FINAL
Preliminary Assessment Report Fort Custer Training Center, Augusta, Michigan

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

February 2020

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Acronyms and Abbreviations

°F	degrees Fahrenheit
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	Area of Interest
ANG	Air National Guard
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSM	conceptual site model
DoD	Department of Defense
FCRA	Fort Custer Recreational Area
FCTC	Fort Custer Training Center
FTA	fire training area
IED	Installations & Environment Division
MDEQ	Michigan Department of Environmental Quality
MDMVA	Michigan Department of Military and Veterans Affairs
MI	Michigan
MIARNG	Michigan Army National Guard
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ROTC	Reserved Officer Training Corps
SI	Site Inspection
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VA	Veterans Affairs
VSI	visual site inspection

Executive Summary

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division (IED), Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. The ARNG is assessing potential effects on human health related to processes at facilities that used per- and 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 Fort Custer Training Center (FCTC) in Augusta, Michigan (MI), to assess potential PFAS release areas and exposure pathways to receptors. FCTC is constructed on a parcel of land owned by the United States Army Corps of Engineers and leased to FCTC. According to the lease document, the lease to FCTC began in 1989 and will be in affect indefinitely.

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 13 December 2018
- Interviewed current and former FCTC personnel including environmental managers and operations staff during the site visit
- Completed visual site inspections (VSIs) at known or suspected PFAS release locations and documented with photographs
- Identified areas of interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential PFAS source-pathway-receptor linkages for each AOI

Two AOIs related to potential PFAS releases were identified at FCTC during the PA. AFFF may have been used to extinguish fires at two separate emergency response locations. AOI 1 comprises the location at FCTC where a semi-truck that potentially had residual AFFF on it was pulled onto the facility following a fire response from an adjacent location along I-94 where it had caught fire, and a wetland connected to a culvert that drains the median on I-94 near where the fire response occurred. AOI 2 is the location at FCTC where geo-grid, a plastic material used for soil stabilization, caught on fire as a result of a prescribed burn. The Battle Creek fire department responded to the scene and reportedly extinguished the fire with fire fighting foam; it is unknown if the foam used was AFFF. The AOIs are shown on **Figures ES-1A** and **ES-1B** and described in the **Table ES-1** below. The CSM for the entirety of FCTC is presented in **Figure ES-2**.

Table ES-1: AOIs at FCTC

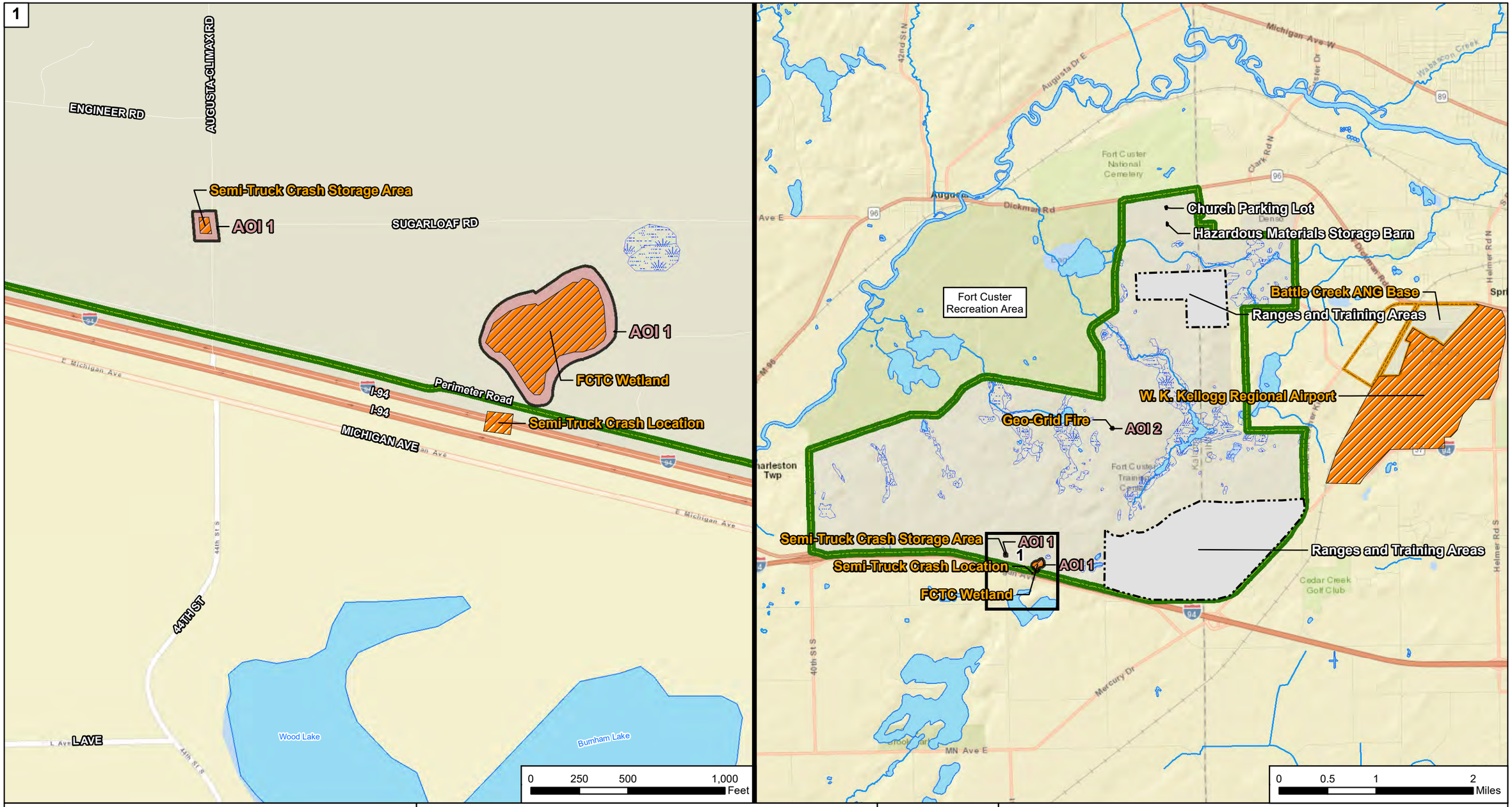
Area of Interest	Name	Used by	Potential Release Date
AOI 1	Semi-Truck Crash Storage Area and FCTC Wetland	Multiple municipal fire departments and FCTC	2015
AOI 2	Geo-Grid Fire	Battle Creek fire department and FCTC	2005

The location where the semi-truck initially crashed and caught fire is located on I-94, outside the southern border of FCTC. Fire response from multiple cities reportedly used firefighting foam to control and extinguish the fire at that location on I-94. Given response from multiple municipalities, it is unknown what types of foam were used or by whom. After the fire was extinguished, the semi-truck was pulled onto FCTC property (AOI 1). Potential PFAS

contamination that may have resulted from fire response at the initial accident location may have traveled towards FCTC via a culvert that drains I-94 to a wetland located on FCTC (AOI 2).

W.K. Kellogg Regional Airport is located upgradient of FCTC, along the eastern boundary, and is a potential off-facility source of PFAS. Additionally, an active PFAS investigation is ongoing by the Air National Guard (ANG) at the adjacent Battle Creek ANG Base, located approximately 1.5-miles east of the eastern boundary of FCTC. 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 USEPA Health Advisory level within 20 miles of the facility.

Based on possible PFAS releases at the AOIs, there is potential for exposure to PFAS contamination in surface soil, surface water, sediments to site workers, construction workers, and trespassers via ingestion and inhalation; subsurface soil to construction workers via ingestion; and groundwater to construction workers and off-facility residents and recreators. Potential off-facility PFAS release areas exist adjacent to FCTC. The CSM for FCTC is shown on **Figure ES-2**.



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SCALE	1:6,000	CHK BY	CP	9/30/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/30/2019

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

N

Summary of Findings AOI 1

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure ES-1A

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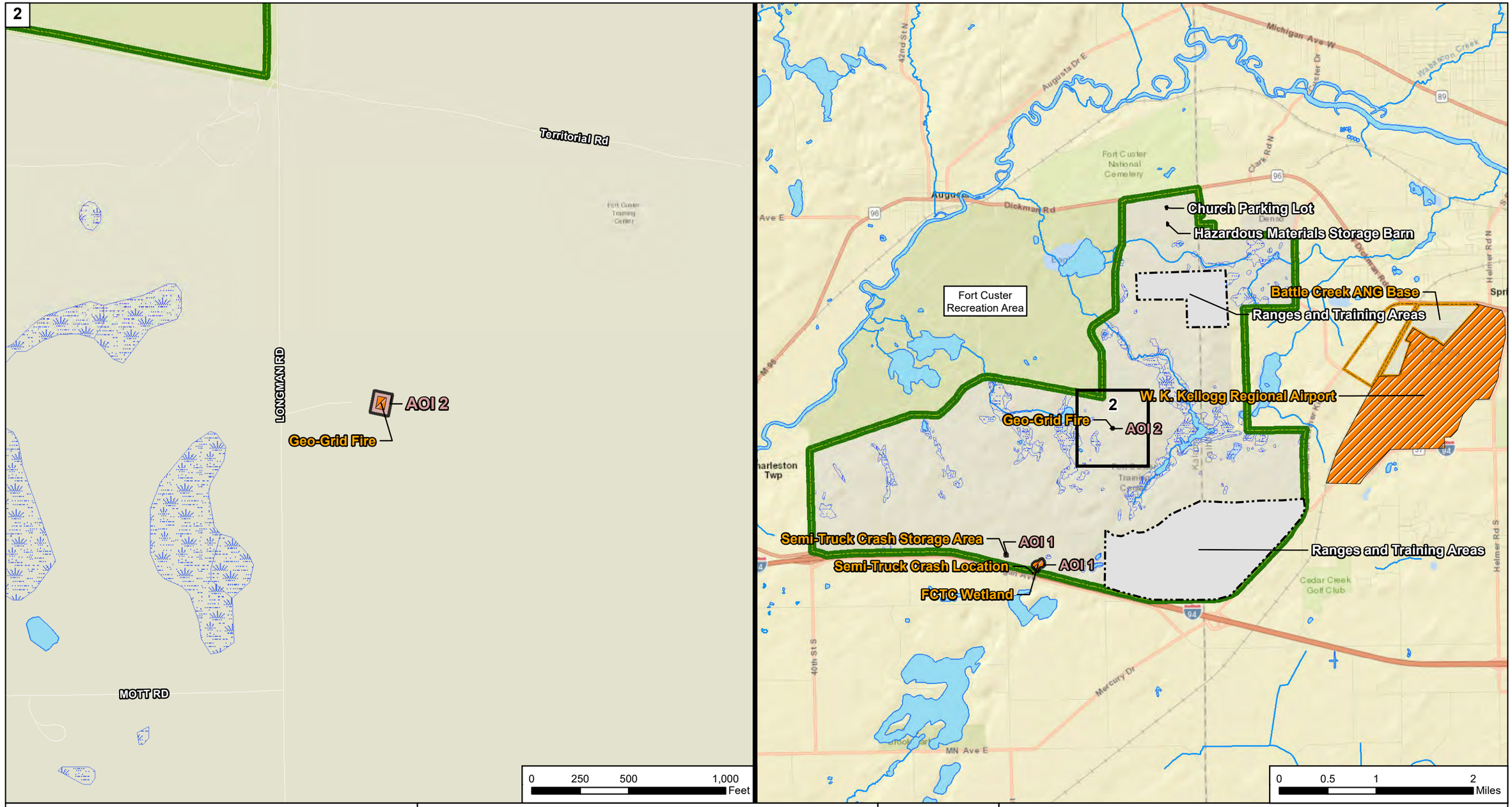

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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/30/2019

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

N

Summary of Findings AOI 2

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Figure ES-1B

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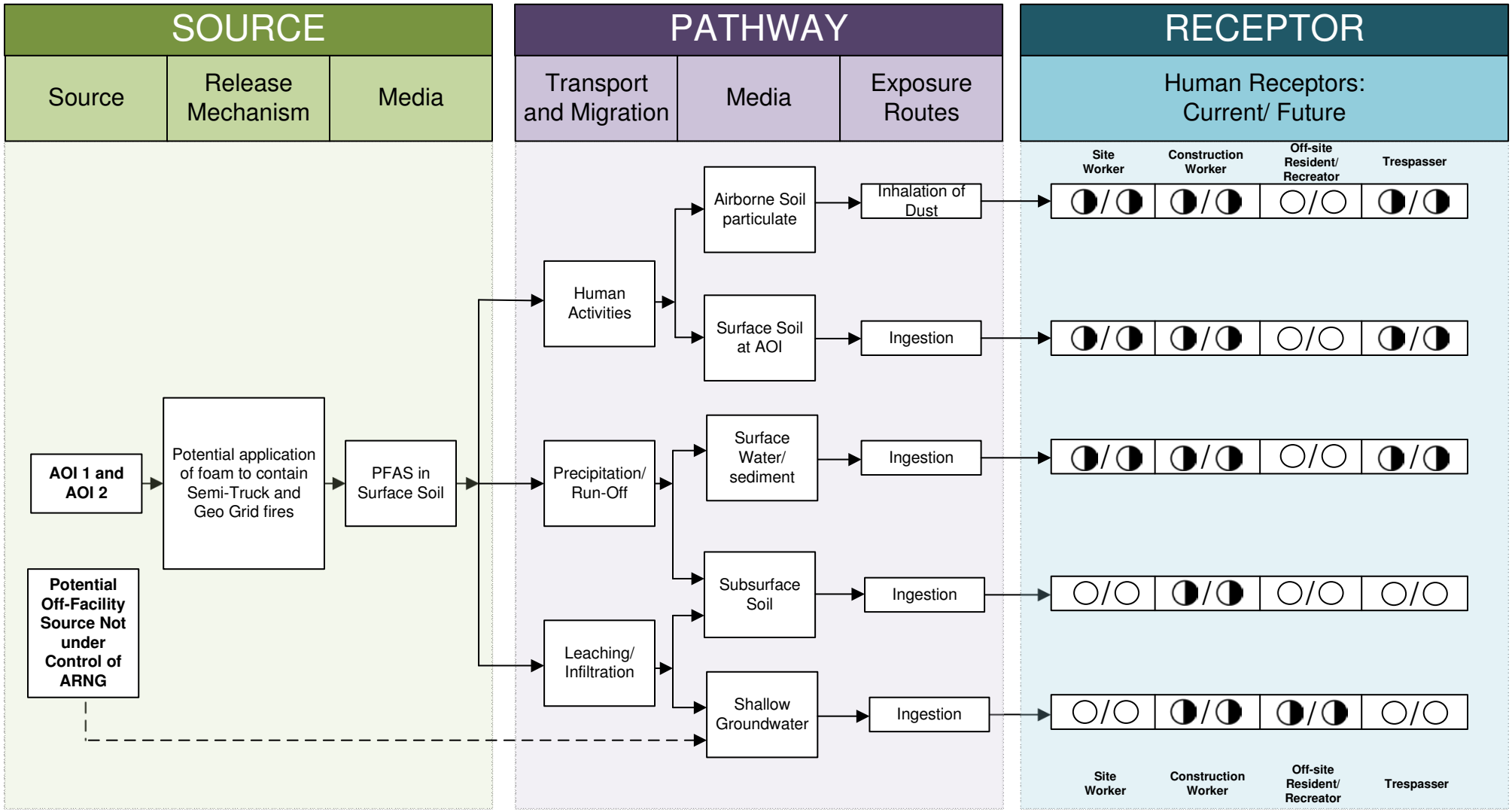


LEGEND

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

Notes:
1. The resident and recreator receptor refers to an off-site resident.
2. Dermal contact exposure pathway is incomplete for PFAS

Figure ES-2
Preliminary Conceptual Site Model
Fort Custer Training Center, MI

1. Introduction

1.1 Authority and Purpose

The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division (IED), Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide* under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017. The ARNG is assessing potential effects on human health related to processes at 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, such as Michigan (MI), have adopted their own drinking water standards for PFAS.

This report presents the findings of a PA for PFAS at Fort Custer Training Center (FCTC) in Augusta, MI, 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 potential locations where PFAS may have been released into the environment at FCTC. 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 13 December 2018.
- Interviewed current and former FCTC personnel including environmental managers and operations staff during the site visit.
- Completed visual site inspections (VSIs) at known or suspected PFAS release locations and documented with photographs.
- Identified areas of interest (AOIs) and developed a preliminary conceptual site model (CSM) to summarize potential PFAS source-pathway-receptor linkages for each AOI.

1.3 Report Organization

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

- **Section 1** – **Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA
- **Section 2** – **Fire Training Areas:** describes the fire training areas (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** – **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 and uncertainties of the PA
- **Section 8** – **References:** provides the references used to develop this document
- **Appendix A** – Data Resources
- **Appendix B** – Preliminary Assessment Documentation
- **Appendix C** – Photographic Log

1.4 Facility Location and Description

FCTC (which will also be referred to as "the Installation") occupies approximately 7,570 acres and is located in Augusta, MI, covering portions of Calhoun and Kalamazoo counties (**Figure 1-1**). Interstate 94 borders the Installation to the south, and the Fort Custer Recreational Area (FCRA) and the Kalamazoo River are located to the northwest. The nearest metropolitan area is Battle Creek, which is less than 2 miles east of FCTC. The Installation is 100 miles west of Detroit and 150 miles northeast of Chicago, Illinois.

FCTC occupies a portion of the land that was formerly part of Camp Custer, which was established in 1917 as a training and staging facility for World War I troops. In 1940, the post became a permanent military installation and was renamed Fort Custer. The Army then acquired an additional 6,100 acres of land, bringing total acreage to approximately 14,400. The Installation was used for the training and organization of the 5th Infantry Division for World War II and the equipping of the 94th Infantry Division. Fort Custer was also used as a processing center for prisoners of war. In 1947, 625 acres were transferred to the US Department of Veterans Affairs (VA) to develop the VA National Cemetery and the VA Medical Center. By 1953, the Installation was no longer used for active Army training; however, US Army Reserve forces and area college US Army Reserve Officer Training Corps (ROTC) units continued to use the Installation. In 1985, Fort Custer was officially renamed Fort Custer Training Center and used for training units from the Michigan ARNG (MIARNG) and other US Army Reserve forces in southern Michigan, northern Ohio, Indiana, and Illinois (Michigan Department of Military and Veterans Affairs [MDMVA], 2012; Argonne National Laboratory, 1993). From 1971 to 1973, 3,033 acres were transferred to the state of Michigan to develop the FCRA. In the early 1970s,

nearly 2,600 acres located to the northeast of the Installation were acquired by the City of Battle Creek to develop an industrial park. In addition, approximately 112 acres were relinquished to various municipalities and private interests between 1960 and 1985. Currently, the Installation occupies 7,570 acres, with approximately 7,396 acres designated as operational range. Land formerly within the borders of FCTC to the north, east, and west of the Installation's current borders has been designated as a Formerly Used Defense Site (URS, Group Inc., 2013). The US Army Corps of Engineers, Louisville District has formally leased the property for use as FCTC since 1989; the lease states that FCTC may use the land indefinitely (**Appendix A**).

1.5 Facility Environmental Setting

According to the 2012 Integrated Natural Resources Management Plan for FCTC, the Installation is located within the Humid Temperate Domain, Hot Continental Division, Eastern Broadleaf Forest, Great Lakes moderated climate, within the Southern Lower Michigan ecological section, and the Kalamazoo Interlobate subsection (MDMVA, 2012). The entirety of FCTC lies within the ecological unit known as the Battle Creek Outwash Plain, which is characterized by outwash deposits, coarse-textured moraines, and ice contact topography. The elevation of the facility is approximately 900 feet above mean sea level. The moraines are low ridges, with the areas between made up of flatter outwash plain sediments. The southern portion of the facility is hilly while the northern portion of the facility is relatively flat (URS Group, Inc., 2013).

1.5.1 Geology

FCTC lies within the Central Lowlands province, along the southwestern portion of the Michigan Basin. The Central Lowlands province is composed of an unconsolidated Pleistocene glacial veneer (i.e. glacial drift) that is underlain by a greater than 12,000-foot sequence of Paleozoic sedimentary rocks. Ultimately, this sedimentary sequence is underlain by a floor of ancient Precambrian rock. The sedimentary rocks were formed by the deposition of marine sediments from overlying seas and by sediments eroding from surrounding highlands. The depositional regime was interspersed with periods of volcanic and intrusive activity. During the accumulation of sedimentary layers, the underlying rocks subsided, forming a bowl-shaped basin with each successive layer out from the center increasing in age (URS Group, Inc., 2013).

The regional bedrock overlying the Precambrian bedrock is composed of Paleozoic sedimentary rocks consisting of the Mississippian aged Coldwater Shale and Marshall Sandstone formations (**Figure 1-2**). The Marshall Sandstone, which comprises primarily sandstone and forms an important aquifer in the Michigan Basin (URS Group, Inc., 2013), underlies only two townships in the northeastern part of Kalamazoo County, below the glacial sediments. The Marshall Sandstone has been eroded away in the remainder of the county, allowing the Coldwater Shale Formation to subcrop below the glacial sediments instead. The Coldwater Shale formation consists primarily of shale, and because of its thickness and areal extent, it effectively forms an impermeable barrier between overlying glacial deposits and underlying coarser-grained bedrock units, limiting available freshwater to glacial deposits in the county.

1.5.2 Hydrogeology

The glacial and surficial geologic features of FCTC area consist primarily of glacial outwash sand and gravel and post glacial alluvium and end moraines of coarse textured glacial till (DLZ, 2018). The thickness of the glacial drift is estimated as ranging from 100 to 200 feet, and the uppermost bedrock formations are the Coldwater Shale and the Marshall Sandstone of Mississippian age (Western Michigan University, 1981, Malcolm Pirnie, 2008).

The surface and subsurface hydrology are interconnected, and the groundwater flow conforms roughly to surface water flow patterns; therefore, regional groundwater flow as shown on **Figure**

1-2 is mainly to the northwest toward the Kalamazoo River, which flows west toward the City of Kalamazoo, and from there north and northwest towards Lake Michigan. Groundwater recharge is generally rapid due to the high permeability of the sandy soils. Precipitation moves readily down through the glacial drift aquifer and into the principle regional aquifer, the Marshall Sandstone Formation. The depth to this formation is highly variable, even across short horizontal distances (MDMVA, 2012).

Available monitoring well logs indicate the aquifer consists primarily of sand and gravel, with depth to groundwater ranging from 8 to 56 feet below ground surface. However, some discontinuous clay layers are present in the subsurface. The stratigraphic cross-section from the 2018 Annual Groundwater Monitoring Report indicates that in the northern portion of FCTC, near Eagle Lake, the uppermost 20 to 25 feet of subsurface soil consists of sand and gravel that is underlain by a sandy clay or silt layer that is approximately 10 feet thick. Groundwater elevations from a cluster of monitoring wells located in the northern area of FCTC show that the clay layer may be associated with a perched water table to the east. The depth to groundwater in eastern monitoring wells is approximately 30 to 40 feet higher than groundwater elevations in western monitoring wells, nearer towards Eagle Lake, where the clay layer was not encountered (DLZ, 2018).

No potable water wells are located within FCTC, only monitoring wells. Off-facility, domestic, public supply, and irrigation wells exist within 4 miles of the Installation (**Figure 1-2**). A query of the Michigan Department of Environmental Quality (MDEQ) Wellogic System database showed household supply wells along the southern and western boundaries of FCTC (MDEQ Wellogic System, 2019). Public supply wells are also located within FCRA, northwest of the Installation. Drinking water for FCTC is supplied by the town of Augusta. The town of Augusta relies solely on groundwater as a water source for its residents (Kalamazoo County Government, 2019). 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 USEPA Health Advisory level within 20 miles of the facility.

1.5.3 Hydrology

Groundwater seeps and springs primarily feed the majority of lakes and streams at FCTC. Groundwater recharge is facilitated by large areas of very permeable Oshtemo complex soils lying over the northern third of the site. These seeps, as well as local surficial flow, feed several large wetland complexes that contain outflow streams. These outflow streams control the general northwest flow of surficial water in this region. Water flows from the interior of the Installation northwest into several public use lakes, namely Eagle, Whitford, and Lawler Lakes, located within FCRA, and eventually into the Kalamazoo River (MDMVA, 2012; Snell Environmental Group, Inc, 2000; Malcolm Pirnie, 2008).

FCTC is bordered on the north and west by the Kalamazoo River. The areas to the south of the Installation are characterized by interconnected streams and wetlands that are tributaries within the Portage River watershed in southern Kalamazoo County (**Figure 1-3**). The eastern portion of the Installation contains wetlands associated with the Kalamazoo River Valley, as well as wetlands associated with an unnamed creek that serves as a tributary to the Kalamazoo River. To facilitate flood control, a network of open ditches, infiltration impoundments, and underground storm sewers have been installed throughout the area, diverting surface runoff from developed areas to the adjacent swamps and lakes (Argonne National Laboratory, 1993, Malcolm Pirnie, 2008).

FCTC lies almost entirely within a subwatershed of the Kalamazoo River between Battle Creek and Galesburg. The Installation does not receive surface water flow from adjacent properties, and it only discharges to the Kalamazoo River. The surface water discharging from the Installation does so through land controlled by other landowners (Snell Environmental Group,

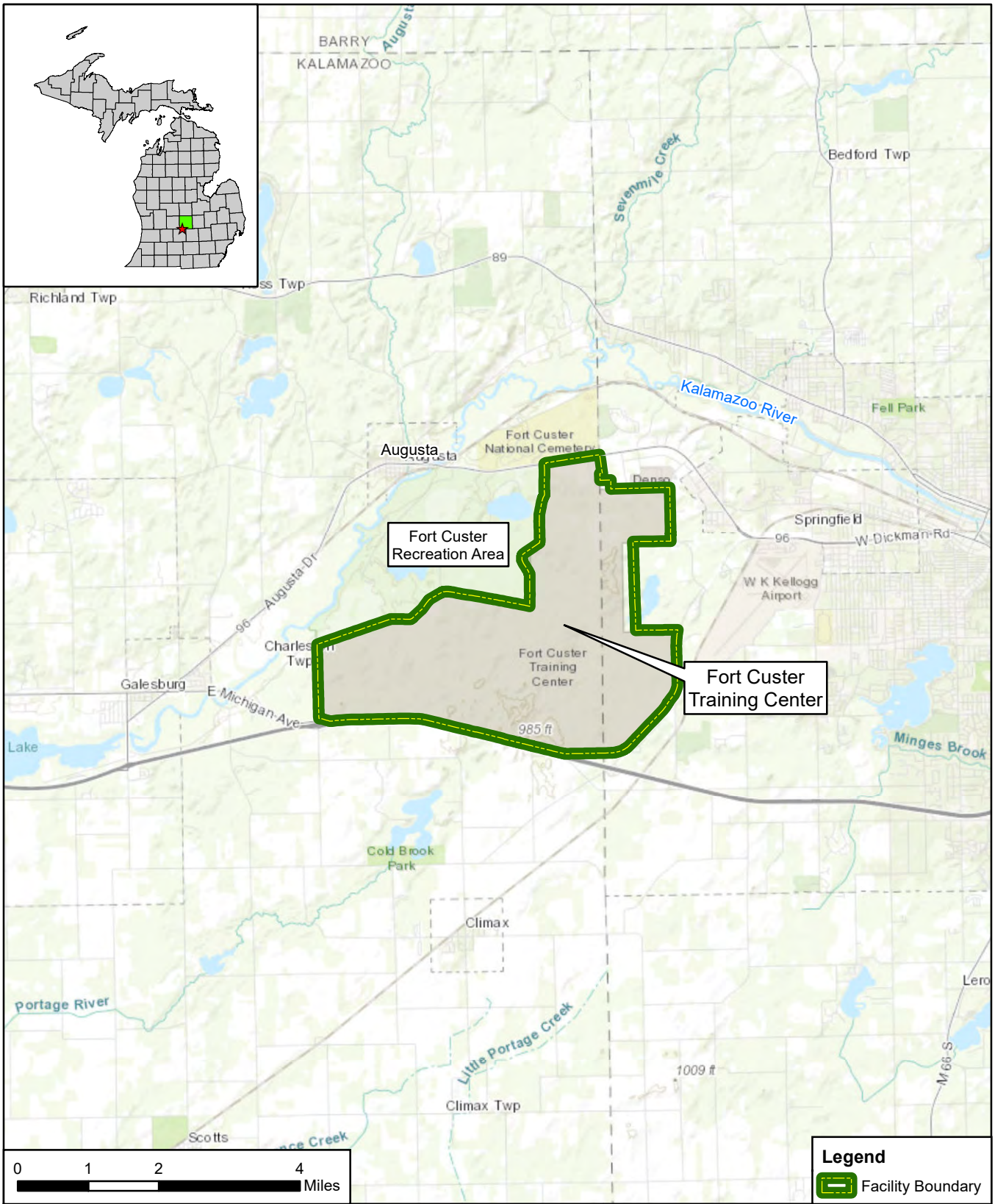
Inc, 2000). The majority of surface water at FCTC drains into the Kalamazoo River through small streams that flow north and northwest. These streams originate in wetlands or small hillside seeps and then flow into nearby lakes before emptying into the Kalamazoo River. Whitman Lake, one of six lakes on the Installation, is located on the eastern portion of the Installation. An unnamed lake located to the northeast of Whitman Lake, just along the Installation's boundary, was created as an additional wildlife habitat for waterfowl and shorebirds during their migration periods. Harts Lake, owned by the city of Battle Creek, is on the eastern border of the Installation. Eagle Lake, Jackson Hole Lake, Lawler Lake, and Whitford Lake are located in FCRA, just west of the Installation. Several seasonal ponds occur in the south-central portion of the facility (MDMVA, 2012; Snell Environmental Group, Inc, 2000; Malcolm Pirnie, 2008).

1.5.4 Climate

The climate at FCTC is temperate forest with moderate daily temperature fluctuations and an average temperature of 48.1 degrees Fahrenheit (°F). Seasonally, temperatures vary from summer highs of 82 °F to winter lows of 16 °F (World Climate, 2019). Average total precipitation is 35.2 inches of rain and 71.4 inches of snow seasonally (MDMVA, 2012). Factors affecting the climate include the Great Lakes and prevailing winds. In winter, the relatively warmer lakes increase cloud formation and precipitation and moderate the overall temperatures. The prevailing wind is from a southwesterly direction (URS Group, Inc., 2013). The prevailing wind averages 13.4 miles per hour, with gusts of up to 40 mph (World Climate, 2019).

1.5.5 Current and Future Land Use

FCTC is home to the Fort Custer Training Site Command, one of six Senior Commands within the MIARNG. The mission of the Fort Custer Training Site Command is to provide a warrior focused training environment in support of deployment operations, unit readiness, homeland security, and state emergencies. The Installation supports various Department of Defense (DoD) organizations, including the ARNG/Air National Guard (ANG), Active and Reserve forces, ROTC, Junior ROTC, Civil Air Patrol, Naval Sea Cadets, and Young Marines. The Installation also supports foreign military services from Canada and Latvia. Future land use is not anticipated to change (MDMVA, 2012; Malcolm Pirnie, 2008).



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Base Map: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN,		PM	RG	7/11/2019

Facility Location

AECOM
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Germantown, MD 20876

Figure 1-1

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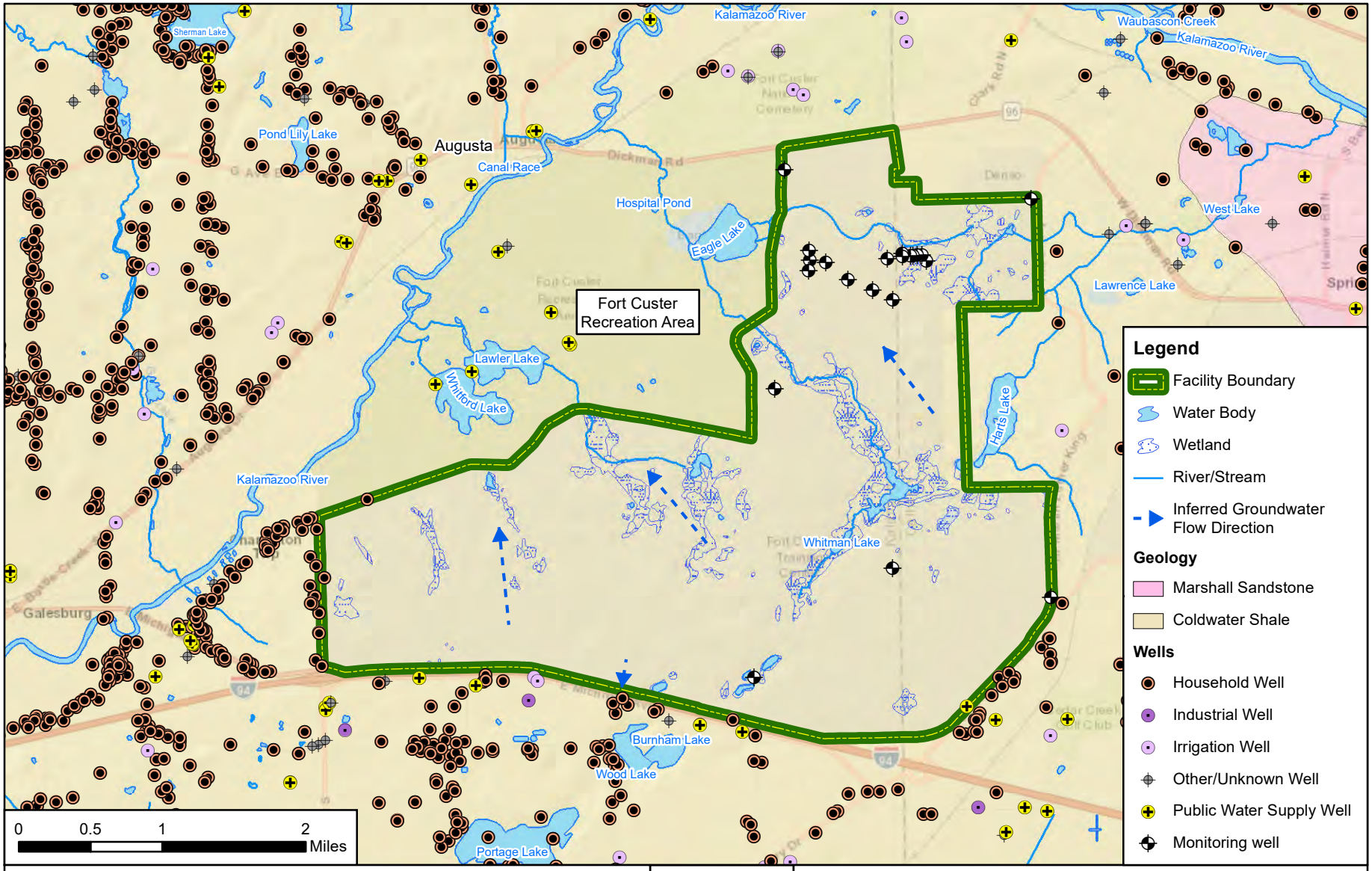

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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri		PM	RG	8/7/2019

N

Groundwater Features

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 1-2

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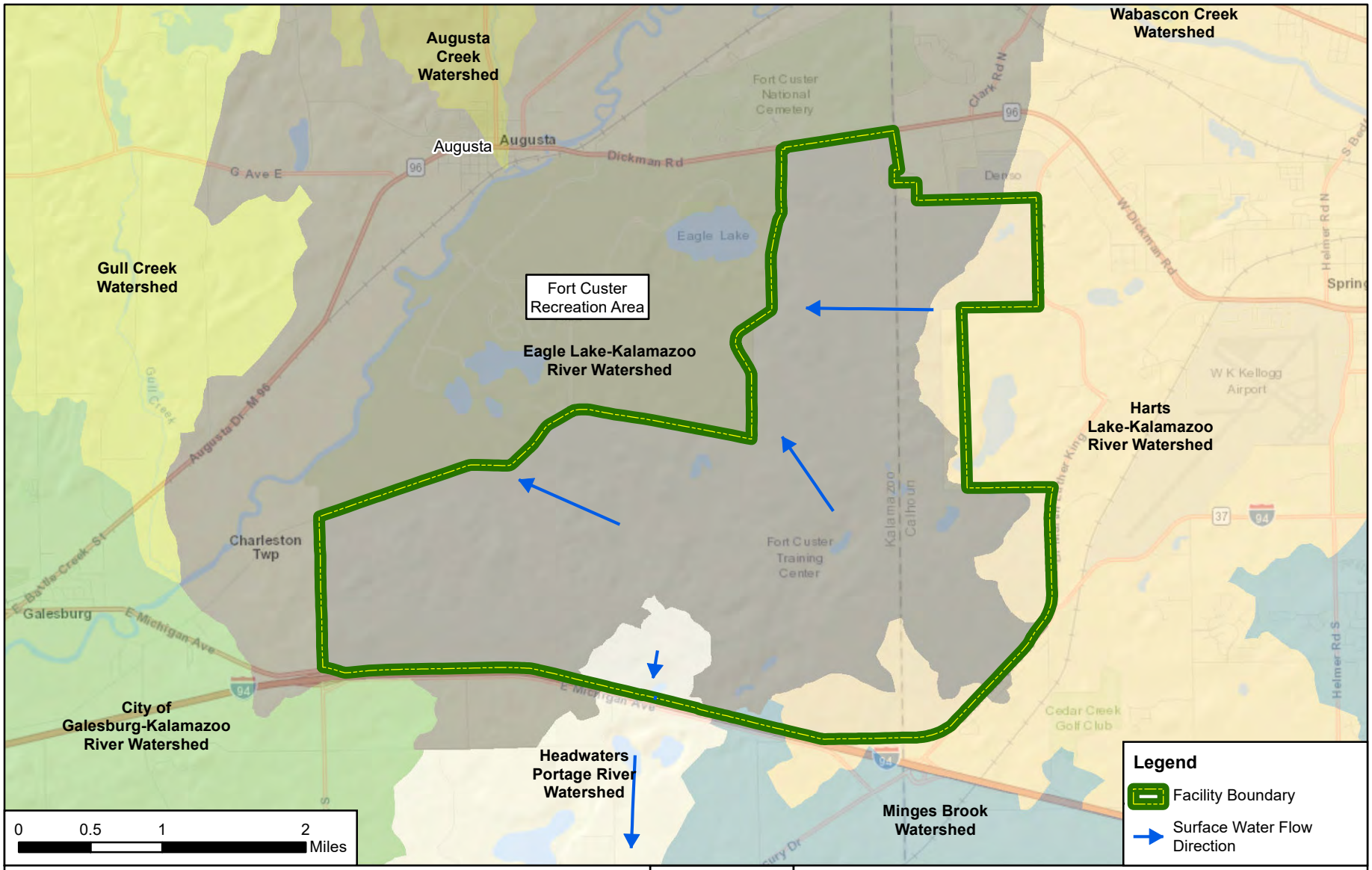

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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri		PM	RG	9/26/2019

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Surface Water Features

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 1-3

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2. Fire Training Areas

No FTAs were identified within FCTC during the PA through interviews or Environmental Data Resource Reports (**Appendix A**).

3. Non-Fire Training Areas

Three non-FTAs where AFFF was potentially stored and/or released were identified during the PA. A description of each non-FTA is presented below, and the non-FTAs are shown on **Figure 3-1**.

3.1 Church Parking Area

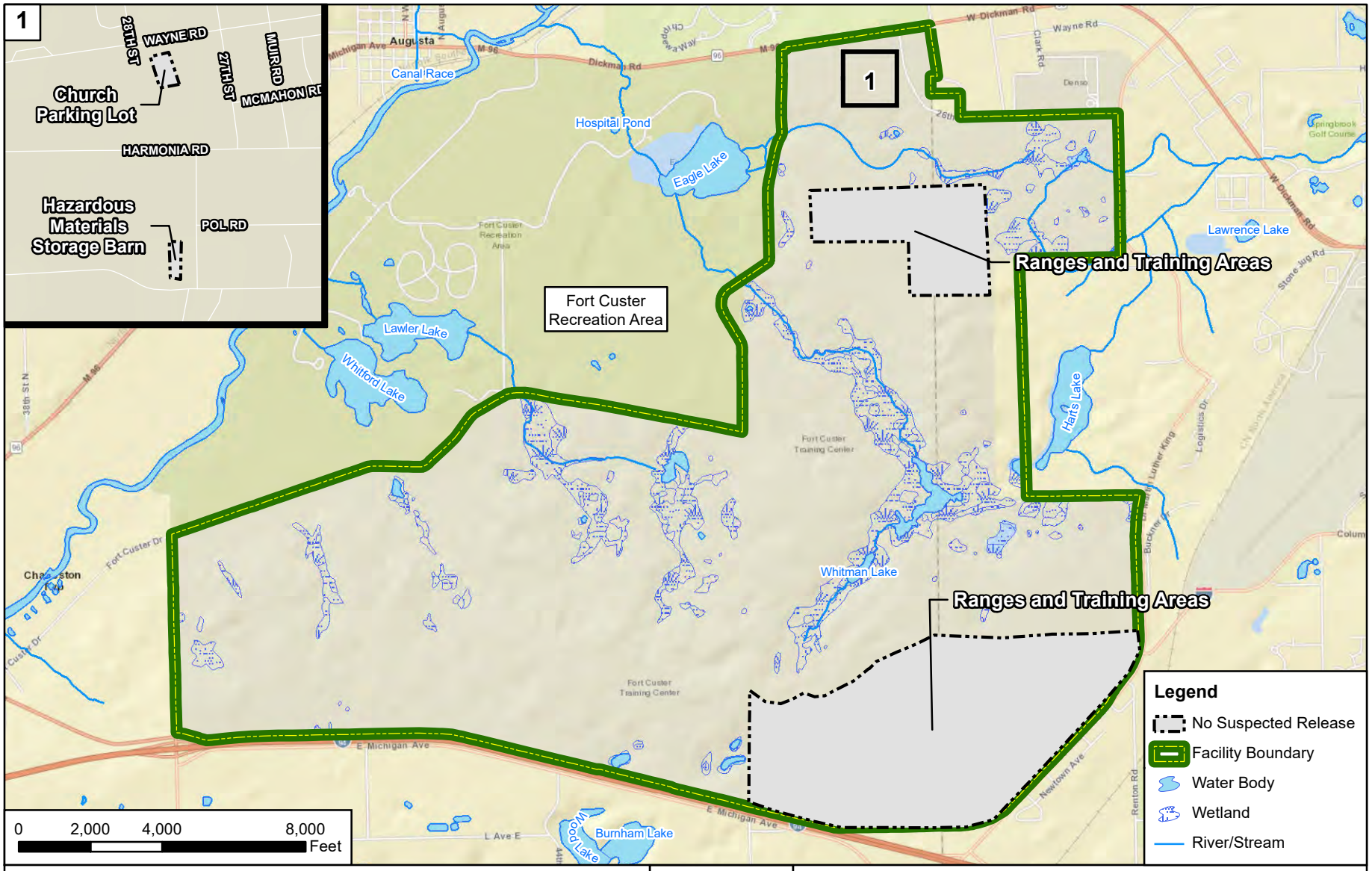
A church parking area is located east of the non-denominational church on the northern portion of FCTC. The geographic coordinates are 42º20'02.3"N; 85º18'14.4"W. According to interviewees, Crew Boss Academy, an interagency organization, comes to FCTC occasionally to perform wildfire response training. The most recent events took place in 2009 and 2017. Training normally involves the use of basic hand pump sprayers with water, but during the 2009 training event, it was noted that trainees were washing cars in the Church Parking Area with Class A Foam. Given interviewee testimony and the type of training occurring, i.e. non-fuel-based response scenarios, it is unlikely that AFFF was used. The Church Parking Area is therefore not suspected to be a source of PFAS.

3.2 Hazardous Materials Storage Barn

A barn used to store hazardous materials is located on the northern portion of FCTC. The geographic coordinates are 42º19'53.2"N; 85º13.6"W. According to interviewees, two 5-gallon containers of Class A foam were stored on pallets in the Storage Barn and disposed of by a contracted waste hauler in 2018. The disposal manifest appears in **Appendix A**. Interviewees confirmed that AFFF has never been stored at the Hazardous Materials Storage Barn; as such, it is not considered a potential source of PFAS.

3.3 Ranges and Training Areas

Training operations using tracer rounds take place on several of the firing ranges and training areas located within the northern and southeastern portions of FCTC. When tracer rounds are used, there is a possibility of a fire occurring. According to interviewees, when fires occur on the ranges, Class A foam or water is used. Interviewees confirmed that AFFF has not been used on ranges or training areas to suppress fires.



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Non-Fire Training Areas

AECOM 12420 Milestone Center Drive Germantown, MD 20876

Figure 3-1

4. Emergency Response Areas

Two emergency response areas were identified within FCTC during the PA through interviews and news reports. A description of each emergency response area is presented below, and the areas are shown on **Figure 4-1**.

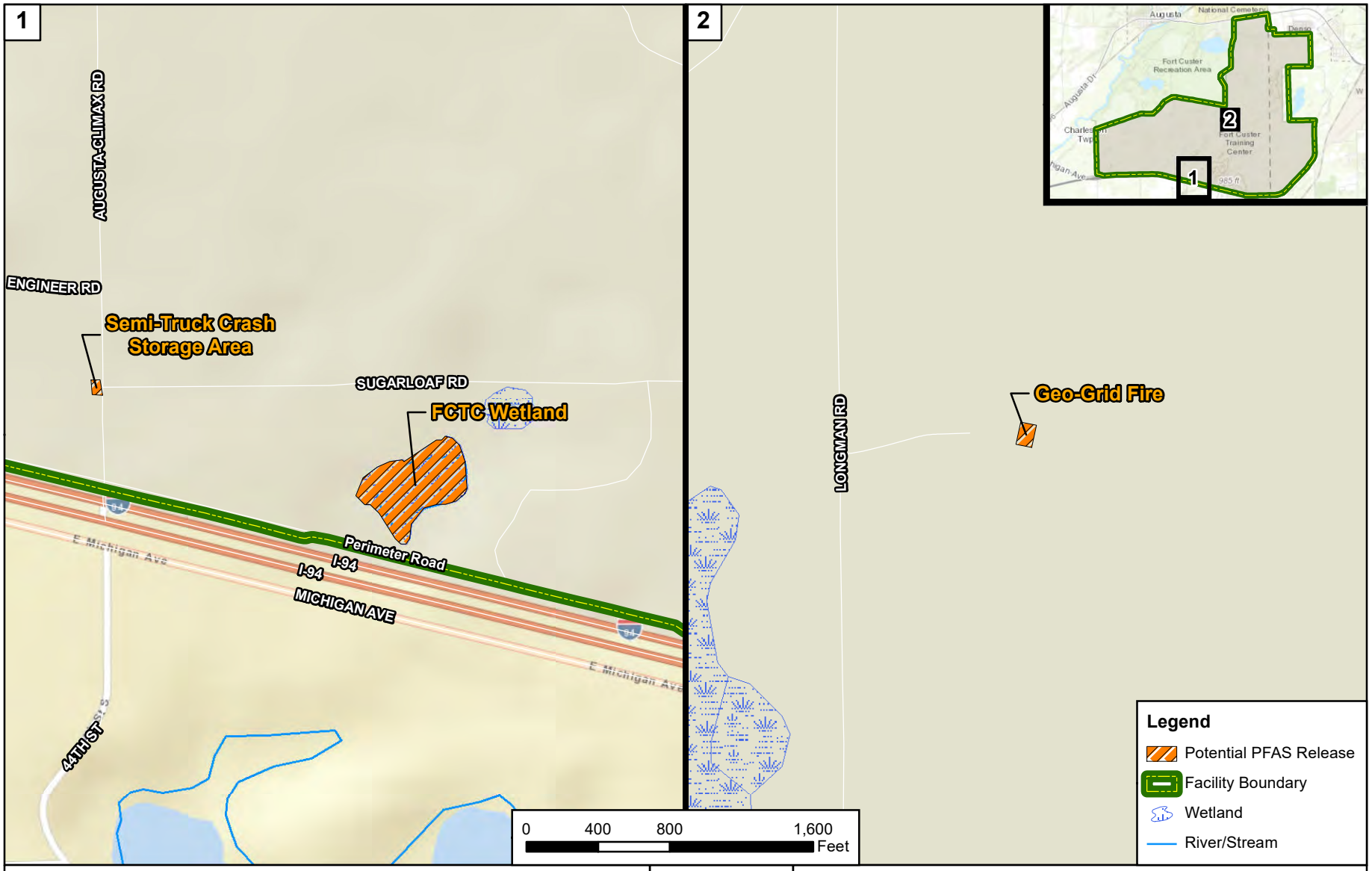
4.1 Semi-Truck Crash Storage Area and FCTC Wetland

In January 2015, a semi-truck carrying fireworks was involved in an accident on I-94, immediately adjacent to the outside of the southern border of FCTC. The semi-truck and its contents caught on fire as a result of the accident. Multiple sources noted that emergency response was dispatched from multiple cities and that foam was used during firefighting activities. After the fire was extinguished, the semi-truck was pulled onto FCTC property through a gate located at the south end of Augusta-Climax Road and stored at a location on the western side of Augusta-Climax Road, approximately half way between Perimeter Road and Engineer Road (**Figure 4-1**). Geographic coordinates are 42°16'56.018"N; 85°20'12.911"W. According to interviewees, the burnt truck remained at this location for several weeks. It is unknown whether any firefighting activities continued once the semi-truck was relocated onto FCTC property; however, residual foam may have remained on the truck after it was transported and subsequently been released to the ground at the storage location.

A culvert that reportedly collects runoff from the median of I-94 is present near the initial accident location (**Appendix C**). This culvert appears to be hydraulically connected to a wetland area located on FCTC, directly north of the culvert and Perimeter Road. Foam used to extinguish the fire may have drained from the initial accident location (off-facility) to the wetland located within the FCTC boundary via the culvert; this FCTC wetland may be a secondary source of PFAS. Additional details regarding the initial incident are provided in **Section 5**.

4.2 Geo-Grid Fire

According to interviewees, geo-grid, a plastic material used to stabilize the ground surface for construction activities, was stored in an open area located off Longman Road, within the central portion of FCTC (**Figure 4-1**). The geographic coordinates are 42º18’03.6”N; 85º18’54.9”W. Interviewees reported during the VSI that in 2005, the geo-grid caught on fire as a result of a prescribed burn being conducted in the area. The Battle Creek fire department was called to the scene to respond to the fire. Foam was reportedly used by the fire department to suppress the fire; however, the type of firefighting foam used is unknown. It is possible that the foam may have been AFFF. Several unsuccessful attempts were made during the PA to determine the type of foam used during the incident. Foam used on the fire would have flowed off the geo-grid and onto soil within the storage area.



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Emergency Response Areas

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Figure 4-1

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5. Adjacent Sources

Three potential off-facility sources of PFAS located adjacent to FCTC, not under the control of ARNG, were identified during the PA. A description of each adjacent source is presented below, and the adjacent sources are shown on **Figure 5-1**.

5.1 Semi-Truck Crash Location

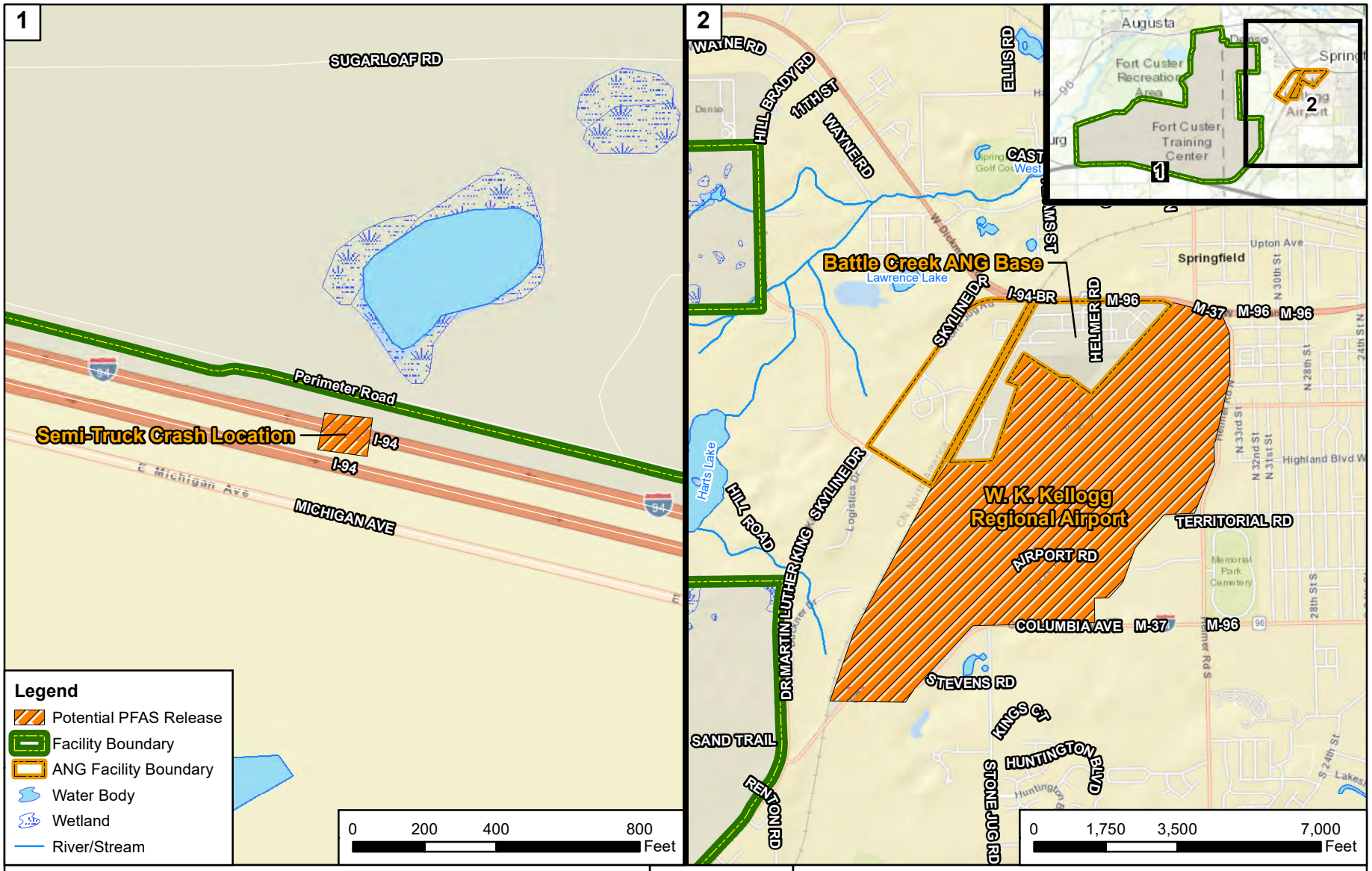
In January 2015, a semi-truck carrying fireworks was involved in an accident along the southern border of FCTC on I-94. The crash occurred at or near mile marker 90, directly south of FCTC, near Augusta-Climax Road. The fireworks within the truck reportedly exploded as a result of the crash and caught the truck on fire. Multiple sources noted that emergency response was dispatched from multiple cities. According to interviewees, foam was used to control and extinguish the fire at the location of the accident on I-94. Due to the intense response from multiple municipalities, it is not known what type of foam was used or by whom. Because of the fuel sources and the intensity of the fire, AFFF may have been used. The approximate geographic coordinates of the initial accident are 42°16'45.85"N; 85°19'53.00"W (**Figure 5-1**). As mentioned in **Section 4.1**, after the fire was extinguished, the semi-truck was pulled onto FCTC.

5.2 Battle Creek Air National Guard Base

The Battle Creek ANG Base is located approximately 1.5-miles east of the eastern boundary of FCTC, adjacent to the northwestern end of W.K. Kellogg Regional Airport (**Figure 5-1**). A PA for PFAS was conducted by the ANG in 2016. Thirteen areas were identified at the base as potential AFFF release areas and recommended for further investigation via an SI (BB&E, 2016). The SI was completed in October 2018; other than one soil sample, PFAS were detected in all groundwater, soil, surface water, and sediment samples analyzed (AECOM, 2018). The USEPA Drinking Water Health Advisory Level was exceeded in groundwater at twelve of the thirteen identified release areas and at base boundary wells. The concentration of PFOS found in groundwater at the northwestern base boundary was 4,300 nanograms per liter (ng/L) and PFOA was positively detected at its limit of detection of 110 ng/L following data validation. The SI concluded that PFAS in groundwater exceeding the Health Advisory Levels are migrating off-base towards the northwest. The northeastern corner of FCTC is situated downgradient from the Battle Creek ANG Base; the remaining majority of FCTC property is located approximately side gradient of the ANG releases (**Figure 5-1**).

5.3 W.K. Kellogg Regional Airport

W.K. Kellogg Regional Airport is located immediately to the east of FCTC. Municipal Airport personnel were not interviewed during the PA because the focus of the assessment was to evaluate potential PFAS related activities and sources at MIARNG properties, not formally assess adjacent sources. Therefore, it is not known if AFFF is used or stored at the airport currently or historically. Because the presence of AFFF at the airport cannot be confirmed, W.K. Kellogg Regional Airport has been identified as a potential off-site PFAS source area. **Figure 5-1** shows the location of W.K. Kellogg Regional Airport (as a potential PFAS source area) in relation to FCTC.



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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 FCTC: AOI 1 is the Semi-Truck Crash Storage Area and FCTC Wetland; and AOI 2 is the Geo-Grid Fire. The AOI locations are shown on **Figures 6-1A** and **6-1B**. The following sections describe the CSM components and the specific preliminary CSMs developed for AOI 1 and AOI 2. 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 at FCTC include site workers, construction workers, trespassers, and off-site residents and recreators. The CSMs for FCTC indicate which specific receptors could potentially be exposed to PFAS (**Figures 6-2** and **6-3**).

6.1 AOI 1 Semi-Truck Crash Storage Area and FCTC Wetland

The semi-truck crash affected multiple areas: the area of the initial crash and fire on I-94 (a possible adjacent PFAS source), the location on FCTC property where the truck was stored following emergency response, and a wetland on FCTC that receives runoff from a culvert that drains the initial accident location (**Figure 6-1A**). AOI 1 encompasses the two locations on FCTC that may have been affected by the initial accident.

Residual firefighting foam may have been present on the semi-truck and subsequently run off onto the soil in the Semi-Truck Crash Storage Area at AOI 1. Also located within AOI 1 is a wetland within FCTC that is located immediately north of the Semi-Truck Crash Location. This wetland may have received run-off of excess firefighting foam from the emergency response via a culvert that drains the median of I-94. Ground-disturbing activities to surface soil within these areas could result in site worker, construction worker, and trespasser exposure to possible PFAS contamination via inhalation and ingestion of surface soil. PFAS contamination may infiltrate to subsurface soil and shallow groundwater; as such, construction workers may also be exposed to potentially contaminated subsurface soil and groundwater via ingestion during intrusive activities. Stormwater runoff from the storage area could affect a nearby drainage ditch directly west of the truck location. Site workers, construction workers, and trespassers may also be potentially exposed to PFAS contamination in intermittent surface water and sediment within the ditch and the wetland.

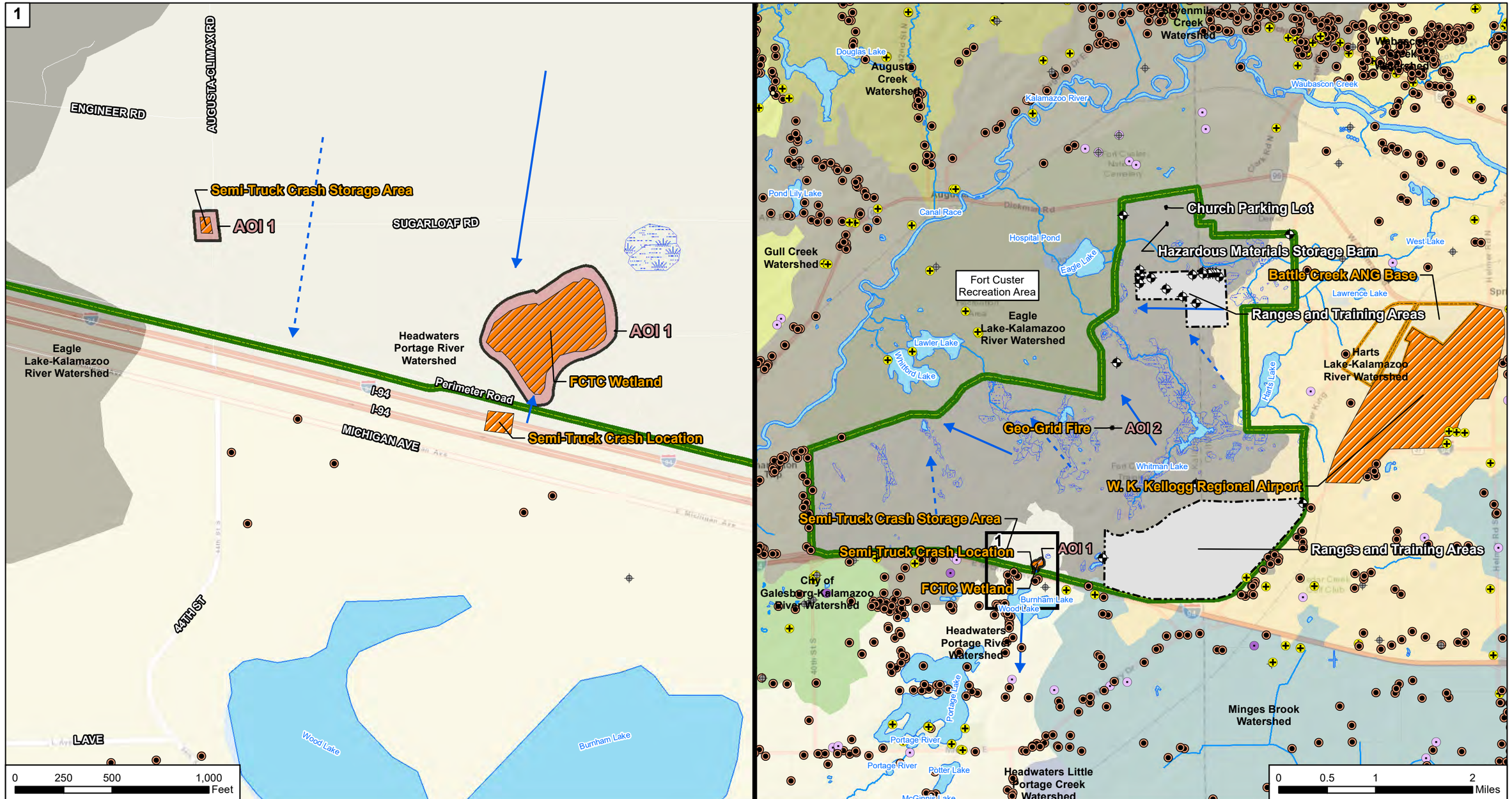
PFAS contamination from potential source areas associated with AOI 1 may have infiltrated to groundwater. AOI 1 is located in a small section of FCTC that lies within the Headwaters Portage River watershed, a separate watershed from which the majority of the facility drains to **(Figure 6-1A)**. The groundwater in this area potentially follows towards Wood and Burnham Lakes to the south, ultimately flowing into Portage River. No potable water wells are located within FCTC; however, several off-facility residential wells exist downgradient from AOI 1. Therefore, the ingestion pathway for groundwater to off-facility residential and recreational receptors is potentially complete. The preliminary CSM for AOI 1 is shown on **Figure 6-2**.

6.2 AOI 2 Geo-Grid Fire

AOI 2 includes the area of the geo-grid fire and is located off Longman Road within the central portion of FCTC (**Figure 6-1B**). According to interviewees, stored geo-grid material caught on fire as a result of a prescribed burn that took place in the area. The Battle Creek fire department was called to the scene to extinguish the fire. Foam was reportedly used by the fire department

to suppress the fire; although it is unknown, the foam used may have been AFFF. Foam used on the fire would have flowed off the geo-grid and onto soil within the AOI.

Because AFFF may have been used within AOI 2, ground-disturbing activities to surface soil at the AOI may potentially result in site worker, construction worker, and trespasser exposure to possible PFAS contamination via inhalation and ingestion of surface soil. PFAS contamination may infiltrate to subsurface soil and shallow groundwater; as such, construction workers may also be exposed to potentially contaminated subsurface soil and shallow groundwater via ingestion during intrusive activities at AOI 2. No potable water wells are located within FCTC; however, the public water supply wells are located approximately two miles downgradient from AOI 2 within FCRA. Therefore, the drinking water pathway for off-facility recreational users within FCRA is considered potentially complete. There are no surface water bodies located within approximately 2,000 feet of the AOI; therefore, exposure pathways for surface water and sediment are considered incomplete for all receptors. The preliminary CSM diagram for AOI 2 is shown on **Figure 6-3**.



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SCALE	1:6,000	CHK BY	CP	9/26/2019
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/26/2019

- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- ANG Facility Boundary
- Water Body
- Wetland
- River/Stream
- Surface Water Flow Direction
- Inferred Groundwater Flow Direction
- Household Well
- Industrial Well
- Irrigation Well
- Other/Unknown Well
- Public Water Supply Well
- Monitoring well

N

Area of Interest 1

AECOM
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Figure 6-1A

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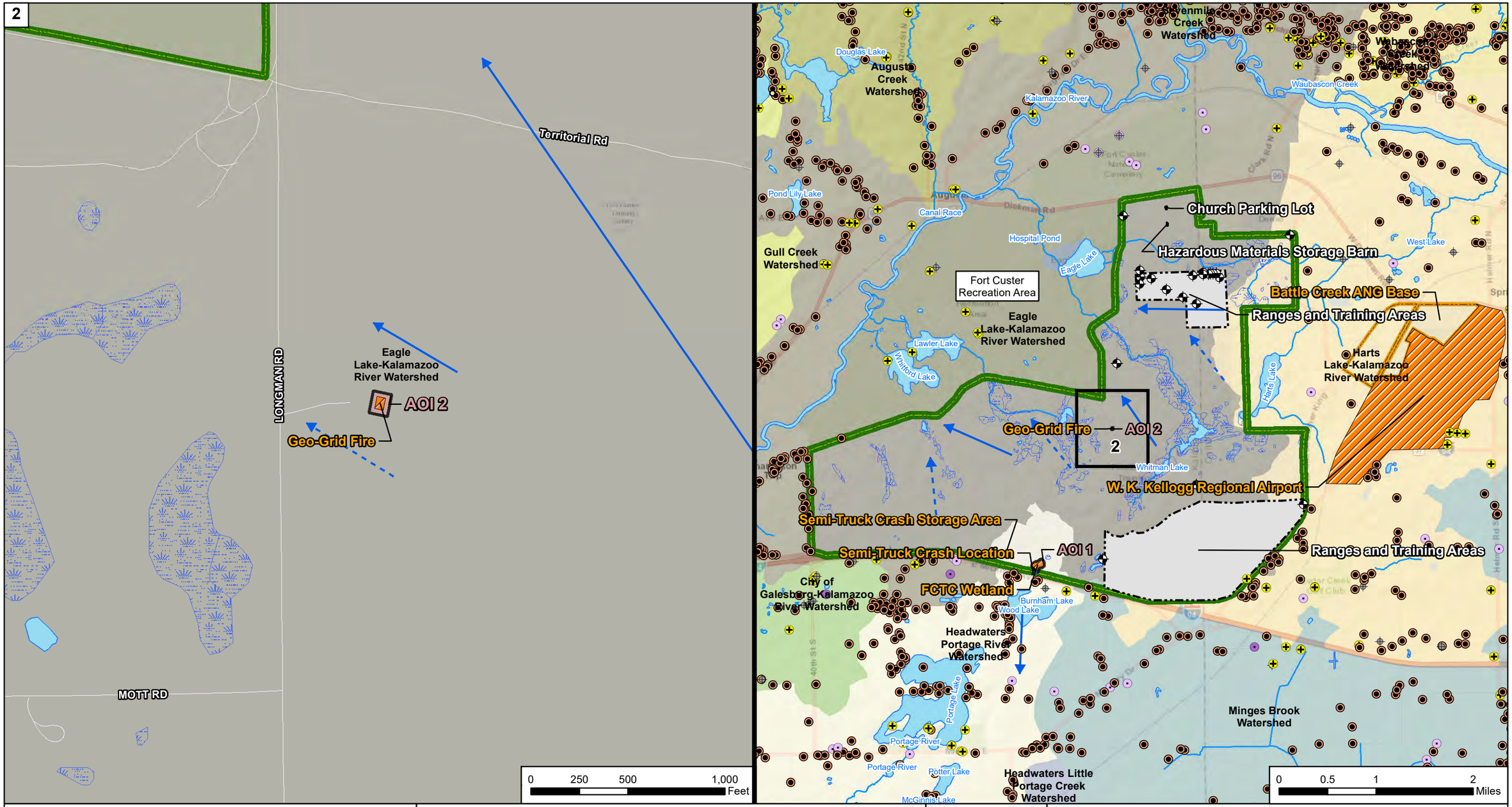

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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/26/2019

- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- ANG Facility Boundary
- Water Body
- Wetland
- River/Stream
- Surface Water Flow Direction
- Inferred Groundwater Flow Direction
- Household Well
- Industrial Well
- Irrigation Well
- Other/Unknown Well
- Public Water Supply Well
- Monitoring well

N

Area of Interest 2

AECOM
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Figure 6-1B

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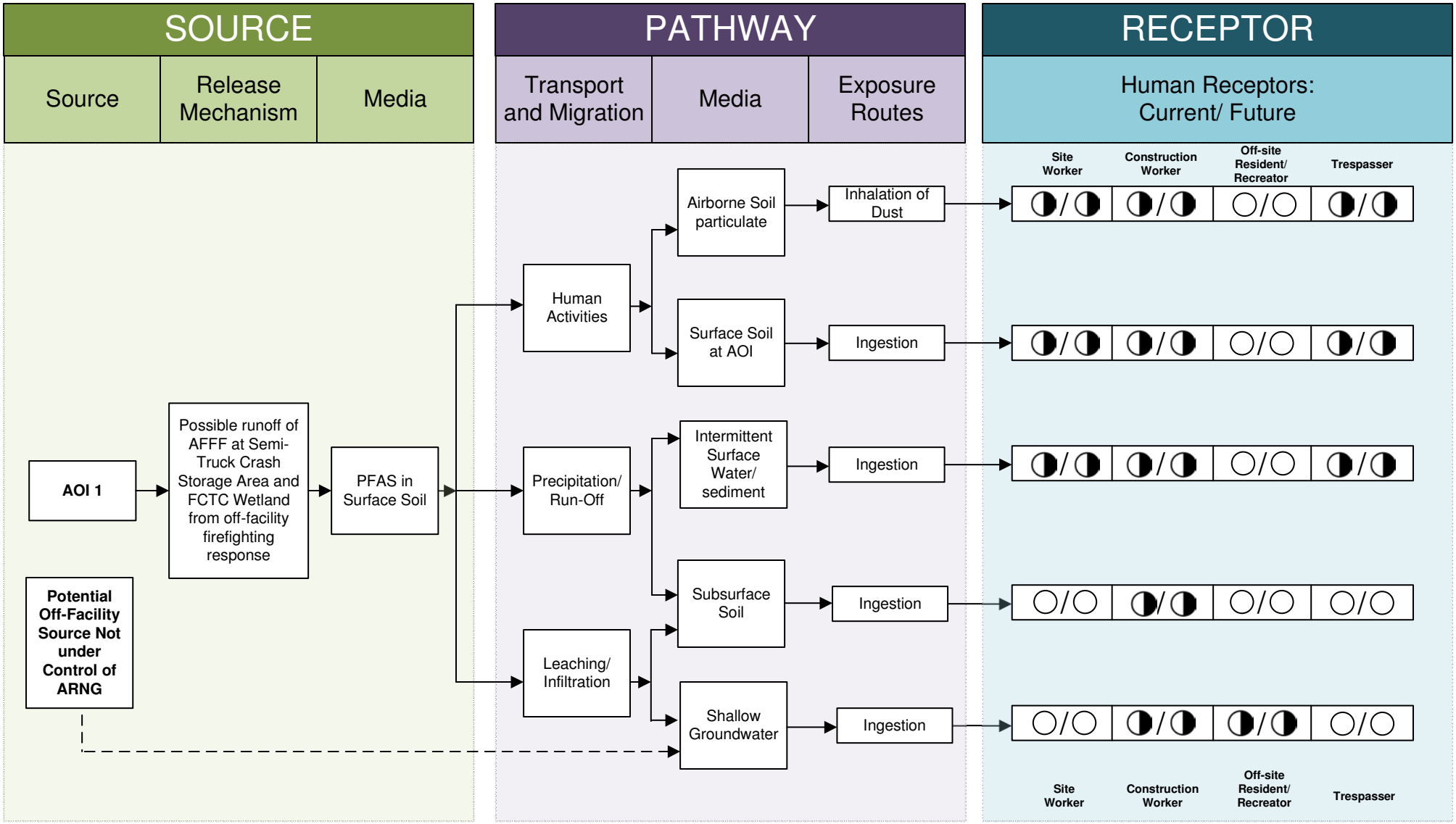
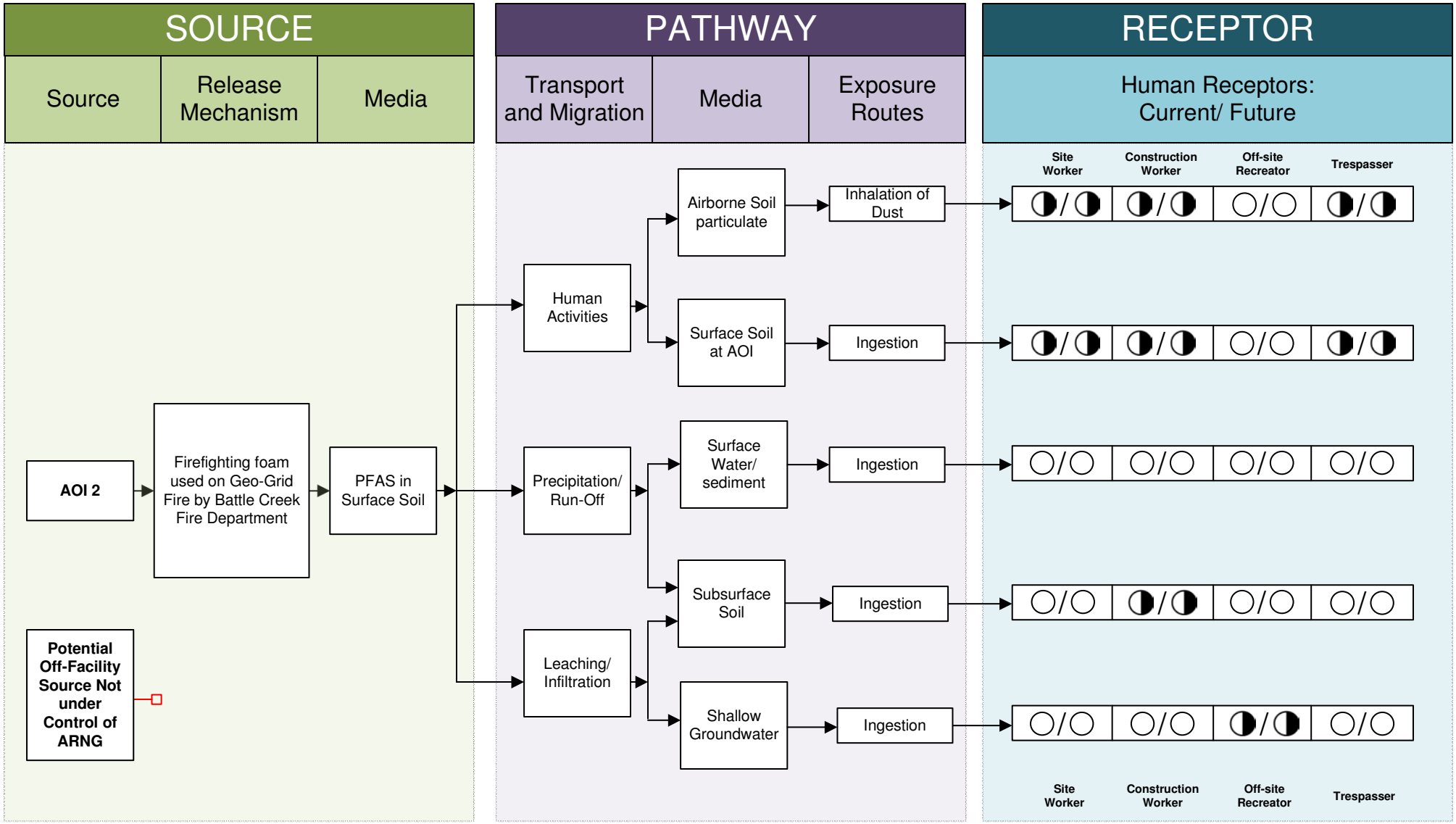


LEGEND

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

Notes:
1. The resident and recreator refers to an off-site resident.
2. Dermal contact exposure pathway is incomplete for PFAS

Figure 6-2
Preliminary Conceptual Site Model
AOI 1 – Semi-Truck Crash Storage Area and FCTC Wetland



LEGEND

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

Notes:
1. The resident and recreator refers to an off-site resident.
2. Dermal contact exposure pathway is incomplete for PFAS

Figure 6-3
Preliminary Conceptual Site Model
AOI 2 – Geo-Grid Fire

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 FCTC. The PA findings are based on the information presented in **Appendix A** and **Appendix B**.

7.1 Findings

Two AOIs related to potential PFAS release (**Table 7-1**) were identified at FCTC during the PA through interviews with facility personnel (**Figures 7-1A** and **7-1B**).

Table 7-1 AOIs at FCTC

Area of Interest	Name	Used by	Potential Release Dates
AOI 1	Semi-Truck Crash Storage Area and FCTC Wetland	Multiple municipal fire departments and FCTC	2015
AOI 2	Geo-Grid Fire	Battle Creek fire department and FCTC	2005

Based on a potential PFAS release at the AOIs, there is potential for exposure to PFAS contamination in surface soil, surface water, and sediments to site workers, construction workers, and trespassers via ingestion and inhalation; subsurface soil to construction workers via ingestion; and groundwater to construction workers and off-facility residents and recreators.

The following areas shown in **Table 7-2**, discussed in **Section 3**, were determined to have no suspected release.

Table 7-2 No Suspected Release Areas

No Suspected Release Area	Used by	Rationale for No Suspected Release Determination
Church Parking Lot	FCTC	Because the type of foam used was reportedly Class A, a potential PFAS release to the environment at the church parking lot is not suspected.
Hazardous Materials Storage Barn	FCTC	According to interviewees, AFFF has never been stored at the Hazardous Materials Storage Barn. Two 5-gallon containers of Class A foam were confirmed to have been disposed of by a contracted waste hauler in 2018.
Ranges and Training Areas	FCTC	Because the type of foam that would be used on this type of fire would be Class A (according to interviewees), a potential PFAS release to the environment at the Ranges and Training Areas is not suspected.

Adjacent sources of PFAS exist near FCTC. These sources include the location where the semi-truck initially crashed and caught fire on I-94. AFFF may have been used to extinguish the fire; excess foam used to extinguish the fire would have traveled onto FCTC property from off-facility via the culvert and flowed into a wetland located on FCTC. W.K. Kellogg Regional Airport is

located upgradient of FCTC, along the eastern boundary, and is a potential off-facility source of PFAS. In addition, an active PFAS investigation is ongoing by the ANG at the adjacent Battle Creek ANG Base located about 1.5-miles east of the northeastern boundary of FCTC.

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 Installation. 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 were first used (1969 to present), and a reliance on personal recollection. Inaccuracies may arise in potential PFAS release locations, dates of release, volume of releases, and the concentration of AFFF used. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available data regarding the use and storage of PFAS were reviewed, 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
AOI 1 Semi-Truck Crash Storage Area	Due to the intense response from multiple municipalities, it is not known what type, quantity, or concentration of foam was used at AOI 1 or by whom. Furthermore, it is unknown if the semi-truck had any residual AFFF on it that may have secondarily dripped onto soil where it was stored on FCTC.
AOI 1 FCTC Wetland	It is not known what type, quantity, or concentration of foam was used at the initial semi-truck crash location or if excess foam was discharged to the wetland on FCTC via a nearby culvert.
AOI 2 Geo-Grid Fire	No information was available on the type, quantity, or concentration of foam used at AOI 2. The firefighting foam used could potentially have been AFFF.
General	A data gap exists between 1969 (when DoD began using AFFF) and 1985. Firsthand knowledge of activities that occurred at FCTC dates back to 1985; activities prior to that date are not known.

It is also unknown whether the potential adjacent off-facility PFAS release areas associated with the Battle Creek ANG Base or potentially the W.K. Kellogg Regional Airport affect FCTC.

7.3 Potential Future Actions

Based on the documented absence (1985-present) of the release of PFAS-containing materials at the Church Parking Area, Hazardous Materials Storage Barn, and the Ranges and Training

Areas, evidence does not indicate that current or former MIARNG activities in these areas contributed PFAS contamination to soil, groundwater, surface water, or sediment at FCTC. These areas will not move forward in the CERCLA process.

Interviews and records (covering 1985 to present) indicate that the emergency response activities associated with the two AOIs may have introduced PFAS into the environment, thus there is potential for receptors to be exposed to PFAS as shown in the CSMs in **Section 6**. **Table 7-4** summarizes the rationale used to determine if the AOI should be considered for further investigation under the CERCLA process and undergo a SI.

ARNG will evaluate the need for an SI at FCTC based on the potential receptors, the potential migration of PFAS contamination off the facility, and the availability of resources.

Table 7-4 PA Findings Summary

Area of Interest	AOI Location	Rational	Potential Future Action
AOI 1 Semi-Truck Crash Storage Area	42°17'00.4"N; 85°20'12.9"W	Truck fire was contained with an unknown foam and then relocated onto FCTC property where residual foam may have been released to the ground.	Proceed to an SI, focus on soil, surface water, sediment, and groundwater
AOI 1 FCTC Wetland	42°16'50.13"N; 85°19'49.21"W	A culvert is located near the semi-truck crash site that discharges into a wetland on FCTC. Excess foam from off-facility fire response may have migrated to the wetland.	Proceed to an SI, focus on surface water, sediment, and groundwater
AOI 2 Geo Grid Fire	42°18'03.6"N; 85°18'54.9"W	An unknown foam was used to contain the Geo Grid fire that occurred near Training Area 8.	Proceed to an SI, focus on soil and groundwater

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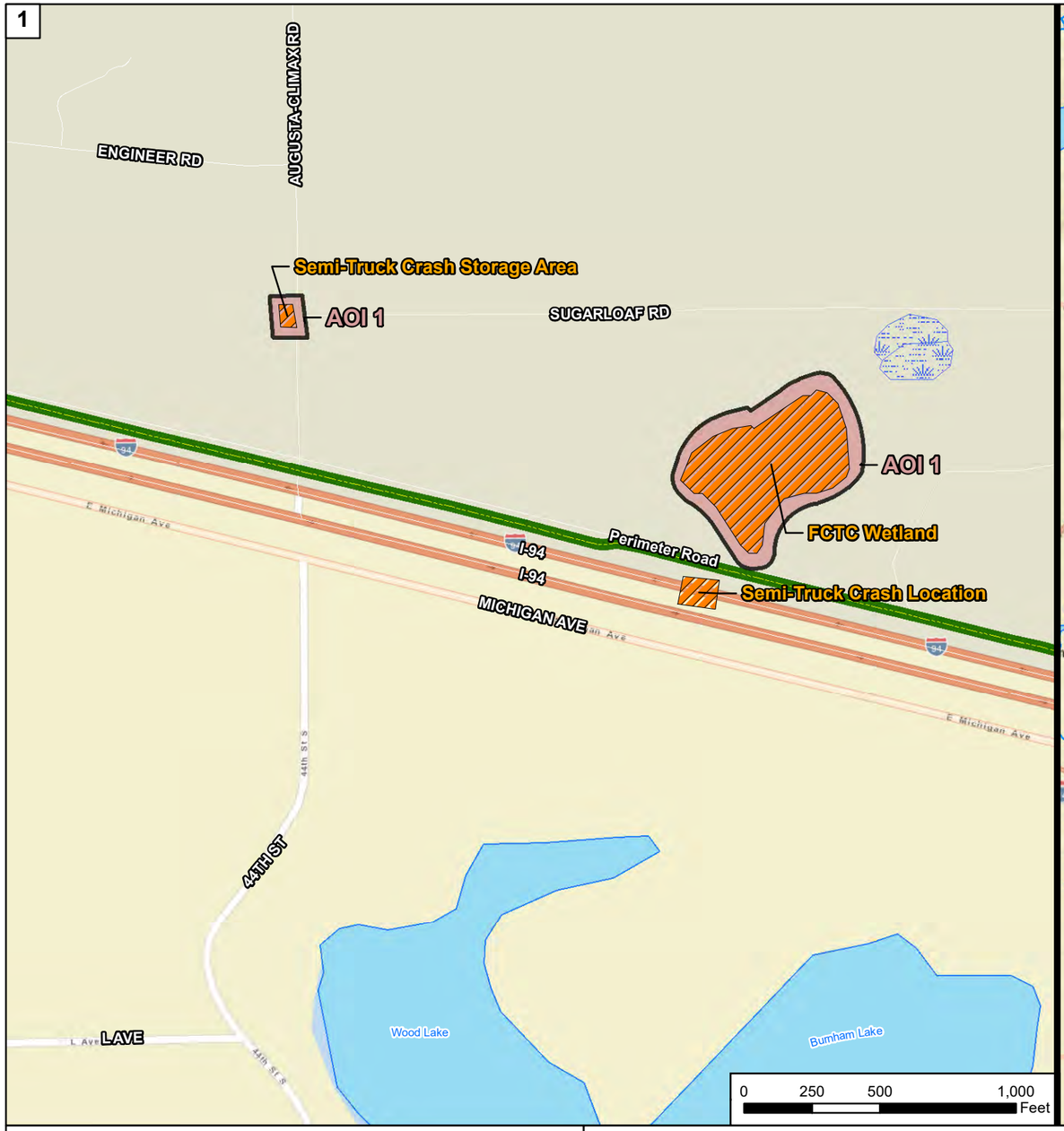

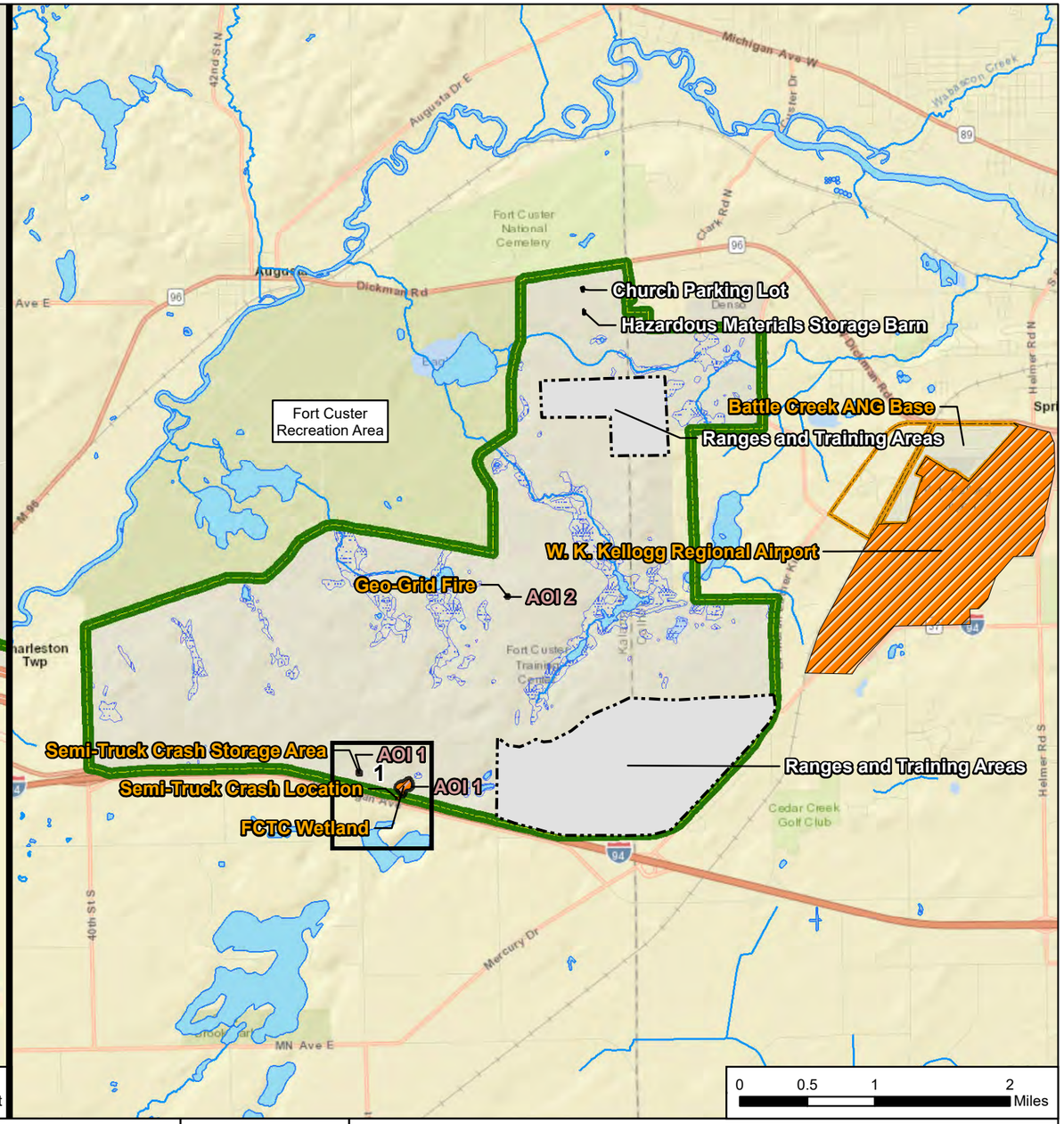

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- Area of Interest
- Potential PFAS Release
- No Suspected Release
- Facility Boundary
- ANG Facility Boundary
- Water Body
- Wetland
- River/Stream

N

Summary of Findings AOI 1

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Figure 7-1A

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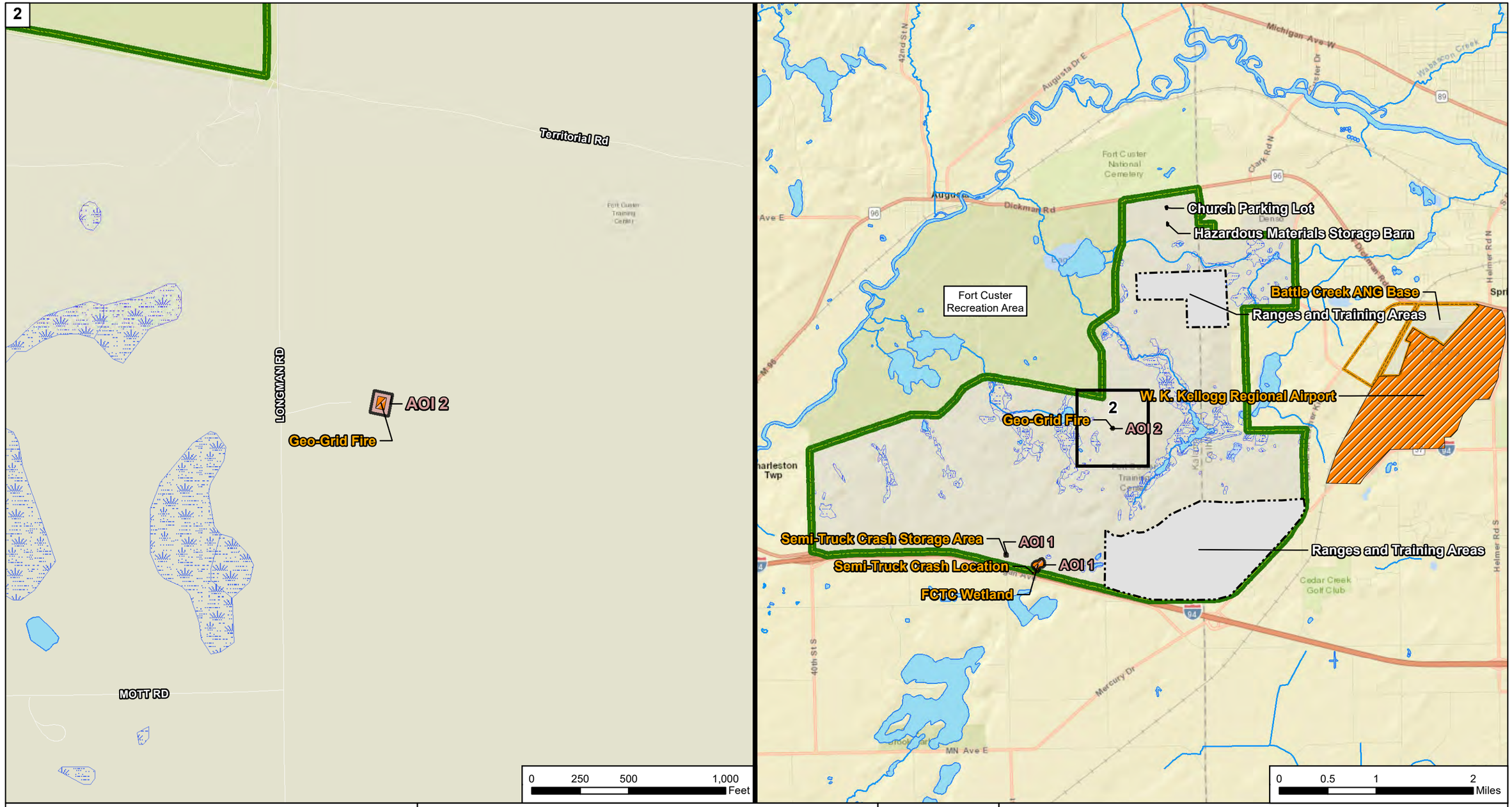

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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	RG	9/26/2019

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

N

Summary of Findings AOI 2

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Figure 7-1B

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Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for Fort Custer Training Center include:

Fort Custer Training Center Leases, Licenses, and Permits

- 1987 Department of the Army License for National Guard Purposes DACA27-3-89-83

Previous Investigations Completed at Fort Custer Training Center

- 2004 Fort Custer Training Center Baseline Surface Water Study
- 2005 Wetland Delineation with IKONOS High-Resolution Satellite Imagery (USGS)
- 2009 Annual Groundwater Monitoring Report (August 2008 Sampling)
- 2008 Draft Final Operational Range Assessment Program Phase I Qualitative Assessment Report
- 2012 Integrated Natural Resources Management Plan
- 2013 Operational Range Assessment, Phase II Report
- 2015 Groundwater Modeling at the Fort Custer Training Center (FCTC) Site: Assessing the Impact of the Proposed Site Development on Prairie Fen Hydrology
- 2018 Annual Groundwater Monitoring Report (July 2018 Sampling)
- 2018 Operational Range Assessment (ORA) Periodic Review Site Visit Trip Report

Fort Custer Training Center Integrated Contingency Plans

- 2016 Integrated Contingency Plan, Fort Custer Training Center

Miscellaneous Data Resources

- 2016 Battle Creek Air National Guard Base Final Perfluorinated Compounds Preliminary Assessment Site Visit Report
- 2018 Final Site Inspection Report for Per- and Polyfluoroalkyl Substances at Kellogg Air National Guard Base
- 2018 Class A Foam Waste Manifest

Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Environmental Manager

Facility: Fort Custer training
Interviewer: Mitchell / Paslawski
Date/Time: 12/13/18

Interviewee: [redacted] **Title:** [redacted] - Env. Manager **Phone Number:** [redacted] **Email:** [redacted]	Can your name/role be used in the PA Report? (Y) or N Can you recommend anyone we can interview? Y or (N)

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

[redacted] 6 months Environment Manager	[redacted] 20 month Resource Analyst.

2. Where can I find previous facility ownership information?

" Discuss w/ [redacted]	USACE before ANG I holds title to land + it's leased to

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

Maintenance – vehicle maintenance facility on property
Fire Training Areas
Firefighting (Active Fire) - wild land / range fire Response / prescribed fires
Crash – semitruck I94 crash
Fire Suppression Systems (Hangers/Dining Facilities) – possible
Fire Protection at Fueling Stations
Non-Technical/Recreational/ Pest Management
Metals Plating Facility
Waterproofing Uniforms (Laundry Facilities)
Other

Chrome plating site on Kalamazoo River Comstock ~~Area~~

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

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

[redacted] possible in kitchens	[redacted] "

FCTC - ~7,000 acres.
pared down ~1960's.

PA Interview Questionnaire - Environmental Manager

Facility: FCTC
Interviewer: Mitchell
Date/Time: 12/13/18

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

[redacted]

none

[redacted]

none.

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

[redacted]

see [redacted]'s Response
purchased under his authority

[redacted]

"

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

class A foam at the Range.

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

class A foam stored at Bldg 2790

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

[redacted]

none
(at least for the last 15 years.)

[redacted]

none

PA Interview Questionnaire - Environmental Manager

Facility: FcTc
Interviewer: Mitchell
Date/Time: 12/13/18

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

NA

NA

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

See [redacted] Response

fire gas training
~~did not know~~
non-fire training

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

unknown

no units stationed here

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

N/A

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

~~BH~~ [redacted]

I 94 semitruck crash.
150+ car pile up.

PA Interview Questionnaire - Environmental Manager

Facility: FCTC
Interviewer: Mitchell
Date/Time: 12/13/18

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

[redacted]

NR

[redacted]

yes. doubt it was common practice

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

[redacted]

NR

[redacted]

w/ class A foam

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

[redacted]

NR

See [redacted] Response

[redacted]

NR

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

N/A - only I94 crash - Review drainage onto FCTC property.

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

[redacted]

possibly... the more I thought about it - I think the 3-4 feet of foam on the parade grounds at a different ~~FCTC~~ facility

PA Interview Questionnaire - Environmental Manager

Facility:_____
Interviewer:_____
Date/Time:_____

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

yes | yes.

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

yes | yes

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

No-kalamazoo River chrome Plating PFAS site

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

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

PA Interview Questionnaire - Environmental Manager

Facility: Fort Custer
Interviewer: Mitchell
Date/Time: 2/13/18

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

[redacted]

DPW Rec. fire training + dining facilities

[redacted] - [redacted]

- Retired but may be able to point to others

PA Interview Questionnaire - Other

Facility: FCTC
Interviewer: Mitchell, Paslawsk
Date/Time: 12/14/18

[redacted]

~~Former Natural Resource Analyst~~
~~Report can use name.~~

[redacted]

use name in our Report?: Yes.
Title: Range NCO; operations @ Post HQ
Tenure: 14 years; 1991 or 1992 retired in 2005

1.) Fire training activities
- no units coming to FTC to do training
- fire truck @ Range operations building
- Machine gun fires M60 Range; firefighters - Range control + the units that caused fire
- ~~to~~ back pack w/ water
- ~~Fire~~ truck was just water; airguard gave FCTC the truck as 2nd Hand
- no fire extinguisher training

2.) Emergency Response Areas:
3.5 grenade launch Range fire swat team from Police dept. set off tier gas. When ~~wh~~ they went to fight fires; over come w/ tier gas.
- Don't know which police dept. it was.
- Do not remember any AFFF use at all. only water - truck + backpack.
- changed Ranges around since he left.

Augusta FD - came out to tier gas fire but don't Recall them using foam to put it out (~~2005~~ EM N2000-2001)
- go past range house to end; then go to gate and go left, units would have to go thru to get to training area N 3/4 mile. off to left.

PA Interview Questionnaire - Other

Facility: Fort Custer
Interviewer: Mitchell
Date/Time: 12/13/18

- OK to use the name in Reports.

Title - Maintenance Mechanic (1985)
Former crewhead

Fire Suppression systems

Barracks - wet (lower) dry (upper)

Range Hood - chemical based (potassium alk. solution) 2602)
all other dining facilities are water based.

No annual fire extinguisher trainings

No emergency Response areas.

No adjacent crashes or Releases to knowledge

No pest management w/ foam.

Dont know what they did when 194 tractor trailer was pulled onto property.

PA Interview Questionnaire - Other

Facility: Fort Custer
Interviewer: Mitchell / Paslawski
Date/Time: 12-13-18

[redacted]

- maintenance Mechanic 34 yrs

- Barricks utilize water fire suppression
  - wet for the upper levels
  - Dry for the lower ~~levels~~ levels

Dining facility utilizes Chemical based potassium alkaline Solution

All other dining facilities use water

- No formal fire extinguisher training

- No emergency responses that he is aware of.

- doesn't recall any uses of foam.

- Indicated that the fireworks trailer was frozen when it was dragged in.

PA Interview Questionnaire - Other

Facility: Fort Custer
Interviewer: Mitchell / Paskowski
Date/Time: 12/13/12

ok to use name.
Title: Retired Col. Guard / Corps Combat Engr.
hired as consultant - land use master plan 1995
Retired in 1996 / trained @ fort custer

museum 2008 - volunteer operation
- President of Historical Society.
accumulate & foster history of Fort Custer
MDMVA Maintains outside; they maintain inside; Requesting fire suppression system.

- Guard fire fighting unit quartered @ camp Grayling late 1980's early 1990's; not often; not a Regular training; used foam.
not sure where

- Riot control training occured; 1979-1988
↳ (1 x per year (Weekend.)

PA Interview Questionnaire - Other

Facility: Fort Custer
Interviewer: Mitchell / Paslawski
Date/Time: 12-13-18

[redacted]

- Involved with the museum since 2008 as a volunteer.
- maintains Historical collection

- There is no water or fire suppression in the museum currently, only electricity

- Possible fire training activities in the late 1980's
  - firefighters were from Camp Grayling
  - Some foam was used, but mainly water.

- 1988 or 1989 was last year for training

- Riot control training took place 1979-1988, annually, foam may have been used.

PA Interview Questionnaire - Other

[redacted]

Facility: Fort Custer
Interviewer: Mitchell /Pasdawski
Date/Time: 12/13/16

[redacted]

see pre-interview form for contact info
Question #'s below correspond to the Environmental Manager form

#2.) USACE leased since he was there
other info ([redacted] w/USACE)

#3) Never used AFFF no fire training; small arms ranges; no other uses.
Had fire - plastic fire used foam to put it out. Battle Creek fire department.
Geogrid - prescribed burn that caught the plastic on fire. ~~200~~ (*) 2005-2006

→ [redacted]

church - class A foamed - washing vehicles w/ the foam; 2009

wood on fire for several days. Training area #6 ~2008
~10 gallons class A foam

#4.) NO; all Halon; powder or water
old mess halls - [redacted]

#10) Not during his time here

#13) did off post but only w/ water + shovels (Re: off post fire training?).

#15.) 1994 tractor trailer + plastic fire
possibly contact battle creek fire department.
→ after action Report.

PA Interview Questionnaire - Other

[redacted]

Facility: Fort Custer
Interviewer: Mitchell / Paslawski
Date/Time: 12/13/18

#16.) No and no fuel spills were dug up.

#17.) No.

#18.) No.

#19.) Only emergency Response Areas 194+ plastic pipe
Used foam at Range 15 - large area south convoy reaction course
burned w/ prescribed fire N 30 02
small arms complex - less than at Range 15

#20.) Washing car ([redacted])

#23 - 24.) No.

#25.) NA

#26.) [redacted] to Reach out to see if we could talk to him
Call tomorrow 12/14/18 at any time
cell phone # = [redacted]
operations / training / Range control

PA Interview Questionnaire - Other

Facility:_____
Interviewer:_____
Date/Time:_____

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

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

Former Natural Resources Manager
July 2003 - July 2016

Ownership: leased from USACE; > 100 years
info in INRMP
Ag land previously

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?

	Known Uses
- Class A fire extinguishers used on base	Use
- would have been purchased through environmental office	Procurement
- would not have had a reason to purchase AFFF	Disposition
- most likely only stored in barn	Storage (Mixed)
- City fire dept would respond to fires on base	Storage (Solution)
- when truck was pulled on property, it smouldered for a week or so, some soil was removed from area, K&D waste	Inventory, Off-Spec
- No fire training areas, to knowledge	Containment
- Local fire would not have trained on base	SOP on Filling
- if AFFF was brought onsite by other parties, there is no reason to believe that it was applied.	Leaking Vehicles
- it's possible foam was used on cars	Nozzle and Suppression System Testing
- fuel spills, small (few gallons) here and there, soil would have been removed in response	Dining Facilities
	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

- personnel barns, Class A used
- no training was involving ski wax

PA Interview Questionnaire - Other

[redacted]

Facility: Fort Custer
Interviewer: Mutchell/Paslawski
Date/Time: 12/13/18

[redacted]

see pre interview form for contact info

Fire fighting capabilities
- Class A only, generally use water
- new firetruck than can use foam but they do not have plans to buy it
- stored @ 4464 (Bldg)

Crew Boss Academy - wild~~f~~fire training for mid level 2009 & 2017
↳ car washing occasion - see other form.
inter agency. S130 S190 - super basic mid fire training hand pumps / all water.

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

Names(s) of people performing VSI: Claire Mitchell / Cynthia Paslawski

Recorded by: Cynthia Paslawski

ARNG Contact:

Date and Time: 12-13-18 8:00 am

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

Source/Release Information

Site Name / Area Name / Unique ID: Fort Custer Training Center

Site / Area Acreage: 7,570 Acres

Historic Site Use (Brief Description):

Current Site Use (Brief Description): National Guard Base, small fire arms training

Physical barriers or access restrictions: The base is fenced in

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):

Possibly used on the I-94 truck fire and geo grid fire

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

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

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

Visual Survey Inspection Log

Other Significant Site Features:

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

1a. If yes, indicate which type of AFFF has been used: According to Interviewees, AFFF is not used in any of the fire suppression systems

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

NA

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

NA

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

Transport / Pathway Information

Migration Potential:

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

1a. If so, note observation and location:

Some surface water drains to Kalamazoo River

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

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

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

3a. If so, please note the location:

Monitoring wells are located near the ranges, drinking water wells are located offsite in residential areas.

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

4a. If so, please note the location:

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

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

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

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

The truck fire incident that occurred just south of the base on I-94

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

Visual Survey Inspection Log

Significant Topographical Features:

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

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

Some buildings have been demolished, ditches, impoundments and storm sewers have been installed to control flooding.

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

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

only the northern portion of FCTC has been developed, the remainder of FCTC is wooded

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:

lakes and wetland areas are present at FCTC

Receptor Information

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

1a. If so, please note to what extent: The perimeter of FCTC is fenced, once inside the perimeter, the areas of the AOIs are not restricted.

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:

Residential areas are located to the south and to the west of FCTC.

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

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

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

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

wetland areas are located throughout FCTC

Visual Survey Inspection Log

Additional Notes

Photographic Log

Photo ID/Name	Date & Location	Photograph Description
		see excel file

Appendix B.3
Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Fort Custer Training Center

Why has this location been identified as a site?

AFFF may have been stored at FCTC in small quantities, AFFF may have been used for emergency response activities at FCTC

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

Training Events

Have any training events with AFFF occurred at this site? According to interviewees, No

If so, how often?

How much material was used? Is it documented?

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? North - Northwest

Average rainfall? 35.2" annually

Any flooding during rainy season? there are wetlands, ditches, and impoundments to handle storm water

Direct or indirect pathway to ditches? yes

Direct or indirect pathway to larger bodies of water? Some surface water flows to the Kalamazoo River

Does surface water pond any place on site? there are lakes and wetlands on FCTC grounds

Any impoundment areas or retention ponds?

Any NPDES location points near the site?

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

Preliminary Assessment – Conceptual Site Model Information

Identify Potential Receptors:

Site Worker – Yes

Construction Worker – Yes

Recreational User

Residential

Child

Ecological – Yes

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

Documentation

Ask for Engineering drawings (if applicable).

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

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? North - Northwest

Depth to groundwater? 8 ft to 56 ft

Uses (agricultural, drinking water, irrigation)?

Any groundwater treatment systems? No

Any groundwater monitoring well locations near the site? yes, In the ranges, not in vicinity of AOIs

Is groundwater used for drinking water? No

Are there drinking water supply wells on installation? No

Do they serve off-post populations? NA

Are there off-post drinking water wells downgradient yes

Waste Water Treatment Plant:

Has the installation ever had a WWTP, past or present? According to interviewees NO

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

Do we understand the fate of sludge waste? NA

Is surface water from potential contaminated sites treated? NA

Equipment Rinse Water

1. Is firefighting equipment washed? Where does the rinse water go? According to interviewees minimal equipment is used on FCTC and any equipment that may have been used would have utilized water.

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?

NA

3. Other?

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Fort Custer Training Center	Augusta, Michigan

Photograph No. 1

Description:

Area of interest (AOI) 1: Fort Custer Training Center (FCTC); Standing on Perimeter Road facing southwest. I-94 is in the foreground. This is the location near I-94 where the truck fire took place. A culvert is located to the north of the truck crash site.

Date: 12/13/18

Photograph No. 2

Description:

AOI 1: FCTC; Standing on Perimeter Road just north of the culvert shown in Photograph No. 1 facing north. View of a wetland area that is directly north of the culvert that may drain water from I-94. The culvert appears to drain into the wetland area.

Date: 12/13/18

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Fort Custer Training Center	Augusta, Michigan

Photograph No. 3

Description:

AOI 1 FCTC: Standing on Augusta Road looking west at the area where the truck that was dragged onto FCTC from I-94 was left.

Date: 12/13/18

Photograph No. 4

Description:

AOI 2 FCTC: Standing in an area east of Longman Road looking east at the geo-grid that caught fire.

Date: 12/13/18