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FINAL
Site Inspection
Quality Assurance Project
Plan Addendum
Army Aviation Support Facility, Davenport, Iowa

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

July 2020

Prepared for:

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UNCLASSIFIED

1. Introduction

1.1 Project Authorization

This is the Installation-Specific Addendum to the Army National Guard (ARNG) Site Inspection (SI) Programmatic Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP). This SI UFP-QAPP Addendum addresses specific SI activities to be completed at the Army Aviation Support Facility (AASF) in Davenport, Iowa.

The ARNG G9 is the lead agency in performing *Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide*. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) under Contract Number W912DR-12-D-0014, Task Order (TO) W912DR17F0192, issued 11 August 2017. Programmatically, the ARNG is assessing the potential environmental impacts primarily from aqueous film forming foam (AFFF) and similar chemical releases suspected at their properties. Each SI will assess potential impacts to human health and the environment related to processes that used per- and polyfluoroalkyl substances (PFAS) (e.g., fire training, firefighting, and metal plating).

The SI project elements will be performed by AECOM Technical Services, Inc. (AECOM) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; United States Environmental Protection Agency [USEPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations [CFR] Part 300; USEPA, 1994), and in compliance with Army requirements and guidance for field investigations, including specific requirements for sampling for PFOA, PFOS, and the group of related compounds known in the industry as PFAS. The term PFAS will be used throughout this plan to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are the key components of AFFF, and the other 16 related compounds listed in the TO. This UFP-QAPP Addendum focuses on the SI phase of work specific to the Davenport AASF (also referred to as the “Site”) in Davenport, Iowa.

1.2 SI Purpose

The objective of this SI effort is to identify whether there has been a release to the environment from the Areas of Interest (AOIs) identified in the PA and determine the presence or absence of PFOA, PFOS, and PFBS at or above screening levels (SLs), as well as the presence or absence of 15 additional PFAS at the facility.

As stated in the *Federal Facilities Remedial Site Inspection Summary Guide* (USEPA, 2005), an SI has five goals:

1) Develop information to potentially eliminate a release from further consideration because it is determined that it poses no significant threat to human health or the environment.
2) Determine the potential need for a removal action (i.e., Time Critical Removal Action [TCRA]; applies to drinking water only).
3) Collect or develop data to evaluate the release.
4) Collect additional data to develop the conceptual site model (CSM) in preparation for an effective Remedial Investigation (RI).

QAPP Worksheet #11: Project/ Data Quality Objectives

DQOs specify the level of data required to support the decision-making process for a project. Specific DQOs will be established for each site and will be described in this UFP-QAPP Addendum. These DQOs will follow the USEPA's seven-step iterative process for DQO development. DQOs are influenced by the ongoing project planning discussions with stakeholders and will be updated if new consensus decisions materialize.

The development of DQOs will follow the seven steps of USEPA's DQO process:

1. State the Problem

The presence of PFAS, which may pose a risk to human health or the environment, in environmental media at the facility is currently unknown. PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. The regulatory framework for managing PFAS at both federal and state level continues to evolve. The DoD has adopted a policy to retain facilities in the CERCLA process based on risk-based SLs for soil and groundwater, as described in a memorandum from the Office of the Secretary of Defense (OSD) dated 15 October 2019 (Assistant Secretary of Defense, 2019). The ARNG program under which this SI was performed follows this DoD policy. Should the maximum site concentration for sampled media exceed the SLs established in the OSD memorandum, the site will proceed to the next phase under CERCLA. The SLs established in the OSD memorandum apply to three compounds, PFOS, PFOA, and perfluorobutanesulfonic acid (PFBS). The SLs are presented in Worksheet #15 of this QAPP Addendum.

The following quotes from Army policy documents form the basis for this project:

- "The Army will research and identify locations where PFOS and/or PFOA containing products, such as AFFF, are known or suspected to have been used. Installations shall coordinate with installation/facility fire response or training offices to identify AFFF use or storage locations. The Army will consider fire training areas, AFFF storage locations, hangars/buildings with AFFF suppression systems, fire equipment maintenance areas, and areas where emergency response operations required AFFF use as possible source areas. In addition, metal plating operations, which used certain PFOS-containing mist suppressants, shall be considered possible source areas."
- "Based on a review of site records…determine whether a CERCLA PA is appropriate for identifying PFOS/PFOA release sites. If the PA determines a PFOS/PFOA release may have occurred, a CERCLA SI shall be conducted to determine presence/absence of contamination."
- "Identify sites where perfluorinated compounds are known or suspected to have been released, with the priority being those sites within 20 miles of the public systems that tested above USEPA HA levels." (USEPA, 2016a; USEPA, 2016b).

2. Identify the Goals of the Study

The goals of the SI include the following:

1. Determine the presence or absence of PFOA, PFOS, and PFBS at or above SLs, as well as the presence or absence of an additional 15 PFAS, at Davenport AASF.
2. Develop information to potentially eliminate a release from further consideration because it is determined that it poses no significant threat to human health or the environment.
3. Determine the potential need for a TCRA (applies to drinking water only). The primary actions that will be considered include provision of alternative water supplies or wellhead treatment.
4. Collect or develop data to evaluate the release.
5. Collect data to better characterize the release for more effective and rapid initiation of an RI (if determined necessary).
6. Identify, within 4 miles of the installation, other potential PFAS sources (fire stations, major manufacturers, other DoD facilities) and receptors, including both groundwater and surface water receptors, in order to determine whether the ARNG is the likely source of PFAS, or whether there is an off-facility source of PFAS responsible for installation detections of PFAS (USEPA, 2005).

3. Identify Information Inputs

Primary information inputs include:

- The PA Report for Davenport AASF;
- Analytical data collected during other environmental sampling efforts at the Davenport AASF;
- Groundwater, surface water, soil and/or sediment sample data (where applicable) collected in accordance with this QAPP Addendum; and
- Field data collected including groundwater elevation and water quality parameters measured using a multi-parameter water quality meter.

4. Define the Boundaries of the Study

The scope of the SI is horizontally bounded by the property limits of Davenport AASF. Off-facility sampling is not included in the scope of this SI; however, if future off-facility sampling is required, the proper stakeholders will be notified, and necessary rights of entry will be obtained by ARNG with the property owner(s). The scope of the SI is vertically bounded as follows: groundwater (30 feet below ground surface [bgs]), soil from direct-push technology (DPT) borings (30 feet bgs), and surface soil (0 to 2 feet bgs). The temporal boundaries of the study are limited by seasonal conditions; the field work for the scope will be performed Spring 2020.

5. Develop the Analytic Approach

All samples will be analyzed by a DoD Environmental Laboratory Accreditation Program (ELAP) and National Environmental Laboratory Accreditation Program (NELAP) certified laboratory (i.e., Pace Gulf Coast [formerly Gulf Coast Analytical Laboratories, LLC. (GCAL)]). Data will be compared to SLs (**Worksheet #15**), and decision rules as defined in the PQAPP will be applied concerning actions to be taken based on any SL exceedances. Decision rules have been developed for groundwater and soil that will apply to all data collected. These rules will govern response actions based on the results of the SI sampling effort.

The decision rules described in the tables at the end of this section (**Tables 11-1** and **11-2**) identify actions based on the following:

Groundwater:

1. Is there a human receptor within 4-miles of the facility?
2. What is the concentration of PFOA, PFOS, and PFBS at the potential source area?
3. What is the concentration of PFOA, PFOS, and PFBS at the boundary?
4. What does the CSM suggest in terms of source, pathway, and receptor?

Soil:

1. What is the concentration of PFOA, PFOS, and PFBS in shallow surface soil (0-2 feet bgs)?
2. What is the concentration of PFOA, PFOS, and PFBS in soil (i.e., capillary fringe) (4-10 feet bgs)?
3. What does the CSM suggest in terms of source, pathway, and receptor?

Soil, groundwater, surface water, and sediment samples will be collected (if applicable) from potential source areas identified in the PA. Based on previous investigations, groundwater is expected to be encountered within the shallow perched aquifer no deeper than 30 feet bgs. The regional aquifers are significantly deeper (100-2,000 feet bgs) and will not be subject to drilling during this investigation. Proposed SI sample locations and depths are defined in **Worksheet #17**.

6. Specify Performance/Acceptance Criteria

See **Worksheet #37**.

7. Develop the Detailed Plan for Obtaining Data

See **Worksheet #17** and **#18**.

Table 11-1: Groundwater Decision Rules

Scenario	PFAS Concentration Range	Response (Off-facility human receptor within 4 miles)	Response (No off-facility human receptor within 4 miles)
Scenario 1	ND	No further action required during SI phase.	No further action required during SI phase.
Scenario 2	> ND (any positive detection) And < SLs	1.) Assess CSM including: - Data reliability and bias - Migration via groundwater flow (i.e., groundwater flow towards potential receptors) - Flow to surface water bodies, drinking water intakes - Distance from boundary to receptor - Aquifer where drinking water well(s) are screened - Estimated timeframe of release(s) 2.) No further action during SI Phase at this time. ARNG may consider need for additional evaluation in the future for groundwater.	1.) Assess CSM as described. 2.) No further action during SI Phase at this time. ARNG may consider need for additional evaluation in the future for groundwater.
Scenario 3	> SLs	1.) Assess CSM as described above and: - Potential off-facility alternative PFAS sources 2.) If exceedance of SLs is near facility boundary and the assessment of the CSM implies unacceptable risk to human health caused by a PFAS release attributable to ARNG activities, ARNG may initiate off-facility sampling protocol. 3.) Proceed to RI.	1.) Assess CSM as described. 2.) Proceed to RI.

Notes:
< = less than
> = greater than
ARNG = Army National Guard
CSM = conceptual site model
ND = non-detect
OSD= Office of the Secretary of Defense
PFAS = per- and polyfluoroalkyl substances
RI = Remedial Investigation
SI = Site Inspection
SL = screening level

Table 11-2: Soil Data Decision Rules

Scenario	PFAS Concentration Range	Response Action
Scenario 1	ND	No further action during SI Phase.
Scenario 2	> ND (any positive detection) and < SLs	1. Assess CSM including: - Potential for particulate runoff (i.e., transport via surface water) - Nearby receptors and land use (residential or industrial/commercial worker) at the source location (i.e., potential for incidental ingestion) - Depth to groundwater; distance to nearby surface water body - Comparison of soil concentrations to groundwater concentrations at the source or nearby surface water body Data reliability and bias 2. No further action for soil during SI Phase at this time. ARNG may consider need for additional evaluation in the future.
Scenario 3	> SLs	1. Assess CSM as above and: - Comparison of soil concentrations to groundwater concentrations at the source and downgradient at the boundary - Comparison of soil concentrations to surface water concentrations at or near the source and downgradient at the boundary 2. Proceed to RI.

Notes:
> = greater than
ARNG = Army National Guard
CSM = conceptual site model
ND = non-detect
OSD= Office of the Secretary of Defense
PFAS = per- and polyfluoroalkyl substances
SI = Site Inspection
SL = screening level

SLs **for Soil and Groundwater**

The DoD has adopted a policy to retain facilities in the CERCLA process based on conservative SLs for soil and groundwater, as described in a memorandum from the OSD dated 15 October 2019 (Assistant Secretary of Defense, 2019). The ARNG program under which this SI was performed follows this DoD policy and should the maximum site concentration for sampled media exceed the SLs established in the OSD memorandum, the site will proceed to the next phase under CERCLA. The SLs established in the OSD memorandum apply to three compounds: PFOS, PFOA, and PFBS.

Analyte	CAS Number	Industrial/ Commercial Composite Worker (Soil) (µg/kg)[a,b]	Tap Water (Groundwater) (ng/L)[a,b]
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1,600	40
Perfluoroheptanoic acid (PFHpA)	375-85-9	-	-
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	-	-
Perfluorononanoic acid (PFNA)	375-95-1	-	-
Perfluorooctanoic acid (PFOA)	335-67-1	1,600	40
Perfluorobutanesulfonic acid (PFBS)	375-73-5	1,600,000	40,000
Perfluorobutanoic acid (PFBA)	375-22-4	-	-
Perfluoropentanoic acid (PFPA)	2706-90-3	-	-
N-ethyl perfluorooctanesulfonamidoacetic acid	2991-50-6	-	-
N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9	-	-
Perfluorodecanoic acid (PFDA)	335-76-2	-	-
Perfluorotetradecanoic acid (PFTA)	376-06-7	-	-
Perfluorododecanoic acid (PFDoA)	307-55-1	-	-
Perfluorohexanoic acid (PFHxA)	307-24-4	-	-
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	-	-
Perfluoroundecanoic acid (PFUnA)	2058-94-8	-	-
6:2 Fluorotelomer sulfonate (6:2 FTS)	27619-97-2	-	-
8:2 Fluorotelomer sulfonate (8:2 FTS)	39108-34-4	-	-

OSD Screening Values Notes:

a.) Assistant Secretary of Defense, 2019. Risk Based Screening Levels Calculated for PFOS, PFOA, PFBS in Groundwater and Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. 15 October 2019.

b.) The SL for soil is based on incidental ingestion of soil (industrial/commercial worker scenarios) and therefore will only be applied to the soil intervals reasonably anticipated to be encountered in these scenarios.

c.) If only one PFAS is present, a Hazard Quotient (HQ) of 1 applies and the values presented would increase by a factor of x10.

CAS = Chemical Abstracts Service
ng/L = nanograms per liter
OSD= Office of the Secretary of Defense
µg/kg = micrograms per kilogram