

Time-Critical Removal Action Action Memorandum

Camp Grayling Cantonment and Lake Margrethe, MI

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

March 2021

Prepared for:



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I. Purpose

The purpose of this Action Memorandum is to document the approval and decision by the Army National Guard (ARNG) to conduct a Time-Critical Removal Action (TCRA) in response to the release of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) from operations conducted within the Cantonment and shoreline area along a portion of Lake Margrethe (also referred to as the “Site”), a portion of Camp Grayling Joint Maneuver Training Center (JMTC), located in Crawford County, Michigan (**Appendix A – Figure 1**). The chosen removal action for the affected properties (one at this time) is to provide drinking water through bottled water as appropriate until the installation of whole house filter systems.

Based on ARNG response actions conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and State of Michigan sampling efforts, PFOS and PFOA have been detected in groundwater at the Site and in off-installation, residential drinking water wells located north of the Cantonment boundary on the southeastern side of Lake Margrethe. Based on these preliminary efforts, it appears that PFOS and PFOA attributable to ARNG operations at the Site have impacted drinking water supplied by shallow, residential drinking water wells, where there are detections above the United States (US) Environmental Protection Agency (USEPA) Health Advisory. The Health Advisory is 70 parts per trillion (ppt) for PFOS and PFOA, individually or combined.

As discussed further in **Section B.1**, investigation efforts are underway to evaluate PFOS and PFOA in groundwater at the Site. The ARNG is completing a CERCLA Site Inspection (SI) to evaluate the presence or absence of PFOS and PFOA in groundwater at potential PFOS and PFOA release areas located within the Cantonment and shoreline area along a portion of Lake Margrethe. Additionally, Michigan Department of Environment, Great Lakes, and Energy (EGLE) has been conducting off-installation residential drinking water well testing and groundwater sampling.

This Action Memorandum is issued in accordance with and satisfies the requirements of CERCLA, Title 42 United States Code (USC) §9601 et seq., as further implemented by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Title 40 Code of Federal Regulations (CFR) Part 300. This Action Memorandum is also consistent with *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA, 2009) and *Army Decision Document Guidance* (US Army, 2018).

II. Site Conditions and Background

A. Site Description

1. Physical Location

The Cantonment and shoreline area along a portion of Lake Margrethe are part of Camp Grayling JMTC, which is located in Grayling Township, Michigan contained within portions of Crawford, Kalkaska, and Otsego counties (**Appendix A - Figure 1**). Camp Grayling JMTC is divided by Interstate Highway 75 and is approximately 200 miles northwest of Detroit and 80 miles south of Michigan's Upper Peninsula.

Camp Grayling JMTC is the National Guard's largest training post. Features of Camp Grayling JMTC include training facilities and support services for the ARNG, Air National Guard, US Army, US Army Reserve units, and allied forces. The installation is located in the north-central portion of the Lower Peninsula and is bisected by the Au Sable River into two areas: the North Post and the South Post. The Cantonment borders the southern end of Lake Margrethe within the northern portion of the South Post, located approximately 3 miles southwest of Grayling Army Airfield (GAAF).

2. Site Description

The Cantonment contains support facilities, including barracks, range control, Officers Club, Post Exchange, parade grounds, athletic fields, a waste water treatment plant, administrative buildings, recreational areas, and lakeside cabins. Access to the area is controlled by guarded gate entry. Private lands and residences abut the northern portion of the Cantonment along the southeastern corner of Lake Margrethe (Michigan Department of Military and Veterans Affairs [MDMVA], 2007).

3. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

At the Site, based on information gathered during ARNG CERCLA response actions, in conjunction with state and local actions, the presence of PFOS and PFOA in groundwater indicates a release of a pollutant or contaminant has occurred. Although delineation of PFOS and PFOA in groundwater has not been completed, results of groundwater sampling conducted by EGLE between September 2018 and April 2020 detected exceedances of the USEPA's Health Advisory of 70 ppt in monitoring wells situated at and downgradient of the Camp Grayling JMTC Cantonment boundary (EGLE, 2020). On 6 February 2020 and 10 September 2020, ARNG conducted sampling of off-installation residential drinking water wells and confirmed combined PFOS+PFOA concentrations in drinking water above USEPA's Health Advisory of 70 ppt in at least one residential well. In December 2020, the monitoring wells situated at the Camp Grayling JMTC Cantonment boundary were resampled by ARNG as part of a Supplemental SI effort, and the groundwater concentrations were confirmed to exceed the USEPA Health Advisory in two monitoring wells. Again, based on ARNG SI efforts, it appears that the Camp Grayling JMTC Cantonment area is the source of the PFOS+PFOA detected above the USEPA Health Advisory in the subject residential drinking water wells. Therefore, the ARNG will take appropriate removal action under CERCLA, as identified in this Action Memorandum, to protect human health.

4. National Priorities List Status

Camp Grayling JMTC is not listed on the National Priorities List, has not received nor is it expected to receive a Hazard Ranking System rating, and will not be referred to the site assessment program. The ARNG is performing this work at the Site as the lead agency under CERCLA and Executive Order 12580.

B. Other Actions to Date

1. Previous Actions

Cantonment and Lake Margrethe – Residential Well Sampling

Drinking water samples from residential drinking water wells around Lake Margrethe have been tested for PFOS and PFOA. According to the residential drinking water map (**Appendix A – Figure 2**), 447 residential well samples have been collected by EGLE, of which two samples contained PFOS+PFOA above the USEPA Health Advisory of 70 ppt. As of 6 January 2021, the number of residential well samples collected by EGLE has been expanded to 505, although no additional exceedances of the USEPA Health Advisory have been detected (EGLE, 2021). The two sample exceedances were located on the southeastern corner of Lake Margrethe, directly north of the Camp Grayling JMTC Cantonment boundary.

EGLE has led drinking water sampling efforts for off-installation drinking water. ARNG completed additional drinking water sampling where there were exceedances of 70 ppt. Based on the data collected as of September 2020, one of the wells exceeded the USEPA Health Advisory.

2. Current Actions

CERCLA Investigations

The ARNG is assessing PFOS and PFOA releases associated with Camp Grayling JMTC, following the CERCLA process. In 2018, ARNG completed a Preliminary Assessment (PA) Report for PFOS and PFOA at Camp Grayling JMTC. As part of the PA, ARNG completed a records review, site visit, interviews, and visual site inspection. No environmental samples were collected as part of the PA. At the Site, six Areas of Interest (AOIs) were identified as potential PFOS and PFOA sources (AECOM, 2018a-b).

ARNG is completing an SI to evaluate the presence or absence of PFOS and PFOA releases at the six AOIs identified by the PA. The monitoring wells situated at the Camp Grayling JMTC Cantonment boundary were sampled by ARNG in December 2020 as part of a Supplemental SI effort, and the groundwater concentrations exceeded the USEPA Health Advisory in two monitoring wells (**Appendix A – Figure 3**).

ARNG performed additional residential sampling along Borchers Way, north of the Cantonment boundary and southeast of Lake Margrethe, for the two residences that had PFOS+PFOA exceedances of the USEPA Health Advisory. Based on the ARNG sampling, one residential drinking water well continued to exceed the USEPA Health Advisory of 70 ppt for PFOS+PFOA. The data collected through the ARNG's PA and ongoing SI indicate the likely existence of a PFAS release area upgradient of Borchers Way on Camp Grayling that has impacted off-installation residential drinking water.

This TCRA Memorandum addresses the drinking water location shown on **Appendix A - Figure 4**, named "Time Critical Removal Action Focus Area". The TCRA Focus Area includes the drinking water well at affected properties located along Borchers Way (one at this time), southeast of Lake Margrethe, with PFOS+PFOA concentrations above the USEPA Health Advisory of 70 ppt.

C. State and Local Authorities' Role

State and local authorities involved at Camp Grayling JMTC include: EGLE, District Health Department #10, Grayling Township, City of Grayling, Michigan Department of Health and Human Services, Michigan Department of Natural Resources, and Michigan Department of Agriculture and Rural Development. The ARNG has coordinated efforts relating to its CERCLA PA/SI and this TCRA with these state and local authorities.

1. State and Local Actions to Date

As of 6 January 2021, a total of 505 drinking water samples were collected off-installation around Lake Margrethe by EGLE. A subset (447 samples) of the drinking water samples collected are represented on **Appendix A - Figure 2**. Two residences located along Borchers Way on the southeast side of Lake Margrethe, directly north of the Camp Grayling JMTC Cantonment boundary, had groundwater exceedances of the USEPA Health Advisory (EGLE, 2021).

Subsequently, EGLE initiated actions to delineate PFAS in groundwater in the southeast corner of Lake Margrethe. EGLE sampled groundwater, surface water, and pore water within the area. Between September 2018 and April 2020, EGLE installed and sampled monitoring wells situated at and downgradient of the Camp Grayling JMTC Cantonment boundary and detected PFOS and PFOS+PFOA exceedances of the USEPA's Health Advisory of 70 ppt (EGLE, 2020). A subset of approximately 10% of the data underwent data validation. The EGLE data suggest an upgradient source originating from the Cantonment area of Camp Grayling JMTC. These results were confirmed by an ARNG Supplemental SI sampling effort of the monitoring wells situated at the Camp Grayling JMTC Cantonment boundary (**Appendix A – Figure 3**).

2. Potential for Continued State/Local Response

EGLE reports that it plans to continue to monitor new residential sampling requests and contact residents to set up sampling dates and times. The ARNG will continue to coordinate its CERCLA actions with EGLE as appropriate.

III. Threat to Public Health or Welfare and Statutory and Regulatory Authorities

A. Threat to Human Health

Based on information gathered during ARNG CERCLA response actions, the ARNG identified potential threat to human health due to the presence of PFOS and PFOA that appear to be from past operations at the Camp Grayling JMTC Cantonment area. Specifically, exceedances in drinking water of the USEPA Health Advisory have been confirmed for the off-installation property that is downgradient of the Camp Grayling JMTC Cantonment boundary. Based on the site-specific circumstances, a TCRA is warranted to address potential exposure to PFOS and PFOA in drinking water, where sampling of the residential drinking water well has identified an exceedance of the USEPA Health Advisory. In accordance with the NCP (40 CFR § 300.415(b)(2)), the following factors warrant this TCRA:

- i. “Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants” and
- ii. “Actual or potential contamination of drinking water supplies or sensitive ecosystems.”

B. Statutory and Regulatory Authorities

PFOS and PFOA are not identified as hazardous substances as determined by CERCLA; however, they may be addressed under CERCLA and the NCP as pollutants and/or contaminants. The concentrations of PFOS+PFOA detected in a residential drinking water well above the USEPA Health Advisory of 70 ppt poses a potential threat to human health based on DoD and Army policy to take action to mitigate drinking water where individual or combined concentrations of PFOS and PFOA exceed the USEPA Health Advisory. The TCRA presented in this action memorandum is taken in accordance with 40 CFR §§ 300.415(b)(1), (b)(2)(i) & (ii), and (b)(3).

IV. Proposed Removal Action and Estimated Costs

A. Proposed Action – Bottled Water and Installation of Whole House Filtration Systems to Residents in the Southeast side of Lake Margrethe

1. Description

The Removal Action Objective (RAO) of this TCRA is to prevent risk to human health posed by PFOS and PFOA in drinking water at levels exceeding the USEPA Health Advisory through the supply of bottled water until installation of one whole house water filtration system to the affected property owners where PFOA and PFOS concentrations in drinking water are above the USEPA Health Advisory of 70 ppt. This proposed action would meet the RAO by providing bottled water until whole house filtration systems can be installed at affected properties in the TCRA Focus Area (**Appendix A - Figure 4**), in this case one home. The following tasks are associated with this Proposed Action Option:

- Whole House Filtration System installation

- Whole House Filtration System replacement filter cartridge
- Bottled Water Supply

All affected properties (one at this time) will have whole house filtration systems installed, and each will receive one replacement filter. The replacement filter cartridges, manufactured by OptimH2O® (or other State- approved filter), are intended to last an estimated period of one year or up to 100,000 gallons of use. The OptimH2O® whole house filtration system is a State-approved, 0.5 micron-rate carbon block filter capable of reducing 98% of PFOA and PFOS.

Bottled water will be offered (to one homeowner at this time) and provided until the affected properties have been installed with whole house infiltration systems and confirmation sampling indicates Health Advisory levels are achieved, or if property owners choose not to receive a Whole House Filtration System.

2. Contribution to Remedial Performance

The ARNG is in the process of completing its SI for the Cantonment and Lake Margrethe; however, the removal action will eliminate the exposure to PFOS and PFOA in drinking water by providing bottled water and installing whole house filtration systems (one at this time) for the affected properties. The ARNG will continue to conduct response actions in accordance with CERCLA, consistent with the NCP, to address release(s) of PFOS and PFOA from ARNG activities at the Site.

3. Project Schedule

Assuming logistics (i.e., rights of entry, etc.) are expedited, it is anticipated that it would take approximately six months to achieve the RAO.

4. Estimated Costs

The estimated cost of this proposed action, which includes bottled water supply, installation of whole house filtration systems to the properties (one at this time) with PFOS+PFOA in drinking water above the USEPA Health Advisory of 70 ppt, and a replacement filter, is approximately \$16,000 per property.

V. Public Participation

The ARNG maintains close communications with the local community and regulators. Several public meetings have been conducted. As part of the outreach and investigation activities, Army personnel have also met with individuals to explain the on-going work. A public comment period of no less than 30 days will be held for this TCRA, in accordance with 40 CFR §300.820(b)(2), in order to notify the community of this action and answer any questions. The public comment period will not delay implementation of the TCRA.

VI. Recommendation and Signature

This Action Memorandum documents the decision for the removal action identified herein to address PFOS and PFOA in affected residential drinking water wells (one at this time) located along the southeastern side of Lake Margrethe and was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the site. Conditions at the site meet the NCP section 300.415(b)(2) criteria for determining that the proposed removal action is appropriate.

Authorizing Signature

Anthony Hammett
Colonel, U.S. Army
Chief, G-9 Army National Guard

22 March 2021

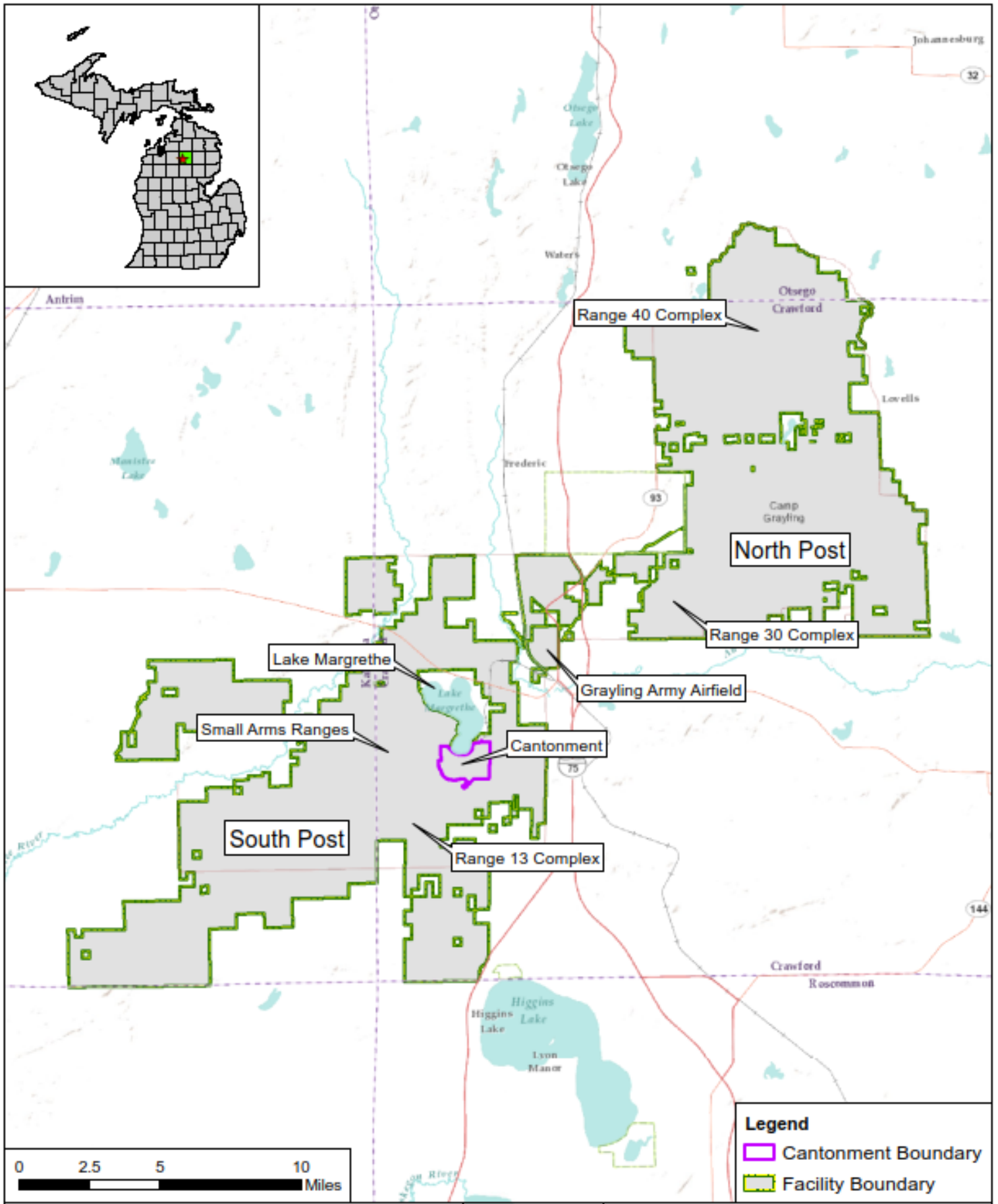
Date

VII. References

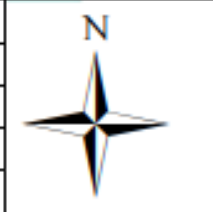
- AECOM Technical Services, Inc. 2018a. *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan, Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide Contract No. W912DR-12-D-004/W912DR17F0192*. 9 March 2018
- AECOM Technical Services, Inc. 2018b. *Final Preliminary Assessment Report, Camp Grayling, Michigan, Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites ARNG Installations, Nationwide Contract No. W912DR-12-D-0014/W912DR17F0192*. August 2018.
- AECOM Technical Services (for EGLE), Inc. 2019. *Camp Grayling – Lake Margrethe PFAS Remedial Investigation*. April 2019
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- Michigan Department of Military and Veterans Affairs (MDMVA). 2007. *Camp Grayling Maneuver Training Center Integrated Natural Resources Management Plan (2007-2011)*. January 2007.
- US Army, 2018. *Army Decision Document Guidance*. June 2018.
- USEPA, 2009. *Superfund Removal Guidance for Preparing Action Memoranda*. September 2009.

Appendix A – Figures

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CLIENT	ARNG			
Time Critical Removal Action for PFAS at Cantonment and Lake Margrethe, MI				
REVISED	1/30/2020	GIS BY	MS	1/30/2020
SCALE	1:316,800	CHK BY	ST	1/30/2020
Base Map: Sources: Esri, USGS, NOAA		PM	RG	1/30/2020
Sources: Esri, Garmin, USGS, NPS				

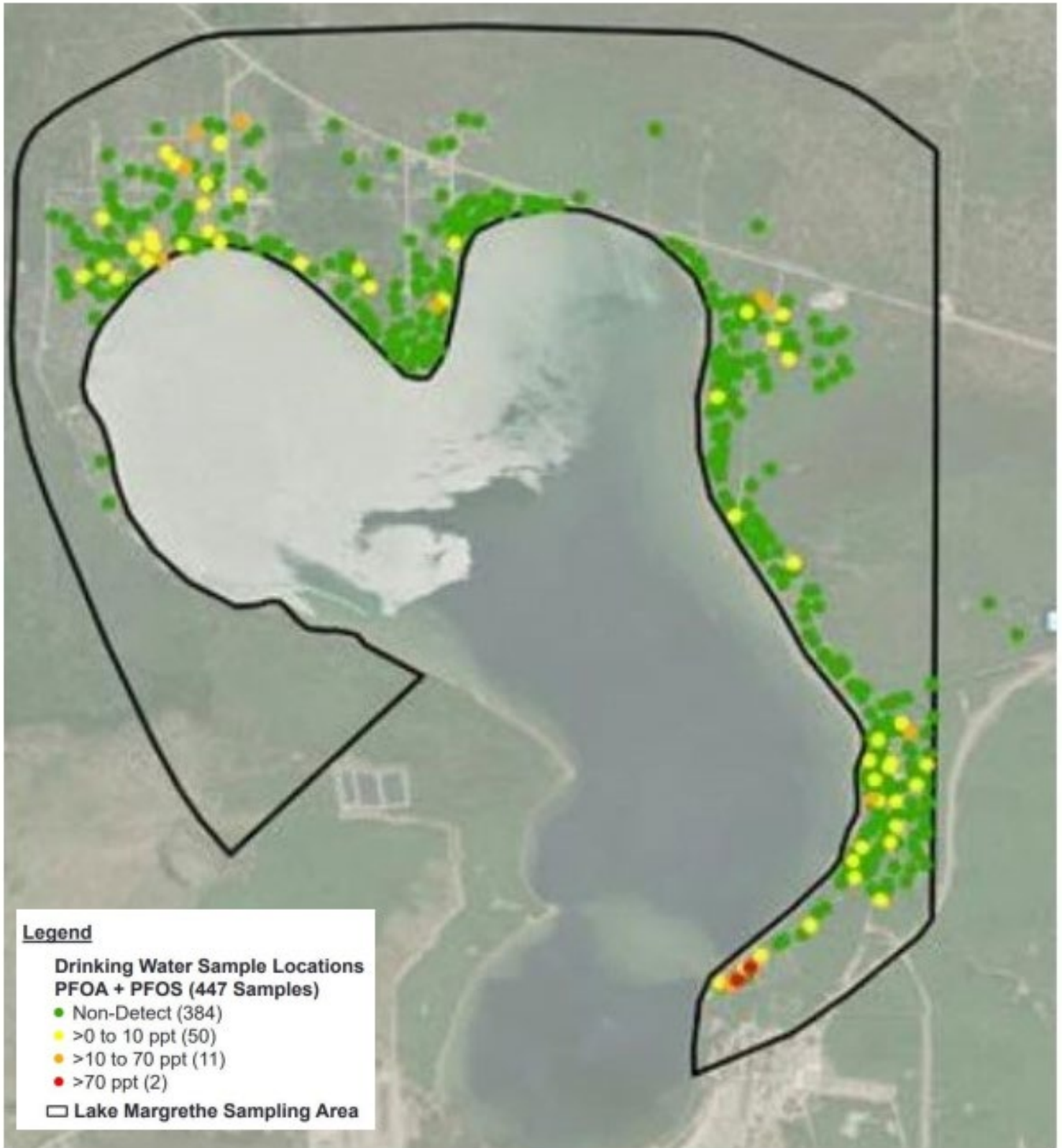


Camp Grayling JMTTC Site Location


AECOM

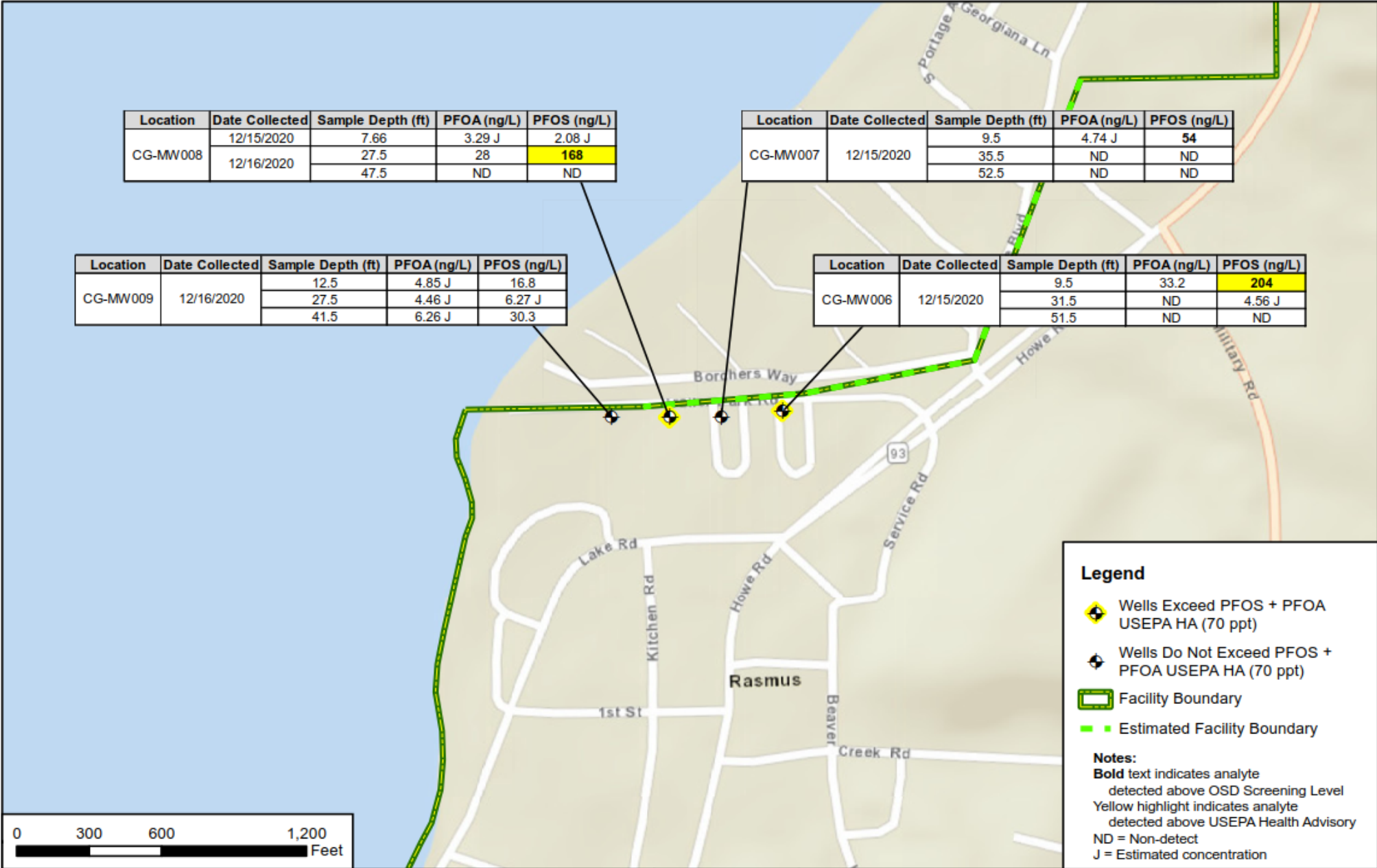
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1

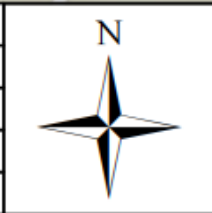


Source: EGLE, 2020. Camp Grayling - Lake Margrethe, Grayling, Crawford County. https://www.michigan.gov/pfasresponse/0,9038,7-365-86511_95645-488777--,00.html

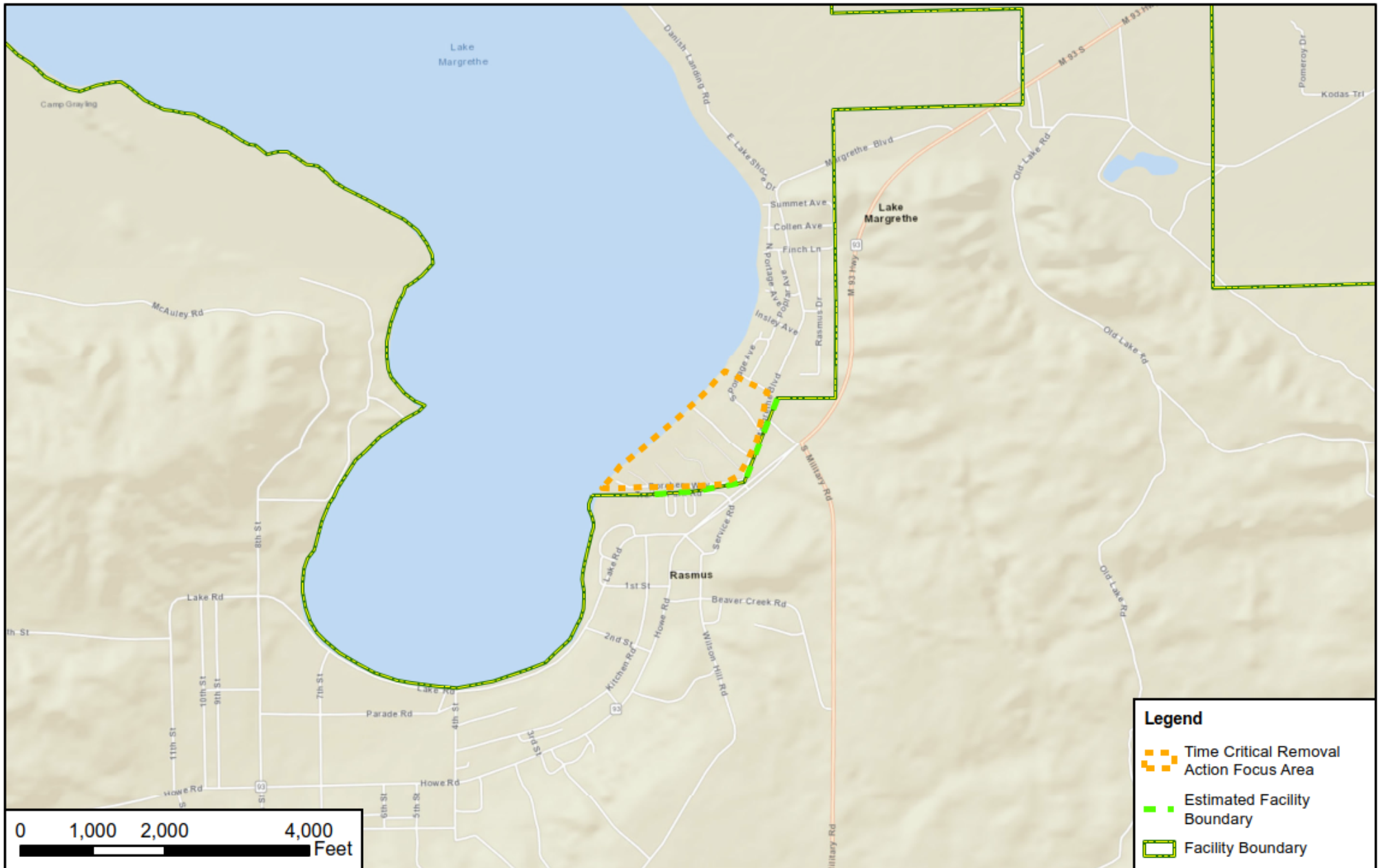
CLIENT		ARNG				PFOS and PFOA Residential Drinking Water Results	
Time Critical Removal Action for PFAS at Cantonment and Lake Margrethe, MI						AECOM	
REVISED	1/30/2020	GIS BY	MS	1/30/2020			
SCALE	1:316,800	CHK BY	ST	1/30/2020			
Base Map: Sources: Esri, USGS, NOAA Sources: Esri, Garmin, USGS, NPS		PM	RG	1/30/2020	12420 Milestone Center Drive Germantown, MD 20876		



CLIENT	ARNG			
PROJECT	Time Critical Removal Action for PFAS at Camp Grayling, MI			
REVISED	2/12/2021	GIS BY	GC	2/12/2021
SCALE	1:7,200	CHK BY	CM	2/12/2021
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	CM	2/12/2021	



TITLE		Cantonment and Lake Margrethe PFOS + PFOA Detections in Groundwater	
AECOM	12420 Milestone Center Drive Germantown, MD 20876		
	Figure 3		



Legend

- Time Critical Removal Action Focus Area
- Estimated Facility Boundary
- Facility Boundary

CLIENT	ARNG			
PROJECT	Time Critical Removal Action for PFAS at Camp Grayling, MI			
REVISED	2/2/2021	GIS BY	MS	2/2/2021
SCALE	1:24,000	CHK BY	ST	2/2/2021
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	2/2/2021	



TITLE		Time Critical Removal Action Focus Area
	12420 Milestone Center Drive Germantown, MD 20876	Figure 4

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