

FINAL

Preliminary Assessment Report

Belmont Armory, Michigan

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

April 2020

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Contract Number: W912DR-12-D-0014
Delivery Order: W912DR17F0192

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Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
AOI	area of interest
ARNG	Army National Guard
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EDR	Environmental Data Resource
FTA	fire training area
IED	Installations and Environment Division
MDEQ	Michigan Department of Environmental Quality
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
ppt	parts per trillion
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
Wolverine	Wolverine World Wide, Inc.
VSI	visual site inspection

Executive Summary

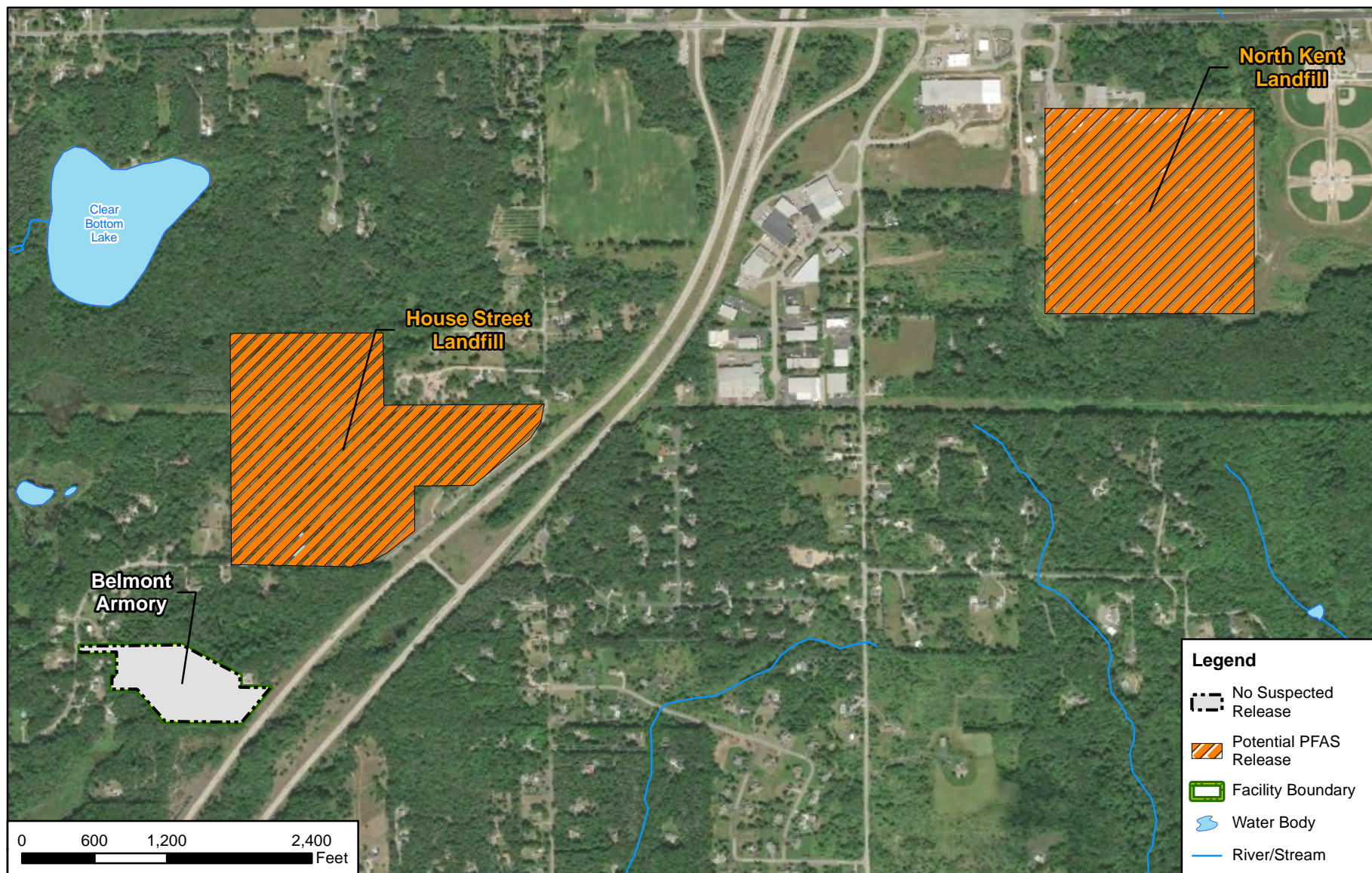
The United States (US) Army Corps of Engineers (USACE) Baltimore District on behalf of the Army National Guard (ARNG)-Installations & Environment Division (IED), Cleanup Branch contracted AECOM Technical Services, Inc. (AECOM) to perform Preliminary Assessments (PAs) and Site Inspections for Perfluorooctanesulfonic 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) (a suite of related chemicals), primarily in the form of aqueous film forming foam released during firefighting activities or training, although other PFAS sources are possible. In addition, the ARNG is reporting on known contamination and other ongoing investigations at businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for an off-site PFAS release.

AECOM completed a PA for PFAS at Belmont Armory in Belmont, Michigan to assess potential PFAS release areas originating from the site and exposure pathways to receptors. The Belmont Armory was purchased by the Michigan Department of Military & Veterans Affairs in approximately 2012. Prior to purchase, the building and property were used as a church. The armory was established in 2014 following two separate phases of construction to retrofit the property for armory use. The performance of this PA included the following tasks:

- Reviewed data resources to obtain information relevant to suspected PFAS releases
- Conducted a 1-day site visit on 5 December 2017 to complete visual site inspections of the facility and provide photographic documentation
- Interviewed current and former Belmont Armory personnel during telephone interviews conducted on 16 and 18 April 2018, including:
 - Former Facility Manager Sergeant Major
 - Current Armory Manager Command Sergeant Major


Two off-facility former landfills located adjacent to the Belmont Armory have been identified as potential PFAS sources (**Figure ES-1**). Both landfills were formerly used by Wolverine World Wide, Inc. to dispose of industrial wastes generated from the production of water resistant consumer products. PFAS have been confirmed in groundwater/drinking water at Belmont Armory and private wells located in adjacent communities and complete exposure pathways exist for PFAS contamination in groundwater in association with the two former off-facility landfills. Both off-facility PFAS sources were identified through interviews with Belmont Armory personnel, independent research, and the 2018 Environmental Data Resource (EDR) Report. Interviews were not conducted with landfill staff and the site visit did not include visiting the landfills.

Based on the documented absence of the use/release of PFAS-containing materials at Belmont Armory, evidence does not support current or former ARNG activities at the armory having contributed to PFAS contamination in soil, groundwater, surface water, or sediment at the facility or adjacent areas. No areas of interest related to PFAS release were identified at Belmont Armory based on PA data, so further investigation is not recommended at the Belmont Armory for PFAS sources.



CLIENT	ARNG			
PROJECT	Preliminary Assessment for PFAS at Belmont, MI			
REVISED	9/4/2018	GIS BY	MS	9/4/2018
SCALE	1:14,400	CHK BY	JL	9/4/2018
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,		PM	RG	9/4/2018



TITLE		Summary of Findings
	12420 Milestone Center Drive Germantown, MD 20876	Figure ES-1

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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 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, and Modification 01 issued 30 September 2017. The ARNG is assessing potential effects on human health related to processes at their facilities that used per- and poly-fluoroalkyl substances (PFAS) (a suite of related chemicals), primarily releases of aqueous film forming foam (AFFF) although other sources of PFAS are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of these 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 (70 parts per trillion [ppt] combined concentration), 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, have adopted their own drinking water standards for PFAS.

The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA. This report presents findings of a Preliminary Assessment (PA) for PFAS at Belmont Armory in Belmont, Michigan, 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 Report documents potential locations where PFAS may have been released into the environment at or adjacent to the Belmont Armory.

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 1-day site visit on 5 December 2017 to complete visual site inspections of the facility and provide photographic documentation
- Interviewed current and former Belmont Armory personnel during telephone interviews conducted on 16 and 18 April 2018, including:
 - Former Facility Manager Sergeant Major
 - Current Armory Manager Command Sergeant Major

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 potential PFAS transport and receptors at the facility
- **Section 7 –Conclusions and Uncertainty:** 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

Belmont Armory is located off of House Street within Plainfield Charter Township in Kent County, approximately 2.7 miles north of the Grand River in the west central area of Michigan (**Figure 1-1**). The 13-acre facility is bordered on the west by US-131; residential properties surround the remaining borders of the armory.

Prior to its purchase in approximately 2012 by the Michigan Department of Military & Veterans Affairs, the armory building and property was formerly used as a church. Following purchase, the Michigan ARNG completed two phases of construction to retrofit the facility for use as an armory; construction was completed in late 2014. Since completion, Belmont Armory has been used as an active armory and home to the 126 Army Band and Headquarters Company 63rd Troop Command. Since late 2017, tactical vehicle storage and recruiting activities and have also been housed at the facility.

1.5 Facility Environmental Setting

The Armory is located within the Greenville Regional Landscape Ecosystem of the Ionia District of Region I (Albert, 1995). This ecosystem is characterized as a transitional stage between the surrounding regional landscapes of Southern Lower Michigan and Northern Lower Michigan due to its intermediate elevations, increasing conifer vegetation, and sandy soils. The terrain is generally hilly and is composed of thick glacial till-plain and end moraine deposits. Many small

kettle lakes, a common occurrence in glacially-affected landscapes, are found in this region, and are typically smaller than one square mile.

1.5.1 Geology

Kent County is covered by thick Pleistocene glacial deposits that range in thickness anywhere from 11 to 800 feet, but on average are 200 to 400 feet thick. The deposits are glacial till-plain and end moraines consisting predominately of unstratified, medium-grained sand (Farrand and Bell, 1982). Belmont Armory sits on approximately 200 feet of medium textured end moraine. Outwash and lacustrine deposits can also be found in the area consisting of clay and fine-grained sand, underlain by sand and gravel (Stramel, et al., 1954).

Underlying the Pleistocene deposits, listed here from oldest to youngest, are the bedrock formations of south central Michigan. Of Mississippian age are the Marshall Formation, Michigan Formation, and Bayport Limestone; of Pennsylvanian age are the Parma Sandstone and a small outcrop of the Saginaw Formation. Directly underlying the end moraine deposit at Belmont Armory is a poorly to unconsolidated Jurassic Red Beds consisting of clay, mudstone, sandstone, shale, and gypsum. The regional dip of bedrock is to the northeast. The bedrock found at the facility location is mostly Red Beds, with some outcrops of the Saginaw Formation (Rose and Westra, 2017).

1.5.2 Hydrogeology

According to a conceptual site model developed for an adjacent off-facility investigation, the elevation of the area is 783 feet with a top of bedrock elevation of 540 to 580 feet; resulting in an overburden thickness of approximately 200 feet (Rose and Westra, 2017). There are 51 state-operated wells within a mile of the facility; nine of these are within a quarter mile, and four are within an eighth of a mile of the facility (**Figure 1-2**). Most of these wells are classified as domestic wells and draw from a depth of around 100 to 150 feet. Due to the thickness of the overlying glacial drift, over 94 percent of wells in the area draw from these Quaternary deposits (EDR, 2018; **Appendix A**). Belmont Armory uses a Type II Groundwater Well for all potable water sources and does not receive drinking water from local utilities. Drinking water from the armory's well was previously sampled by the National Guard Bureau in May 2017; PFAS were found above the combined USEPA health advisory level of 70 ppt. The combined concentration of PFOA and PFOS was 96.9 ppt and total PFAS was 421.5 ppt; the armory was switched to bottled water at that time. A two-stage activated carbon treatment system was installed for the armory's groundwater well, which has been in operation since October 2018.

Based on static water levels and ground surface elevation, the groundwater gradient on-site flows southeast and discharges at the Rogue River. The hydraulic gradient is approximately 0.0075 foot/foot. Little to no flow is expected towards the north or northwest, where the hydraulic gradient drops to as little as 0.0002 foot/foot. Seepage velocity of groundwater from the facility to its discharge location at the Rogue River is about 1 to 2 feet/day, or 360 to 730 feet/year (Rose and Westra, 2017).

1.5.3 Hydrology

Belmont Armory is situated in the Rogue River basin, within the Lower Grand River Watershed. The facility sits on a basin sub-divide that drains to the Rogue River on the eastern half and to the Grand River on the western half. There is an additional sub-basin within the Freska Lake-Rogue River Watershed that lies close to the property boundary to the north that also drains to the Rogue River (**Figure 1-3**).

The overland flow at the facility is predominantly towards the southeast towards a storm water retention pond located in the eastern portion of the facility. Soil on-site is classified as somewhat poorly drained loam, which reduces infiltration.

According to the US Fish and Wildlife National Wetlands Inventory there are no wetlands present at the Belmont Armory, however, there are approximately two dozen wetlands within a mile of the facility. Most of these wetlands are emergent or wooded swampland (USFWS, 2018). Three freshwater lakes, Duck Lake, Freska Lake, and Clear Bottom Lake, are located approximately 0.6 miles upgradient of the armory to the northwest.

1.5.4 Climate

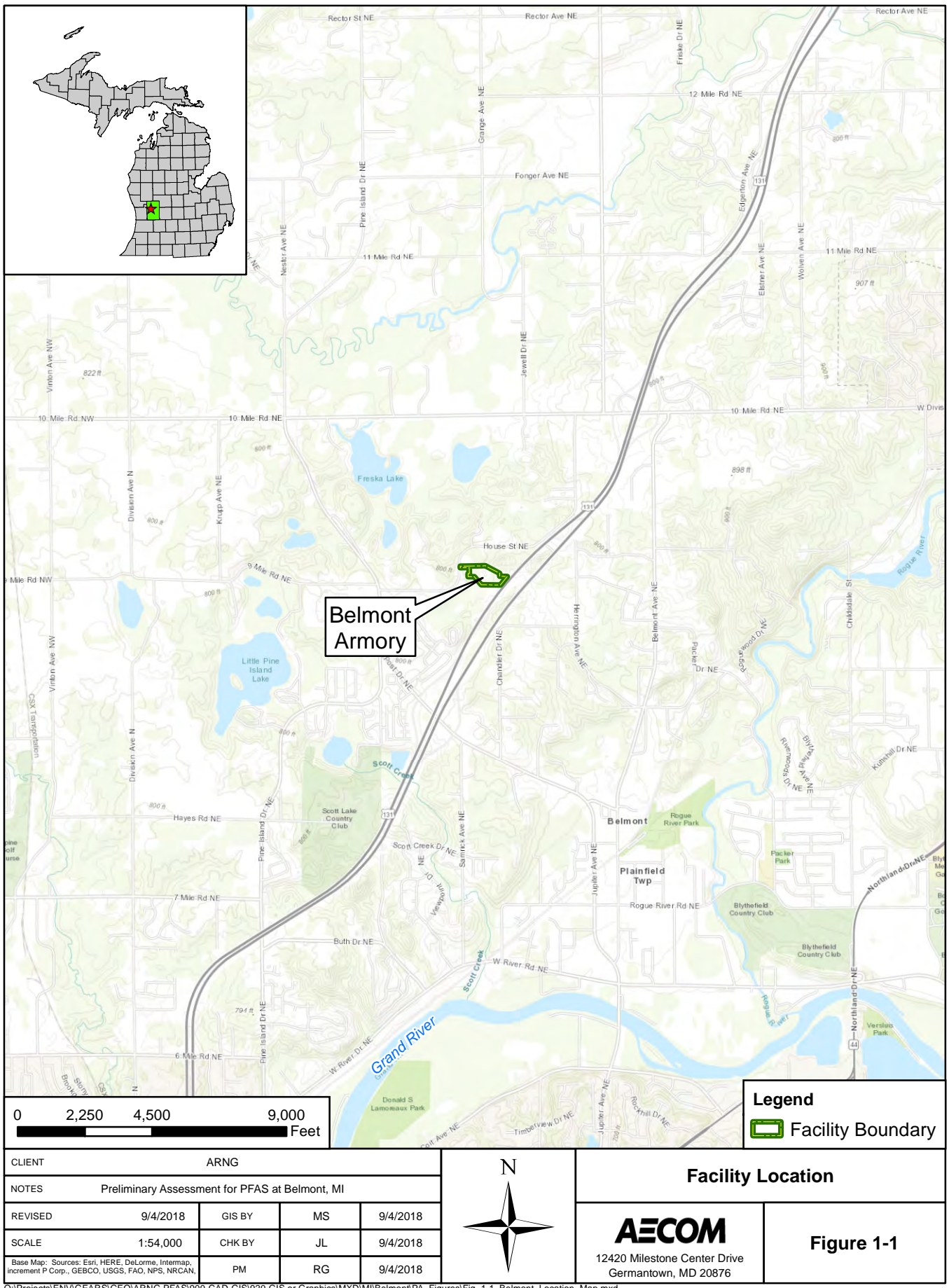
Climate data was unavailable for the area immediately surrounding Belmont Armory. The following data presented is for the nearest available city, East Grand Rapids City, located approximately 10 miles to the south.

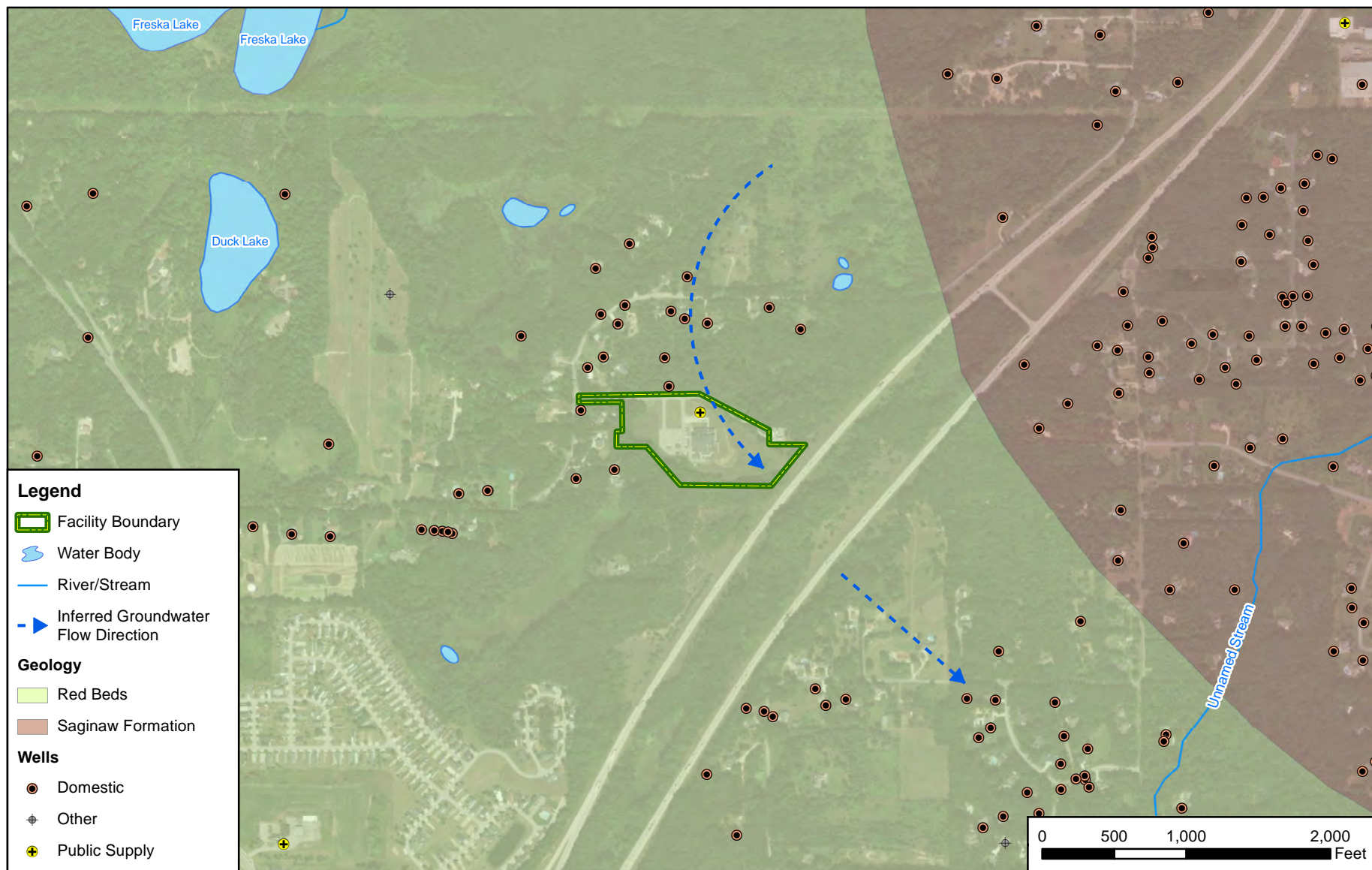
The climate in the area is temperate, with an average temperature of 49.2 °F. Seasonally, temperature ranges are moderate with an average summer temperature of 68 °F and an average winter temperature of 29 °F. Summer highs can reach into the low 80's °F while winter lows rarely drop below 20 °F. Rainfall is evenly dispersed throughout the year, averaging approximately two to five inches per month. The remaining precipitation falls predominantly as snowfall, reaching an average of 20 inches per month in the winter months and 1 to 2 inches per month in late fall/early spring (NOAA, 2018).



1.5.5 Current and Future Land Use

According to a Plainfield Charter Township Zoning Map dated 13 April 2018, the facility is located within mixed rural and residential land use (Plainfield Charter Township, 2015). The building was retrofitted in 2012 from use as a church to suit current armory operations. Some of the original infrastructure remains, including the original water sprinkler system for fire suppression. The building includes offices, large storage areas, and an amphitheater. Interviews with current and former armory personnel indicated the facility is mainly used for classroom based training and 126 Army Band activities. The armory has been used to store tactical vehicles and used for recruiting activities since late 2017.

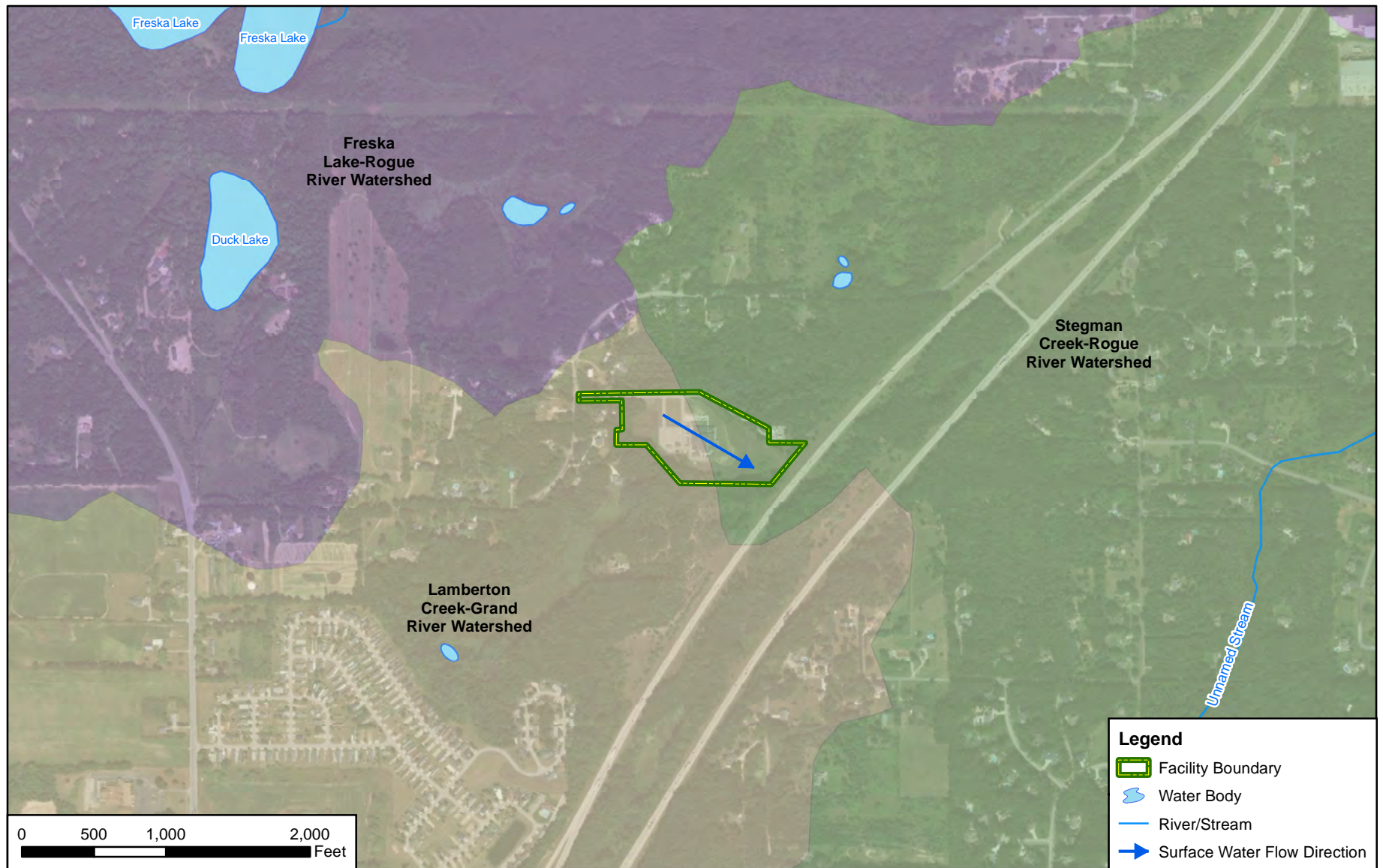
Reasonably anticipated future land use is not expected to change from the current land use described above.







CLIENT					<div>N</div> 	TITLE		
PROJECT						Groundwater Features		
REVISED							12420 Milestone Center Drive Germantown, MD 20876	Figure 1-2
SCALE								
Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community Well Data: MDEQ								
3/11/2019		GIS BY	MS	3/11/2019				
1:12,000		CHK BY	JL	3/11/2019				
		PM	RG	3/11/2019				

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CLIENT					<div>N</div> 	TITLE			
PROJECT						Surface Water Features			
REVISED		3/11/2019	GIS BY	MS		3/11/2019		12420 Milestone Center Drive Germantown, MD 20876	Figure 1-3
SCALE		1:12,000	CHK BY	JL		3/11/2019			
Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community			PM	RG		3/11/2019			
Preliminary Assessment for PFAS at Belmont, MI									

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2. Fire Training Areas

No FTAs were identified at Belmont Armory during the PA. According to an interview with a former armory manager (**Appendix B**), firefighting support via water trucks is coordinated with the Plainsfield Township Fire Department. However, firefighting training has never occurred at Belmont Armory.

3. Non-Fire Training Areas

No Non-FTAs were identified at Belmont Armory during the PA. Current and former facility managers stated during interviews that activities associated with PFAS containing materials (i.e., waterproofing activities) have not been conducted at the armory (**Appendix B**). The fire suppression system at the armory is the original water sprinkler system from previous church occupancy. Photographs of the water sprinkler system are included in the Photographic Log (**Appendix C**).

4. Emergency Response Areas

No instances of emergency response were identified at Belmont Armory during the PA. Helicopters reportedly often land at the armory; however, no crashes have occurred. Coordination of firefighting support via water trucks is made with the Plainsfield Township Fire Department but there has been no need for response as of the date of the PA interviews (**Appendix B**).

5. Adjacent Sources

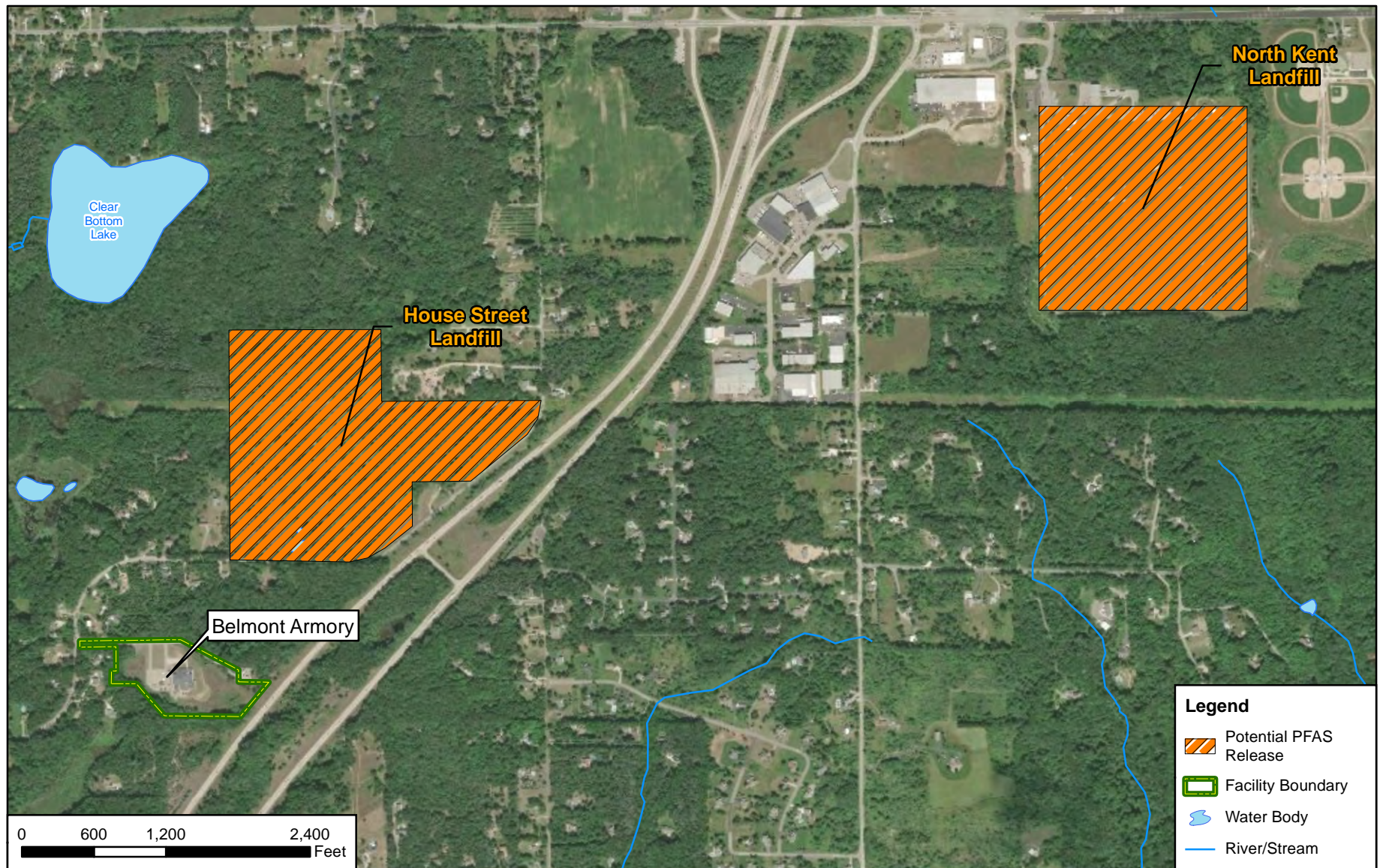
Two off-site PFAS sources adjacent to the Belmont Armory facility were identified during the PA through interviews (**Appendix B**), online research, review of reports, and the Environmental Data Resource (EDR) Report (**Appendix A**). Both sites are associated with the same activities from a single commercial business. **Figure 5-1** presents the location of potential adjacent source areas.

5.1 Wolverine Worldwide House Street and North Kent Landfills

Located approximately 2,000 feet northeast of Belmont Armory is a landfill formerly used by Wolverine Worldwide, Inc. (Wolverine). This property was used during the mid-1960s as a licensed landfill for the disposal of solid waste. Wolverine disposed of industrial wastes generated from the production of water resistant consumer products, specifically, lime-sludge wastes from the treatment of tanning wastes generated by the nearby Rockford tannery. Lime slurry wastes were also disposed of in trenches dug across the property; seepage pits, on the property were used for disposing of lime liquor (a mixture of lime, water, dissolved protein, and fat), and other liquid wastes (State of Michigan, 2018). The landfill is located hydraulically upgradient of the armory, at the following geographic coordinates 43° 6'24.47"N and 85°37'17.96"W.


Wolverine and the Michigan Department of Environmental Quality (MDEQ) began sampling drinking water in April 2017 after citizens expressed concern regarding landfill impacts (State of Michigan, 2018). During PA interviews, a former armory manager confirmed that the drinking water well for the armory was tested for PFAS in May 2017. Well water at the armory was found to contain PFAS compounds above the combined USEPA health advisory level of 70 ppt. The combined concentration of PFOA and PFOS was 96.9 ppt and total PFAS was 421.5 ppt; the armory was switched to bottled water at that time. Wolverine and MIARNG worked in conjunction with MDEQ to install a two-stage activated carbon treatment system for the armory's groundwater well, which has been in operation since October 2018 and is currently being monitored for effectiveness. Wolverine and MDEQ have subsequently expanded drinking water sampling within the surrounding communities; PFAS has been found in drinking water above the combined USEPA health advisory level in private wells at numerous homes.

The North Kent (Ten Mile) Landfill, located approximately 1.5 miles northeast of the Armory (geographic coordinates 43° 6'45.76"N and 85°35'44.53"W), was also identified as having received several years' worth of tannery sludge from the Wolverine facility during the 1980s. Monitoring wells at the sampled in December 2017 by MDEQ found PFAS compounds above the combined USEPA health advisory level. An investigation of the area surrounding the landfill is currently being led by MDEQ (Kent County Health Department, 2018).



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REVISED	9/4/2018	GIS BY	MS	9/4/2018
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,		PM	RG	9/4/2018



TITLE		
Adjacent Sources		
 12420 Milestone Center Drive Germantown, MD 20876		Figure 5-1

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6. Conceptual Site Model

Based on the PA findings, no release areas were identified as areas of interest (AOIs) at Belmont Armory. A conceptual site model identifies three components necessary for potentially complete exposure pathways related to a site: (1) source, (2) pathway, and (3) receptor. If any of these elements are missing, the pathway is considered incomplete. Based on the findings of this PA, there are no PFAS sources that originate at Belmont Armory or from activities associated with the armory.

Drinking water at the armory was found to contain PFAS compounds above the combined USEPA health advisory level. Sampling conducted by the National Guard Bureau in May 2017 found a combined PFOA and PFOS concentration of 96.9 ppt in drinking water. Exposure of Belmont Armory personnel to PFAS contaminated drinking water, resulting from off-site non-Department of Defense, non-ARNG releases of PFAS from former landfills associated with Wolverine, has been eliminated through installation of a whole building drinking water filter system. MIARNG is working with MDEQ and the local health department to monitor the currently operating filter system that is intended to remove PFAS to below action levels. The system was activated in October 2018. Prior to operation of the filter, between May 2017 and October 2018, bottled water was supplied to the Armory for consumption. Off-site investigations are ongoing by others.

7. Conclusions

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

7.1 Findings

Two off-facility former landfills located adjacent to the Belmont Armory have been identified as potential PFAS sources (**Figure 7-1**). Both landfills were formerly used by Wolverine World Wide, Inc. to dispose of industrial wastes generated from the production of water resistant consumer products. PFAS have been confirmed in groundwater/drinking water at Belmont Armory and private wells located in adjacent communities and complete exposure pathways exist for PFAS contamination in groundwater in association with the two former off-facility landfills. Both off-facility PFAS sources were identified through interviews with Belmont Armory personnel, independent research, and the EDR Report. Interviews were not conducted with landfill staff and the site visit did not include visiting the landfills. Off-site investigations at these adjacent sources are ongoing by others.

Based on the documented absence of the use or release of PFAS-containing materials at Belmont Armory, evidence does not support current or former ARNG activities at the armory having contributed to PFAS contamination in soil, groundwater, surface water, or sediment at the facility or adjacent areas. No AOIs related to PFAS release were identified at Belmont Armory based on PA data.

7.2 Uncertainty

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

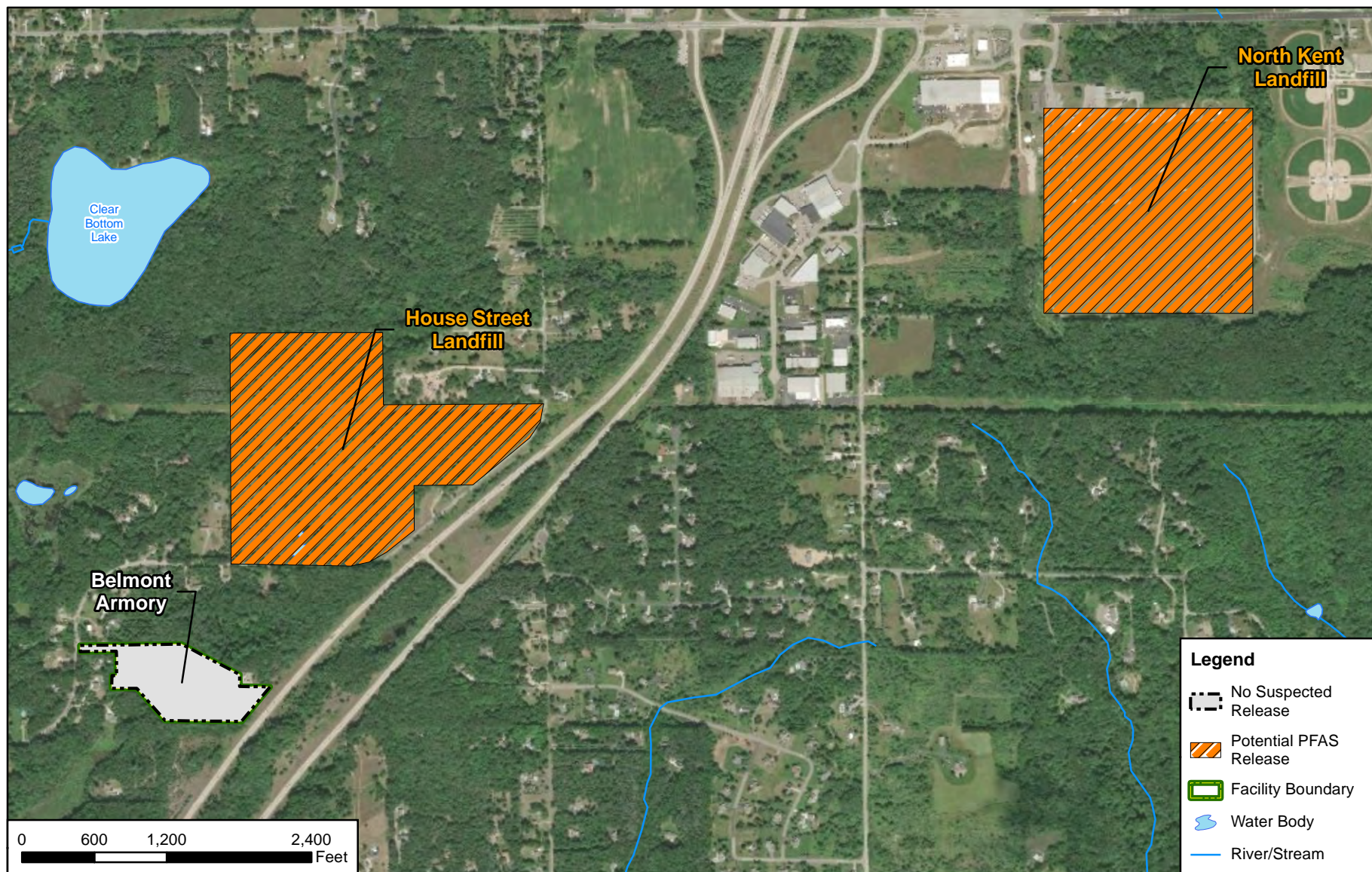
The conclusions of this PA are predominantly based on the information provided during interviews with personnel who had direct knowledge of PFAS use at the facility. Sometimes the provided information is vague or conflicts with other sources. Gathered information has a degree of uncertainty due to the absence of written documentation, the limited number of personnel with direct knowledge due to staffing changes, the time passed since PFAS was first used (early 1970s), 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. Comprehensive information on all industrial practices that may potentially be sources of PFAS is incomplete. Therefore, this PA may not identify all potential PFAS sources.

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

No AOIs were identified at Belmont Armory. Based on the historical and current use of the facility, and the well documented off-facility sources, minimal uncertainty is associated with the findings of this PA.


7.3 Potential Future Actions

Based on the documented absence (2014-present) of the use or release of PFAS-containing materials at Belmont Armory, no AOIs were identified during the PA. Evidence does not indicate that current or former ARNG activities contributed PFAS contamination to soil, groundwater, surface water, or sediment at the facility or adjacent areas. Belmont Armory will not move forward in the CERCLA process.



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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA,		PM	RG	9/4/2018



TITLE		Summary of Findings
	12420 Milestone Center Drive Germantown, MD 20876	Figure 7-1

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8. References

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Appendix A

Data Resources

Data resources will be provided separately on CD. Data resources for Belmont Armory include:

Previous Investigations Completed

- 2018 The EDR Radius Map Report with GeoCheck; Aerial Photo Decade Package; & Certified Sanborn Map Report; Target Property Belmont Armory, 1650 House St. NE, Belmont, Michigan 49306.
- 2017 Conceptual Site Model and Remedial Investigation Work Plan, Former House Street Disposal Area, Wolverine World Wide, Inc.

Miscellaneous Data Resources

- Wellogic Water Well and Pump Record for Belmont Armory Type II drinking water well.
- 2018 News Update on Northern Kent County PFAS Investigation
- 2018 Public Notice Regarding North Kent (Ten Mile) Landfill Water Testing Results

Appendix B

Preliminary Assessment Documentation

Appendix B.1

Interview Records

PA Interview Questionnaire - Other

Facility: Belmont Armory, MI

Interviewer: Jennifer Li

Date/Time: 4/18/2018 @ 1100 EST

Interviewee: [REDACTED] Title: Current Facility Manager (Armory Manager) Phone Number: [REDACTED] Email: [REDACTED]	Can your name/role be used in the PA Report? <input checked="" type="radio"/> Y or N Can you recommend anyone we can interview? Y or <input checked="" type="radio"/> N
Roles or activities with the Facility/Years working at the Facility:	
Armory Manager 1 January 2018 to present overlap since October 2017 with former Armory Manager.	
What is the current use of the facility? Armory, NGI recruiters, HQ HHC G3 troop end, and 126 Army Band Armory previously used as a church.	
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 built), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?	
Has AFFF or other PFAS containing material (i.e., waterproofing or "scotch guarding") been used at the facility?	Known Uses
none.	Use
	Procurement
	Disposition
What is the current fire suppression system at the facility?	Storage (Mixed)
water based sprinkler system	Storage (Solution)
	Inventory, Off-Spec
	Containment
	SOP on Filling
	Leaking Vehicles
	Nozzle and Suppression System Testing
	Dining Facilities
	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Belmont Armory, MI

Interviewer: Jennifer Li

Date/Time: 4/18/2018 @ 1100 EST

Were any current/past buildings constructed with AFFF dispensing systems or fire suppression systems?

not aware of any ever

Have any city, county, and/or state personnel came on-post for training? If so, please state which state/county agency or military entity?

Host classroom based training for ARNG personnel

Any specific emergency response incidents at the facility (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?

not since been there.

Was AFFF ever brought to the facility for use by other entities? Official use or other?

no.

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? Integrated Contingency Plan?

not aware of any.

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

not aware of any.

PA Interview Questionnaire - Other

Facility: Belmont Armory, MI
Interviewer: Jennifer Li
Date/Time: 4/16/2018 @ 1100 EST

Interviewee: [REDACTED] Title: Former Facility 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) no additional
Roles or activities with the Facility/Years working at the Facility: late 2014 - 2017 (dec)	
First Facility Manager @ armory	
When was the facility constructed or purchased? What was the building prior to ARNG use?	
Purchased ~ 2012, 2-phases of construction to retrofit from Church to armory	
What is the current use of the facility? Armory, HQ HHC 63 troop command. 126 Army Band.	
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 builds), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?	
- none - no farm use or other PFAS materials	Known Uses - none
- water sprinkler system used in previous church still used today	Use
	Procurement
	Disposition
- no waterproofing activities - carpet cleaned once professionally	Storage (Mixed)
	Storage (Solution)
- until recently didn't store tactical vehicles; until late 2017.	Inventory, Off-Spec
	Containment
	SOP on Filling
- May 2017, MI ARNG switched facility to bottled water after testing of GW	Leaking Vehicles
	Nozzle and Suppression System Testing
	Dining Facilities
- May 10, 2017 Tetra Tech Sampled DW.	Vehicle Washing
	Ramp Washing
	Fuel Spill Washing and Fueling Stations
	Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Belmont Armory, MI
Interviewer: Jennifer Li
Date/Time: 4/16/2018 @ 1100 EST

Were any current/past buildings constructed with AFFF dispensing systems or fire suppression systems?

No - original fire suppression system of church is still in place to date - water sprinkler system.

Have any city, county, and/or state personnel came on-post for training? If so, please state which state/county agency or military entity?

Military helicopters routinely land - no foam, no accidents
Coordinated w/ local FD for water trucks - Plainfield Township FD but not used.

Any specific emergency response incidents at the facility (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?

no incidents

Was AFFF ever brought to the facility for use by other entities? Official use or other?

no

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? Integrated Contingency Plan?

→ Phase II construction had siting since - no known report as plan
- no NPDES Permits
- Rob has ICP + will send, water system vulnerability study too

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

- PFAS sampling results - Rob MacLeod to send.

Appendix B.2

Visual Site Inspection Checklists

Visual Survey Inspection Log

Recorded by: Joe Witte
 ARNG Contact: [REDACTED]
 Date: Dec 5, 2017

Source/Release Information

Site Name / Area Name / Unique ID:

Belmont Armory

Site / Area Acreage:

5.25 acres (based on google aerial imagery)

Historic Site Use (Brief Description):

Church

Current Site Use (Brief Description):

MIARNG Armory and band practice

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

☒ Y ☐ N

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

2. Has usage been documented?

☒ Y ☐ N

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

3. What types of businesses are located near the site?

Industrial / Commercial / Plating / Waterproofing Residential

3a. Indicate what businesses are located near the site

Residential area

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

☒ Y ☐ N

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

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: No AFFF, only water used

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?

NA

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation?

☒ Y ☐ N

1a. If so, note observation and location:

East and south away from the Armory

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

☒ Y ☐ N

2a. If so, please note observation and location: Stormwater retention pond east of site

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

☒ Y ☐ N

3a. If so, please note the location: Immediately north of armory building on site property approx. 100 feet north of Armory building.

4. Are surface water intakes located near the site?

☒ Y ☐ N

4a. If so, please note the location: Stormwater retention pond east of site approx. 0.05 miles. No SW intakes.

5. Is there a wind sock present within the site/area?

☒ Y ☐ N

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

5b. Is wind sock log information available? NA

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): Formerly used as a church, additional storage area constructed on north and east sides of armory

2. Is the site/area vegetated?

☒ Y ☐ N

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

3. Does the site or area exhibit evidence of erosion?

☒ Y ☐ N

Visual Survey Inspection Log

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:

Stormwater Retention pond

Receptor Information

1. Is access to the site restricted?

☒ Y ☐ N

1a. If so, please note to what extent:

Locked gate, however, the gate is never closed

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:

Only MIARNG use site, city access to radio tower

3. Are residential areas located near the site?

☒ Y ☐ N

3a. If so, please note the location/distance:

House street is a residential street approx. 0.1 miles from the access gate (to the west). Nearest residential driveways less than 0.1 miles west of site.

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

☒ Y ☐ N

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

Described as on Post St, roughly 10 mins away
*Chandler Woods Charter Academy roughly 0.85 miles south of site on Post Drive.

5. Are any wetlands located near the site?

☒ Y ☐ N

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

Freshwater pond, freshwater emergent wetland, and freshwater forested shrub wetland approx 0.2 miles southwest of site.

Additional Notes

- Construction currently visible on Google imagery is currently complete
- Spoke with MSG [redacted] and SAG [redacted]
- Left interview forms with MSG [redacted] to be distributed and returned

Photographic Log

Photo ID/Name	Date & Location	Photograph Description

Appendix B.3

Conceptual Site Model Information

Preliminary Assessment – Conceptual Site Model Information

Site Name: Belmont Armory

Why has this location been identified as a site?

PFAS detections in drinking water at Belmont Armory as well as surrounding areas as a result of Wolverine Shoe Company dumping waste nearby.

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

Wolverine disposal site nearby.

Training Events

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

If so, how often? NA

How much material was used? Is it documented? NA

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? Radially east, southeast, south, and potentially southwest

Average rainfall? 38 inches annually (NOAA, 2017), snowfall = 76 inches annually

Any flooding during rainy season?

Direct or indirect pathway to ditches? Yes

Direct or indirect pathway to larger bodies of water? No

Does surface water pond any place on site?

Any impoundment areas or retention ponds?

Stormwater retention pond east of site by 0.05 miles and freshwater pond 0.2 miles southwest of site

Any NPDES location points near the site?

How does surface water drain on and around the flight line? No flight line

Preliminary Assessment – Conceptual Site Model Information

Groundwater:

Groundwater flow direction? Assumed general south/southeast

Depth to groundwater?

Uses (agricultural, drinking water, irrigation)? Drinking, however, all taps and water fountains have posted signs to not use at Army

Any groundwater treatment systems? water softener system

Any groundwater monitoring well locations near the site?

Is groundwater used for drinking water?

Are there drinking water supply wells on installation?

Do they serve off-post populations?

Are there off-post drinking water wells downgradient

Yes, on site property. No.

Designed to, but not currently.

Yes

No

Yes

Waste Water Treatment Plant:

Does the installation have a WWTP?

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

Is surface water from potential contaminated sites treated?

No

No

No

Equipment Rinse Water

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

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?

3. Other?

Identify Potential Receptors:

Site Worker

Construction Worker

Recreational User

Residential

Child

Yes

No

No

Yes

Yes

Preliminary Assessment – Conceptual Site Model Information

Ecological Kent County T&E species: Snuffbox mussel, Karner blue butterfly, Indiana bat, northern long-eared bat,
Note what is located near by the site (e.g. daycare, schools, hospitals, churches, agricultural, livestock)? eastern massasauga

Residential areas near site. Not much else. Highway 131 east & south of site.

Documentation

Ask for Engineering drawings (if applicable). To be requested from JFQ.

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

Construction completed to transform former church to Belmont Armory
in _____

Appendix C

Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Belmont Armory	Belmont, Michigan
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Photograph No. 1

Description:

No drinking sign posted to water fountain inside Belmont Armory. Sign reads:

“Do Not Consume Belmont Tap Water Until Further Notice; As of: 30 May 2017; No water consumption, coffee, or cooking.”



Photograph No. 2

Description:

Potable well at the Belmont Armory facility located north of the armory building. View facing east.



APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Belmont Armory	Belmont, Michigan
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Photograph No. 3

Description:

Stormwater retention pond
east of Belmont Armory.
Highway (US-131) visible in
background.



Photograph No. 4

Description:

Diesel generator powered
water sprinkler system at
Belmont Armory.

