31/2022 |

N

**Site Inspection Sample Locations**

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

**Figure 5-1**

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# 6. Site Inspection Results

This section presents the analytical results of the SI. The SLs used in this evaluation are presented in **Section 6.1**. A discussion of the results for the AOI is provided in **Section 6.3**. **Table 6-2** through **Table 6-4** present results in soil or groundwater for the relevant compounds. Tables that contain all results are provided in **Appendix F**, and the laboratory reports are provided in **Appendix G**.

## 6.1 Screening Levels

The DoD has adopted a policy to retain facilities in the CERCLA process based on risk-based SLs for soil and groundwater, as described in a memorandum from the OSD dated 6 July 2022 (Assistant Secretary of Defense, 2022). The ARNG program under which this SI was performed follows this DoD policy. Should the maximum site concentration for sampled media exceed the SLs established in the OSD memorandum, the AOI will proceed to the next phase under CERCLA. The SLs established in the OSD memorandum apply to the five compounds presented on **Table 6-1** below.

**Table 6-1: Screening Levels (Soil and Groundwater)**

| Analyte[b] | Residential (Soil) (µg/kg)[a] 0-2 feet bgs | Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a] 2-15 feet bgs | Tap Water (Groundwater) (ng/L)[a] |
|---|---|---|---|
| **PFOA** | 19 | 250 | 6 |
| **PFOS** | 13 | 160 | 4 |
| **PFBS** | 1,900 | 25,000 | 601 |
| **PFHxS** | 130 | 1,600 | 39 |
| **PFNA** | 19 | 250 | 6 |

**Notes:**
bgs = below ground surface; µg/kg = micrograms per kilogram; ng/L = nanograms per liter

a.) Assistant Secretary of Defense, 2022. Risk Based Screening Levels in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ) = 0.1. 6 July 2022.

b.) Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

The data in the subsequent sections are compared to the SLs presented in **Table 6-1**. The SLs for groundwater are based on direct ingestion. The SLs for soil are based on incidental ingestion and are applied to the depth intervals reasonably anticipated to be encountered by the receptors identified at the facility: the residential scenario is applied to surface soil results (0 to 2 feet bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil results (2 to 15 feet bgs). However, as discussed in **Section 5.2**, surface soil at AOI01-01 was collected from 2 to 3 feet bgs due to overlying concrete and fractured concrete and gravel fill. Consequently, the residential scenario was applied to this sample, providing a conservative assessment of the potential exposure route for site workers and construction workers.

## 6.2 Soil Physicochemical Analyses

To provide basic soil parameter information, soil samples were analyzed for TOC and pH, which are important for evaluating transport through the soil medium. **Appendix F** contains the results of the TOC and pH sampling.

The data collected in this investigation will be used in subsequent investigations, where appropriate, to assess fate and transport. According to the Interstate Technology Regulatory Council (ITRC), several important partitioning mechanisms include hydrophobic and lipophobic effects, electrostatic interactions, and interfacial behaviors. At relevant environmental pH values, certain PFAS are present as organic anions and are therefore relatively mobile in groundwater (Xiao et al., 2015), but tend to associate with the organic carbon fraction that may be present in soil or sediment (Higgins and Luthy, 2006; Guelfo and Higgins, 2013). When sufficient organic carbon is present, organic carbon normalized distribution coefficients ($K_{oc}$ values) can help in evaluating transport potential, though other geochemical factors (for example, pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC, 2018).

## 6.3 AOI 1

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1: Fire Extinguisher FTA and Ramp Area. The soil and groundwater results are summarized on **Table 6-2** and **Table 6-4**. Soil and groundwater results are presented on **Figure 6-1** through **Figure 6-7**.

### 6.3.1 AOI 1 Soil Analytical Results

**Figure 6-1** through **Figure 6-5** present the ranges of detections in soil. **Table 6-2** and **Table 6-3** summarize the soil results.

Surface soil was sampled between 0 to 2 feet bgs at borings AOI01-02 through AOI01-05 and from 2 to 3 feet bgs at AOI01-01. Soil was also sampled from the shallow subsurface soil interval (4 to 5 feet and 5 to 7 feet bgs) from boring AOI01-01. In surface soil, PFOA, PFOS, PFHxS, and PFNA were detected at concentrations below their SLs, whereas PFBS was not detected. The ranges of detections in surface soil are as follows:

- PFOA was detected at two of the five borings, with concentrations of 0.084 J micrograms per kilogram (µg/kg) and 0.105 J µg/kg.
- PFOS was detected at three locations, with concentrations ranging from 0.088 J µg/kg to 0.802 J µg/kg.
- PFHxS was detected at three locations, with concentrations ranging from 0.039 J µg/kg to 0.050 J µg/kg.
- PFNA was only detected at AOI01-04, with a concentration of 0.034 J µg/kg.

PFOA, PFOS, PFHxS, and PFNA were detected in shallow subsurface soil at concentrations below their SLs. PFOS and PFHxS were detected in both subsurface soil intervals, with maximum concentrations of 0.243 J µg/kg and 0.057 J µg/kg, respectively. PFOA and PFNA were detected only in the shallower interval (4 to 5 feet bgs), at concentrations of 0.398 µg/kg and 0.031 µg/kg, respectively. PFBS was not detected in shallow subsurface soil.

### 6.3.2 AOI 1 Groundwater Analytical Results

**Figure 6-6** and **Figure 6-7** present the ranges of detections in groundwater. **Table 6-4** summarizes the groundwater results.

Groundwater was sampled from temporary monitoring wells AOI01-01 through AOI01-05. The following exceedances of the SLs were measured.

- PFOA was detected above the SL of 6 nanograms per liter (ng/L) at temporary wells AOI01-01 and AOI01-02, with concentrations of 44.1 ng/L and 19.7 ng/L, respectively.
- PFOS was detected above the SL of 4 ng/L at all five temporary wells, with concentrations ranging from 5.61 ng/L to 46.9 ng/L. The maximum detection was observed at AOI01-02.
- PFNA was detected above the SL of 6 ng/L at temporary well AOI01-02 with a concentration of 12.3 ng/L.

PFHxS and PFBS were detected at concentrations below their SLs. PFHxS was detected at three of the five temporary wells, with concentrations ranging from of 1.35 J ng/L to 15.7 ng/L. PFBS was detected at four of five temporary well locations, with concentrations ranging from 1.80 J ng/L to 5.47 ng/L.

### 6.3.3 AOI 1 Conclusions

Based on the results of the SI, PFOA, PFOS, PFHxS, and PFNA were detected in soil below their SLs. PFOA, PFOS, and PFNA were detected in groundwater at concentrations above their SLs. Based on the exceedances of the SLs in groundwater, further evaluation at AOI 1 is warranted.

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**Table 6-2**
**PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil**
**Site Inspection Report, Former Chicago Midway AASF**

| Area of Interest | | AOI01 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | AOI01-01-SB-2-3 | | AOI01-02-SB-0-2 | | AOI01-03-SB-0-1 | | AOI01-04-SB-0-2 | | AOI01-05-SB-0-2 | |
| Sample Date | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | |
| Depth | | 2-3 ft | | 0-2 ft | | 0-1 ft | | 0-2 ft | | 0-2 ft | |
| Analyte | OSD Screening Level [a] | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| **Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)** | | | | | | | | | | | |
| PFBS | 1900 | ND | U | ND | U | ND | U | ND | U | ND | U |
| PFHxS | 130 | ND | U | 0.050 | J | ND | U | 0.041 | J | 0.039 | J |
| PFNA | 19 | ND | U | ND | U | ND | U | 0.034 | J | ND | U |
| PFOA | 19 | ND | U | ND | U | ND | U | 0.105 | J | 0.084 | J |
| PFOS | 13 | ND | U | 0.088 | J | ND | U | 0.802 | J | 0.102 | J |

Grey Fill — Detected concentration exceeded OSD Screening Levels

**Note:** The surface soil sample at boring AOI01-01 was collected at 2 to 3 feet bgs due to the top 2 feet consisting mostly of fractured concrete and gravel that was unable to be sampled.

References

a. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1, May 2022. Soil screening levels based on residential scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

U = The analyte was not detected at a level greater than or equal to the adjusted DL

Chemical Abbreviations

| | |
|---|---|
| PFBS | perfluorobutanesulfonic acid |
| PFHxS | perfluorohexanesulfonic acid |
| PFNA | perfluorononanoic acid |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctanesulfonic acid |

Acronyms and Abbreviations

| | |
|---|---|
| AASF | Army Aviation Support Facility |
| AOI | Area of Interest |
| D | duplicate |
| DL | detection limit |
| ft | feet |
| HQ | hazard quotient |
| ID | identification |
| LCMSMS | liquid chromatography with tandem mass spectrometry |
| LOD | limit of detection |
| ND | analyte not detected above the LOD |
| OSD | Office of the Secretary of Defense |
| QSM | Quality Systems Manual |
| Qual | interpreted qualifier |
| SB | soil boring |
| USEPA | United States Environmental Protection Agency |
| µg/kg | micrograms per kilogram |

**Table 6-3**
**PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil**
**Site Inspection Report, Former Chicago Midway AASF**

| | Area of Interest | AOI01 | | | | | |
|---|---|---|---|---|---|---|---|
| | Sample ID | AOI01-01-SB-4-5 | | AOI01-01-SB-5-7 | | AOI01-01-SB-5-7-D | |
| | Sample Date | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | |
| | Depth | 4-5 ft | | 5-7 ft | | 5-7 ft | |
| Analyte | OSD Screening Level [a] | Result | Qual | Result | Qual | Result | Qual |
| **Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)** | | | | | | | |
| PFBS | 25000 | ND | U | ND | U | ND | U |
| PFHxS | 1600 | 0.057 | J | 0.046 | J | 0.054 | J |
| PFNA | 250 | 0.031 | J | ND | U | ND | U |
| PFOA | 250 | 0.398 | J | ND | U | ND | U |
| PFOS | 160 | 0.168 | J | 0.243 | J | ND | UJ |

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1, May 2022. Soil screening levels based on industrial/commercial composite worker scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

U = The analyte was not detected at a level greater than or equal to the adjusted DL

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Chemical Abbreviations

| | |
|---|---|
| PFBS | perfluorobutanesulfonic acid |
| PFHxS | perfluorohexanesulfonic acid |
| PFNA | perfluorononanoic acid |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctanesulfonic acid |

Acronyms and Abbreviations

| | |
|---|---|
| AASF | Army Aviation Support Facility |
| AOI | Area of Interest |
| D | duplicate |
| DL | detection limit |
| ft | feet |
| HQ | hazard quotient |
| ID | identification |
| LCMSMS | liquid chromatography with tandem mass spectrometry |
| LOD | limit of detection |
| ND | analyte not detected above the LOD |
| OSD | Office of the Secretary of Defense |
| QSM | Quality Systems Manual |
| Qual | interpreted qualifier |
| SB | soil boring |
| USEPA | United States Environmental Protection Agency |
| µg/kg | micrograms per kilogram |

**Table 6-4**
**PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater**
**Site Inspection Report, Former Chicago Midway AASF**

| Area of Interest | | AOI01 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | AOI01-01-GW | | AOI01-02-GW | | AOI01-03-GW | | AOI01-04-GW | | AOI01-05-GW | | AOI01-05-GW-D | |
| Sample Date | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | | 03/24/2022 | |
| Analyte | OSD Screening Level [a] | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual | Result | Qual |
| **Water, LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)** | | | | | | | | | | | | | |
| PFBS | 601 | 5.47 | | 2.59 | J | 1.80 | J | 1.91 | J | ND | U | ND | U |
| PFHxS | 39 | 6.29 | | 15.7 | | ND | U | ND | U | 1.35 | J | 1.48 | J |
| PFNA | 6 | 3.83 | J | 12.3 | | 2.44 | J | 2.75 | J | 1.30 | J | 1.29 | J |
| PFOA | 6 | 44.1 | | 19.7 | | 4.07 | | 4.47 | | 2.34 | J | 2.32 | J |
| PFOS | 4 | 5.61 | | 46.9 | | 9.70 | | 9.88 | | 5.78 | | 5.65 | |

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1, May 2022 Groundwater screening levels based on residential scenario for direct ingestion of groundwater.

Interpreted Qualifiers

J = Estimated concentration

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

U = The analyte was not detected at a level greater than or equal to the adjusted DL

Chemical Abbreviations

| | |
|---|---|
| PFBS | perfluorobutanesulfonic acid |
| PFHxS | perfluorohexanesulfonic acid |
| PFNA | perfluorononanoic acid |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctanesulfonic acid |

Acronyms and Abbreviations

| | |
|---|---|
| AASF | Army Aviation Support Facility |
| AOI | Area of Interest |
| D | duplicate |
| DL | detection limit |
| GW | groundwater |
| HQ | hazard quotient |
| ID | identification |
| LCMSMS | liquid chromatography with tandem mass spectrometry |
| LOD | limit of detection |
| ND | analyte not detected above the LOD |
| OSD | Office of the Secretary of Defense |
| QSM | Quality Systems Manual |
| Qual | interpreted qualifier |
| USEPA | United States Environmental Protection Agency |
| ng/l | nanogram per liter |

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Facility Boundary

**PFOA Results (µg/Kg)**

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

N

0 50 100 200 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

## PFOA Detections in Soil

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/30/2022 | GIS BY | MS | 8/30/2022 |
| SCALE | 1:1,200 | CHK BY | SS | 8/30/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/30/2022 |

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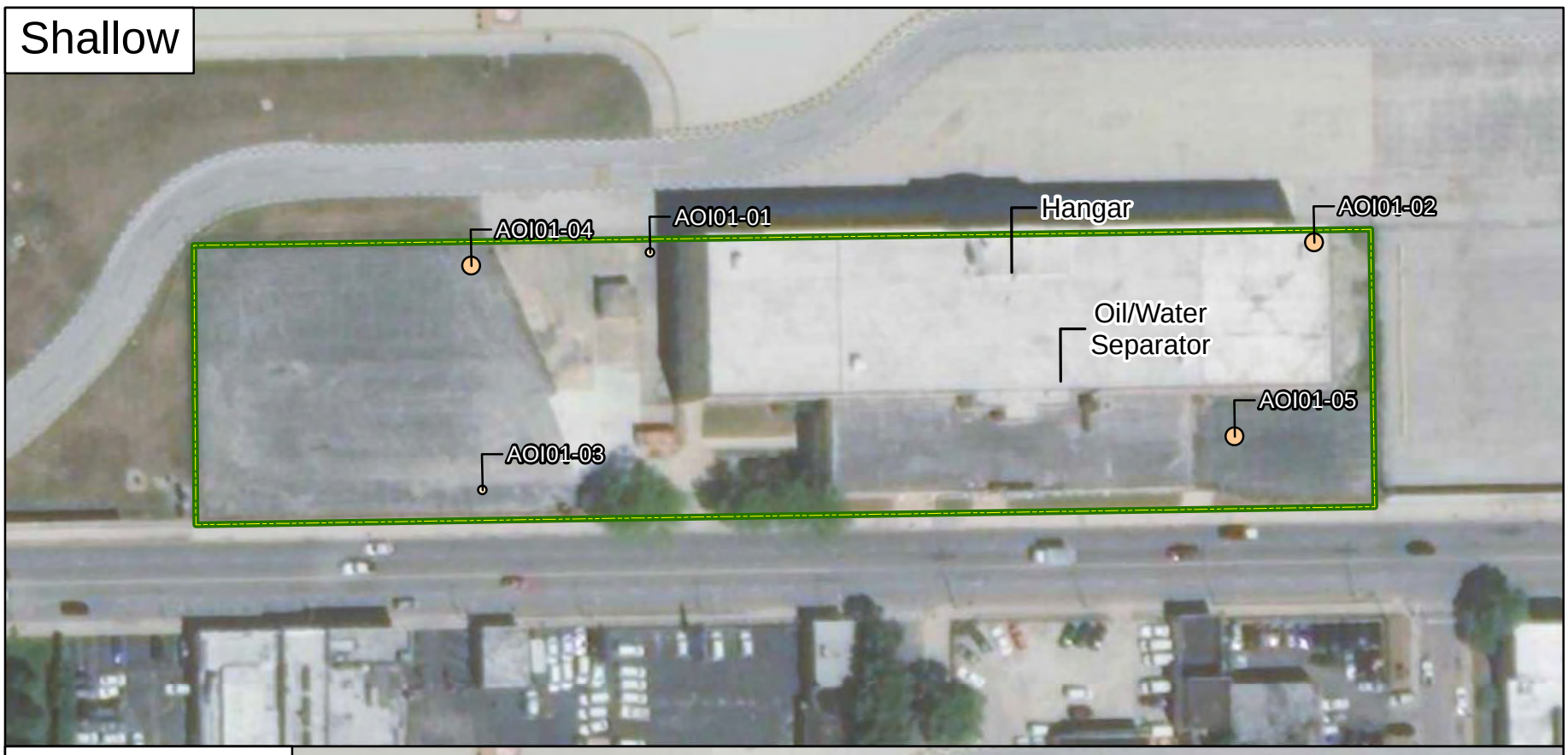
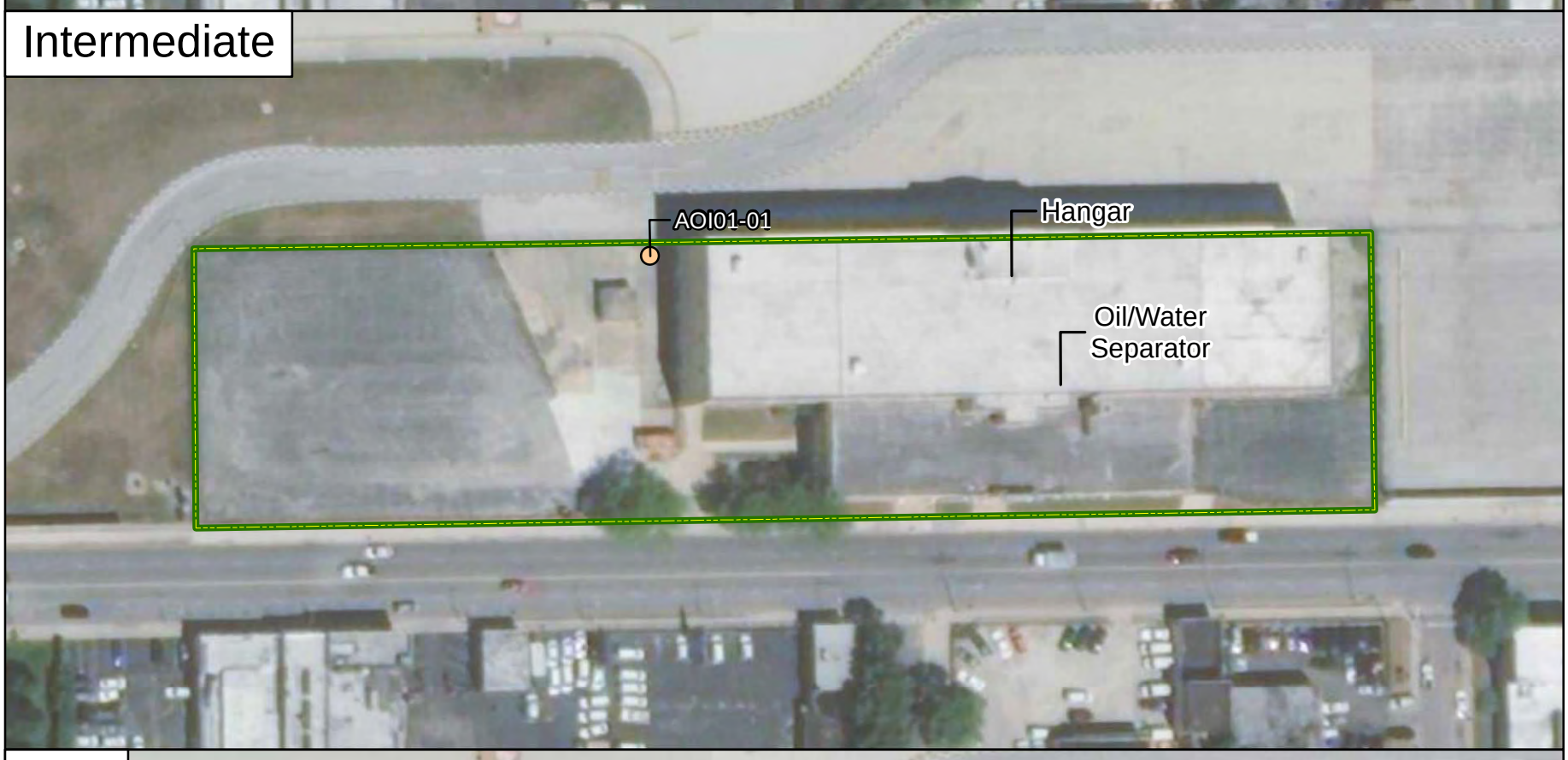
**Figure 6-1**

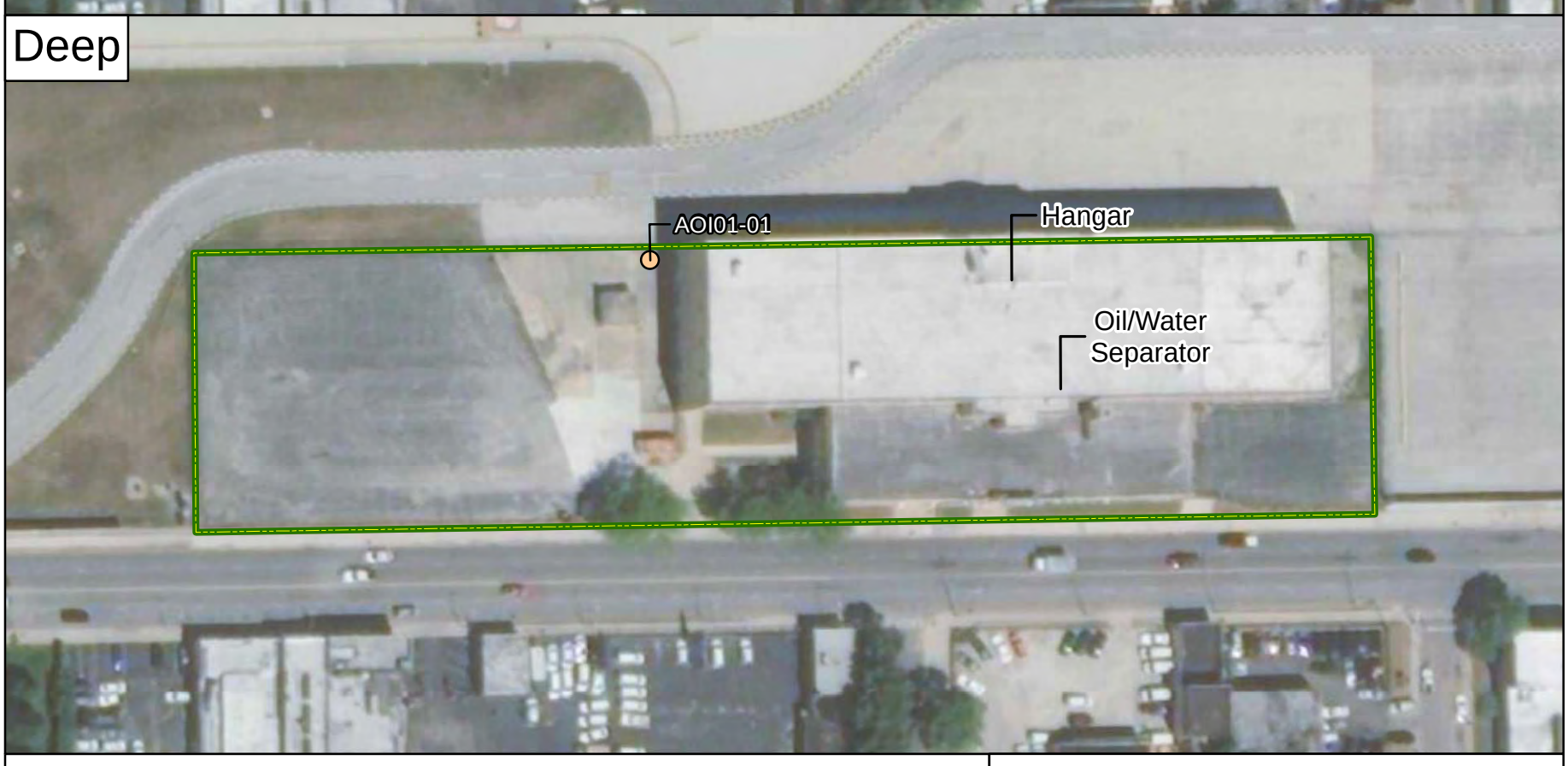
Shallow




Intermediate




Deep




Facility Boundary

**PFOS Results (µg/Kg)**

- ND
- >ND - 13
- >13 - 160
- >160 - 1,600
- >1,600

N

0 50 100 200 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

## PFOS Detections in Soil

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/30/2022 | GIS BY | MS | 8/30/2022 |
| SCALE | 1:1,200 | CHK BY | SS | 8/30/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/30/2022 |

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**Figure 6-2**


Facility Boundary

**PFBS Results (µg/Kg)**

- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

N

0 50 100 200 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

## PFBS Detections in Soil

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/30/2022 | GIS BY | MS | 8/30/2022 |
| SCALE | 1:1,200 | CHK BY | SS | 8/30/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/30/2022 |

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**Figure 6-3**


Facility Boundary

**PFHxS Results (µg/Kg)**

- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

N

0 50 100 200 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

## PFHxS Detections in Soil

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/30/2022 | GIS BY | MS | 8/30/2022 |
| SCALE | 1:1,200 | CHK BY | SS | 8/30/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/30/2022 |

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**Figure 6-4**


Facility Boundary

**PFNA Results (µg/Kg)**

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

N

0 50 100 200 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

## PFNA Detections in Soil

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/30/2022 | GIS BY | MS | 8/30/2022 |
| SCALE | 1:1,200 | CHK BY | SS | 8/30/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/30/2022 |

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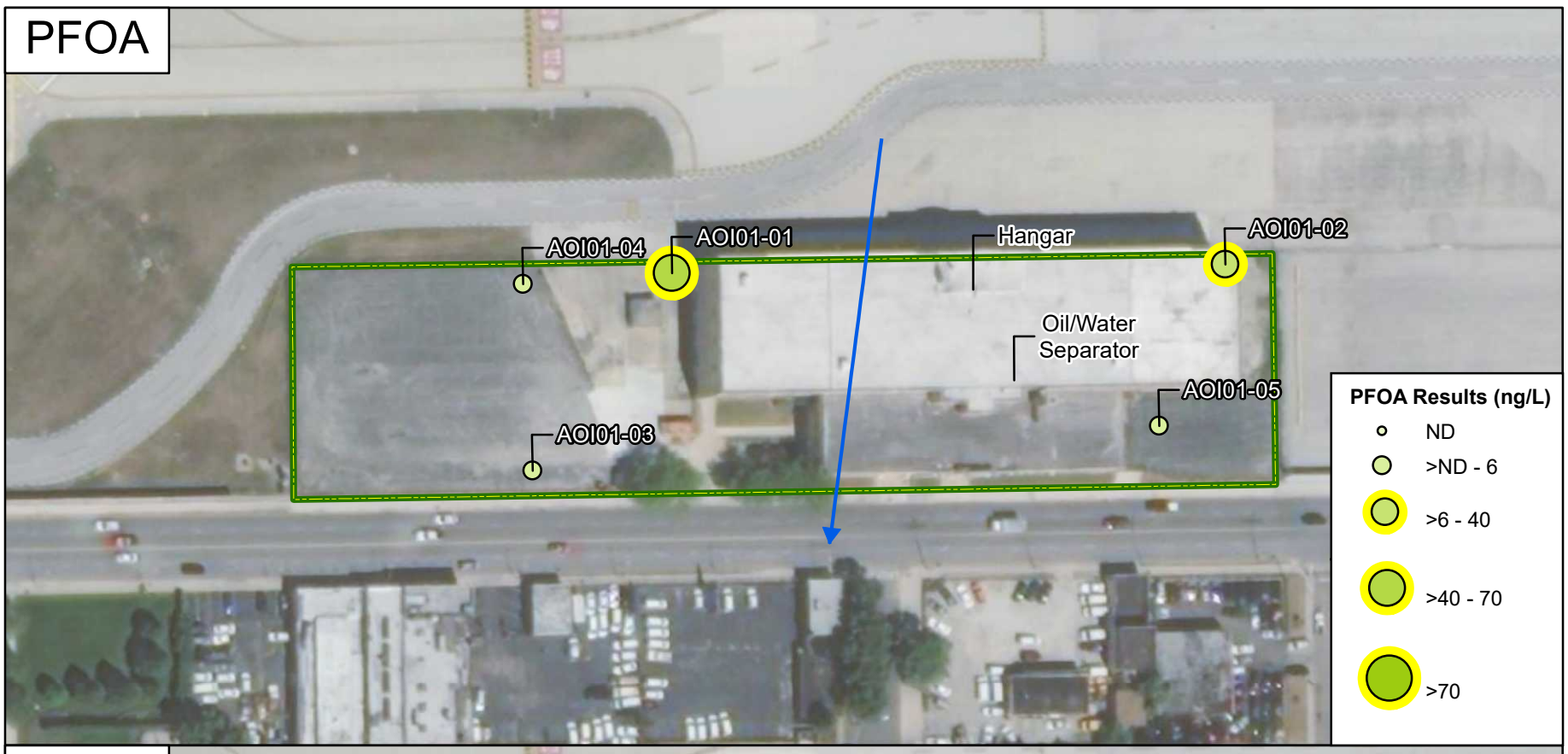
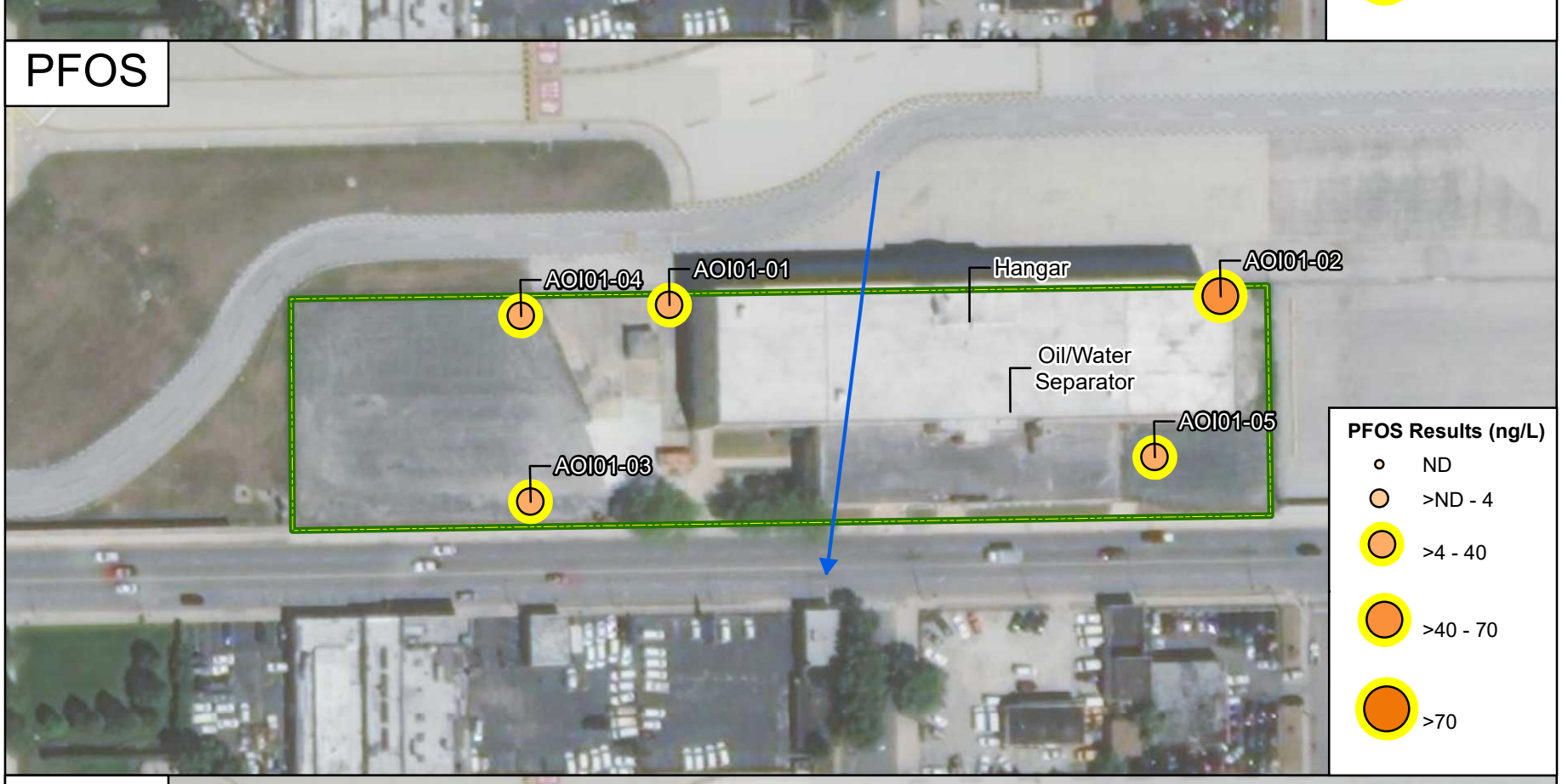
**Figure 6-5**

PFOA




PFOS




PFBS


Facility Boundary

Groundwater Flow Direction

N

0 60 120 240 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

# PFOA, PFOS, and PFBS Detections in Groundwater

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 10/5/2022 | GIS BY | MS | 10/5/2022 |
| SCALE | 1:1,440 | CHK BY | SS | 10/5/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 10/5/2022 |

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**Figure 6-6**

PFHxS


PFNA


Facility Boundary

Groundwater Flow Direction

N

0 50 100 200 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

## PFHxS and PFNA Detections in Groundwater

| | | | | |
|---|---|---|---|---|
| CLIENT | ARNG | | | |
| PROJECT | Site Inspection at Chicago Midway AASF, IL | | | |
| REVISED | 8/31/2022 | GIS BY | MS | 8/31/2022 |
| SCALE | 1:1,200 | CHK BY | SS | 8/31/2022 |
| Base Map: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | | PM | CM | 8/31/2022 |

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**Figure 6-7**

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# 7. Exposure Pathways

The CSM for the AOI, revised based on the SI findings, is presented on **Figure 7-1**. Please note that while the CSM discussion assists in determining if a receptor may be impacted, the decision to move from SI to Remedial Investigation (RI) or interim action is determined based upon exceedances of the SLs for the relevant compounds and whether the release is more than likely attributable to the DoD. A CSM presents the current understanding of the site conditions with respect to known and suspected sources, potential transport mechanisms and migration pathways, and potentially exposed human receptors. A human exposure pathway is considered potentially complete when the following conditions are present:

1. Contaminant source;
2. Environmental fate and transport;
3. Exposure point;
4. Exposure route; and
5. Potentially exposed populations.

If any of these elements are missing, the pathway is incomplete. The CSM figures use an empty circle symbol to represent an incomplete exposure pathway. Areas with an incomplete pathway generally warrant no further action. However, the pathway is considered potentially complete if the relevant compounds are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of relevant compounds above the SLs. Areas with an identified potentially complete pathway that have detections of the relevant compounds above the SLs may warrant further investigation. Although the CSMs indicate whether potentially complete exposure pathways may exist, the recommendation for future study in an RI or no action at this time is based on the comparison of the SI analytical results for the relevant compounds to the SLs.

In general, the potential routes of exposure to the relevant compounds are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of toxicological study. The receptors evaluated are consistent with those listed in USEPA guidance for risk screening (USEPA, 2001). Receptors at the facility include site workers (e.g., facility staff and visiting soldiers), construction workers, trespassers (although unlikely due to restricted access), residents outside the facility boundary, and recreational users outside of the facility boundary. However, because ILARNG does not currently use the facility, current site worker and construction worker pathways for all media are considered incomplete.

## 7.1 Soil Exposure Pathway

The SI results in soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at AOI 1 based on the aforementioned criteria.

### 7.1.1 AOI 1

AOI 1 is the Fire Extinguisher FTA and Ramp Area, where Tri-Max 30 fire extinguishers were released and stored between 2000 and 2005.

PFOA, PFOS, PFHxS, and PFNA were detected in surface soil at AOI 1 at concentrations below their SLs. Site workers and construction workers could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathways for future site workers and future construction workers are potentially complete. Off-facility residents are located as close as 200 feet from the south of the facility property and could contact constituents in surface soil via inhalation of dust. Consequently, the inhalation of dust exposure pathway is potentially complete for off-facility residents. PFOA, PFOS, PFHxS, and PFNA were detected in subsurface soil at AOI 1 below their SLs. Construction workers could contact constituents in subsurface soil via incidental ingestion, and therefore, the subsurface soil exposure pathway for future construction workers is potentially complete. The facility is secured and access is restricted, and therefore trespassers are unlikely. Therefore, the soil exposure pathways to trespassers are incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.

## 7.2 Groundwater Exposure Pathway

The SI results in groundwater were used to determine whether a potentially complete pathway exists between the source and potential receptors based on the aforementioned criteria.

### 7.2.1 AOI 1

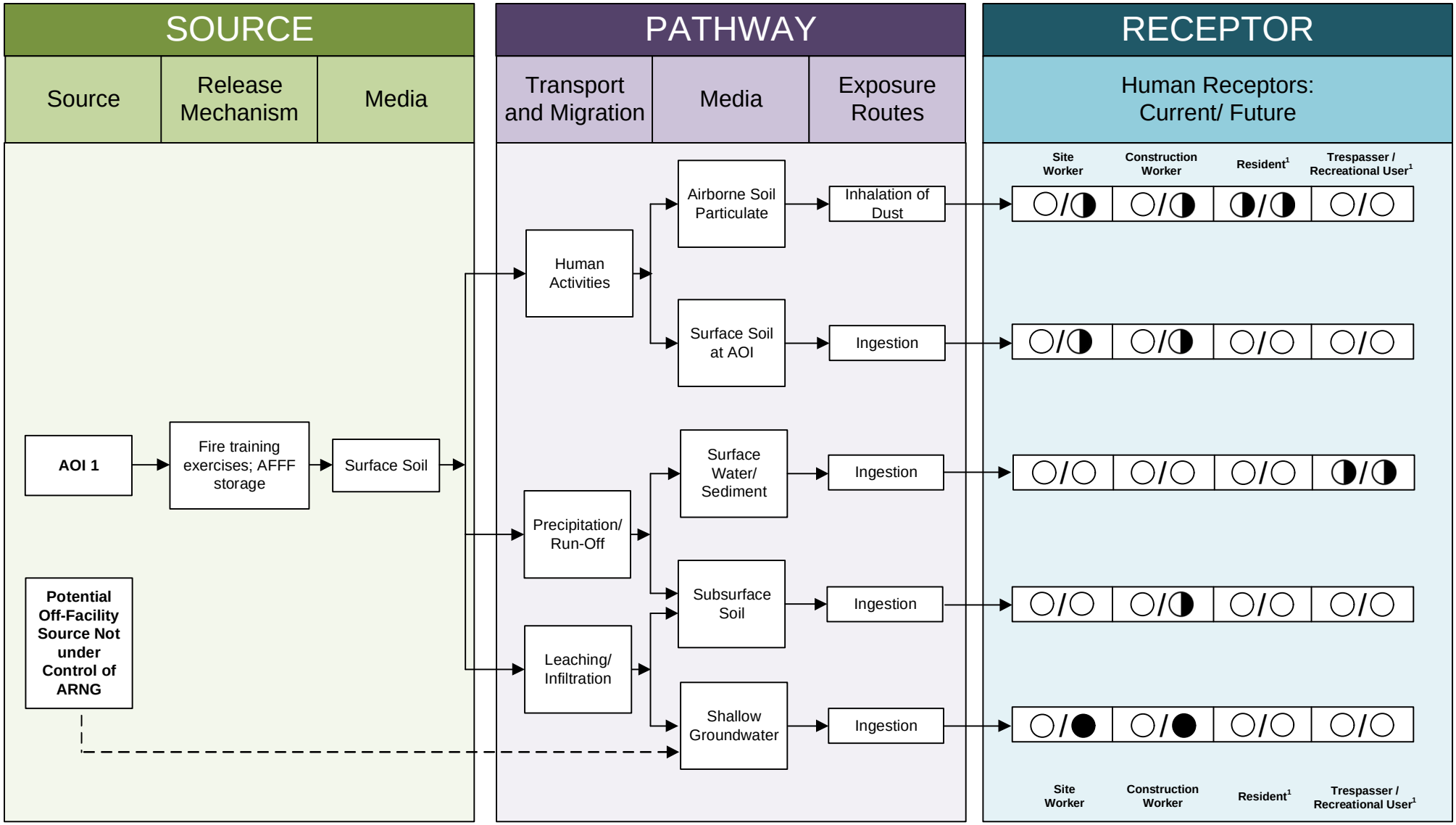
PFOA, PFOS, and PFNA were detected above their respective SLs in groundwater samples collected at AOI 1. Drinking water for the Former AASF is supplied by the City of Chicago and sourced from Lake Michigan. Consequently, the ingestion exposure pathway for site workers and offsite residents is incomplete. Shallow groundwater was encountered between 0.64 and 7.57 feet bgs and is therefore shallow enough to be encountered during construction activities; consequently, the ingestion exposure pathway for future construction workers is potentially complete. Where groundwater is within 2 feet of the surface, the pathway for the site worker is also potentially complete. The CSM for AOI 1 is presented on **Figure 7-1**.

## 7.3 Surface Water and Sediment Exposure Pathway

The SI results in soil and groundwater, in combination with knowledge of the fate and transport properties of PFAS, were used to determine whether a potentially complete pathway exists between the source and potential receptors.

### 7.3.1 AOI 1

PFAS are water soluble and can migrate readily from soil to surface water via leaching and run-off. Because PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in soil and groundwater at AOI 1, it is possible that those compounds may have migrated from soil and groundwater to downgradient surface water bodies. Off-facility recreational users using these downgradient surface water bodies could contact constituents in surface water and sediment. Consequently, the exposure pathway to off-facility recreational users is considered potentially complete. There are no surface water bodies at the facility and, therefore, the exposure pathways for site workers and construction workers are considered incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.




**LEGEND**

- Flow-Chart Stops
- Flow-Chart Continues
- Partial/ Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

**Notes:**

1. The resident and recreational users refer to off-facility receptors.

Figure 7-1
Conceptual Site Model, AOI 1
Former Chicago Midway AASF, Illinois

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# 8. Summary and Outcome

This section summarizes SI activities and findings. The most significant findings are summarized in this section and are reproduced directly or abstracted from information contained in this report. The outcome provides general and comparative interpretations of the findings relative to the SLs.

## 8.1 SI Activities

The SI field activities consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land surveying. Two rounds of utility clearance occurred on 21 October 2021 and on 21 March 2022. The remaining field activities were conducted from 24 to 25 March 2022 in accordance with the SI QAPP Addendum (AECOM, 2021a), except as noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI QAPP Addendum (AECOM, 2021a), samples were collected and analyzed for a subset of 18 compounds by LC/MS/MS compliant with QSM 5.3 Table B-15 as follows.

- Seven soil samples from five boring locations;
- Five grab groundwater samples from five temporary wells;
- Eleven (11) QA/QC samples.

An SI is conducted when the PA determines an AOI exists based on probable use, storage, and/or disposal of PFAS-containing materials. The SI includes multi-media sampling at AOI to determine whether or not a release has occurred. The SI may conclude further investigation is warranted, a removal action is required to address immediate threats, or no further action is required. Additionally, the CSM was refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOI, which are described in **Section 7**.

## 8.2 Outcome

Based on the results of this SI, further evaluation under CERCLA is warranted in an RI for AOI 1. Based on the CSM developed and revised in light of the SI findings, there is potential for exposure to drinking water receptors from AOI 1 from sources on the facility resulting from historical AASF activities. Sample analytical concentrations collected during the SI were compared to the project SLs in soil and groundwater, as described in **Table 6-1**. A summary of the results of the SI data relative to the SLs is as follows:

- At AOI 1:
    - The detected concentrations of PFOA, PFOS, PFHxS, and PFNA, in soil at AOI 1 were below their SLs.
    - PFOA, PFOS, and PFNA in groundwater exceeded their respective SLs. PFOA exceeded the SL of 6 ng/L, with a maximum concentration of 44.1 ng/L at location AOI01-01. PFOS exceeded the SL of 4 ng/L, with a maximum concentration of 46.9 ng/L at location AOI01-02. PFNA exceed the SL of 6 ng/L, with a maximum concentration of 12.3 ng/L at location AOI01-02. Based on the results of the SI, further evaluation of AOI 1 is warranted in an RI.

Samples collected at locations AOI01-01 and AOI01-02 are located on the upgradient facility boundary and adjacent to the release areas that comprise AOI 1. Therefore, it is unclear if impacts to groundwater are migrating from potential adjacent locations or AOI 1.

Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

**Table 8-1** summarizes the SI results for soil and groundwater used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI.

**Table 8-1: Summary of Site Inspection Findings and Recommendations**

| AOI | Potential Release Area | Soil – Source Area | Groundwater – Source Area | Groundwater – Facility Boundary | Future Action |
|---|---|---|---|---|---|
| 1 | Fire Extinguisher FTA & Ramp Area | ◐ | ● | ● | Proceed to RI |

**Legend:**

● = detected; exceedance of the screening levels

◐ = detected; no exceedance of the screening levels

○ = not detected

# 9. References

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