FINAL PRELIMINARY ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES

Devens Reserve Forces Training Area, Massachusetts

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Preliminary Assessment of Per- and Polyfluoroalkyl Substances

Devens Reserve Forces Training Area, Massachusetts

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EXECUTIVE SUMMARY

The United States Army (Army) is performing preliminary assessments (PAs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS), at Army installations nationwide. The PA identifies areas of potential interest (AOPIs) where PFAS-containing materials were used, stored, and/or disposed, or areas where known or suspected releases to the environment occurred. This Devens Reserve Forces Training Area (DRFTA) PA was completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, The National Oil and Hazardous Substances Pollution Contingency Plan, and Army/Department of Defense policy and guidance.

DRFTA is located in the towns of Harvard and Lancaster in Worcester County, Massachusetts, approximately 35 miles northwest of Boston, Massachusetts. DRFTA comprises approximately 5,089 acres and includes portions of the Main and North Posts, and all the South Post of Former Fort Devens. Fort Devens was identified for cessation of operations and closure under the Defense Base Realignment and Closure (BRAC) Act of 1990, and officially closed in March 1996. DRFTA was retained by the Army for reserve forces training.

Based on the results of the PA for DRFTA, one AOPI was identified:

- AOC 50: Former Moore Army Airfield

The AOC 50: Former Moore Army Airfield AOPI identified as a result of the PA at DRFTA, was included in historical PFAS investigations (i.e., site inspection investigations) led by BRAC and is currently included in ongoing PFAS investigations (i.e., remedial investigation) led by BRAC at Former Fort Devens.

1 INTRODUCTION

The United States (U.S.) Army (Army) is performing preliminary assessments (PAs) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS), at Army installations (installations) nationwide. The Army is the lead agency under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Executive Order 12580 and is conducting the PA/SI consistent with its authority under CERCLA, 42 United States Code §§ 9600, et seq. (as amended), and the Defense Environmental Restoration Program, 10 United States Code §§ 2701, et seq. The purpose of this PA is to identify locations that are areas of potential interest (AOPIs) at Devens Reserve Forces Training Area (DRFTA) based on the use, storage, and/or disposal of PFAS-containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances (Army 2018). This report provides the PA for DRFTA and was completed in accordance with CERCLA, The National Oil and Hazardous Substances Pollution Contingency Plan, and Army/Department of Defense (DoD) policy and guidance.

1.1 Project Background

PFAS are a class of compounds that have been used in a wide range of industrial applications and commercial products due to their unique surface tension/leveling properties. Due to industry and regulatory concerns about the potential health effects and adverse environmental impacts, there has been a reduction in the manufacture and use of PFAS worldwide. In the U.S., significant reductions in the production, importation, and use of PFOS and PFOA (two individual compounds in the PFAS class) occurred between 2001 and 2015 (Interstate Technology Regulatory Council 2017). PFBS replaced PFOS in some applications and is currently used and manufactured in the U.S.

In 2016, the United States Environmental Protection Agency (USEPA) established a lifetime health advisory of 70 nanograms per liter (ng/L) in drinking water for PFOS or PFOA and for the sum of PFOS and PFOA when both are present (USEPA 2016). On 15 October 2019, the OSD provided guidance on the investigation of PFOS, PFOA, and PFBS at Department of Defense (DoD) restoration sites (OSD 2019). The DoD guidance provides risk screening levels for PFOS, PFOA, and PFBS in groundwater (tap water) or soil, calculated using the USEPA's Regional Screening Level (RSL) calculator for residential and industrial/commercial worker receptor scenarios. Following the issuance of the 2019 OSD memo, on 08 April 2021, USEPA published an updated toxicity assessment for PFBS (USEPA 2021). Based on the updated toxicity assessment for PFBS, the OSD issued a memorandum on 15 September 2021 to include updated PFBS risk screening levels. The September 2021 Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program is provided for reference as **Appendix A**. The OSD risk screening levels for tap water (also used to evaluate groundwater or surface water used as drinking water sources) are 40 ng/L for PFOS and PFOA, and 600 ng/L for PFBS. The PFOS and PFOA soil screening levels for the residential and industrial/commercial scenarios are 0.13 milligrams per kilogram (mg/kg) (residential) and 1.6 mg/kg (industrial/commercial). The soil screening levels for PFBS are 1.9 mg/kg (residential) and 25 mg/kg (industrial/commercial).

1.2 PA Objectives

During the PA, investigators collect readily available information and conduct site reconnaissance if necessary. This PA will evaluate and document areas where PFAS-containing materials were used, stored, and/or disposed, so the Army can distinguish between sites that pose little or no threat to human health and the environment and sites that require further investigation.

A PFAS PA led by Base Realignment and Closure (BRAC) was previously completed for Former Fort Devens (i.e., not active Army property) (KOMAN Government Solutions, LLC, 2017a), however, the PFAS PA included an evaluation of use, storage, and/or disposal of PFAS-containing materials at active DRFTA parcels as well. Therefore, this PA utilized information collected during the BRAC PA, including records review, interviews, and site reconnaissance observations. The 2017 PFAS PA is included as **Appendix B**. This PA for DRFTA provides the PA findings and conclusions for the active DRFTA parcels only (**Figure 1**). Additionally, records review included the 2017/2018 PFAS site inspections (SI) led by BRAC (**Appendix C**, **Appendix D**). This PA includes relevant PFAS (including PFOS, PFOA, and PFBS) data collected during SI activities led by BRAC at Former Fort Devens, where available data overlaps with identified AOPIs.

1.3 PA Process Description

The PA development process for DRFTA is described in **Sections 1.3.1** below. **Section 3** provides a summary of the PA activities completed and describes the areas evaluated for potential use, storage, and/or disposal of PFAS-containing materials, which were categorized as either AOPIs or areas not retained for further investigation.

1.3.1 Summary of Preliminary Assessment Activities

This PA consisted of records review (including available PFAS investigation reports that were led by BRAC). For this PA, site reconnaissance at DRFTA was not conducted since there was a pre-existing PFAS PA (which included document research, personnel interviews, and site reconnaissance) (**Appendix B**).

2 INSTALLATION OVERVIEW

The following subsections provide general information about DRFTA. Relevant data and documents obtained and/or reviewed for DRFTA during the PA process are provided in **Appendix B** (2017 Former Fort Devens PFAS PA report), **Appendix C** (2018 Former Fort Devens PFAS SI report), and **Appendix D** (2018 Former Fort Devens PFAS SI Addendum report).

2.1 Site Location, Mission and Brief History, and Land Use

DRFTA is located in the towns of Ayer and Shirley in Middlesex County and in the towns of Harvard and Lancaster in Worcester County, Massachusetts, approximately 35 miles northwest of Boston, Massachusetts (**Figure 1**). DRFTA is within the Nashua River basin, which encompasses 529 square miles within New Hampshire and Massachusetts. Surrounding land uses include residential, commercial, industrial, agricultural, and woodland (KOMAN Government Solutions, LLC, 2017a).

In 1932, the site was named Fort Devens and made a permanent installation with the primary mission of commanding, training, and providing logistical support for non-divisional troops. Fort Devens was identified for cessation of operations and closure under the Defense BRAC Act of 1990, and officially closed in March 1996. Prior to base closure, Fort Devens occupied approximately 9,260 acres and was divided into the North Post, Main Post, and South Post. As part of the BRAC, in May 1996, portions of the Main and North Posts, and all of the South Post, were retained by the Army for reserve forces training and realigned as DRFTA. After closing in March 1996, various parcels were further transferred to non-Army entities (KOMAN Government Solutions, LLC, 2017a). Currently, the DRFTA consists of several non-contiguous parcels including: the 3800 area in the Former North Post; a Main Post parcel, cemetery, and 3400 area in the Former Main Post; and the entirety of the South Post (**Figure 1**).

2.2 Potable Water Supply and Drinking Water Receptors

Groundwater is used as the source of potable water at DRFTA. There are five water supply wells on post, which provide drinking water to South Post (Well 01G, Well 02G, Well 03G, Well 04G, Well 05G) (**Figure 2**). The remainder of DRFTA (i.e., Main Post and North Post) parcels are supplied drinking water by MassDevelopment. As shown on Figure 3 in the 2018 Former Fort Devens PFAS SI report (**Appendix B**), previous investigations identified various off-post potable wells within a four-mile radius of DRFTA.

2.3 Previous PFAS Investigations

Previous (i.e., pre-PA) and concurrent PFAS investigations relative to DRFTA are summarized below to provide full context of available PFAS data for DRFTA. Potable water, groundwater, and soil have historically been investigated at DRFTA for PFAS, including PFOS, PFOA, and PFBS, during separate and concurrent investigations for Former Fort Devens.

Potable Water

Water supply wells Well 01G, Well 02G, and Well 03G were sampled in June 2016. Samples were analyzed for PFAS by USEPA Method 537 and PFAS were not detected in any sample above laboratory detection limits. Water supply well Well 05G was brought online in November 2018 and was sampled for

PFAS in June 2019, along with water supply wells Well 01G, Well 02G, Well 03G, and two buildings (3413 and 657) which are supplied potable water by MassDevelopment. Well 04G was brought online in 2020 and was sampled for PFAS in April 2020. PFAS were not detected in any DRFTA water supply wells at South Post (Well 01G, Well 02G, Well 03G, Well 04G, Well 05G) above the respective laboratory reporting limits; however, select PFAS (including PFOS and PFOA) were detected in the samples collected from buildings 3413 and 657 (**Table 1**) at concentrations below the OSD risk screening level for tap water (40 ng/L) and USEPA lifetime health advisory (70 ng/L). MassDevelopment subsequently installed granular activated carbon filter treatment systems to remove PFAS from their water supply. MassDevelopment submitted a letter in October 2019 to DRFTA notifying them that PFAS were not detected in potable water supplied by them following treatment (**Appendix E**).

Soil and Groundwater

Soil and groundwater samples were historically collected at the one identified AOPI (AOC 50: Former Moore Army Airfield), which is further described in **Section 3.2.1**, in 2017 (**Appendix C**). Groundwater samples were also collected from existing monitoring wells in the eastern portion of the Main Post at DRFTA in 2018 (**Appendix D**).

The soil and groundwater samples collected in 2017 and 2018 were analyzed at TestAmerica Laboratories during the previous SI events (BERS-Weston Services, JVA, LLC. 2018a, BERS-Weston Services, JVA, LLC. 2018b). While the method used at the time of sampling is described as a Modified version of 537, the data analysis was largely or wholly consistent with DoD requirements for analysis of PFAS in non-potable matrices. The 2017 and 2018 SI data were collected, analyzed, and validated in accordance with approved sampling and analysis plans independent of work completed under the current Army-wide effort (KOMAN Government Solutions, LLC, 2017b; KOMAN Government Solutions, LLC, 2018a). The 2017 and 2018 data were collected in accordance with appropriate field SOPs and the approved (at the time of submittal) laboratory analytical method (USEPA Method 537 [modified]). The 2017 data pre-dated TestAmerica's DoD ELAP-certification for PFAS. However, similar to the requirements for PFAS analysis under the QSM, the 2017 PFAS analysis utilized isotope dilution for quantification. The 2018 data was analyzed after TestAmerica received their DoD ELAP-certification for PFAS under DoD QSM 5.1 Table B-15. Data collected in the 2017 and 2018 SI activities were subject to data validation according to the requirements of the DoD QSM 5.1 Table B-15. Due to the collection and/or validation according to the requirements for PFAS laid out in the QSM 5.1 Table B-15, the PFAS data is considered usable.

Analytes that were not detected at concentrations greater than the limit of detection provided for this data are reported as non-detect. Data qualifiers reported are as provided in the referenced reports (BERS-Weston Services, JVA, LLC 2018a; BERS-Weston Services, JVA, LLC. 2018b). Historical groundwater data are reported in ng/L, or parts per trillion, and soil data are reported in mg/kg, or parts per million.

Groundwater

During the 2017 investigation, six PFAS (including PFOS, PFOA, and PFBS) were analyzed in groundwater samples overlapping the Area of Concern (AOC) 50: Former Moore Army Airfield AOPI (BERS-Weston Services, JVA, LLC. 2018a).

PFOS, PFOA, and/or PFBS were detected in all four grab groundwater samples collected within AOC 50: Former Moore Army Airfield, AOC50-17-03, AOC50-17-04, AOC50-17-06, AOC50-17-07. The PFOS, PFOA, and PFBS results in groundwater collected from AOC 50: Former Moore Army Airfield in 2017 are included in **Table 3**. All historical groundwater data relevant to the AOC 50: Former Moore Army Airfield AOPI at DRFTA is included in Table 7 and Figure 7 in **Appendix C**.

- PFOS was detected above the OSD risk screening level for tap water (40 ng/L) in two of the four grab groundwater samples collected, 530 ng/L in AOC50-17-04 and 54 ng/L in AOC50-17-07. PFOS was detected below the OSD risk screening level for tap water (40 ng/L) in two of the four grab groundwater samples collected, 11 ng/L in AOC50-17-03 and 2.9 J (estimated) ng/L in AOC50-17-06.
- PFOA was detected above the OSD risk screening level for tap water (40 ng/L) in two of the four grab groundwater samples collected, 2,100 ng/L in AOC50-17-03 and 320 ng/L in AOC50-17-04. PFOA was detected below the OSD risk screening level for tap water (40 ng/L) in two of the four grab groundwater samples collected, 34 ng/L in AOC50-17-06 and 16 ng/L in AOC50-17-07.
- PFBS was detected at concentrations lower than the OSD risk screening level for tap water (600 ng/L) in three of the four grab groundwater samples, 49 ng/L in AOC50-17-03, 67 ng/L in AOC50-17-04, and 3.2 ng/L AOC50-17-06. PFBS was not detected in one of the four groundwater samples, AOC50-17-07.

During the 2018 investigation, 14 PFAS (including PFOS, PFOA, and PFBS) were analyzed in groundwater samples collected from the eastern portion of the Main Post at DRFTA (BERS-Weston Services, JVA, LLC. 2018b).

PFOS, PFOA, and PFBS were detected in both of the groundwater samples collected from existing monitoring wells AAFES-7 and XGM-94-06X. All historical groundwater data relevant to the eastern portion of Main Post at DRFTA is included in Table 3 and Figure 3 in **Appendix D**.

- PFOS was detected above the OSD risk screening level for tap water (40 ng/L) in monitoring well AAFES-7 (65 ng/L) and in monitoring well XGM-94-06X (90 ng/L).
- PFOA was detected above the OSD risk screening level for tap water (40 ng/L) in monitoring well AAFES-7 (51 ng/L) and was detected below the OSD risk screening level for tap water (40 ng/L) in XGM-94-06X (33 ng/L).
- PFBS was detected at concentrations lower than the OSD risk screening level for tap water (600 ng/L) in monitoring well AAFES-7 (6.3 ng/L) and in monitoring well XGM-94-06X (4.0 ng/L).

Soil

During the 2017 investigation, six PFAS (including PFOS, PFOA, and PFBS) were analyzed in soil and samples at the AOC 50: Former Moore Army Airfield AOPI (BERS-Weston Services, JVA, LLC. 2018a).

PFOS and/or PFOA were detected in all four soil samples collected within AOC 50: Former Moore Army Airfield. PFBS was not detected in any of the four soil samples collected within AOC 50: Former Moore Army Airfield. The PFOS, PFOA, and PFBS results in soil collected from AOC 50: Former Moore Army Airfield in 2017 are included in **Table 4**. All historical sampling soil data relevant to the AOC 50: Former Moore Army Airfield AOPI at DRFTA is included in Table 13 and Figure 13 in **Appendix C**.

- PFOS was detected below both the residential (0.13 mg/kg) and industrial/commercial (1.6 mg/kg) risk screening levels at all four soil sample locations.
- PFOA was detected below both the residential (0.13 mg/kg) and industrial/commercial (1.6 mg/kg) risk screening levels at three soil sample locations and was not detected at one soil sample location.

2.4 Readily Identifiable Off-Post PFAS Sources

An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at DRFTA) is not part of the PA. However, potential off-post PFAS sources were identified during the records search and are discussed below.

There are various known and potential PFAS sources at Former Fort Devens that are being addressed under separate investigations (e.g., SIs and a remedial investigation [RI]) led by BRAC. As a result of the 2017 and 2018 SIs at Former Fort Devens, PFAS constituents were detected at multiple AOCs at Former Fort Devens (i.e., off post of active Army parcels [DRFTA]) (**Appendix C**). Specifically, PFAS constituents were detected in soil and groundwater at a Former Fort Devens fire station, within 200 feet of the 3800 Area DRFTA boundary (Figure 7 of **Appendix C**). PFAS were detected in soil and groundwater at another Former Fort Devens fire station (AOC 76), within one half mile of the Main Post DRFTA boundary (Figure 1 of **Appendix D**). As described in **Section 2.1**, Former Fort Devens is no longer active Army (i.e., BRAC). According to records reviewed, PFAS (including PFOS, PFOA, and PFBS) impacts will be further evaluated as part of the PFAS RI for the Former Fort Devens led by BRAC.

3 SUMMARY AND DISCUSSION OF PA RESULTS

The preliminary locations evaluated for potential use, storage, and/or disposal of PFAS-containing materials across the entire DRFTA were further refined during the PA process and identified either as an area not retained for further investigation or as AOPIs. In accordance with the established process for the PA, one area was identified as an AOPI. The process used for refining these areas is presented on **Figure 3**, below.

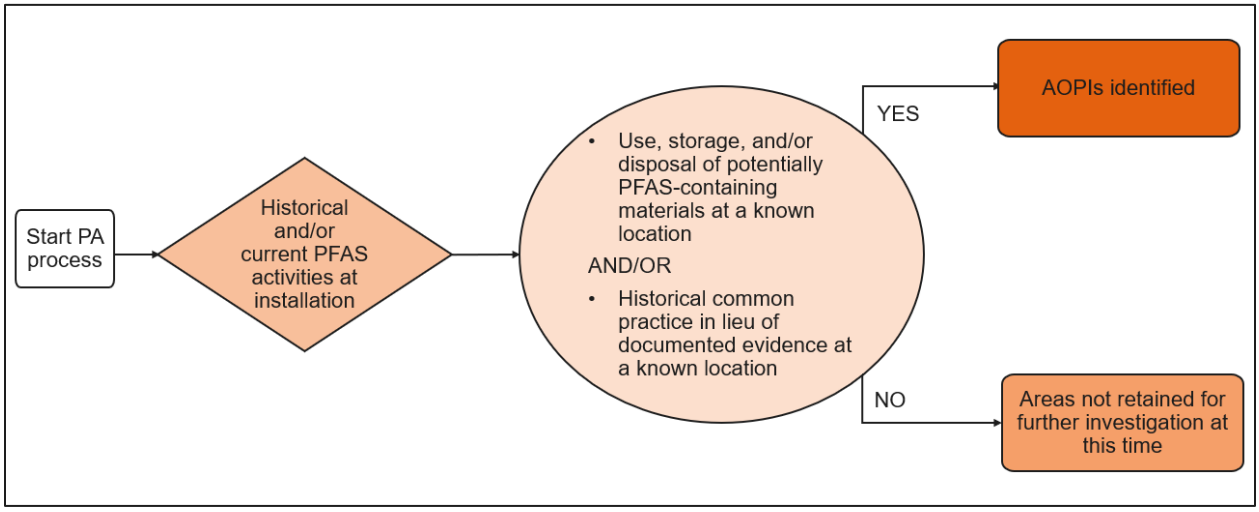

Figure 3: AOPI Decision Flowchart

A summary of the data collected through records review is presented below.

Data limitations for this PA/SI at DRFTA are presented in **Section 4**.

3.1 Areas Not Retained for Further Investigation

Based on the evaluation of information obtained during records review (i.e., which included additional records review, personnel interviews, and site reconnaissance), the areas described below were not retained for further investigation. These areas were previously identified as potential PFAS sources at DRFTA. However, following site research conducted for this PA, use, storage, and/or disposal of PFAS-containing materials is not suspected at these areas. Therefore, these areas are not retained for further investigation at this time.

A brief site history for areas not retained for further investigation and the rationale for eliminating the areas as AOPIs is presented in **Table 2**, below.

Table 2. Installation Areas Not Retained for Further Investigation

Area Description	Dates of Operation	Relevant Site History	Rationale
AOC 25: Explosive Ordnance Disposal (EOD) Range	1979 to 1996	AOC 25 is located in the impact area in South Post and currently only used for emergency detonation purposes. AOC 25 operated under a Resource Conservation and Recovery Act emergency permit as a hazardous waste thermal treatment facility and is used periodically for disposal of waste ordnance. Following records review and interviews documented in the 2017 Former Fort Devens PFAS PA report (**Appendix B**) with personnel familiar with historical operations at these range areas, it was concluded that water would have been used to extinguish fires at the ranges, and since 2008, a Class A (not AFFF which is Class B) foam may also have been used occasionally to extinguish wild land fires within these range areas.	No AFFF (or other PFAS containing materials) use, storage, or disposal.
AOC 26: 20-acre Zulu Ranges	At least 1981 to current	AOC 26 is located near the western boundary of the impact area in South Post. The Zulu Ranges includes the Zulu 1 (Light Demolition/EOD training) and Zulu 2 (Hand Grenade Familiarization) ranges. Following records review and interviews documented in the 2017 Former Fort Devens PFAS PA report (**Appendix B**) with personnel familiar with historical operations at these range areas, it was concluded that water would have been used to extinguish fires at the ranges, and since 2008, a Class A (not AFFF which is Class B) foam may also have been used occasionally to extinguish wild land fires within these range areas.	No AFFF (or other PFAS containing materials) use, storage, or disposal.
AOC 27: Hotel Range	Unknown to current	AOC 27 consists of approximately 7 acres on the northwestern edge of the impact area. Unexploded ordnance is present on the range and therefore access is restricted. AOC 27 historically was used for firing rifle grenades and EOD. Currently, AOC 25 is used for small arms training. Following records review and interviews documented in the 2017 Former Fort Devens PFAS PA report (**Appendix B**) with personnel familiar with historical operations at these range areas, it was concluded that water would have been used to extinguish fires at the ranges, and since 2008, a Class A (not AFFF which is Class B) foam may also have been used occasionally to extinguish wild land fires within these range areas.	No AFFF (or other PFAS containing materials) use, storage, or disposal.

Area Description	Dates of Operation	Relevant Site History	Rationale
AOC 28: Former Hand-Grenade Range	1940s to current	AOC 28 is located in South Post and consists of 6 acres. AOC 28 was formerly used as a hand-grenade range and is now periodically used for military obstacle course training. Following records review and interviews documented in the 2017 Former Fort Devens PFAS PA report (**Appendix B**) with personnel familiar with historical operations at these range areas, it was concluded that water would have been used to extinguish fires at the ranges, and since 2008, a Class A (not AFFF which is Class B) foam may also have been used occasionally to extinguish wild land fires within these range areas.	No AFFF (or other PFAS containing materials) use, storage, or disposal.
AOC 46: Training Area 6D	Unknown	AOC 46 is located at the impact area at the southwest boundary of South Post and is approximately 200 square feet. AOC 46 historically contained armored tanks and spent tear gas canisters. AOC 46 is not currently used for training. Following records review and interviews documented in the 2017 Former Fort Devens PFAS PA report (**Appendix B**) with personnel familiar with historical operations at these range areas, it was concluded that water would have been used to extinguish fires at the ranges, and since 2008, a Class A (not AFFF which is Class B) foam may also have been used occasionally to extinguish wild land fires within these range areas.	No AFFF (or other PFAS containing materials) use, storage, or disposal.
AOC 43G: Former Army Air Force Exchange Service (AAFES) gas station and Historical Gas Station G	1950s to 1996	AOC 43G consists of the former AAFES gas station and Historical Gas Station G and has been investigated historically due to petroleum contamination in soil and groundwater from past operations (KOMAN Government Solutions, LLC, 2018b). Historical Gas Station G was used by the Army primarily during World War II through the 1950s, prior to the widespread use of AFFF at DoD facilities. The AAFES gas station was reportedly in use through 1993 with the associated underground tanks removed in 1996 (KOMAN Government Solutions, LLC, 2018b). The 2017 Former Fort Devens PFAS PA report (**Appendix B**) did not identify a potential PFAS source at AOC 43G, and records reviewed found no evidence of use, storage, and/or disposal of PFAS-containing materials at AOC 43G related to its operational history. The majority of AOC 43G is located in the Main Post portion of DRFTA; however, some portions of AOC 43G are off-post on Former Fort Devens. The portion of AOC 43G within DRFTA has a current land use of	No AFFF (or other PFAS containing materials) use, storage, or disposal identified related to AOC 43G operational history. Additionally, the referenced groundwater sample locations are proximal to the DRFTA boundary, where an off-post source of PFAS could be flowing underneath DRFTA.

Area Description	Dates of Operation	Relevant Site History	Rationale
		industrial/commercial. In 2018, groundwater monitoring wells downgradient of AOC 43G were sampled during supplemental SI sampling (BERS-Weston Services, JVA, LLC, 2018b). PFOS, PFOA, and/or PFBS were detected in the groundwater monitoring wells (see **Section 2.3** for results). The groundwater monitoring wells downgradient of AOC 43G were selected for sampling since they were usable, existing monitoring wells, and to provide more information about the overall extent of PFAS at Former Fort Devens to support the RI led by BRAC (**Appendix D**). AOC 43 was not selected for sampling based on a suspected or known PFAS source within it.	

3.2 AOPIs

An overview for the AOPI identified during the PA process is presented in this section. The location of the AOPI is depicted on **Figure 4**. A brief site history for the AOPI is provided in the sub-sections below

3.2.1 AOC 50: Former Moore Army Airfield

AOC 50: Former Moore Army Airfield is identified as an AOPI following records research due to the potential for historical AFFF use. A portion of AOC 50: Former Moore Army Airfield, which is comprised of two former airfield hangars, is located within the 3800 area of DRFTA (**Figure 4**) and has a current land use of industrial/commercial. While the 2017 Former Fort Devens PFAS PA report (Appendix B) did not identify AFFF suppression systems or known AFFF releases in the two hangars at AOC 50, it did not rule out AFFF storage and/or usage for the entire operational history of former Moore Army Airfield (KOMAN Government Solutions, LLC, 2017a).

Additionally, as summarized in **Section 2.3**, groundwater and soil surrounding the two former airfield hangars at AOC 50 within DRFTA was sampled for PFAS (including PFOS, PFOA, and PFBS) during the Fort Devens SI in June 2017 (BERS-Weston Services, JVA, LLC. 2018a). **Figure 5** and **Tables 3** and **4** illustrate the historical PFOS, PFOA, and PFBS analytical results in groundwater and soil at the AOC 50: Former Moore Army Airfield AOPI.

According to records reviewed, the AOC 50: Former Moore Army Airfield PFAS (including PFOS, PFOA, and PFBS) impacts will be further evaluated as part of the PFAS RI for the Former Fort Devens, for the overall delineation of PFAS in groundwater and to inform the selection of future sampling locations (BERS-Weston Services, JVA, LLC. 2018b).

4 CONCLUSIONS AND RECOMMENDATIONS

The PFAS PA at DRFTA evaluated the installation to identify preliminary locations of use, storage, and/or disposal of PFAS-containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances (Army 2018). Records review, including information regarding personnel interviews and site reconnaissance, was used to identify specific areas of suspected PFAS use, storage, and disposal at DRFTA. Following the evaluation, one AOPI was identified as AOC 50: Former Moore Army Airfield.

OSD provided residential risk screening levels for PFOS, PFOA, and PFBS in soil and groundwater (tap water) and industrial/commercial risk screening levels for PFOS, PFOA, and PFBS in soil (**Appendix A**). As described in records reviewed, soil and groundwater at AOC 50: Former Moore Army Airfield were sampled for PFOS, PFOA, and PFBS in 2017 as part of SI activities at the Former Fort Devens conducted by BRAC. PFOS, PFOA, and/or PFBS were detected in soil at AOC 50: Former Moore Army Airfield at concentrations less than the OSD residential and industrial/commercial risk screening levels and PFOS, PFOA, and/or PFBS were detected in groundwater at AOC 50: Former Moore Army Airfield at concentrations greater than the OSD residential risk screening levels for tap water.

As described in **Section 2.4**, off-post PFAS detections in soil and groundwater proximal to the DRFTA AOPI (AOC 50: Former Moore Army Airfield) are located on Former Fort Devens and not active Army parcels (i.e., BRAC). These off-post PFAS sources are being addressed under separate PFAS investigations led by BRAC. According to records reviewed, the AOC 50: Former Moore Army Airfield PFAS (including PFOS, PFOA, and PFBS) impacts will be further evaluated as part of the PFAS RI for the Former Fort Devens, for the overall delineation of PFAS in groundwater and to inform the selection of future sampling locations (BERS-Weston Services, JVA, LLC. 2018b).

Data collected during the PA (**Section 2** and **Section 3**) were sufficient to draw the conclusions summarized above. The data limitations relevant to the development of this PA for PFAS at DRFTA are discussed below.

An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at DRFTA) is not part of the PA. The search was limited to areas that were identified during relevant records review.

Records gathered for the use, storage and/or disposal of PFAS-containing materials were reviewed during the PA process. Documentation specific to AFFF may have been limited (e.g., each AFFF use; procurement records, documentation of AFFF used during crash responses or fire training activities) due to lack of recordkeeping requirements for the full timeline of common AFFF practices. Anecdotal accounts of AFFF use (and therefore likely PFOS, PFOA, and PFBS use) were limited to available installation personnel, whose knowledge of AFFF use may have been restricted by their time spent at the installation or previous roles held that limited their relevant knowledge of potential AFFF (or other PFAS-containing material) use. Records reviewed were also limited to the characteristics of the historical investigations for PFAS at DRFTA (e.g., media sampled, sampling methods, laboratory analysis). The available PFAS analytical data is limited to analytical results from samples collected in 2016 and 2019 at drinking water wells at DRFTA and to soil and groundwater samples collected in 2017 and 2018. Lastly, the available data including PFOS, PFOA, and PFBS were analyzed per the selected analytical method.

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ACRONYMS

AFFF	aqueous film-forming foam
AOC	area of concern
AOPI	area of potential interest
Arcadis	Arcadis U.S., Inc.
Army	United States Army
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DoD	Department of Defense
DRFTA	Devens Reserve Force Training Area
EOD	explosive ordnance disposal
installation	U.S. Army or Reserve installation
mg/kg	milligrams per kilogram (parts per million)
ng/L	nanograms per liter (parts per trillion)
OSD	Office of the Secretary of Defense
PA	preliminary assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
RSL	Regional Screening Level
SI	site inspection
U.S.	United States
USEPA	United States Environmental Protection Agency

TABLES

Table 1 - On-Post Potable Water Wells and Historical PFOS, PFOA, and PFBS Analytical Results
USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, Massachusetts

	Location	Well 01G/ FAC-11	Well 02G/ 4329	Well 03G/ 4217	Well 04G/ Area 9	Well 05G/ FBI005	Building 3413	Building 657
	Sample ID	01G-61019	02G-61019	03GR-61019	09G041720	05GR-61019	3413-061019	657-061019
	Sample Date	6/10/2019	6/10/2019	6/10/2019	4/17/2020	6/10/2019	6/10/2019	6/10/2019
Units	OSD risk screening level*	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
Perfluorooctanoic acid (PFOA)	40	ND**	ND**	ND**	1.92 U	ND**	**10.8**	**9.84**
Perfluorobutanesulfonic acid (PFBS)	600	ND**	ND**	ND**	1.92 U	ND**	ND**	ND**
Perfluorooctane sulfonate (PFOS)	40	ND**	ND**	ND**	1.92 U	ND**	**5.85**	**4.93**

Notes and Acronyms:
* risk screening level for tap water (OSD 2021).

**Source: Data provided by DRFTA Directorate of Public Works. Laboratory reporting limits not given.

Bold - detected concentration
ND - not detected above the laboratory reporting limit
ng/L - nanograms per liter
OSD - Office of the Secretary of Defense
U - not detected above the associated laboratory method detection limit

Table 3 - Historical Groundwater PFOS, PFOA, and PFBS Analytical Results
USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, Massachusetts

AOPI	Sample/ Parent ID	Sample Date	Analyte	PFOS (ng/L)		PFOA (ng/L)		PFBS (ng/L)	
			OSD Risk Screening Level - Tap Water	40		40		600	
			Sample Type	Result	Qual	Result	Qual	Result	Qual
AOC 50: Former Moore Army Airfield Hangars	AOC50-17-03	6/12/2017	Parent	**11**		**2,100**		**49**	
	AOC50-DUP03	6/12/2017	Duplicate	**5.9**		**1,800**		**47**	
	AOC50-17-06	6/12/2017	Parent	**2.9**	J	**34**		**3.2**	
	AOC50-17-07	6/12/2017	Parent	**54**		**16**		2.0	U
	AOC50-17-04	6/12/2017	Parent	**530**		**320**		**67**	

Notes:
1. **Bolded** values indicate the result was detected greater than the limit of detection
2. Grey shaded values indicate the result was detected greater than the Office of the Secretary of Defense (OSD) risk screening levels (OSD. 2021. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. September.).

Sources:
-BERS-Weston Services, JVA, LLC, 2018. Final Site Inspection Report for Per-and Polyfluoroalkyl Substances (PFAS) at Former Fort Devens Army Installation. Devens, Massachusetts. May.

Acronyms/Abbreviations:
AOC = Area of Concern
AOPI = Area of Potential Interest
ID = identification
ng/L = nanograms per liter (parts per trillion)
PFBS = perfluorobutane sulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonic acid
Qual = qualifier

Qualifier Definitions:
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
U = The analyte was analyzed for but the result was not detected above the limit of quantitation.

Table 4 - Historical Soil PFOS, PFOA, and PFBS Analytical Results
USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, Massachusetts

AOPI	Sample/Parent ID	Sample Date	Analyte	PFOS (mg/kg)		PFOA (mg/kg)		PFBS (mg/kg)	
			OSD Risk Screening Level - Residential Scenario	0.13		0.13		1.9	
			OSD Risk Screening Level - Industrial/ Commercial Scenario	1.6		1.6		25	
			Sample Type	Result	Qual	Result	Qual	Result	Qual
AOC 50: Former Moore Army Airfield Hangars	AOC50-17-03	6/7/2017	Parent	**0.00044 J**		0.00068		0.00031 U	
	AOC50-17-06	6/7/2017	Parent	**0.0033**		**0.00032 J**		0.00032 U	
	AOC50-17-07	6/7/2017	Parent	**0.00078**		0.00032 U		0.00032 U	
	AOC50-17-04	6/7/2017	Parent	**0.0075**		**0.0009**		0.00033 U	

Notes:
1. **Bolded** values indicate the result was detected greater than the limit of detection
2. Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential and industrial/commercial scenarios (OSD. 2021. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. September.). No concentrations of PFBS, PFOS, or PFOA exceeded either the residential and/or the industrial/commericial OSD risk screening levels.

Sources:
-BERS-Weston Services, JVA, LLC, 2018. Final Site Inspection Report for Per-and Polyfluoroalkyl Substances (PFAS) at Former Fort Devens Army Installation. Devens, Massachusetts. May.

Acronyms/Abbreviations:
AOPI = Area of Potential Interest
ID = identification
mg/kg = milligrams per kilogram (parts per million)
PFBS = perfluorobutane sulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonic acid
Qual = qualifier

Qualifier Definitions:
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
U = The analyte was analyzed for but the result was not detected above the limit of quantitation.

FIGURES

USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, MA

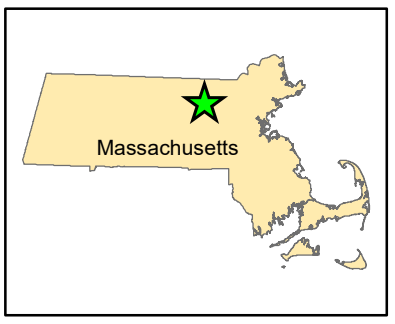


Figure 1
Site Location

Sources:
1. KOMAN Government Solutions, LLC, *Final Base-Wide Preliminary Assessment for Evaluation of Perfluoroalkyl Substances at Former Fort Devens Army Installation BRAC Legacy Sites Report*, September 2017.

Devens RFTA Boundary

Former Fort Devens Boundary

Data Sources:
Devens RFTA, GIS Data, 2019
ESRI ArcGIS Online, Street Map Data

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, MA

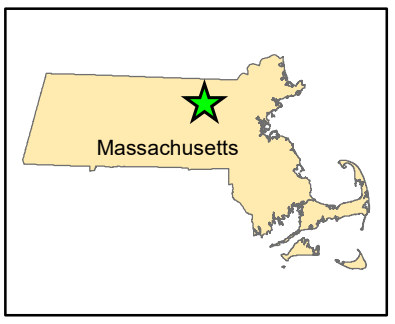


Figure 2
Site Layout

Data Sources:
Devens RFTA, GIS Data, 2019
USGS, NHD Data, 2019
ESRI ArcGIS Online, Aerial Imagery

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, MA

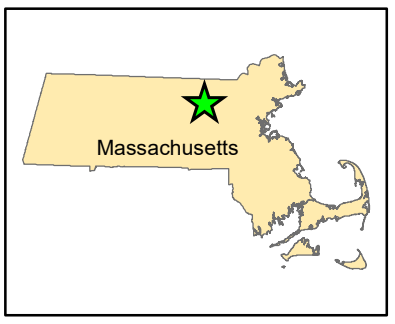
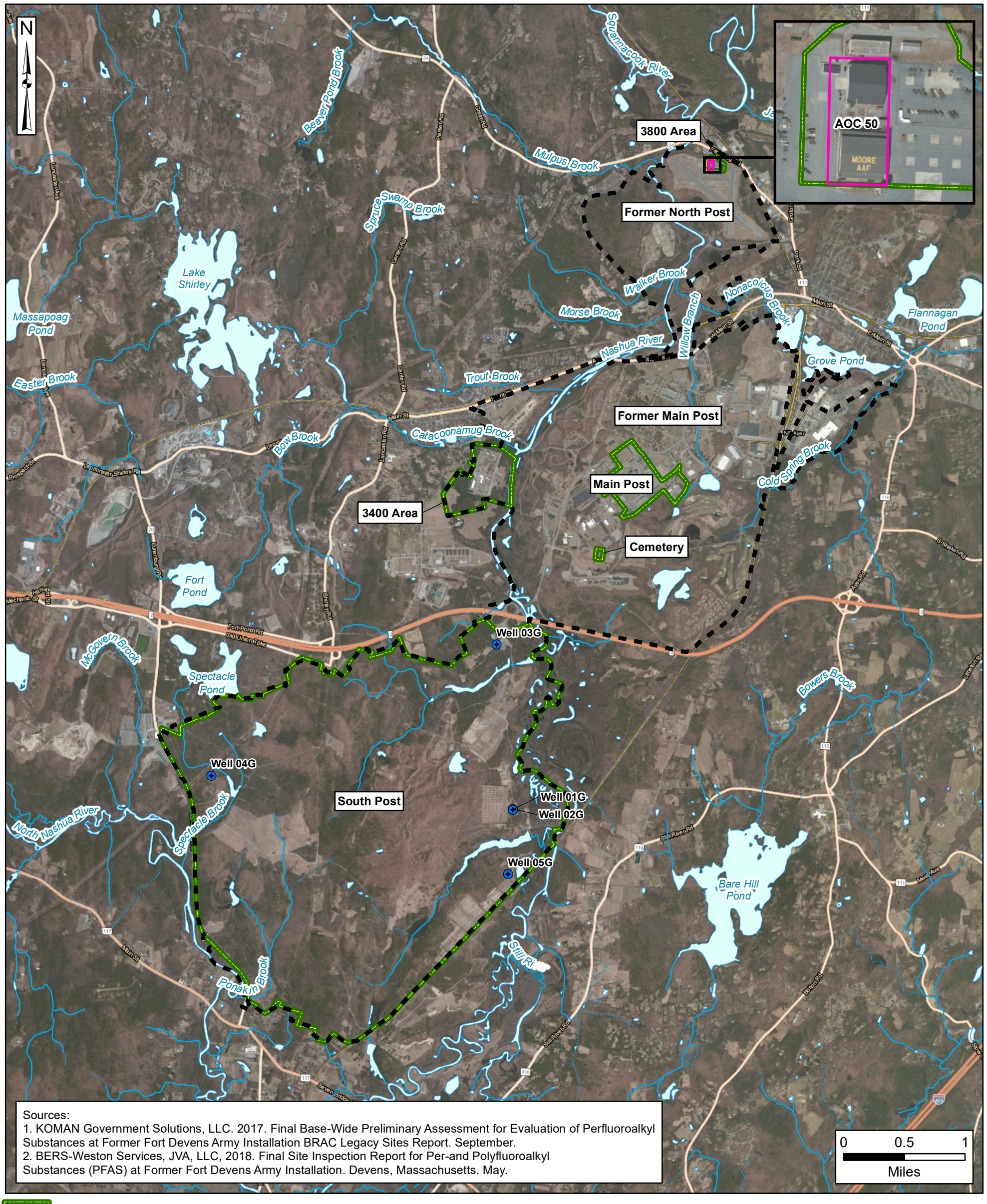


Figure 4
AOPI Locations



Sources:
1. KOMAN Government Solutions, LLC. 2017. Final Base-Wide Preliminary Assessment for Evaluation of Perfluoroalkyl Substances at Former Fort Devens Army Installation BRAC Legacy Sites Report. September.
2. BERS-Weston Services, JVA, LLC, 2018. Final Site Inspection Report for Per-and Polyfluoroalkyl Substances (PFAS) at Former Fort Devens Army Installation. Devens, Massachusetts. May.

Devens RFTA Boundary
Former Fort Devens Boundary
AOPI
Installation Water Supply Well
River/Stream (Perennial)
Stream (Intermittent)
Water Body

AOPI = area of potential interest

Data Sources:
Devens RFTA, GIS Data, 2019
USGS, NHD Data, 2019
ESRI ArcGIS Online, Aerial Imagery

Coordinate System:
WGS 1984, UTM Zone 19 North

USAEC PFAS Preliminary Assessment
Devens Reserve Forces Training Area, MA

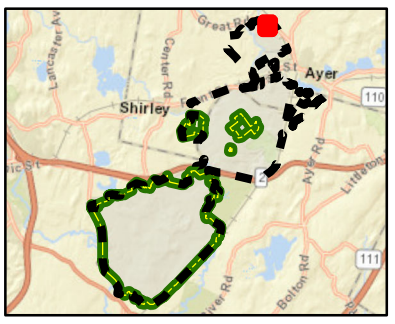
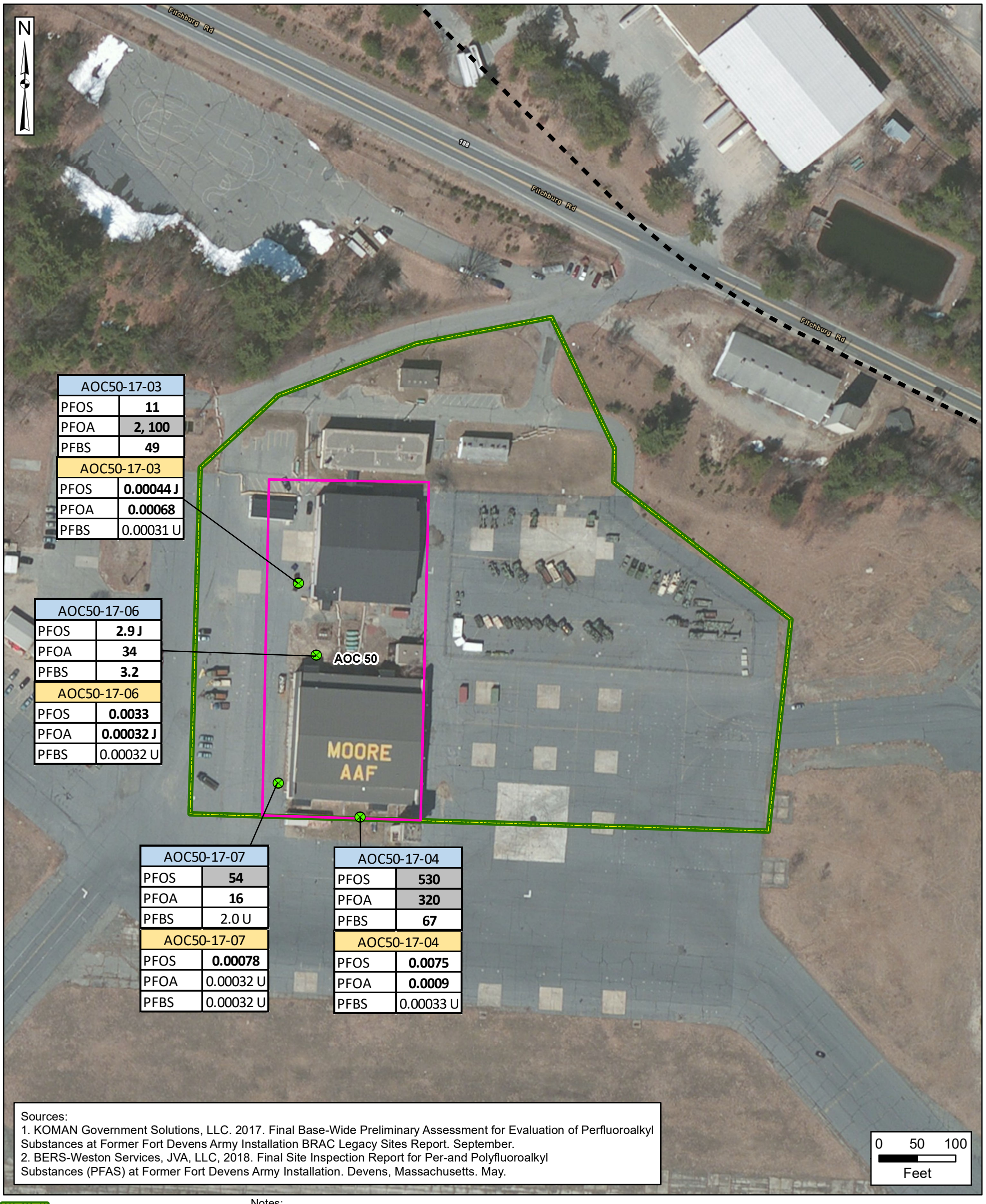


Figure 5
Historical PFOS, PFOA, PFBS Analytical Results at AOC 50: Former Moore Army Airfield Hangars



Devens RFTA Boundary

Former Fort Devens Boundary

AOPI

Historical Sample Locations

Groundwater/Soil Sample

Notes:
1. Groundwater results, shown in blue data boxes, are in nanograms per liter (ng/L), or parts per trillion. Soil results, shown in peach boxes, are in milligrams per kilogram (mg/kg), or parts per million.
2. All soil samples were collected from 0-5 feet below ground surface (ft bgs).
3. All samples were collected 31 May 2017 to 16 June 2017.
4. Bolded values indicate the result was detected greater than the limit of detection.
5. Concentrations of PFOS and PFOA that exceed the Office of the Secretary of Defense (OSD) residential tap water risk screening level of 40 ng/L in the presence of multiple PFAS (OSD 2021) are highlighted gray.
6. U flag indicates the analyte was analyzed for but the result was not detected above the limit of detection.
7. J flag indicates the analyte was positively identified but the associated numerical value is an estimated concentration only.

AOPI = area of potential interest
PFAS = per- and polyfluoroalkyl substances
PFBS = perfluorobutanesulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate

Data Sources:
Devens RFTA, GIS Data, 2019
USGS, NHD Data, 2019
ESRI ArcGIS Online, Aerial Imagery

Coordinate System:
WGS 1984, UTM Zone 19 North

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