SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES AT FORMER FORT CHAFFEE, ARKANSAS

Prepared for:

ODCS, G-9, ISE BRAC

Final
January 2024

SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES AT FORMER FORT CHAFFEE, ARKANSAS

Final

Prepared for:
ODCS, G-9, ISE BRAC
600 Army Pentagon
Washington, DC 20310

Prepared by:
ARS Aleut Remediation
663 Emory Valley Rd
Oak Ridge, TN 37830

Kaleb Brumbaugh
AAR – Project Manager

Don Welch
AAR – Corporate Quality Manager

Blake Smotherman
AAR – Deputy Director – Environmental Services Group

Contract Number W912BV20D0037
Delivery Order Number
W912BV21F0060

January 2024

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

%	percent
%R	percent recovery
°C	degrees Celsius
°F	degrees Fahrenheit
AFFF	aqueous film-forming foam
amsl	above mean sea level
AOPI	Area of Potential Interest
ARARNG	Arkansas Army National Guard
ARNG	U.S. Army National Guard
Army	U.S. Army
AWWCC	Arkansas Water Well Construction Commission
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CoC	chain-of-custody
CSM	conceptual site model
DERP	Defense Environmental Restoration Program
DL	detection limit
DoD	U.S. Department of Defense
DPT	direct push technology
DQO	data quality objective
DUA	data usability assessment
ELAP	Environmental Laboratory Accreditation Program
EIS	extracted internal standard
ERM	Environmental Resource Management Group
FCJMTC	Fort Chaffee Joint Maneuver Training Center
FCRA	Fort Chaffee Redevelopment Authority
FD	field duplicate
ft	feet
FTCH	Fort Chaffee
GPS	global positioning system
GW	groundwater
HFPO-DA	hexafluoropropylene oxide dimer acid (GenX)
HDPE	high-density polyethylene
HQ	hazard quotient
HQDA	Headquarters Department of the Army
ID	identification
IDW	investigation-derived waste
JRTC	Joint Readiness Training Center
LC/MS/MS	liquid chromatography with tandem mass spectrometry
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
mg/kg	milligrams per kilogram
MIL-SPEC	Military Specification

MS	matrix spike
MSD	matrix spike duplicate
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/L	nanograms per liter
NPL	National Priorities List
OSD	Office of the Secretary of Defense
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutane sulfonate
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexane sulfonate
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PPE	personal protective equipment
ppm	parts per million
ppt	parts per trillion
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
QSM	Quality Systems Manual
RC	Reserve Component
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
RSL	regional screening level
SDG	sample delivery group
SGS	SGS North America, Inc.
SI	Site Inspection
SL	screening level
SO	soil
SOP	standard operating procedure
SVOC	semivolatile organic compound
TCLP	toxicity characteristic leaching procedure
TGI	technical guidance instruction
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
U.S.	United States
USACE	U.S. Army Corps of Engineers
USAG	U. S. Army Garrison
USAR	U.S. Army Reserve
USDOE	U.S. Department of Energy
USDOT	U. S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

EXECUTIVE SUMMARY

The United States (U.S.) Army (Army) is conducting Preliminary Assessments (PAs) and Site Inspections (SIs) to determine the use, storage, disposal, or release of per- and polyfluoroalkyl substances (PFAS) at Base Realignment and Closure (BRAC) installations, nationwide. This report documents SI activities conducted for 19 areas of potential interest (AOPIs) at the former Fort Chaffee (FTCH) in Sebastian, Crawford, and Franklin Counties, Arkansas. AOPIs were identified during the PA phase for investigation through multimedia sampling in an SI phase to determine whether a PFAS release occurred. Activities were completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 U.S.C. §9601, et. seq.), the Defense Environmental Restoration Program (DERP, 10 U.S.C. §2700, et. seq.) the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR Part 300), and Army and U.S. Department of Defense (DoD) policy and guidance, and U.S. Environmental Protection Agency (USEPA) guidance.

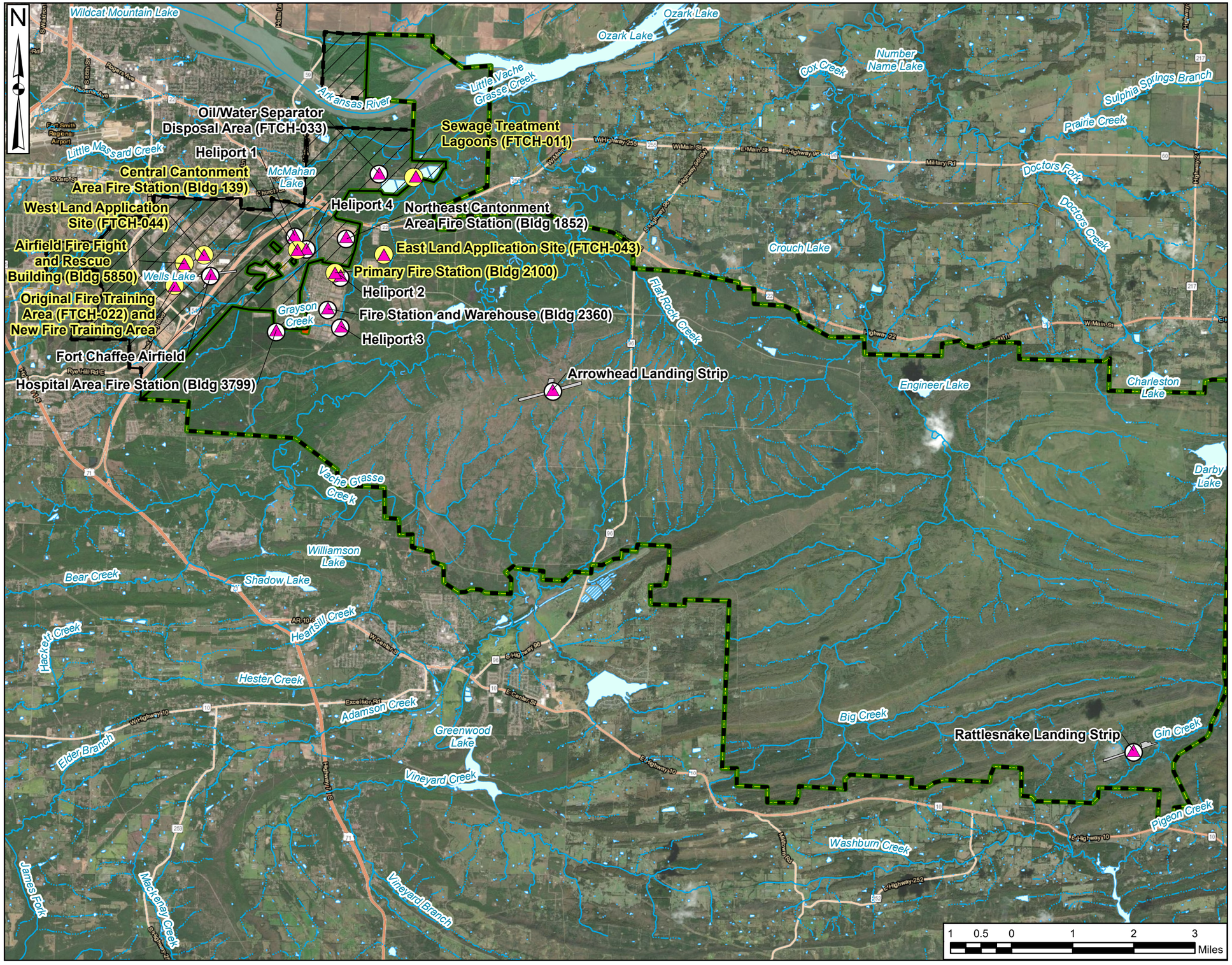
The PA identified areas where PFAS-containing materials were used, stored, and/or disposed of, or areas where known or suspected releases to the environment occurred. Based on recommendations from the PA, soil, sediment, surface water, and/or groundwater samples were collected from 19 AOPIs. The field investigation at FTCH was conducted in accordance with the Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) (AAR 2023a). Samples collected during this SI were analyzed for PFAS using procedures compliant with the DoD Quality Systems Manual (QSM) Version 5.3, Table B-15 (DoD 2019) and the laboratory standard operating procedure (SOP).

To determine if further investigation is warranted at each AOPI, this SI followed established USEPA guidance as well as DoD policy and guidance for investigating perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), perfluorohexanoic acid (PFHxA), perfluorobutanoic acid (PFBA), and hexafluoropropylene oxide dimer acid (HFPO-DA) (also known as GenX) (DoD 2023). Analytical results for samples collected during this SI were compared to residential scenario screening levels (SLs) calculated using the USEPA's regional screening level calculator for soil and the tap water criteria for groundwater, as published in the 2023 Office of the Secretary of Defense (OSD) Memorandum (DoD 2023). Analytical results for surface water and sediment samples collected during this SI were compared against these tap water and soil SLs, respectively. However, the surface water and sediment comparisons are qualitative and are not used to make recommendations to investigate any AOPI further. Screening levels are further discussed in Section 5. Of the eight PFAS compounds presented in the 24 August 2023 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte in the Final UFP-QAPP for this SI (AAR 2023a). Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at FTCH because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF). Also, based on GenX's history, including distribution limitations that restricted its use, GenX is generally not a component of other products the military used. Since PFAS is a large grouping consisting of thousands of individual chemicals, PFOA, PFOS, PFBS, PFNA, PFHxS, PFHxA, and PFBA altogether will be referred to in this report as "Target PFAS."

CSMs were developed during the PA, and then updated during the SI for each AOPI where Target PFAS were detected (at concentrations above the level of detection [LOD]). The updated CSMs detail site geological conditions; determine primary and secondary release mechanisms; identify potential human receptors; and detail complete, potentially complete, and incomplete exposure pathways for current and reasonably anticipated future exposure scenarios. Target PFAS were detected in at least one medium at 14 AOPIs. PFOS, PFOA, PFNA, and/or PFHxS concentrations exceeded SLs for groundwater at four of the AOPIs. PFOS, PFOA, PFNA, and/or PFHxS concentrations exceeded SLs for surface water at two of the AOPIs. Target PFAS did not exceed SLs for sediment. PFOS, PFOA, and/or PFHxS concentrations exceeded SLs for soil at six AOPIs. As described in Section 3.4.8, due to installation-imposed access restrictions imposed at Arrowhead Landing Strip, groundwater samples were not collected, an attempt to drill for groundwater was made at FTCH-ALS-SO-01. Therefore, a data gap concerning Target PFAS presence in groundwater exists. It is recommended that groundwater be sampled in a future investigation to resolve this data gap. The LOD for PFOS in groundwater was greater than the SL at the Fire Station and Warehouse, Northeast Cantonment Area Fire Station, Hospital Area Fire Station, Rattlesnake Landing Strip, and Fort Chaffee Airfield. The LOD for PFOS, PFOA, and PFNA in groundwater was greater than the SL at the Oil/Water Separator Sludge Disposal Area. Therefore, a data gap concerning Target PFAS presence in groundwater exists. It is also recommended that groundwater be sampled in a future investigation to resolve this data gap. Finally, although the Target PFAS were not detected in any of the soil samples collected at the Cantonment Area Heliports 1, 3, and 4, Target PFAS may be present in groundwater, which was not analyzed. Therefore, it is recommended that groundwater be sampled in the future to resolve this data gap. Figure ES-1 depicts the facility-wide map of AOPIs and the distribution of SL exceedances and proximity to facility boundaries.

Table ES-1 summarizes the AOPIs investigated during the SI and recommendations for further investigation.

Document Path: C:\Users\KyleRester\OneDrive - Aleut Federal\Multi-Site PFAS\05 Deliverables_Submittals\05.04 Drawings\FTCH GIS\MXDs\SI Report\Figure ES-1 Summary of Sites1.mxd



ALEUT

1 in = 221 miles

Legend

- Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
- BRAC Surplus Property
- Historical Fort Chaffee Installation Boundary
- Area Transferred to the United States Department of Energy
- River/Stream (Perennial)
- Stream (Intermittent)
- Water Body
- Airfield
- AOPI
- AOPI with OSD Risk Screening Level Exceedance
- AOPI with Further Investigation Recommended

Abbreviations:
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
LOD = Limit of Detection
OSD = Office of Secretary of Defense

Notes:
Monitoring wells (MW) are those identified in historical documents available for review and are not a complete list of the MW which existed or currently remain in the area.

Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery

Coordinate System:
WGS 1984, UTM Zone 15 North

Site Inspections (SI) of Per- and Polyfluoroalkyl Substances (PFAS)

Location: Fort Chaffee, Arkansas

Figure ES-1: Summary of AOPI Locations

Drawn By:	
K RESTER	M. FLETCHER

Table ES-1. Summary of AOPIs and Recommendations for Further Investigation

AOPI Name	Exceedance of SLs				Recommendation
	Groundwater	Surface Water[1]	Soil	Sediment[1]	
Original Fire Training Area (FTCH-022)[2]	Yes	Yes	Yes	No	Further investigation recommended
New Fire Training Area[2]					
Central Cantonment Area Fire Station (Building 139)	No	NS	Yes	NS	Further investigation recommended
Airfield Fire Fight and Rescue Station (Building 5850)	No	NS	Yes	NS	Further investigation recommended
Primary Fire Station (Building 2100)	No	NS	Yes	NS	Further investigation recommended[3]
Cantonment Area Heliports: Heliport 2	NS	NS	No	NS	
Fire Station and Warehouse (Building 2360)	No	NS	No	NS	Further investigation recommended[4]
Northeast Cantonment Area Fire Station (Building 1852)	No	NS	No	NS	Further investigation recommended[4]
Hospital Area Fire Station (Building 3799)	ND	NS	No	NS	Further investigation recommended[4]
Oil/Water Separator Sludge Disposal Area (FTCH-033)	ND	NS	NS	NS	Further investigation recommended[4]
Sewage Treatment Lagoons (FTCH-011)	Yes	NS	NS	NS	Further investigation recommended
East Land Application Site (FTCH-043)	ND	NS	Yes	NS	Further investigation recommended
West Land Application Site (FTCH-044)	Yes	NS	NS	NS	Further investigation recommended
Arrowhead Landing Strip	NS	NS	No	NS	Further investigation recommended[5]
Rattlesnake Landing Strip	No	NS	No	NS	Further investigation recommended[4]
Cantonment Area Heliports: Heliport 1	NS	NS	ND	NS	Further investigation recommended[6]
Cantonment Area Heliports: Heliport 3	NS	NS	ND	NS	Further investigation recommended[6]
Cantonment Area Heliports: Heliport 4	NS	NS	ND	NS	Further investigation recommended[6]
Fort Chaffee Airfield	ND	NS	NS	NS	Further investigation recommended[4]

Notes:

AOPI – area of potential interest ND – non-detect

No – PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and/or PFBA detected at a concentration below the SL

NS – not sampled SL – screening level

Yes – PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and/or PFBA detected at a concentration above the SL

[1]Comparisons of Target PFAS in surface water to residential tap water SLs and in sediment to residential soil SLs are not used on their own to make recommendations to investigate any AOPI further.

[2]Due to ongoing construction at the Original and New Fire Training Areas, sampling locations were modified and are considered representative of both AOPIs. See Section 3.4.8 for additional details.

[3]Groundwater was not collected at the Cantonment Area Heliport: Heliport 2. However, it is in close proximity to the Primary Fire Station, where soil samples did exceed SLs. Therefore, it is recommended that this heliport be further investigated along with the Primary Fire Station.

[4]At this AOPI, concentrations of Target PFAS were below SLs. However, the limit of detection for at least one Target PFAS was above the SL. Although unlikely, Target PFAS could be present at values above the SL. Therefore, it is recommended that groundwater be sampled at this AOPI during a future investigation.

[5]As described in Section 3.4.8, groundwater samples could not be collected from this AOPI due to installation-imposed access restrictions. As a result, there is a data gap presented at this AOPI. Therefore, it is recommended that groundwater be sampled at this AOPI during a future investigation.

[6]Although the Target PFAS were not detected in any of the soil samples collected at these AOPIs, Target PFAS may be present in groundwater, which was not analyzed. Therefore, it is recommended that groundwater be sampled at these AOPIs during a future investigation.

1. INTRODUCTION

The U.S. Army (Army) is conducting Preliminary Assessments (PAs, 40 CFR 300.420(b)) and Site Inspections (SIs, 40 CFR 300.420(c)) to investigate the potential presence or release of Per- and Polyfluoroalkyl Substances (PFAS), by investigating the use, storage, or disposal of per- and polyfluoroalkyl substances (PFAS) at multiple Base Realignment and Closure (BRAC) installations, nationwide. This SI is focused on the former Fort Chaffee (FTCH) property that was controlled and operated by the DoD/Active Army prior to the closure of the active-duty garrison on 27 September 1997. This SI was conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 United States Code [U.S.C.] §9601 et seq.); the Defense Environmental Restoration Program (DERP, 10 U.S.C. §2700 et seq.); the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 Code of Federal Regulations [CFR] Part 300); and guidance documents developed by the U.S. Environmental Protection Agency (USEPA), the Department of Defense (DoD) and the Army. FTCH is not on the National Priorities List (NPL), and the Army is responsible for compliance with CERCLA in accordance with Executive Order 12580, as amended.

Based on results of the FTCH PFAS PA, 19 areas of potential interest (AOPIs) were identified for investigation through multimedia sampling in an SI to determine whether a PFAS release occurred. The maximum extent for FTCH was estimated to be approximately 71,400 acres that extended through Sebastian County, Crawford County, and Franklin County in Arkansas and is referred to as the "site" throughout the document. (Fort Chaffee U.S. Army Garrison [USAG] 1991). The installation is approximately six miles southeast of Fort Smith, Arkansas. The location of the installation, including its historical boundary, is depicted on Figure 1-1.

In late 1995, the federal government declared approximately 7,050 acres of FTCH to be surplus (identified in Figure 1-1 as the BRAC Surplus Property), and the remaining approximate 64,350 acres were assigned to the Arkansas Army National Guard (ARARNG). On 27 September 1997, the active-duty garrison was closed and the ARARNG took control of those 64,350 acres, which became known as the Fort Chaffee Joint Maneuver Training Center (FCJMTC). The BRAC Surplus Property was transferred for primarily non-federal control to the Fort Chaffee Redevelopment Authority (FCRA) beginning in 2000. The FCRA has overseen the sale of the parcels withing the BRAC Surplus Property for industrial, commercial, and residential redevelopment. Additionally, a small amount of BRAC Surplus Property was transferred to other Federal organizations such as the U.S. Army Reserve and the U.S. Department of Energy (USDOE). Final conveyances were completed on 24 September 2003 (Headquarters Department of the Army [HQDA] 2019).

1.1 SCOPE AND OBJECTIVES

The overall objective of the SI is to determine the presence or absence of PFAS at each AOPI. The SI Report will use the findings from the PA in conjunction with soil and groundwater sampling data to determine whether PFAS have been released to the environment and whether a release has affected or may affect specific human health targets. Furthermore, the SI will evaluate and summarize the need for additional investigation (40 CFR 300.420(c)(1)).

The SI scope included preparation of project planning documents; field investigation; validation and management of analytical data; comparison of analytical data to OSD screening levels (SLs); and documentation of the investigation results. This SI was conducted in accordance with the Programmatic Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) (AAR 2023a). The field activities followed site-specific sampling and health and safety protocols, as identified in the Accident Prevention Plan and the Site Safety and Health Plan (Appendix E of the UFP-QAPP Addendum).

1.2 FORT CHAFFEE DESCRIPTION

FTCH was an Army facility located in west central Arkansas. The 1995 BRAC Commission recommended the closure of FTCH with the retention of essential ranges, facilities, and training areas to be used as a Reserve Component (RC) Training enclave for the execution of individual and annual training. Approximately 7,050 acres were declared to be surplus and 64,350 acres were assigned to and eventually taken control of by the ARARNG.

The 7,050 surplus acres were transferred to the following recipients:

- FCRA: approximately 5,429 acres
- City of Fort Smith: approximately 1,000 acres
- State of Arkansas: approximately 615 acres
- U.S. Department of Energy: approximately 6 acres

The first conveyances were completed on 25 October 2000 and the final conveyances were completed on 24 September 2003 (HQDA 2019). Land which has been transferred has undergone industrial, commercial, and residential redevelopment.

During the development of the PA, historical records, interviews, site reconnaissance, available documentation and physical evidence were reviewed to determine where PFAS-containing materials may have previously been stored, used, or disposed (40 CFR 300/420(b)(5)). The evaluated areas include fire stations; pesticide storage facilities; photochemical processing facilities; chemical storage areas; and munitions disposal sites. The FTCH PFAS PA recommended 19 AOPIs for further investigation in an SI due to known or potential historical PFAS-containing material use, storage, or disposal. The AOPIs, as well as the dates of operation and sizes of each area, are presented in Table 1-1 and illustrated in Figure 1-2.

Table 1-1. List of AOPIs at FTCH

AOPI Name	Dates of Operation	Approximate Size (acres)
Original Fire Training Area (FTCH-022)	1971 to 1990 (estimated)	2
New Fire Training Area	1990s to 1997	5
Central Cantonment Area Fire Station (Building 139)	1942 to 1997	0.5
Airfield Fire Fight and Rescue Station (Building 5850)	1943 to 1997	2
Primary Fire Station (Building 2100)*	Early 1940s to unknown	5
Cantonment Area Heliports: Heliport 2*	1980 to unknown	0.1
Fire Station and Warehouse (Building 2360)*	Early 1940s to 1992	0.7
Northeast Cantonment Area Fire Station (Building 1852)	1942 to 2008	0.5

AOPI Name	Dates of Operation	Approximate Size (acres)
Hospital Area Fire Station (Building 3799)*	1942 to 2002 (estimated)	1
Oil/Water Separator Sludge Disposal Area (FTCH-033)	1975 to 1992	1
Sewage Treatment Lagoons (FTCH-011)	1967 to 1995	100
East Land Application Site (FTCH-043)*	1990	9
West Land Application Site (FTCH-044)	1990	10
Arrowhead Landing Strip*	1983 to 1997	38
Rattlesnake Landing Strip*	1983 to 1997 (estimated)	39
Cantonment Area Heliports: Heliport 1	1980 to unknown	0.1
Cantonment Area Heliports: Heliport 3*	1980 to unknown	0.1
Cantonment Area Heliports: Heliport 4	1980 to unknown	0.1
Fort Chaffee Airfield	1953 to 1965 1972 to 1991	32

Notes: * Site is owned by ARARNG

1.3 REPORT ORGANIZATION

The contents of the remaining sections of this SI Report are summarized below:

- ***Section 2. Environmental Setting***—This section discusses the environmental setting at FTCH. Demographics, land use, geology, hydrogeology, hydrology, soil, and climate are described.
- ***Section 3. Field Investigation Activities***—This section provides field procedures followed during the implementation of the SI.
- ***Section 4. Data Analysis and Quality Assurance Summary***—This section describes the laboratory chemical analysis program for the investigation. Sample handling procedures, laboratory equipment calibration, laboratory analytical methods, data reporting and validation, and sample data quality assurance (QA)/quality control (QC) are discussed.
- ***Section 5. Screening Levels***—This section presents the PFAS with SLs outlined in the 2023 Office of the Secretary of Defense (OSD) Memorandum (DoD 2023) and the SLs to which SI results are compared.
- ***Section 6. SI Results***—This section presents the data gathered during the SI activities and updated conceptual site models (CSMs).
- ***Section 7. Conclusions and Recommendations***—This section summarizes the SI conclusions and presents recommendations for the FTCH AOPIs.
- ***Section 8. References—***This section lists the references that were used in the preparation of this report.
- ***Appendices***—Appendices A - I include data from field activities or related assessments:
  - Appendix A. Daily Quality Control Reports
  - Appendix B. Photograph Log
  - Appendix C. Boring Logs and Well Construction Logs
  - Appendix D. Sampling and Calibration Logs
  - Appendix E. Investigation-Derived Waste (IDW) Documents
  - Appendix F. Data Usability Assessment and Laboratory Reports
  - Appendix G. Data Presentation Tables.

2. ENVIRONMENTAL SETTING

This section provides general information about FTCH, including the site location, operational history, current and projected land use, climate, topography, geology, hydrogeology, surface water hydrology, potable wells within a 5-mile radius of the site, and applicable ecological receptors.

2.1 SITE LOCATION

FTCH, including its previous iterations (e.g., Camp Chaffee), was established in 1942 and has had a long history as a major training area for all military services. FTCH is located approximately six miles southeast of Fort Smith, Arkansas in the Ozark Mountains of the west central part of Arkansas. The original area acquired for FTCH was 76,075 acres. After disposal, corrected surveys, and audits, the area encompassing FTCH was estimated to be approximately 71,400 acres that extended through Sebastian County, Crawford County, and Franklin County in Arkansas (Environmental Resource Management Group [ERM] 1996). Figure 2-1 depicts the FTCH site features, including the site boundary, roads, buildings, topography, and surface water bodies.

2.2 SITE OPERATIONAL HISTORY

FTCH has a long history as a major training area for all military services, including Active Components (those who are in the Army as their full-time occupation) and RC (made up of the U.S. Army National Guard [ARNG] and U.S. Army Reserve [USAR]), for several civilian agencies, and for other agencies including the USDOE, the Federal Bureau of Investigation, the Federal Marshal Service, Navy Sea, Air, Land special forces, the Justice Department, and the Department of the Interior. At the time of the 1995 BRAC commission's recommendation of closure, the mission of FTCH was to maintain a major training area for the Army and to serve as a Forces Command designated mobilization station and contingency mission site.

The facilities of FTCH made it uniquely qualified as a host for a wide array of training activities. In addition to the standard small arms ranges, FTCH also had two tactical landing strips, 19 drop zones, two mock villages, a mock prisoner of war compound, a Military Operation Urban Terrain site, a live-fire complex, a river-crossing site, and a 6,000-acre artillery impact area. Each year, more than 3,000 sorties were flown by active and RC members of the Air Force, Navy, and Marines using an ARARNG-operated high-performance aircraft bombing and gunnery complex located on FTCH. In 1994, more than 10,000 Active Components and 40,000 RC soldiers trained at FTCH (Department of the Army 1996). From 1987 to 1993, the mission was to host and provide support for the Joint Readiness Training Center (JRTC).

In addition to its training support mission, FTCH was the mobilization site for 46 units with 10,500 assigned soldiers. Further, it served as a site for accommodation of contingency missions involving large numbers of people in resettlement programs.

The installation was activated on 27 March 1942 as Camp Chaffee. From 1948 until 1957, the mission was to host and support the 5th Armored Division. During World War II, several Armored Divisions trained there, and it served as a prisoner of war camp for enemy combatants. In 1957, the installation was renamed Fort Chaffee, and the Field Artillery Training Center was moved to Fort Sill, Oklahoma. From 1957 to 1959, the mission was to host and provide support as the Army's

Field Artillery Training Center. From 1961 to 1962, the mission was to host and provide support for the 100th Infantry Division. From 1962 to 1986, the mission was to provide RC Training. It was declared inactive intermittently from 1960 to 1974. From 1975 to 1976, FTCH processed refugees from Southeast Asia and in May 1980, it began processing Cuban refugees.

2.3 DEMOGRAPHICS, PROPERTY TRANSFER, AND LAND USE

The site is primarily surrounded by other cities of Arkansas including Fort Smith to the Northwest; Barling, Central City, Lavaca, and Charleston to the North; Booneville to the Southeast; Washburn to the South; and Greenwood to the Southwest. There are no zoning regulations in effect for the area surrounding FTCH. Land use in Sebastian County, Crawford County, and Franklin County is mostly woodlands and pastures along with dispersed residential areas (Arkansas Water 2014).

The 7,050 acres (identified as the BRAC Surplus Property) transferred to the FCRA has undergone industrial, commercial, and residential redevelopment. The FCRA released an updated Future Land Use Plan in 2022 that depicts future land use for commercial/office, mixed uses (residential/commercial/office, neighborhood commercial/office, business park, historic area, industrial/office), single family residential, institutional, landfill, former landfill, park/open space (public), community attraction (private), and cemetery purposes (FCRA 2022a).

The FCJMTC continues to be used for training purposes.

2.3.1 BRAC Events

The 1991 BRAC Commission recommended that FTCH be returned to semi-active status with an Active Component Garrison to be used in support of RC Training. However, the permanent JRTC would be moved from FTCH and established at Fort Johnson (formerly Fort Polk), Louisiana. This move was completed in 1993.

The 1995 BRAC Commission recommended the closure of FTCH with the retention of essential ranges, facilities, and training areas to be used as a RC training enclave for the execution of individual and annual training. In late 1995, the federal government declared approximately 7,050 acres of FTCH to be surplus (identified as the BRAC Surplus Property), and the remaining approximately 64,350 acres were transferred to the ARARNG, remaining under DoD control. On 27 September 1997, the active-duty garrison was closed and the ARARNG took control of those 64,350 acres, which became known as the FCJMTC. This area is broken down into cantonment, maneuver, artillery impact, and special use areas. Approximately 7,050 acres were transferred from federal control to the FCRA. A small amount of the BRAC Surplus Property acreage was transferred to other Federal organizations such as the USAR and the DOE. Final conveyances were completed on 24 September 2003 (HQDA 2019).

FTCH Joint Maneuver Training Center

The FCJMTC was retained and operated by the ARARNG as a training installation following the 1995 BRAC determination because of its ideal terrain for training

The FCJMTC is currently utilized by all DoD components, as well as several local, state, and federal agencies. The extent of the FCJMTC is shown on Figure 2-1. The PA accounted for activities related to Army Actions on this property that took place prior to the 1997 BRAC event.

BRAC Surplus

The majority of BRAC Surplus property was transferred to the FCRA (approximately 5,429 acres). However, property was also transferred to the USDOE (approximately 6 acres), the City of Fort Smith (approximately 1,000 acres), and the State of Arkansas (approximately 615 acres). Land use included expanding a city landfill, expanding interstate I-49, and for the development of parks, passive recreation area and open space (U.S. Fort Chaffee Base Transition Team 1998).

The State of Arkansas formed the FCRA in 1997 with the mission of overseeing the redevelopment of the BRAC Surplus Property for beneficial use and as a revenue generator for the local community. The majority of the BRAC Surplus Property was transferred to the FCRA. The FCRA created the Chaffee Crossing area, which consists of commercial, industrial, and residential property use types.

2.4 TOPOGRAPHY

The majority of FTCH lies within the Arkansas Valley, a section of the greater Ouachita Mountain Province. The installation is characterized by gently to moderately rolling hills. In the southeastern portion of the installation, steep and rugged ridges cut across the reservation in a southwesterly to northeasterly direction. The area is characterized by five physiographic groups. The riparian area to the north, the cantonment area to the west, the well-draining central hills, and the poorly draining Massard Prairie to the northeast, and the well-draining Washburn Mountains in the southeast (Fort Chaffee USAG 1991).

2.5 GEOLOGY

The physiographic features within FTCH boundaries were developed by stream erosion on a series of deformed strata. The installation is underlain by Pennsylvania age rocks and Quaternary age rocks. The Atoka formation is the oldest, consisting of 7,000 feet (ft) of sandstone and shale. It is the surface feature in the southeastern portion of the installation. Above the Atoka formation is the Hartshorne formation, which consists of 200 ft of brown to light gray sandstone. It is the surface feature within the central portion and just north of the southeast corner of the installation. The McAlester formation overlays Hartshorne. It is reported to exceed 1,400 ft. The lower portion of the McAlester formation consists of thick beds of sandstone and intervening beds of shale. The upper portion consists of alternating beds of sandstone and coal. The McAlester formation is the surface formation found in the western cantonment area, surrounding the central portion of the installation, and north of the Hartshorne surface features in the southeast. The youngest rock formation is the Savanna Sandstone, which is approximately 1,100 ft thick. There are five layers of this formation, ranging from 50 to 200 ft with shale seams between the sandstone layers. It is the surface feature of the eastern cantonment area and the northeast portion of the installation. Alluvial deposits along the Arkansas River yield sand, silt, clay, and occasionally gravel. Depth to bedrock at FTCH ranges between a few inches and 12 ft deep (Fort Chaffee USAG 1991).

2.6 HYDROGEOLOGY

FTCH is underlain by rocks of Pennsylvanian age and alluvium of Quaternary age. Groundwater is held in the consolidated rocks and in the unconsolidated alluvial and terrace sediments that occur along the Arkansas River and its tributaries (U.S. Army Corps of Engineers [USACE] Little Rock District 1999). The hydrogeology in the area consists of a shallow alluvial system with a lower confining shale layer from the Savanna or McAlester formations (ERM 1996). Groundwater throughout the area varies due to the versatility of lithologies in the formations. Some areas have high permeability that can produce about 60 gallons per minute of water and others have low permeability that can produce about 20 gallons per minute of water. Areas with high permeability may be along fractures and areas with low permeability may be along the alluvial deposits (USACE Little Rock District 1999).

Small quantities of water can be obtained from wells 50 to 200 ft deep. Wells in the area do not produce much water due to the consolidated formations (USACE Little Rock District 1999). At around 500 ft the concentration of total dissolved solids begins increasing and does not become ideal for extraction. Six wells exist throughout the property, but the wells are not used for drinking purposes. One well was created during a gas exploration effort and the other five wells were created to retrieve water for vegetable gardens (Fort Chaffee USAG 1991).

Shallow groundwater system discharges directly to surface streams, drainage ways, and underlaying bedrock aquifers (ERM 1997). The groundwater flow in the area has not been studied extensively but based off the local topography and groundwater sampling events, it is suggested that flow generally runs south to north.

2.7 SURFACE WATER HYDROLOGY

Multiple bodies of water are located on FTCH and the surrounding area. There are six streams/creeks that run throughout FTCH, with the major river being the Arkansas River. The Arkansas River crosses in the norther portion of FTCH. The six streams, in order from west to east are (ERM 1996):

1. Massard Creek
2. Little Vache Grasse Creek
3. Vache Grasse Creek
4. Flat Rock Creek
5. Big Creek
6. Gin Creek

All streams drain north to the Arkansas River with the exception of Gin Creek that drains south to Washburn Creek. A couple of lakes are located on and around FTCH as well. This includes Wells Lake, Torians Lake, No-Name Lake, Bown’s Lake, Mendenhall Swamp, Christmas Lake, Engineer Lake, and Darby Lake (ERM 1996).

2.8 WATER USAGE

FTCH receives potable water from the City of Fort Smith. It does not utilize any wells on-post for any purpose other than a watering resource for vegetable gardens. The City of Fort Smith extracts

water from Lake Fort Smith in Mountainburg, Arkansas, and the Lee Creek Reservoir, Arkansas, and is treated by their water treatment plants. The water is delivered to FTCH through an 18-inch cast iron main. The water comes off the main at a connection on Massard Road and connects to the FTCH distribution system. Water is then sent to two water storage tanks for storage (ERM 1996).

2.9 ECOLOGICAL PROFILE

Generally, the installation lies within the broad southern forest, which stretches along the Atlantic Coastal Plan from southern Virginia down to the top of Florida, westward into the eastern portion of Texas and northward into Oklahoma. The installation is under the influence of two types of native forest regions: the northerly Oak-Hickory Forest and the southerly Oak-Pine Forest (Fort Chaffee USAG 1991). In 1993, a survey of rare and endangered plants and animals was completed for FTCH. The survey included insects, mollusks, fishes, crustaceans, amphibians, reptiles, mammals, birds, and plants. In this survey, the American burying beetle (*Nicrophorus americanus),* ornate box turtle (*Terrapene ornata ornata*), northern scarlet snake (*Cemphora coccinea copei*), Bewick's wren (*Thryomanes bewickii*), and eastern harvest mouse (*Reithrondontomys humulis*) were identified. The spadefoot frog (*Scaphiopus holbrookii hurterii*) and Strecker's chorus frog (*Pseudacris streckeri streckeri*) were listed as "should occur at Fort Chaffee." Finally, the southern red-backed salamander (*Plethodon serratus*) was listed as possibly occurring (ERM 1996).

Common primary consumers in the area include the gray fox, gray squirrel, beaver, cottontail rabbit, and whitetail deer. Common secondary consumers include armadillo, opossum, racoon, skunk, mink, muskrat, red and gray foxes, bobcat, coyote, and mixed canids. A 1988 Audubon Christmas Bird count revealed 188 different species found on the installation (Fort Chaffee USAG 1991).

2.10 CLIMATE

FTCH weather is affected by the Boston Mountains to the north and its proximity to the Gulf of Mexico. The Boston Mountains allow for cold continental air in the winter, and the proximity to the gulf creates humid summers (ERM 1996). According to the National Oceanic and Atmospheric Administration's National Weather Service, the hottest month in the area occurs during July and ranges in the mid-90s with an average high of 73.8 degrees Fahrenheit (°F). There is an average of only 8.7 days where the temperature exceeds 100°F. The coldest month occurs in January and ranges in the high 20s with an average low of 50.9°F. There is an average of only 2.9 inches of snowfall per year.

FTCH lies in or near the humid subtropical belt resulting in abundant precipitation (ERM 1996). The area averages 47.34 inches of rainfall a year and 98.2 rainy days. The rainiest time is in the late spring and early summer. Precipitation is distributed throughout the year, with the least precipitation in February and the most in May (U.S. Department of Commerce, National Oceanic and Atmospheric Administration 2022).

3. FIELD INVESTIGATION ACTIVITIES

This section provides field procedures followed during the implementation of the SI (40 CFR 300.420(c)(4)(i)). The principal guidance document for the field investigation activities and procedures used for the FTCH SI were consistent with the requirements presented in the Army Guidance for Addressing Releases of PFAS (U.S. Army 2018).

3.1 SITE INSPECTION DATA QUALITY OBJECTIVES

The data quality objectives (DQOs) were developed to define the problem at the AOPIs, identify the necessary decisions, specify decision-making rules and the level of confidence necessary to resolve the problem, identify the number of samples necessary to support the decision, and obtain agreement from the decision makers before the sampling program was initiated. The FTCH sample locations were determined based on current site conditions (i.e., topography), historical data (e.g., suspected location of PFAS release), and historical activities (e.g., remedial activities, disposal of potentially contaminated materials). The project stakeholders concurred that selected sampling schemes would be representative of site conditions prior to initiation of field investigation activities. The field investigation at FTCH was conducted in accordance with the UFP-QAPP (AAR 2023a). The field activities employed to execute the UFP-QAPP are described below and include any variances or deviations.

3.2 SAMPLE DESIGN AND RATIONALE

19 AOPIs were investigated during the FTCH SI to determine the presence or absence of PFAS in the environment. Information inputs from the preliminary CSMs presented on Worksheet #10 of the UFP-QAPP (AAR 2023a) are the basis for sample design at each AOPI. All samples were analyzed for the Target PFAS list of PFOA, PFOS, PFBS, PFNA, PFHxS, PFHxA, and PFBA. The presence of HFPO-DA (commonly referred to as GenX) is not anticipated at FTCH because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF). Also, based on GenX's history, including distribution limitations that restricted its use, GenX is generally not a component of other products the military used. Therefore, HFPO-DA was not included as an analyte in the Final UFP-QAPP for this SI (AAR 2023a).

The general approach for determining the presence or absence of PFAS at an AOPI consisted of collecting groundwater samples within and/or downgradient from the AOPI and at least two soil samples. Groundwater samples were not proposed within and/or downgradient of the Cantonment Area Heliports because of the limited quantities of AFFF that may have been released there. Groundwater was not collected at Arrowhead Landing Strip because of restrictions imposed on access by the installation. Soil samples were not proposed within the Fort Chaffee Airfield, Sewage Treatment Lagoons, Oil/Water Separator Sludge Disposal Area, or West Land Application Site because the areas have been redeveloped and impacted surface soils were not anticipated to be present.

All sample identifications were assigned in the following format:

- Parent soil samples: FTCH-[AOPI]-SO-[Boring No.]-[MMDDYY];
- Parent grab groundwater samples: FTCH-[AOPI]-GW-[Boring No.]-[MMDDYY];

- FD: FTCH-FD-[Duplicate No.]-[Medium Type]-[MMDDYY];
- Blank QC samples: FTCH-[QC sample type]-[QC sample type number]-[MMDDYY].
    - Note: [MMDDYY] = Month Day Year
    - Example Sample Nomenclature: FTCH-FCA-GW-01-072823

3.3 FIELD INVESTIGATION ACTIVITIES

SI field activities were conducted from 19 July to 17 August 2023. The locations and methods of sample collection under the SI are described in the following sections. Sampling procedures adhered to the UFP-QAPP (AAR 2023a), with relevant information summarized below.

Sampling activities at FTCH included collecting surface soil samples from soil borings, installing temporary groundwater monitoring wells, and sampling direct push technology (DPT) screen point samplers. One round of groundwater sampling was conducted. Samples were analyzed for 26 PFAS to determine the presence or absence of PFAS. A total of 90 samples were planned among the 19 AOPIs, including 24 DPT screen point groundwater samples and 66 surface soil samples. As described in Section 3.4.8, one unplanned surface water sample was collected, two planned surface soil samples were not collected and five planned groundwater samples were not collected. A breakdown of samples collected at each AOPI is provided in Table 3-1. Prior to beginning sampling, site reconnaissance and utility clearance were performed. Sampling was completed at one AOPI before moving to the next AOPI when feasible. Any variances in sampling procedure, such as moving a location or sample point elimination, were communicated in the Daily Quality Control Reports submitted via email (Appendix A). Field procedures and any variances are discussed in the following sections. Photographs of SI field activities are provided in Appendix B.

Table 3-1. FTCH AOPI SI Sample Collection

AOPI Name	Soil Samples	Sediment Samples	Surface Water Samples	Groundwater Samples
New Fire Training Area Original Fire Training Area (FTCH-022)	3	1	1	2
Central Cantonment Area Fire Station (Building 139)	2	0	0	1
Airfield Fire Fight and Rescue Station (Building 5850)	6	0	0	2
Primary Fire Station (Building 2100)*	7	0	0	2
Cantonment Area Heliports: Heliport 2*	4	0	0	0
Fire Station and Warehouse (Building 2360)*	2	0	0	1
Northeast Cantonment Area Fire Station (Building 1852)	2	0	0	1
Hospital Area Fire Station (Building 3799)*	2	0	0	1

AOPI Name	Soil Samples	Sediment Samples	Surface Water Samples	Groundwater Samples
Oil/Water Separator Sludge Disposal Area (FTCH-033)	0	0	0	1
Sewage Treatment Lagoons (FTCH-011)	0	0	0	2
East Land Application Site (FTCH-043)*	2	0	0	1
West Land Application Site (FTCH-044)	0	0	0	1
Arrowhead Landing Strip	7	0	0	0
Rattlesnake Landing Strip*	15	0	0	3
Cantonment Area Heliports: Heliport 1	4	0	0	0
Cantonment Area Heliports: Heliport 3*	4	0	0	0
Cantonment Area Heliports: Heliport 4	4	0	0	0
Fort Chaffee Airfield	0	0	0	1
Total	**64**	**1**	**1**	**19**

Notes:
*Site is owned by ARARNG

3.4 FIELD PROCEDURES

The following sections describe utilities clearance, temporary well installation and development procedures, field procedures for sampling each medium, borehole abandonment, and location survey.

Because many materials routinely used during environmental investigation can potentially contain PFAS, the field crew conducted SI activities in accordance with the PFAS sampling SOPs/Technical Guidance Instructions (TGIs) presented in Appendix B of the UFP-QAPP (AAR 2023a). Procedures include requirements for equipment, containers, handling, and sampling, including PFAS specific requirements, to ensure that sample contamination does not occur during collection and transport.

3.4.1 Utility Clearance

Prior to initiating intrusive activities, the field manager coordinated underground utility clearances for the 19 AOPIs through Arkansas811 "Call Before You Dig." FTCH utility clearance was coordinated separately through the FCJMTC Civil Engineering department's dig permit process. For three AOPIs (Original/New Fire Training Area and West Land Application Site) an additional private utility clearance was completed using ground penetrating radar. As part of the utility clearance process, individual utility companies were consulted (as needed), each area was visually inspected to verify that utilities had been marked, and the field manager looked for signs of unidentified utilities (including overhead utilities) prior to initiating drilling operations. In addition

to field manager, the rig geologist and drillers would also check for marked utilities and signs of unidentified utilities prior to initiating drilling operations. As part of field activities hand clearance was conducted at each boring location prior to conducting powered drilling within of known or suspected subsurface utilities, the boreholes were excavated using a low-impact technique (hand auger) to a minimum of 5 ft below ground surface (bgs). If power drilling operations were required within the first 5 ft bgs it was first discussed between the rig geologist, field manager, driller, and any utility company (if needed).

3.4.2 Bulk Source Water Sampling

Prior to beginning work, a bulk source water sample was collected on 12 August 2023 (FTCH-SB-01). The sample was collected from the point of exit from the water tanks used by the drilling subcontractors (Cascade Environmental). It underwent PFAS analysis as a QA/QC measure. Source water was used for decontamination of equipment, including drill tooling, and for abandonment of boreholes. Source water was purged for a minimum of 1 minute prior to filling high-density polyethylene (HDPE) bottles. Concentrations of PFAS were not detected in the source water blank above laboratory reporting limits.

3.4.3 Soil Sampling

All soil samples were collected in accordance with the procedures outlined in the UFP-QAPP (AAR 2023a). QC samples, including duplicates, equipment rinsate blanks, and matrix spike/matrix spike duplicates (MS/MSDs), were also collected.

Soil samples were collected using a stainless-steel hand auger bucket. Each soil core was logged for lithology in accordance with USACE guidance and recorded on a drilling log (drilling logs are provided in Appendix C). Sample bottles were labeled and sealed in Ziploc® bags and placed on wet ice for cooling to ≤6 degrees Celsius (°C). Additional details on protocols for obtaining soil samples are outlined on Worksheet #18 and the Arcadis P-08 TGI PFAS Field Sampling Guide provided in the UFP-QAPP (AAR 2023a). Surface soil samples were collected from the 0- to 2-foot bgs interval.

Soil borings were abandoned following sample collection by backfilling the borehole with bentonite chips. Bentonite chips were hydrated using the bulk source water. Surface restoration matched the surrounding surface (e.g., concrete, asphalt, grass).

3.4.4 Groundwater Sampling

All groundwater samples were collected in accordance with the procedures outlined in the UFP-QAPP (AAR 2023a). QC samples, including duplicates, equipment blanks, and MS/MSDs were also collected.

Groundwater was sampled from temporary monitoring wells and from DPT groundwater sampling assemblies (e.g., Geoprobe® SP16 screen point samplers or like tooling). Groundwater was collected using the low-flow purge method via peristaltic pump whenever conditions allowed. Otherwise, groundwater would be collected using grab methods via installed DPT groundwater sampling assemblies, peristaltic pump, or bailers.

Prior to sampling, static water level measurements were collected to the nearest 0.01 foot. Following completion of monitoring well purging and stabilization, samples were collected in laboratory-supplied HDPE plastic containers. All samples were collected and handled while wearing clean non-powdered, disposable nitrile gloves. Sample bottles were labeled and sealed in Ziploc® bags and placed on wet ice for cooling to ≤6°C. New, clean nitrile gloves were donned prior to each new sample collection. Sampling containers were labeled with the following information: site name, sample identification, date and time of sample collection, and type of analysis.

3.4.4.3 Temporary Monitoring Well Sampling

Temporary monitoring wells were installed at the Airfield Fire Fight and Rescue Station (Building 5850), Fort Chaffee Airfield, and Sewage Treatment Lagoons (FTCH-011) AOPIs using a Geoprobe® DPT drill rig, with use of both DPT tooling and auger tooling depending on the lithology encountered and constructed using new ¾-inch 5-foot prepacked 0.010-inch slot schedule 40 polyvinyl chloride (PVC) 65mesh stainless steel wire wrapped screen and ¾-inch 5-foot schedule 40 PVC risers. All temporary wells were purged or pumped until dry multiple times and considered developed after all criteria were achieved excluding stability parameters. Well development forms are provided in Appendix D.

Five temporary wells (FTCH-AFFRS-GW-01, FTCH-AFFRS-GW-02, FTCH-FCA-GW-01, FTCH-STL-GW-01, and FTCH-STL-GW-02) were not capable of sustaining adequate purging and experienced continuous drawdown at the lowest pump settings. These wells were purged dry and allowed to recharge. The field team returned to the wells when a sufficient volume of water had entered the wells, not to exceed 24 hours unless recharge was not adequate for sample collection, and grab samples were collected using a peristaltic pump and new HDPE tubing. One temporary well (FTCH-STL-GW-02) did not produce adequate water for a sample to be collected.

Once groundwater sampling was complete, all temporary monitoring wells were abandoned in accordance with the Arkansas Water Well Construction Commission (AWWCC, AWWCC 2022) and as outlined in the FTCH Well Installation Plan (AAR 2023b). Temporary monitoring wells were abandoned by removing all PVC casing and screen and backfilling the borehole from the bottom to the surface with bentonite chips. The chips were then hydrated with bulk source water. Surface completion matched the surrounding surface (i.e., concrete, asphalt, grass).

3.4.4.2 DPT Screen Point Sampling

Groundwater samples were collected from 15 DPT groundwater sample locations. Collection methods for DPT groundwater samples are outlined in the FTCH Well Installation Plan (AAR 2023b) and the Arcadis P-08 TGI PFAS Field Sampling Guide provided in the UFP-QAPP (AAR 2023a). Following completion of drilling each borehole for soil lithology and sample collection, the inner drill rods were removed and a decontaminated SP16 DPT groundwater sampling assembly, which included a 3-foot slotted stainless screen attached to the inner drill rods, was installed in the borehole. The outer drilling rods were then retracted, allowing formation water to enter the screened interval. Groundwater samples were grab collected using a peristaltic pump with new HDPE tubing inserted through the drilling rods or a HDPE bailer.

If groundwater volume allowed for the collection of water quality measurements, they were recorded after the collection of the groundwater sample. Once sampling was complete, all tooling and materials were removed and the borehole abandoned. The borehole was sealed with bentonite chips to approximately 1-foot bgs and the chips were hydrated with bulk source water obtained onsite. Surface restoration matched the surrounding surface (e.g., concrete, asphalt, grass).

3.4.4.3 Monitoring Well Sampling

No existing permanent monitoring wells were sampled at FTCH as part of the SI field event. All groundwater samples were collected from temporary sampling locations (e.g., temporary wells or DPT screen point sampling).

3.4.5 Surface Water and Sediment Sampling

As described in Section 3.4.8, a surface water and sediment sample was collected from the Original Fire Training Area/New Fire Training Area. The surface water sample was collected by submerging a HDPE sample bottle just below the water surface, being careful to avoid sediment agitation.

Following the collection of the surface water sample, a sediment sample was collected directly from the selected location from 0 to 6 inches bgs using decontaminated stainless steel hand augers. Sediment sampling was performed after surface water sampling to avoid sediment in the surface water sample. All sediment samples were homogenized in disposable HDPE bags prior to placing the sediment into laboratory-supplied 4-ounce HDPE sample bottles. Sample containers were labeled, sealed in Ziploc® bags, and placed on wet ice for cooling to ≤6°C.

3.4.6 Equipment Calibration

Equipment including a handheld gas monitor (RKI GX-6000) and a water quality instrument (YSI Professional Plus and YSI Professional Quatro) were calibrated daily per Worksheet #24 of the UFP-QAPP (AAR 2023a) against known standards in accordance with the manufacturer's instructions and documented on the calibration forms provided in Appendix D.

3.4.7 Location Survey

Environmental sample locations and notable site features were located and mapped using a portable Trimble global positioning system (GPS) unit capable of achieving ± 3 ft accurate results. GPS data was transferred for use in ArcGIS mapping applications during data evaluation and reporting.

3.4.8 Deviations and Field Change Requests

The following deviations from the UFP-QAPP are noted below that were indicated during the SI fieldwork:

- Samples at the Original Fire Training Area and New Fire Training Area could not be collected as originally proposed due to conditions encountered during the SI fieldwork. Sample locations were adjusted to collect groundwater, one sediment, and one surface water sample from downgradient locations as detailed below:

- One proposed groundwater sample was adjusted at the New Fire Training Area to be a surface water sample located downgradient of both the Original and New Fire Training Areas. The surface water sample location was observed to receive surface water runoff from the two fire training areas, which were an active construction site at the time of sampling, in addition to runoff from the southwest in the drainage ditch.

- Two proposed soil samples were not collected at the New Fire Training Area due to the disturbance of soil as a result of construction within the AOPI. One soil sample was adjusted to be a sediment sample co-located with the surface water sample.

- Three proposed groundwater samples were not collected at the Arrowhead Landing Strip due to access restrictions which were imposed by the installation, which limited the amount of time available to collect groundwater samples (one day). The drill rig hit refusal with flight augers between 9-11 ft bgs while attempting to collect groundwater at FTCH-ALS-SO-03 and groundwater was not encountered. Due to the installation-imposed access restriction, it was not possible to install a temporary monitoring well at FTCH-ALS-SO-03 or attempt collecting groundwater samples at FTCH-ALS-SO-01 or FTCH-ALS-SO-02.

- One proposed groundwater sample was not collected at the Sewage Treatment Lagoons due to insufficient groundwater for sampling in the temporary monitoring well.

- The soil and groundwater samples proposed for the Northeast Cantonment Area Fire Station (Building 1852) had to be moved approximately 0.35 miles north of the AOPI due to site construction activities during the SI field event that prevented access. The two soil samples were collected from surface water ditches that are topographically downgradient of the AOPI. The one groundwater sample was collected from a location intended to be downgradient of the AOPI.

The following deviations from the UFP-QAPP are noted below that were indicated during validation:

- Groundwater samples hold time was listed as 14 days from sample collection to sample preparation in the UFP-QAPP.

- Laboratory SOP for groundwater sample hold time was listed as 28 days from sample collection to sample preparation in the UFP-QAPP, resulting in a "J" flag on all groundwater samples, indicating that they are estimated concentrations.

3.5 DECONTAMINATION PROCEDURES

To ensure that chemical analysis results reflect the actual concentrations at sample locations, the non-dedicated, reusable equipment used in sampling activities was rigorously cleaned and decontaminated between sample locations in accordance with the UFP-QAPP (AAR 2023a). The non-disposable sampling equipment used to conduct sampling activities (e.g., drilling rods, screen

point samplers, water level meters) was decontaminated before sampling activities began, between locations, between sampling events, and after sampling activities were completed. Decontamination guidelines followed the direction provided in the Arcadis P-07 TGI for Groundwater and Soil Sampling Equipment Decontamination provided in the UFP-QAPP (AAR 2023a). Wastewater generated from decontamination activities was handled as IDW. Decontamination water was combined with well development and sampling purge water and managed as one medium.

The decontamination process included an initial scrub with a laboratory-grade, phosphate-free, biodegradable detergent (e.g., Liquinox® or Alconox®) to remove particulate matter and surface film. Following this scrub, the equipment was then rinsed twice in separate bins containing bulk source water and laboratory-certified PFAS-free water. Decontaminated sampling equipment was wrapped in thin sheets of HDPE to prevent subsequent contamination if being stored and not used immediately.

Decontamination of downhole drill rig equipment was completed prior to use, between locations, and after final use before departing the site. Tooling such as hollow stem augers, DPT rods, and hand augers were decontaminated in a mobile decontamination trailer by using a steam cleaner/power washer followed by a PFAS Free Water rinse. Non-dedicated tools, such as hand augers, water level meters, and taglines were bucket washed in an HPDE bucket with bulk source water/biodegradable detergent (e.g., Liquinox® or Alconox®) and rinsed with bulk source water, followed by a final rinse of PFAS-Free water at the drilling site. Equipment was scrubbed using polyethylene or PVC brushes to remove particulates if required.

3.6 DISPOSITION OF FIELD INVESTIGATION-DERIVED WASTE

The IDW generated during the SI at FTCH included solids (e.g., soil, well construction materials, acetate liners) and liquids (e.g., development and purge water, decontamination rinse water). These materials were managed in accordance with the Arcadis P-12 TGI Investigation-Derived Waste Handling and Storage provided in the UFP-QAPP (AAR 2023a).

All IDW generated at FTCH was placed in U.S. Department of Transportation (USDOT)-approved, 55-gallon drums for storage, transport, and disposal. Permanent labels for the drums included a unique container number, a description of the contents (i.e., soil or wastewater), the fill date, the source location, the generator's name (i.e., FTCH), and a telephone number for the generator's point of contact (e.g., AAR Project Manager or Field Manager. Each bucket or carboy used to temporarily store liquid IDW before it was transferred to a 55-gallon drum was marked "Non-potable Water" or "Decontamination Waste" to comply with requirements of the P-12 TGI provided in the UFP-QAPP (AAR 2023a).

The contents of the IDW drums were sampled for characterization and profiling. A solid waste sample was composited by collecting aliquots from the solid waste drums using a decontaminated stainless-steel spoon. The solids were homogenized in a stainless-steel bowl and then placed into laboratory-supplied sample containers. For drums containing liquid IDW (i.e., wastewater), a composite sample was collected using a peristaltic pump and new HDPE tubing and pumping directly into sample bottles. It was determined that volatile organic compounds (VOCs), semi-

volatile organic compounds (SVOCs), and metals had the potential to be present in soil and groundwater samples collected. Therefore, both solid and liquid IDW were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP SVOCs, and TCLP metals. In addition, the certified waste hauler required the analysis of pH, flashpoint, and percent solids (solid IDW only).

No IDW from FTCH was characterized as hazardous. The signed waste manifests and certificates of disposal will be provided in Appendix E prior to the finalization of this report, if available. The signed waste manifests and certificates of disposal will be provided in a supplemental letter report if not available at the time of report writing. Containerized waste will be disposed of in accordance with applicable state and Federal Resource Conservation and Recovery Act (RCRA) regulations. Upon the completion of waste disposal, the SI report will be updated, or a letter report will be drafted, describing the licensed and certified waste hauler, the date that IDW drums were picked up by the hauler, and the disposal location for these drums. Soiled personal protective equipment (PPE) that came into contact with sample media was contained in USDOT-approved 55-gallon drums.

4. DATA ANALYSIS AND QUALITY ASSURANCE SUMMARY

This section summarizes the QA/QC program and laboratory chemical analysis program implemented as part of the FTCH SI field activities (40 CFR 300.420(c)(4)). Additional information on these procedures is presented in the UFP-QAPP (AAR 2023a).

SGS North America, Inc. (SGS), located in Orlando, Florida, was selected as the DoD Environmental Laboratory Accreditation Program (ELAP)-accredited analytical laboratory for the analysis of PFAS during the FTCH SI field activities. Sections 4.1 through 4.4 summarize sample handling procedures, laboratory analytical methods, data QA/QC, data reporting and validation, and sample QA/QC. A QA summary of the analytical data is presented in Section 4.5. Appendix F provides the data usability assessment that details the quality and usability of the SI analytical data and the process performed to evaluate the data for compliance with established QC criteria.

4.1 SAMPLE HANDLING PROCEDURES

A critical aspect of sample collection and analysis protocols is the maintenance of strict chain-of-custody (CoC) procedures, which include tracking and documentation during sample collection, shipment, and laboratory processing. The Sample Manager was responsible for sample custody until the samples were properly packaged, documented, and released to FedEx. The laboratory was responsible for sample custody thereafter in accordance with approved procedures.

4.1.1 Chain-of-Custody Record

CoC forms were used to document the traceability and integrity of all samples from the point of collection to the laboratory by maintaining a record of sample collection, shipment, and receipt by the laboratory. A CoC form was filled out and was signed and dated by each sample custodian.

Shipping containers were sealed with custody tape. Sealed coolers were transported to FedEx for priority overnight delivery to the laboratory. The FedEx tracking number associated with each cooler acted as the custody documentation while the sealed coolers were in the possession of FedEx. The CoC form was placed in a resealable plastic bag and taped to the inside lid of the cooler.

When the possession of samples was transferred, the individual relinquishing the samples and the individual receiving the samples signed, dated, and noted the time of transferal on the CoC. This record represents the official documentation for all transferal of sample custody until the samples arrived at the laboratory.

4.1.2 Laboratory Sample Receipt

All samples received by the Laboratory Sample Custodian or designee were checked for proper preservation (e.g., pH, temperature of coolant blank above 2°C or below 6°C); integrity (e.g., leaking, broken bottles); and proper, complete, and accurate documentation and identification (ID) of the samples. The temperature of the coolant blank was noted. No insufficiencies and/or discrepancies were noted.

Samples received at the laboratory were logged into the laboratory computer database. Initial entries included field sample number, date of receipt, and analyses required. As samples were received, they were assigned a laboratory sample ID number. The sample custodian labeled each container with its sample ID number, and the samples then were transferred to their designated storage areas.

Samples received by the laboratory were considered to be physical evidence and were handled according to USEPA procedural safeguards. In addition, all data generated from the sample analyses, including all associated calibrations, method blanks, and other supporting QC analyses, were identified with the project name, project number, and sample delivery group (SDG) designation. All data were maintained under the proper custody. The laboratory provided complete security for samples, analyses, and data.

4.2 LABORATORY ANALYTICAL METHODS

The chemical analysis program for the FTCH SI conforms to the analytical requirements presented in the UFP-QAPP (AAR 2023a) for the chemical analysis of field investigation samples. All samples were analyzed for PFAS using liquid chromatography with tandem mass spectrometry (LC/MS/MS) procedures compliant with U.S. Department of defense (DoD) QSM Version 5.3, Table B-15 (DoD 2019) and the laboratory SOP.

4.3 DATA QUALITY ASSURANCE/QUALITY CONTROL

This section presents the QA/QC procedures applied during sampling and laboratory analysis. This discussion includes laboratory QA/QC (Section 4.3.1) and field QA/QC (Section 4.3.2) procedures. Details on the results of the QC samples (field and laboratory) are presented in the data usability assessment (DUA) included in Appendix F.

4.3.1 Laboratory Quality Assurance/Quality Control

Samples were analyzed for PFAS using LC/MS/MS in compliance with DoD QSM Version 5.3, Table B-15 (DoD 2019). QC checks included holding times, method blanks, calibration standards, extracted internal standards (EISs), laboratory control samples (LCSs), MS/MSDs, and detection limits. The acceptance criteria and laboratory SOP are provided in the UFP-QAPP (AAR 2023a).

Method Blanks—Method blanks were used to monitor the possibility of laboratory-induced contamination by running a volume of approved reagent water through the entire analytical scheme (i.e., extraction, concentration, analysis). Blank requirements are specified in the DoD QSM Version 5.3, Table B-15 (DoD 2019) and the laboratory SOP.

Matrix Spike/Matrix Spike Duplicates—Additional sample volume was collected from select field sample locations to evaluate accuracy and precision using MS/MSD analyses. MS/MSDs are aliquots of environmental samples to which known concentrations of certain target analytes have been added before sample preparation, cleanup, and determinative procedures have been implemented (SW846 Chapter One). Accuracy was expressed as the percent recovery (%R) of each added compound. Precision was expressed as the relative percent difference (RPD) between

the MS and the MSD results. MS/MSD samples were collected and analyzed at a frequency of one for every 20 samples of similar matrix received at the laboratory.

Laboratory Control Samples—LCSs were analyzed to evaluate the accuracy of the analysis in the absence of sample matrix impacts. A known concentration of select compounds were added to the LCS. The spiked samples were analyzed in the same manner as the environmental samples. Accuracy was expressed as the %R of each added compound. An LCS was analyzed with each SDG.

4.3.2 Field Quality Assurance/Quality Control

Table 4-1 summarizes the frequency of field QC samples that were collected during the FTCH field investigation. The requirements for field QC were established on Worksheet #20 of the UFP-QAPP (AAR 2023a).

Table 4-1. Frequency of Field QC Samples for FTCH Field Investigation

QC Sample	Frequency
Field Blank	1 for every 20 or fewer investigative groundwater samples
Source Water Blank	1 per bulk rinse water source that is not laboratory-certified PFAS free water
Matrix Spike	1 for every 20 or fewer investigative samples, per media
Matrix Spike Duplicate	1 for every 20 or fewer investigative samples, per media
Equipment Blank	1 for every 20 or fewer investigative samples
Field Duplicate	1 for every 10 or fewer investigative samples, per media

4.4 DATA REPORTING AND VALIDATION

The AAR QA Manager or designee (Arcadis U.S., Inc.) initiated a validation of the analytical data packages. One hundred percent of the data were validated using objective criteria taken from the requirements of the UFP-QAPP (AAR 2023a) and DoD QSM Version 5.3 (DoD 2019) and qualified in accordance with DoD Data Validation Guidelines Module 3 (DoD 2020) and the revised table for sample qualification in the presence of blank contamination (DoD 2022).

Reported laboratory data were reviewed in accordance with DoD QSM Stage 2B validation guidelines to ensure that the QC results fell within appropriate QC limits for holding times, blank contamination, EISs, calibrations, MS/MSDs, LCSs, and ion ratios. Any data validation qualifiers resulting from outlier QC results were applied and a data validation report, as previously described, was prepared. In addition, 10 percent (%) of the data were validated in accordance with DoD QSM Stage 4 guidelines, and analytical results were checked and recalculated from raw data.

Equipment blanks and field blanks were associated with the corresponding environmental samples. These blanks were evaluated following the same criteria as method blanks, and the associated environmental samples were appropriately qualified as needed. After the data validation for the project was completed, a project DUA (Appendix F) was prepared.

Results from the data validation process that potentially impact the SI findings includes the following:

- The UFP-QAPP for the project indicated that holding time between sample collection and sample preparation was 14 days for aqueous samples. However, the quality manual for laboratory used for the project indicates a holding time between sample collection and sample preparation of 28 days for aqueous samples. Due to this discrepancy, the data validation flagged all aqueous samples as being out of hold time for sample preparation. The affected samples were subsequently qualified as follows:
    - Non-detect samples were UJ qualified as estimated less than the LOD.
    - Samples with detections were qualified as estimated (J).

4.5 QUALITY ASSURANCE SUMMARY

A comprehensive QA/QC program was implemented during the sampling event in July and August 2023 at FTCH. Samples and associated QC samples (e.g., field duplicates, field blanks, equipment blanks, source water blanks, MSs, MSDs) were collected and analyzed for PFAS using methods specified in the UFP-QAPP (AAR 2023a). Consistent with the data quality requirements established in the UFP-QAPP (AAR 2023a) and DQOs, all sample data and associated QC data were evaluated during the review and validation process. Individual sample results were qualified, as necessary, to designate usability of the data toward meeting project objectives. Data qualifiers were applied based on deviations from the measurement performance criteria in the UFP-QAPP (AAR 2023a). Results of the validation are found in the DUA (Appendix F). The analyses associated with each data quality indicator are summarized below, with details of the results of the QC checks provided in the DUA.

4.5.1 Precision

Precision was evaluated by the analysis of MS/MSDs and field duplicate samples and the RPD between the duplicate spike results.

4.5.2 Accuracy

Bias introduced due to blank contamination (in method, instrument, or field blanks) and any impact on accuracy were evaluated during validation. Analytical accuracy was measured through the use of LCSs, MS/MSDs, isotope dilution standards, initial and continuing calibration, and target compound quantitation requirements.

4.5.3 Sensitivity

Sensitivity requirements were evaluated against minimum required LOQs and LODs in the UFP-QAPP (AAR 2023a).

4.5.4 Representativeness

Representativeness was satisfied by ensuring that the UFP-QAPP (AAR 2023a) protocols were followed, appropriate sampling techniques were used, established analytical procedures were implemented, and analytical holding times of the samples were not exceeded.

4.5.5 Comparability

Comparability was achieved by using consistent, documented and UFP-QAPP-approved methods and meeting project accuracy and precision objectives.

4.5.6 Completeness

Completeness measures the amount of valid data obtained from the sampling and analysis effort. For analytical data to be usable, each data point must be validated and meet criteria without significant non-conformance.

4.5.7 Data Usability

Data that have been qualified as estimated (i.e., J and UJ) during validation indicate accuracy, precision, or sensitivity QC measurements may have exceeded criteria, but the results are considered valid. Results that have been qualified as estimated by the laboratory or during the data validation process are done relative to the LOD. J-flagged results were detected above the Detection Limit (DL) but are less than the LOD and UJ-flagged results are qualified as being less than the LOD. Additionally, J+ and J- qualifiers were used to indicate data that was an estimated quantity, but that the results may be biased high or low, respectively.

Data that were recommended for exclusion during validation (qualified X) and subsequently rejected (qualified R) by the project decision team were not used during the evaluation of project objectives.

5. SI SCREENING LEVELS

Detected concentrations of the Target PFAS in samples collected during this SI are compared to residential scenario SLs calculated using the USEPA regional screening level (RSL) calculator for soil and the tap water criteria for groundwater, as published in the 2023 OSD Memorandum (DoD 2023). Analytical results for surface water and sediment samples were compared, respectively, against these tap water and soil SLs. However, the surface water and sediment comparisons are qualitative and are not used to make recommendations to investigate any AOPI further.

This SI uses the SLs and a target hazard quotient (HQ) of 0.1 to evaluate the Target PFAS concentrations. These SLs (Table 5-1) are used to evaluate the data and determine if further investigation is warranted at each AOPI.

Table 5-1. Screening Levels from the 2023 OSD Memorandum

Chemical	Residential Tap Water HQ = 0.1 (ng/L or ppt)	Residential Soil HQ = 0.1 (mg/kg or ppm)
PFOS	4	0.013
PFOA	6	0.019
PFBS	600	1.9
PFNA	5.9	0.019
PFHxS	39	0.13
PFHxA	990	3.2
PFBA	1,800	7.8

Note: The residential tap water SLs are used to evaluate groundwater data and are compared against surface water data. The residential soil SLs are used to evaluate soil data and are compared against sediment data.

6. SI RESULTS

This section presents the background, summary of analytical results, and the CSM for each AOPI at FTCH. Sampled media and QA/QC samples were analyzed for the list of 25 PFAS specified in the Performance Work Statement (AAR 2022). The sample results discussed below focus on seven Target PFAS outlined in the 2023 OSD Memorandum and sampled as part of this SI (DoD 2023): PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA. Analytical data tables for all PFAS analyzed using approved methods are provided in Appendix G.

6.1 CONCEPTUAL SITE MODELS

The preliminary CSMs developed for each AOPI during the QAPP were further refined where Target PFAS were detected above the LOD in soil or groundwater. Based on the SI sample results, CSMs presented for each AOPI represent the current understanding of site conditions with respect to known or suspected sources of PFAS-containing materials, potential transport mechanisms and migration pathways, and potentially exposed human receptors.

The CSMs were prepared in accordance with the Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A) (USEPA 1989) and the *USACE Engineer Manual on Conceptual Site Models*, EM 200-1-12 (USACE 2023). The CSMs evaluated ingestion, dermal contact, and inhalation exposure routes for human receptors. The exposure pathways are evaluated as complete, potentially complete, or incomplete in the CSMs presented in figures in each AOPI-specific CSM section. A complete exposure pathway consists of a constituent source and release mechanism, a transport or retention medium, an exposure point where human contact with the contaminated medium could occur, and an exposure route at the exposure point (USEPA 1989). If any of these elements is missing, the exposure pathway is incomplete. For an exposure pathway to be complete, there may also not be any land use controls (LUCs) in place restricting access or use of the media. Pathways are "potentially complete" where data or information are insufficient to conclude the pathway is either "complete" or "incomplete." For example, if PFAS are not detected in soil, there is no source at the AOPI, and the soil exposure pathway is incomplete. Exposure pathways are also potentially complete where Target PFAS are detected, but existing LUCs are in place for non-PFAS constituents in that media type, because the LUCs are not Target PFAS specific. Where PFAS are detected in groundwater and the hydrogeologic connection between groundwater at the AOPI and a drinking water well is not documented, the groundwater exposure pathway is potentially complete.

There are land use restrictions in place for one of the nineteen AOPIs. There are no land use restrictions present at any of the 19 AOPIs. However, there is a groundwater use restriction in place at the Northeast Cantonment Area Fire Station, preventing the withdrawal of groundwater from the property for potable use (FCRA 2022b). This groundwater use restriction is not specific to Target PFAS.

The McAlester formation is the surface formation found in the western cantonment area, surrounding the central portion of the installation, and north of the Hartshorne surface features in the southeast. The Savanna Sandstone formation, of which there are five layers, with shale seams

between the sandstone layers, is the surface feature of the eastern cantonment area and the northeast portion of the installation. Alluvial deposits along the Arkansas River yield sand, silt, clay, and occasionally gravel.

The hydrogeology in the area consists of a shallow alluvial system with a lower confining shale layer from the Savanna or McAlester formations (ERM 1996). Shallow groundwater system discharges directly to surface streams, drainage ways, and underlaying bedrock aquifers (ERM 1997). Based off the local topography and groundwater sampling events, groundwater flow generally runs south to north at FTCH.

FTCH water is supplied by the City of Fort Smith, which extracts water from Lake Fort Smith and Lee Creek Reservoirs which are 20 to 40 miles north of the installation. Surface water downgradient of the FTCH is not used for drinking water.

6.2 Original Fire Training Area (FTCH-022) and New Fire Training Area AOPIs

6.2.1 AOPI Backgrounds

The Original Fire Training Area (FTCH-022) and New Fire Training Area were identified as AOPIs following records research, personnel interviews, and site reconnaissance. The Original Fire Training Area is collocated with the New Fire Training Area. Together, they represent two generations of fire training areas as shown on Figure 6-1. Firefighting training activities were confirmed to have occurred here. The FTCH Fire Department would train here in addition to neighboring fire departments (e.g., 188th Tactical Fighter Group based in Fort Smith, Arkansas) according to an interview. This training area first appeared between 1971 and 1980 and was comprised of two unlined deep earthen pits located to the southeast of the parcel (Figure 6-1). Flammable liquids were routed from a fuel storage tank to the pits, ignited, and extinguished with "fire suppression chemicals." Used oil from across the installation was also burned here; stored in a fuel storage bin. A 500-gallon "Fire Training Pit Fuel Truck" serviced the area. Soil was removed in 1990 to remediate petroleum hydrocarbon impacts at the East and West Land Application Areas (FTCH-043 and FTCH-044).

The New Fire Training Area was constructed to replace the Original Fire Training Area (FTCH-022). Together, they represent two generations of fire training areas as shown on Figure 6-1. The FTCH Fire Department would train here in addition to neighboring fire departments (e.g., 188th Tactical Fighter Group based in Fort Smith, Arkansas) according to an interview. Flammable liquids were routed from a fuel storage tank to the pits, ignited, and extinguished with "fire suppression chemicals." Used oil from across the installation was also burned here; stored in a fuel storage bin kept to the west of the pit. The new fire training area was completed in the early 1990s; considered to be a more "environmentally friendly" setup. An aircraft hull and lined containment area would be filled with flammable materials and used for fuel-based firefighter training. Piping from the aircraft hull containment area conveyed overflow fuel and extinguishing media to a lined overflow weir and then to an oil/water separator. It is unclear whether this oil/water separator was connected to the sanitary sewer system. The location containing both fire training areas was under construction for a new apartment complex during the SI field event. The proposed sampling locations for soil and groundwater were revised in the field due to the construction activities

blocking access to much of the area. Runoff for the area generally flows to the southwest corner of Custer Boulevard and Chad Colley Boulevard.

This AOPI is no longer owned by the Army. This area was transferred to a private owner with no land use restrictions imposed. Based on the construction occurring during the SI field event, the property will be used for multi-family housing for the foreseeable future.

6.2.2 SI Sampling and Results for the Original Fire Training Area and New Fire Training Area

Soil samples and groundwater samples were originally proposed in site-specific locations throughout the footprints of the Original Fire Training Area and New Fire Training Area. However, the property was being developed during the sampling event and was not accessible to sampling as described in Section 3.4.8. Therefore, one soil sample was collected within the AOPI footprints between the historical overflow weir and the old fire training pits (FTCH-NFTA-SO-01) and one soil sample was collected from within the stormwater drainage ditch located east of the AOPIs (FTCH-OFTA-SO-01). Two groundwater samples were also collected from within this stormwater drainage ditch (FTCH-OFTA-GW-01 and FTCH-OFTA-GW-02). One surface water sample was also collected from some standing water in this drainage ditch (FTCH-OFTA-NFTA-SW-01) and was co-located with a sediment sample (FTCH-OFTA-SS-01). These sample locations are representative of conditions for both the Original and New Fire Training Areas and are discussed below cumulatively. The Target PFAS analytical results for soil, sediment, surface water, and groundwater samples collected are provided in Table 6-1 and Figure 6-2 and summarized below.

Soil

PFOS was detected in soil at concentrations above its respective SL (0.013 mg/kg). PFOA, PFBA, PFNA, PFHxS, PFHxA, and PFBA were detected in soil at concentrations below their respective.

Detections of PFOS were above the SL and were higher at FTCH-NFTA-SO-01 (0.0279 mg/kg).

Detections of PFOA, PFBA, PFNA, PFHxS, PFHxA, and PFBA were below the SL and were higher at FTCH-NFTA-SO-01 (0.0012, 0.0004 J, 0.0013, 0.003, 0.004, and 0.00047 J mg/kg, respectively). A J flag indicates that the analyte was positively identified and that the associated numerical value is the approximate concentration of the analyte in the sample.

Groundwater

PFOS, PFOA, PFNA, and PFHxS were detected in groundwater at concentrations above their SLs (4 ng/L, 6 ng/L, 5.9 ng/L, and 39 ng/L, respectively). PFBS, PFHxA, and PFBA were detected in groundwater at concentrations below their respective SLs.

Detections of PFOS, PFOA, PFNA, and PFHxS were detected at estimated concentrations (J flagged) above the SL and were higher at FTCH-OFTA-GW-01 (550 J ng/L, 102 J ng/L, 17.8 J ng/L, and 186 J ng/L, respectively).

Detections of PFBS, PFHxA, and PFBA were detected at estimated concentrations (J flagged) below the SL and were higher at FTCH-OFTA-GW-01 (28.2 J ng/L, 258 J ng/L, and 167 J ng/L, respectively).

Surface Water

PFOS, PFOA, PFBA, PFNA, PFHxA, and PFHxS were detected in surface water concentrations above their SLs (4 ng/L, 6 ng/L, 5.9 ng/L, and 39 ng/L, respectively). PFHxA and PFBA were detected in groundwater at concentrations below their respective SLs. PFBS was not detected.

Detections of PFOS, PFOA, PFBA, PFNA, PFHxA, and PFHxS were detected at estimated concentrations (J flagged) above the SL and were 550 J ng/L, 25.2 J ng/L, 24.4 J ng/L,14.2 J ng/L, 20.4 J ng/L, and 78.9 J ng/L, respectively.

Detections of PFHxA and PFBA were detected at estimated concentrations (J flagged) below the SL and were 20.4 J ng/L and 24.4 J ng/L, respectively.

Sediment

PFOA, PFOS, PFBA, PFHxA, and PFHxS were detected in the sediment sample FTCH-OFTA-SS-01 at concentrations below their respective SLs. PFBS and PFNA were not detected in the sediment samples collected.

PFOS and PFHxA were detected at concentrations of 0.007 mg/kg and 0.0013 mg/kg, respectively. PFBA, PFHxS, and PFOA were detected at estimated concentrations (J flagged) of 0.00078 J mg/kg, 0.001 J mg/kg, and 0.00047 J mg/kg, respectively.

6.2.3 CSM

The Original Fire Training Area and New Fire Training Area are cumulatively approximately 7 acres in size (2 and 5 acres, respectively). The ground surface elevation of the former training areas is about 485 ft above mean sea level (amsl). Stormwater runoff from the area appears to flow through conveyance pipes to the drainage feature located at the northeast corner of Custer Boulevard and Chad Colley Boulevard, which then flows to Little Vache Grasse Creek located farther east. Surface water and sediment may be present at these AOPIs, in stormwater drainage ditches when they are inundated with water.

The area is part of the BRAC Surplus property and was transferred to the FCRA in the early 2000s. The area is zoned for residential use and is undergoing construction. The area surrounding these AOPIs has been redeveloped for residential and commercial purposes. The area upgradient is also currently zoned for residential use and there are no Target PFAS specific land use restrictions at these AOPIs. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

The primary release mechanism is the potential release of PFAS-containing materials to surface soils and/or paved surfaces related to fire-fighting training activities at the Original Fire Training Area and New Fire Training Area. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface

soil and groundwater through infiltration, leaching, and percolation, transport via sediment carried in and dissolution to stormwater and surface water, adsorption/desorption between surface water and sediment, and/or discharge/recharge of groundwater from surface water in the nearby drainage tributary to Little Vache Grasse Creek.

Target PFAS were detected in soil samples at the AOPIs. The AOPIs were under construction during the SI field event. Residential use is the anticipated future land use and all exposure pathways for future onsite residents are complete. The soil exposure pathway is complete for site workers because workers may access the AOPIs and Target PFAS were detected in soil samples at the Original Fire Training Area and New Fire Training Area AOPIs. The soil exposure pathway is also potentially complete for onsite recreational users that visit the nearby Janet Huckabee Arkansas River Valley Nature Center for recreational activities such as hiking trails where soil may be contacted.

Target PFAS were detected in groundwater samples at the AOPIs. Although there are no potable water wells located at this AOPI and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways (via drinking water ingestion and dermal contact) at the Original Fire Training Area and New Fire Training Area are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents.

Target PFAS were detected in the surface water and sediment samples collected east of the AOPIs, the sample was collected from the surface stormwater drainage ditch located at the southwest corner of Custer Boulevard and Chad Colley Boulevard and represents stormwater runoff downgradient of the AOPIs. Stormwater runoff from the AOPIs likely follow topography and stormwater conveyances which lead east towards Little Vache Grasse Creek. The surface water and sediment exposure pathways are complete for site workers because workers may access the AOPIs and Target PFAS were detected in surface water and sediment samples at the Original Fire Training Area and New Fire Training Area AOPIs. Surface water and sediment exposure pathways for recreational users at nearby Janet Huckabee Arkansas River Valley Nature Center are potentially complete. Drinking water exposure pathways for surface water is unlikely since municipal water is supplied by the City of Fort Smith, which extracts water from Lake Fort Smith and Lee Creek Reservoirs which are 20 to 40 miles north of the installation. Surface water downgradient of the AOPI is not used for drinking water. Therefore, the surface water pathways for onsite future residents and offsite drinking water users are incomplete.

Figure 6-3 presents the CSM for the Original Fire Training Area and New Fire Training Area AOPIs.

6.2.4 Recommendation

Human exposure pathways are complete or potentially complete and detected concentrations of Target PFAS in groundwater and soil at the Original Fire Training Area and New Fire Training Area AOPIs were above the SLs. Therefore, further investigation is recommended.

Surface water and sediment samples contained Target PFAS. However, comparisons of these concentrations against residential SLs are qualitative and are not used to make recommendations on conducting further investigation.

Table 6-1. Target PFAS Analytical Results at the Original Fire Training Area and New Fire Training Area AOPI

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-NFTA-SO-01	FTCH-NFTA-SO-01-081123	HA	0-2	08/11/2023	**0.0223**	J+	**0.0009**	J	**0.00054**	U	**0.0011**		**0.003**		**0.0033**		**0.00045**	**J**
	FTCH-FD-08-SO-081123	HA	0-2	08/11/2023	**0.0279**		**0.0012**		**0.0004**	J	**0.0013**		**0.0048**		**0.004**		**0.00047**	**J**
FTCH-OFTA-SO-01	FTCH-OFTA-SO-01-081123	HA	0-2	08/11/2023	**0.0008**	**J**	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Sediment				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-OFTA-SS-01	FTCH-OFTA-SS-01-081123	HA	0-2	08/11/2023	**0.007**		**0.00047**	**J**	0.00065	U	0.00065	U	**0.001**	**J**	**0.0013**		**0.00078**	**J**
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-OFTA-GW-01	FTCH-OFTA-GW-01-081323	DPT SP	15.8	08/13/2023	**455**	J-	**80.8**	**J**	**24.5**	**J**	**14.6**	**J**	**158**	**J**	**220**	**J**	**149**	**J**
	FTCH-FD-09-081323	DPT SP	15.8	08/13/2023	**550**	**J**	**102**	**J**	**28.2**	**J**	**17.8**	**J**	**186**	**J**	**258**	**J**	**167**	**J**
FTCH-OFTA-GW-02	FTCH-OFTA-GW-02-081323	DPT SP	13.1	08/13/2023	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	**3.7**	**J**	**10.9**	**J**	**7.2**	**J**
Surface Water				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-OFTA-NFTA-SW-01	FTCH-OFTA-NFTA-SW-01-081123	SW	N/A	08/11/2023	**550**	**J**	**25.2**	**J**	23	UJ	**14.2**	**J**	**78.9**	**J**	**20.4**	**J**	**24.4**	**J**

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
Comparisons of Target PFAS in surface water to residential tap water SLs and in sediment to residential soil SLs are not used on their own to make recommendations on further investigation.
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
J+ = The result is an estimated quantity; the result may be biased high.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
SW= surface water
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.3 Central Cantonment Area Fire Station (Building 139) AOPI

6.3.1 AOPI Background

The Central Cantonment Area Fire Station (Building 139) was identified as an AOPI following records research, personnel interviews, and site reconnaissance. The Central Cantonment Area Fire Station AOPI was constructed in 1942 and located in the Central Cantonment Area in Building 139 as shown on Figure 6-4. It had capacity for two firefighting vehicles and is identified as an AOPI due to possible historical nozzle testing and AFFF storage. The fire station was near one of the installation heliports, which was installed between 1971 and 1980 and used as part of the JRTC training mission. The final date of use as a fire station is unknown but is prior to 1997.

This AOPI is no longer owned by the Army. This area was transferred to private ownership with no restrictions imposed.

6.3.2 SI Sampling and Results

Two soil samples and one QC duplicate were collected from two soil borings (FTCH-CCAFS-SO-01 and FTCH-CCAFS-SO-02). Soil samples were collected from areas where runoff from vehicle washing or other maintenance activities may have accumulated. One groundwater sample and one QC duplicate was collected from one location in a downgradient position to the AOPI (FTCH-CCAFS-GW-01). The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-2 and Figure 6-5 and summarized below.

Soil

PFOS was detected in soil at concentrations above its respective SL at FTCH-CCAFS-SO-02. PFHxS and PFHxA were detected in soil at concentrations below their respective SLs. PFOA, PFBS, PFNA, and PFBA were not detected in the soil samples collected at the Central Cantonment Area Fire Station AOPI.

Detections of PFOS were above the SL (0.013 mg/kg) and were higher at FTCH-CCAFS-SO-02 (0.0845 mg/kg).

Detections of PFHxS and PFHxA were detected at an estimated concentration (J flagged) below the SL and were higher at FTCH-CCAFS-SO-02 (0.0011 J and 0.00046 J mg/kg, respectively).

Groundwater

PFBA was detected at an estimated concentration (J flagged) below the SL at FTCH-CCAFS-GW-01 (8.9 J ng/L). PFOS, PFOA, PFBS, PFNA, PFHxS, and PFBA were not detected in any of the groundwater samples collected at the Central Cantonment Area Fire Station AOPI.

PFOS was not detected above the DL or LOD in groundwater (4.8 ng/L). The LOD is above the PFOS SL of 4 ng/L. It is possible that PFOS are present in groundwater at concentrations above the SL at this AOPI.

6.3.3 CSM

The Central Cantonment Area Fire Station is approximately 0.5 acres in size and is comprised of a fire station and garage structure. Stormwater runoff from the area likely flows east to the stormwater drains running along the streets and continues to flow east towards Little Vache Grasse Creek, located approximately 0.3 miles away. Surface water and sediment are not present at the AOPI.

The area is part of the BRAC Surplus property and was transferred to FCRA in the early 2000s. The area consists of a garage and living/office area. The area surrounding this AOPI has been redeveloped for a mix of commercial, industrial, and residential uses. There are no Target PFAS specific land use restrictions at this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical routine hose flushing operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to groundwater through infiltration, leaching, and percolation, transport via sediment carried in and dissolution to stormwater and surface water, adsorption/desorption between surface water and sediment, and/or discharge/recharge of groundwater from surface water in nearby water bodies.

Target PFAS were detected in soil samples at the AOPI. There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI. Future residential development is a reasonably anticipated future land use; therefore, all exposure pathways for future onsite residents are potentially complete. The surface soil exposure pathway at the Central Cantonment Area Fire Station AOPI is complete for site workers because workers may access the AOPI and Target PFAS were detected in surface soil at the AOPI.

Target PFAS were detected in groundwater samples at the AOPI. Although there are no potable water wells located at this AOPI and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways (via drinking water ingestion and dermal contact) at the Central Cantonment Area Fire Station are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil or groundwater at the AOPI could migrate and discharge to downgradient surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water

may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also potentially complete for incidental ingestion and dermal contact. Figure 6-6 presents the CSM for the Central Cantonment Area Fire Station.

6.3.4 Recommendation

Human exposure pathways are complete or potentially complete and detected concentrations of Target PFAS in soil at the Central Cantonment Area Fire Station exceed the SL; therefore, further investigation is recommended.

Table 6-2. Target PFAS Analytical Results at the Central Cantonment Area Fire Station

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-CCAFS-SO-01	FTCH-CCAFS-SO-01-072623	HA	0-2	07/26/2023	**0.00039**	**J**	0.00056	U	0.00056	U	0.00056	U	**0.00072**	**J**	0.00056	U	0.00056	U
	FTCH-FD-05-SO-072623	HA	0-2	07/26/2023	**0.00031**	**J**	0.00056	U	0.00056	U	0.00056	U	**0.001**	**J**	0.00056	U	0.00056	U
FTCH-CCAFS-SO-02	FTCH-CCAFS-SO-02-072623	HA	0-2	07/26/2023	**0.0845**		0.00061	U	0.00061	U	0.00061	U	**0.0011**	**J**	**0.00046**	J	0.00061	U
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-CCAFS-GW-01	FTCH-CCAFS-GW-01-072623	DPT SP	19	07/26/2023	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	**8.9**	**J**
	FTCH-FD-06-GW-072623	DPT SP	19	07/26/2023	5.3	UJ	5.3	UJ	5.3	UJ	5.3	UJ	5.3	UJ	5.3	UJ	**8.1**	**J**

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.4 Airfield Fire Fight and Rescue Station (Building 5850) AOPI

6.4.1 AOPI Background

The Airfield Fire Fight and Rescue Station (Building 5850) is identified as an AOPI following records review due to possible nozzle testing, vehicle maintenance and washing, and AFFF storage being conducted here. The AOPI was constructed in 1943 and is located in the Western Cantonment Area in Building 5850 as shown on Figure 6-7. This building was utilized as a fire station until an unknown date prior to 1997. In 1997, it was described as being in very poor condition. At the time of this PA the building still stands. Various records also describe it as a vehicle maintenance building.

This fire station is the closest to the Original Fire Training Area (FTCH-022), New Fire Training Area, and the FTCH Airfield. Records show that it was named the "Airfield Fire Fight and Rescue Building." One chemical additive pumper was listed as a firefighting support vehicle and primarily housed here. One wash rack is located south of the building near Building 5866, where fire response vehicles could have been washed.

This AOPI is no longer owned by the Army. This area was transferred to private ownership with no restrictions imposed.

6.4.2 SI Sampling and Results

Six surface soil samples were collected from six soil borings (FTCH-AFFRS-SO-01 through FTCH-AFFRS-SO-06) outside the building footprint and the potential release area at the Fire Truck Service Extension AOPI. In addition, two groundwater samples (FTCH-AFFRS-GW-01 and FTCH-AFFRS-GW-02) were collected from locations in downgradient positions to the AOPI. The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-3 and Figure 6-8 and summarized below.

Soil

PFOS, PFOA and PFHxS were detected in soil at concentrations above their respective SLs at FTCH-AFFRS-SO-01. PFBS, PFNA, PFHxA, and PFBA were detected in soil at concentrations below their respective SLs in the soil samples collected at the Airfield Fire Fight and Rescue Station (Building 5850) AOPI.

Detections of PFOS, PFOA, and PFHxS were above the SLs (0.013, 0.019, and 0.13 mg/kg, respectively) and were highest at FTCH-AFFRS-SO-01 (0.0503, 0.0238, and 0.247 mg/kg, respectively).

Detections of PFBS and PFHxA were detected below the SL and were highest at FTCH-AFFRS-SO-01 (0.0146 and 0.0228 mg/kg, respectively). Detections of PFNA and PFBA were detected below the SL and were highest at FTCH-AFFRS-SO-05 (0.00067 J and 0.0011 mg/kg, respectively).

Groundwater

PFOS, PFHxS, and PFHxA were detected at estimated concentrations (J flagged) below their respective SLs and were higher at FTCH-AFFRS-GW-02 (2.3 J, 4.9 J, and 4.5 J ng/L, respectively). PFOA, PFBS, PFNA, and PFBA were not detected in the groundwater samples collected at the Airfield Fire Fight and Rescue Station AOPI.

6.4.3 CSM

The Airfield Fire Fight and Rescue Station AOPI is approximately 2 acres in size and is comprised of a former fire station building and garage. The ground surface elevation of this AOPI is approximately 470 ft amsl. Surface water and sediment are not present at the AOPI. An unnamed manmade stormwater accumulation pond is located approximately 100 ft east of the AOPI. Stormwater conveyances likely follow topography and lead to this pond.

The area is part of the BRAC Surplus property and was transferred to FCRA in the early 2000s. This AOPI is zoned for commercial use and is surrounded by residential and commercial buildings. There are no Target PFAS specific land use restrictions at this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Airfield Fire Fight and Rescue Station AOPI, however as stated previously, stormwater drains likely convey stormwater to the unnamed manmade stormwater accumulation pond to the east.

Target PFAS were detected in soil at the AOPI. There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI. Future residential development is a reasonably anticipated future land use; therefore, all exposure pathways for future onsite residents are potentially complete. The surface soil exposure pathway at the Airfield Fire Fight and Rescue Station AOPI is complete for site workers because Target PFAS were detected in surface soil and site workers may access the AOPI.

Target PFAS were detected in groundwater samples at the AOPI. Although there are no potable water wells located at this AOPI and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways (via drinking water ingestion and dermal contact) at the Airfield Fire Fight and Rescue Station are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil or groundwater at the AOPI could migrate and discharge to surface water or sediment in the unnamed manmade stormwater accumulation pond to the east. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-9 presents the CSM for the Airfield Fire Fight and Rescue Station.

6.4.4 Recommendation

Human exposure pathways are complete or potentially complete, and Target PFAS concentrations in soil were detected above SLs at the Airfield Fire Fight and Rescue Station; therefore, further investigation is recommended.

Table 6-3. Target PFAS Analytical Results at the Airfield Fire Fight and Rescue Station

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-AFFRS-SO-01	FTCH-AFFRS-SO-01-072523	HA	0-2	07/25/2023	**0.0503**		**0.0238**		**0.0146**		0.00054	U	**0.247**		**0.0228**		**0.00042**	**J**
FTCH-AFFRS-SO-02	FTCH-AFFRS-SO-02-072523	HA	0-2	07/25/2023	**0.00075**	**J**	**0.00055**	**J**	0.00053	U	0.00053	U	**0.0027**		**0.00032**	**J**	0.00053	U
FTCH-AFFRS-SO-03	FTCH-AFFRS-SO-03-072523	HA	0-2	07/25/2023	**0.0068**		0.00053	U	0.00053	U	0.00053	U	**0.00096**	**J**	0.00053	U	0.00053	U
FTCH-AFFRS-SO-04	FTCH-AFFRS-SO-04-072523	HA	0-2	07/25/2023	**0.0023**		**0.0011**		**0.0023**		0.0005	U	**0.0139**		**0.0082**		**0.00065**	**J**
FTCH-AFFRS-SO-05	FTCH-AFFRS-SO-05-072523	HA	0-2	07/25/2023	**0.019**		**0.0014**		0.00055	U	**0.00067**	**J**	0.00055	U	**0.00056**	**J**	**0.0011**	
FTCH-AFFRS-SO-06	FTCH-AFFRS-SO-06-072523	HA	0-2	07/25/2023	**0.0006**	**J**	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-AFFRS-GW-01	FTCH-AFFRS-GW-01-072723	TMW	22.5	07/27/2023	4.3	UJ	4.3	UJ	4.3	UJ	4.3	UJ	4.3	UJ	4.3	UJ	8.7	UJ
FTCH-AFFRS-GW-02	FTCH-AFFRS-GW-02-072723	TMW	8.5	07/27/2023	2.3	J	4.2	UJ	4.2	UJ	4.2	UJ	4.9	J	**4.5**	**J**	8.3	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
TMW = temporary monitoring well
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.5 Primary Fire Station (Building 2100) AOPI

6.5.1 AOPI Background

The Primary Fire Station (Building 2100) is identified as an AOPI following records review, personnel interviews, and site reconnaissance due to possible nozzle testing and AFFF storage being conducted here. The Primary Fire Station is located at Building 2100 and was constructed in the early 1940s and located in the Eastern Cantonment Area (Figure 6-10). It is currently utilized by the ARARNG. At the time of closure, FTCH had one pumper, one tanker, two brush trucks, one rescue truck, one chemical foam additive pumper, and hazardous material response equipment. The chemical foam additive pumper was housed primarily at the Airfield Fire Fight and Rescue Station but was here for some amount of time. It is not indicated whether the chemical foam used with this pumper was Class B, but as it was used primarily at the Airfield Fire Fight and Rescue Station, it is assumed to be AFFF. It was near one of the installation heliports, which was installed between 1971 and 1980 and used as part of the JRTC training mission.

This area is under the control of ARARNG with no restrictions imposed.

6.5.2 SI Sampling and Results

Seven surface soil samples and two QC duplicate samples were collected from seven soil borings (FTCH-PFS-SO-01 through FTCH-PFS-SO-07) outside the building footprint and the potential release area at the Primary Fire Station AOPI. In addition, two groundwater samples (FTCH-PFS-GW-01 and FTCH-PFS-GW-02) were collected from locations in downgradient positions to the AOPI. The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-4 and Figure 6-11 and summarized below.

Soil

PFOS was detected in soil at concentrations above the SL at four soil sample locations. PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were detected in soil at concentrations below their respective SLs in the soil samples collected at the Primary Fire Station (Building 2100) AOPI.

Detections of PFOS was above the SL (0.013 mg/kg) and were highest at FTCH-PFS-SO-06 (0.529 mg/kg).

Detections of PFOA and PFNA were below the SL and were highest at FTCH-PFS-SO-03 (0.0121 and 0.007 mg/kg, respectively). Detections of PFBS, PFHxS, and PFHxA were below the SL and were highest at FTCH-PFS-SO-06 (0.0036, 0.114, and 0.0095 mg/kg, respectively). Detections of PFBA were below the SL and were highest at FTCH-PFS-SO-04 (0.0012 mg/kg).

Groundwater

PFBA was detected at an estimated concentrations (J flagged) below the SL at FTCH-PFS-GW-02 (5.5 J ng/L). PFOS, PFOA, PFBS, PFNA, PFHxS, and PFHxA were not detected in the groundwater samples collected at the Primary Fire Station (Building 2100) AOPI.

6.5.3 CSM

The AOPI is approximately 5 acres in size and is comprised of active fire station buildings, garages, and outdoor shelters. The ground surface elevation of this AOPI is approximately 440 ft amsl. Stormwater runoff from the area likely flows east towards Grayson Creek, located approximately 0.25 miles east. Surface water and sediment are not present at the AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir. The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995. There are no Target PFAS specific land use restrictions at this AOPI.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Primary Fire Station AOPI.

Target PFAS were detected in soil at the AOPI. There are no current residents at FCJMTC. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use and all exposure pathways for hypothetical future onsite residents are potentially complete. The soil exposure pathway is complete for site workers because workers may access the AOPI and Target PFAS were detected in soil samples at the AOPI.

Target PFAS were detected in groundwater samples at the AOPI. Although there are no potable water wells located at FCJMTC and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil or groundwater at the AOPI could migrate east and discharge to Grayson Creek surface water or sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-12 presents the CSM for the Primary Fire Station.

6.5.4 Recommendation

Human exposure pathways are complete or potentially complete, and Target PFAS concentrations in soil were detected above SLs at the Primary Fire Station; therefore, further investigation is recommended.

Table 6-4. Target PFAS Analytical Results at the Primary Fire Station

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-PFS-SO-01	FTCH-PFS-SO-01-072223	HA	0-2	07/22/2023	**0.0119**		**0.003**		**0.00029**	**J**	**0.00054**	**J**	**0.0127**		**0.0017**		**0.00068**	**J**
FTCH-PFS-SO-02	FTCH-PFS-SO-02-072223	HA	0-2	07/22/2023	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
FTCH-PFS-SO-03	FTCH-PFS-SO-03-072223	HA	0-2	07/22/2023	**0.495**		**0.0121**		**0.0015**		**0.007**		**0.0885**		**0.0034**		**0.00072**	**J**
FTCH-PFS-SO-04	FTCH-PFS-SO-04-072223	HA	0-2	07/22/2023	**0.114**		**0.002**		**0.00042**	**J**	**0.0021**		**0.01**		**0.0026**		**0.0012**	
FTCH-PFS-SO-05	FTCH-PFS-SO-05-072223	HA	0-2	07/22/2023	**0.0013**		0.00059	U	**0.0015**		0.00059	U	**0.0194**	**J**	**0.0017**		0.00059	U
	FTCH-FD-03-SO-072223	HA	0-2	07/22/2023	0.00059	U	0.00059	U	**0.00098**	**J**	0.00059	U	**0.0093**	**J**	**0.002**		0.00059	U
FTCH-PFS-SO-06	FTCH-PFS-SO-06-072223	HA	0-2	07/22/2023	**0.529**		**0.006**		**0.0036**		**0.001**	**J**	**0.114**		**0.0095**		0.0006	U
FTCH-PFS-SO-07	FTCH-PFS-SO-07-072223	HA	0-2	07/22/2023	**0.0341**		**0.0017**		0.00054	U	**0.00072**	**J**	**0.0045**		**0.0016**	**J**	**0.00085**	**J**
	FTCH-FD-02-SO-072223	HA	0-2	07/22/2023	**0.03**		**0.0019**		0.00055	U	**0.00064**	**J**	**0.0056**		**0.0016**		**0.0011**	
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-PFS-GW-01	FTCH-PFS-GW-01-072223	DPT SP	34	07/22/2023	6.3	UJ	6.3	UJ	6.3	UJ	6.3	UJ	6.3	UJ	6.3	UJ	13	UJ
FTCH-PFS-GW-02	FTCH-PFS-GW-02-072223	DPT SP	34	07/22/2023	5.6	UJ	5.6	UJ	5.6	UJ	5.6	UJ	5.6	UJ	5.6	UJ	11	UJ
	FTCH-FD-01-GW-072223	DPT SP	34	07/22/2023	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	**5.5**	**J**

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.6 Cantonment Area Heliport 2 AOPI

6.6.1 AOPI Background

The Cantonment Area Heliport 2 AOPI includes a heliport located within the Cantonment Area as shown on Figure 6-10 and is in close proximity to the Primary Fire Station. It first appears on a 1980 historical aerials. This heliport was identified as AOPIs due to the possible historical use of AFFF in response to helicopter failures.

This area was taken control of by ARARNG with no restrictions imposed.

6.6.2 SI Sampling and Results

Groundwater samples were not collected at the Cantonment Area Heliports based on the UFP-QAPP. However, groundwater samples were collected from the Primary Fire Station, which is located 350 feet to the west of this AOPI. Groundwater sampling results are discussed in Section 6.5.2.

Four surface soil samples were collected from four soil borings (FTCH-CAH2-SO-01 through FTCH-CAH2-SO-04) surrounding the helipad. The Target PFAS analytical results for the soil samples collected are provided in Table 6-5 and Figure 6-11 and summarized below.

Soil

Cantonment Area Heliport 2 was the only heliport location to have detections of Target PFAS the soil samples collected. PFOS, PFOA, PFHxS, and PFHxA were detected in soil at concentrations below their respective SLs at Heliport 2. PFBS and PFNA were not detected in any of the soil samples collected at the Cantonment Area Heliport 2 AOPI.

Detections of PFOS, PFOA, PFHxS, and PFHxA were below the SL and were highest at FTCH-CAH2-SO-03 (0.0012, 0.00034 J, 0.0007 J, and 0.00052 J mg/kg, respectively.

6.6.3 CSM

The AOPI is approximately 0.1 acres in size. The concrete pad is still visible. The ground surface elevation of this AOPI is approximately 440 ft amsl. Stormwater runoff from the area likely flows east towards Grayson Creek, located approximately 0.25 miles east. Surface water and sediment are not present at the AOPI.

The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995 event. This AOPI is currently a vacant mowed grass field located east of the Primary Fire Station. The area surrounding this AOPI is on the ARARNG facility and is used for a mix of commercial and industrial purposes. Based on the current and historical land use of the AOPI, it is likely to continue being a vacant field for the foreseeable future. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface

water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Cantonment Area Heliport 2 AOPI, however as stated previously, stormwater drains likely convey stormwater towards Grayson Creek.

Target PFAS were detected in soil at the AOPI. There are no current residents at FCJMTC. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use and all exposure pathways for hypothetical future onsite residents are potentially complete. The surface soil exposure pathway at the Cantonment Area Heliport 2 AOPI is complete because Target PFAS were detected in surface soil and site workers and hypothetical future residents may access the AOPI.

Groundwater samples were not collected at this AOPI but were collected from the Primary Fire Station, located approximately 350 feet west. Target PFAS were detected in groundwater at the Primary Fire Station. Although there are no potable water wells located at FCJMTC and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents since the presence of target PFAS in groundwater at the AOPI is unknown albeit unlikely.

Target PFAS in soil (or groundwater) at the AOPI could migrate and discharge to surface water or sediment in water bodies. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-13 presents the CSM for Cantonment Area Heliport 2.

6.6.4 Recommendation

Complete human exposure pathways exist at this AOPI. Although concentrations of Target PFAS in soil at the Cantonment Area Heliport 2 do not exceed the SLs, it is located within 350 feet of soil samples at the Primary Fire Station which do exceed SLs; therefore, further investigation is recommended.

Table 6-5. Target PFAS Analytical Results at Cantonment Area Heliport 2

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-CAH2-SO-01	FTCH-CAH2-SO-01-072223	HA	0-2	07/22/2023	**0.00048**	J	0.00058	U	0.00058	U	0.00058	U	**0.00032**	J	0.00058	U	0.00058	U
FTCH-CAH2-SO-02	FTCH-CAH2-SO-02-072223	HA	0-2	07/22/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	**0.00042**	J	0.00058	U	0.00058	U
FTCH-CAH2-SO-03	FTCH-CAH2-SO-03-072223	HA	0-2	07/22/2023	**0.0012**		**0.00034**	J	0.00059	U	0.00059	U	**0.0007**	J	**0.00052**	J	0.00059	U
FTCH-CAH2-SO-04	FTCH-CAH2-SO-04-072223	HA	0-2	07/22/2023	**0.00033**	J	0.00057	U	0.00057	U	0.00057	U	**0.00063**	J	0.00057	U	0.00057	U

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
FD = field duplicate sample
HA = hand auger
ID = identification
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection

6.7 Fire Station and Warehouse (Building 2360) AOPI

6.7.1 AOPI Background

The Fire Station and Warehouse (Building 2360) is identified as an AOPI following records review due to possible nozzle testing and AFFF storage being conducted here. Located in Building 2360, it was constructed in the early 1940s and located in the Eastern Cantonment Area as shown on Figure 6-14. The building was utilized as a fire station and warehouse. It is unclear when the building was transitioned to a warehouse. However, it appears on a 1998 Building Assignment List as having been renovated in 1992. Therefore, it is assumed that the building was utilized as a fire station until 1992. The Fire Station and Warehouse is not visible in historical aerials between 1994 and 2001 and is assumed to have been demolished.

This area was taken control of by ARARNG with no restrictions imposed.

6.7.2 SI Sampling and Results

Two surface soil samples were collected from two soil borings (FTCH-FSW-SO-01 and FTCH-FSW-SO-02) outside the former building footprint and the potential release area at the Fire Station Warehouse (Building 2360) AOPI. In addition, one groundwater sample (FTCH-FSW-GW-01) was collected from a location in a downgradient position to the AOPI. The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-6 and Figure 6-15 and summarized below.

Soil

PFOS was detected at an estimated concentration (J flagged) below the SL at FTCH-FSW-SO-01 (0.00039 J mg/kg). PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected in any groundwater samples collected at the Fire Station and Warehouse (Building 2360).

Groundwater

PFBA was detected at an estimated concentration (J flagged) below the SL at FTCH-FSW-GW-01 (17.6 J ng/L). PFOS, PFOA, PFBS, PFNA, PFHxS, and PFHxA were not detected in any groundwater samples collected at the Fire Station and Warehouse (Building 2360).

PFOS was not detected above the DL or LOD in sample FTCH-FSW-GW-01 (5.3 ng/L). The LOD is above the PFOS SL of 4 ng/L. Because the LOD for all other Target PFAS in soil and groundwater were below their respective SLs, it is unlikely but possible that PFOS is present at concentrations above the SL at this AOPI.

6.7.3 CSM

This AOPI is approximately 0.7 acres in size. Although the building is no longer standing, the former footprint of the fire station is visible. The ground surface elevation of the AOPI is approximately 445 ft amsl. Grayson Creek is located approximately 0.25 miles east of the AOPI. Stormwater conveyances likely follow topography and lead to Grayson Creek. Surface water and sediment are not present at the AOPI.

The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995 event. There are no Target PFAS specific land use restrictions at this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Fire Station and Warehouse AOPI.

Target PFAS were detected in soil at the AOPI. The surface soil exposure pathway at the Fire Station and Warehouse AOPI is complete because site workers may access the AOPI, and Target PFAS were detected in soil at the AOPI. There are no current residents at FCJMTC. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use and all exposure pathways for hypothetical future onsite residents are potentially complete.

Target PFAS were detected in groundwater samples at the AOPI. Although there are no potable water wells at FCJMTC and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways (via drinking water ingestion and dermal contact) at the Fire Station and Warehouse are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil or groundwater at the AOPI could migrate east and discharge to Grayson Creek surface water or sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-16 presents the CSM for the Fire Station and Warehouse.

6.7.4 Recommendation

Complete and potentially complete human exposure pathways exist. The LOD for PFOS in the one groundwater sample is above the SL. It is unlikely that PFOS is present at concentrations above the SL at this AOPI because all other Target PFAS concentrations in soil and groundwater were not detected above their respective SLs. However, the PFOS LOD being above SL presents as a data gap and further investigation is therefore recommended.

Table 6-6. Target PFAS Analytical Results at the Fire Station and Warehouse

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-FSW-SO-01	FTCH-FSW-SO-01-072023	HA	0-2	07/20/2023	**0.00039**	**J**	0.00054	U	0.00054	U	0.00054	U	0.00054	U	0.00054	U	0.00054	U
FTCH-FSW-SO-02	FTCH-FSW-SO-02-072023	HA	0-2	07/20/2023	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-FSW-GW-01	FTCH-FSW-GW-01-072023	DPT SP	34	07/20/2023	5.3	UJ	5.3	UJ	5.3	UJ	5.3	UJ	5.3	UJ	5.3	UJ	**17.6**	**J**

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.8 Northeast Cantonment Area Fire Station (Building 1852) AOPI

6.8.1 AOPI Background

The Northeast Cantonment Area Fire Station (Building 1852) is identified as an AOPI following records review due to possible nozzle testing and AFFF storage being conducted here. Located in Building 1852, it was constructed in 1942 and located in the Eastern Cantonment Area as shown on Figure 6-17. It had capacity to house three fire-related vehicles. The building was destroyed in a 2008 fire.

This AOPI is no longer owned by the Army. This area was transferred to the private ownership with a groundwater restriction imposed which prevents the withdrawal of groundwater for potable purposes. This groundwater restriction is not Target PFAS specific.

6.8.2 SI Sampling and Results

This AOPI, in addition to much of the surrounding property, was under construction for new warehouse and distribution facility during the SI field event. The sampling locations proposed in the UFP-QAPP were not available and upon mobilization, the surface runoff flow direction appeared to be to the north rather than the east. Therefore, soil and groundwater samples were collected from locations downgradient of the AOPI. Two surface soil samples were collected from two soil borings (FTCH-NCAFS-SO-01 and FTCH-NCAFS-SO-02) installed in drainage ditches located downgradient of the AOPI location. In addition, one groundwater sample and one QC duplicate were collected from a location in a regionally downgradient position to the AOPI (FTCH-NCAFS-GW-01). The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-7 and Figure 6-18 and summarized below.

Soil

PFOS and PFHxS were detected below their respective SLs. PFOA, PFBS, PFNA, PFHxA, and PFBA were not detected in any soil samples collected at the Northeast Cantonment Area Fire Station.

PFOS was detected below the SL and was higher at FTCH-NCAFS-SO-02 (0.0093 mg/kg). PFHxS was detected at estimated concentrations (J flagged).

Groundwater

PFBS, PFHxS, PFHxA, and PFBA were detected at estimated concentrations (J flagged) below their respective SLs at FTCH-NCAFS-GW-01 (4.1 J, 6.4 J, 15, and 9.2 J mg/kg, respectively). PFOS, PFOA, and PFNA were not detected in any groundwater samples collected at the Northeast Cantonment Area Fire Station.

PFOS was not detected above the DL or LOD in sample FTCH-NACFS-GW-01 (4.5 ng/L). The LOD is above the PFOS SL of 4 ng/L. Because the LOD for all other Target PFAS in soil and groundwater were below their respective SLs, it is unlikely but possible that PFOS is present at concentrations above the SL at this AOPI.

6.8.3 CSM

The Northeast Cantonment Area Fire Station AOPI is a former fire station that is approximately 0.5 acres in size. The ground surface elevation of the area is approximately 410 ft amsl. The former building footprint is no longer visible. Stormwater runoff from the area likely flows north in the stormwater ditches located parallel to 2nd Avenue before eventually draining into Grayson Creek to the north of the site.

The area is part of the BRAC Surplus property and was transferred to FCRA in the early 2000s.There has been redevelopment initiated in the area, and a new warehouse and distribution facility is being constructed over this location and a concrete floor has been installed over the footprint of the former fire station. The AOPI has been zoned for commercial use. Based on the current land use of the AOPI, it is likely to continue being used as a commercial structure for the foreseeable future. However, Target PFAS-specific land use restrictions are not present that would prevent future residential development of this AOPI and future use of this property for commercial or hypothetical residential use is possible. There is one groundwater use restriction in place which prevents the withdrawal of groundwater for potable purposes, but this restriction is not Target PFAS specific. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical routine hose flushing and nozzle testing operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to groundwater through infiltration, leaching, and percolation, and to surface water and sediment via runoff of precipitation.

Target PFAS were detected in soil samples collected from drainage ditches located north of the AOPI. The AOPI is currently zoned for commercial use and a large warehouse and distribution center is being built on the former AOPI location. However, there are no Target PFAS specific land use restrictions imposed to prevent residential development of this AOPI. Therefore, future residential development remains a potential future land use and all soil exposure pathways for hypothetical future onsite residents are potentially complete. The surface soil exposure pathway at the Northeast Cantonment Area Fire Station AOPI is complete for site workers because workers may access the AOPI and Target PFAS were detected in surface soil at the AOPI. However, it should be noted that the footprint of the former fire station has been covered by a concrete floor installed during the redevelopment of the area, which prevents current exposure to surface soil.

Target PFAS were detected in a groundwater sample collected downgradient of the AOPI. There are no potable water wells located at this AOPI, groundwater is not used for drinking water, and a groundwater restriction on this land prevents the withdrawal of groundwater for potable purposes. However, this groundwater restriction is not specific to Target PFAS. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways (via drinking water ingestion and dermal contact) are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use

restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil or groundwater at the AOPI could migrate north and discharge to Grayson Creek surface water or sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-19 presents the CSM for the Northeast Cantonment Area Fire Station.

6.8.4 Recommendation

Complete and potentially complete human exposure pathways exist. The LOD for PFOS in groundwater is above the SL. It is unlikely that PFOS is present at concentrations above the SL at this AOPI because all other Target PFAS concentrations in soil and groundwater were not detected above their respective SLs. However, the PFOS LOD being above SL presents as a data gap and further investigation is therefore recommended.

Table 6-7. Target PFAS Analytical Results at the Northeast Cantonment Area Fire Station

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-NCAFS-SO-01	FTCH-NCAFS-SO-01-080923	HA	0-2	08/09/2023	**0.0024**		0.00052	U	0.00052	U	0.00052	U	**0.00037**	**J**	0.00052	U	0.00052	U
FTCH-NCAFS-SO-02	FTCH-NCAFS-SO-02-080823	HA	0-2	08/08/2023	**0.0093**		0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
Groundwater				Units	ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
				Screening Levels	4		6		600		5.9		39		990		1,800	
FTCH-NCAFS-GW-01	FTCH-NCAFS-GW-01-081323	DPT SP	15.2	08/13/2023	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	9.1	UJ
	FTCH-FD-08-081323	DPT SP	15.2	08/13/2023	4.8	U	4.8	U	**4.1**	**J**	4.8	U	**6.4**	**J**	**15**		**9.2**	**J**

Bolded values indicate the result was detected greater than the limit of detection.
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.9 Hospital Area Fire Station (Building 3799) AOPI

6.9.1 AOPI Background

The Hospital Area Fire Station (Building 3799) was constructed in 1942 and located in the Hospital Area in the southern portion of the Cantonment Area as shown on Figure 6-20. Little site history could be uncovered regarding this location and the Hospital Area Fire Station is no longer present on historical aerials between 2001 to 2002, however it is identified as an AOPI due to possible historical nozzle testing and AFFF storage.

This area was taken control of by ARARNG with no restrictions imposed.

6.9.2 SI Sampling and Results

Two surface soil samples were collected from two soil borings (FTCH-HAFS-SO-01 and FTCH-HAFS-SO-02) outside the former building footprint and the potential release area at the Hospital Area Fire Station AOPI. In addition, one groundwater sample was collected from a location in a downgradient position to the AOPI (FTCH-HAFS-GW-01). The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-8 and Figure 6-21 and summarized below.

Soil

PFOS was detected at an estimated concentration (J flagged) below the SL at FTCH-HAFS-SO-02 (0.00029 J mg/kg). PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected at concentrations in any of the soil samples collected.

Groundwater

PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected in the groundwater samples collected at the Hospital Area Fire Station AOPI.

PFOS was not detected above the DL or LOD in sample FTCH-HAFS-GW-01 (5.6 ng/L). The LOD is above the PFOS SL of 4 ng/L. Because the LOD for all other Target PFAS in soil and groundwater were below their respective SLs, it is unlikely but possible that PFOS is present at concentrations above the SL at this AOPI.

6.9.3 CSM

The AOPI is approximately 1 acre in size located in a heavily wooded area. The ground surface elevation of the AOPI is approximately 460 ft amsl. The former building footprint is no longer visible. Stormwater runoff from the area likely flows south towards the stormwater drains running along the streets eventually draining into Grayson Creek, located approximately 400 ft south of the AOPI. Surface water and sediment are not present at the AOPI.

The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995. There are no Target PFAS specific land use restrictions at this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to nozzle testing and storage. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to groundwater through infiltration, leaching, and percolation, and to surface water and sediment via runoff of precipitation.

Target PFAS were detected in soil samples at the AOPI. There are no current residents at FCJMTC. The Hospital Area is largely vacant. The BRAC Surplus area around the AOPI is currently zoned for commercial use and will likely remain in commercial use for the foreseeable future as part of a military installation. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use and all exposure pathways for hypothetical future onsite residents are potentially complete. The surface soil exposure pathway at the Hospital Area Fire Station AOPI is complete for site workers because workers may access the AOPI and Target PFAS were detected in surface soil at the AOPI.

Target PFAS were not detected in groundwater samples at the AOPI. However, the LOD for PFOS in groundwater was greater than the SL. Therefore, it is possible that PFOS is present in groundwater. Although there are no potable water wells located at FCJMTC and groundwater is not used for drinking water, and residential development is not a reasonably anticipated future land use, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways (via drinking water ingestion and dermal contact) are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil or groundwater at the AOPI could migrate and discharge to Grayson Creek surface water or sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-22 presents the CSM for the Hospital Area Fire Station.

6.9.4 Recommendation

Complete and potentially complete human exposure pathways exist. The LOD for PFOS in groundwater is above the SL. It is unlikely that PFOS is present at concentrations above the SL at this AOPI because all other Target PFAS concentrations in soil and groundwater were not detected above their respective SLs. However, the PFOS LOD being above SL presents as a data gap and further investigation is therefore recommended..

Table 6-8. Target PFAS Analytical Results at the Hospital Area Fire Station

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-HAFS-SO-01	FTCH-HAFS-SO-01-072023	HA	0-2	07/20/2023	0.00059	U	0.00059	U	0.00059	U	0.00059	U	0.00059	U	0.00059	U	0.00059	U
FTCH-HAFS-SO-02	FTCH-HAFS-SO-02-072023	HA	0-2	07/20/2023	**0.00029**	**J**	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-HAFS-GW-01	FTCH-HAFS-GW-01-072023	DPT SP	34	07/20/2023	5.6	UJ	5.6	UJ	5.6	UJ	5.6	UJ	5.6	UJ	5.6	UJ	11	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.10 Oil/Water Separator Sludge Disposal Area (FTCH-033) AOPI

6.10.1 AOPI Background

The Oil/Water Separator Sludge Disposal Area (FTCH-033) is identified as an AOPI following records review due to possible AFFF accumulation from fire truck washing runoff. The AOPI is located northwest of the Sewage Treatment Lagoons as shown on Figure 6-23. The area was used for oily debris which clogged up the wash racks. The material collected from concrete wash rack troughs was spread on the ground surface here in an area that may have ranged between 150 square feet and 1 acre in size. AFFF may have accumulated in the sediments and sludge of wash racks when fire trucks were washed.

This AOPI is no longer owned by the Army. This area was transferred to private ownership with no restrictions imposed.

6.10.2 SI Sampling and Results

Soil samples were not proposed at the Oil/Water Separator Sludge Disposal Area as a specific disposal area was not apparent in historical investigations of the site.

One groundwater sample was collected from a location in a downgradient position to the AOPI (FTCH-OWS-GW-01). The Target PFAS analytical results for groundwater samples collected are provided in Table 6-9 and Figure 6-24 and summarized below.

Groundwater

PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected in the groundwater sample collected at this AOPI.

PFOS, PFOA, and PFNA were not detected above the DL or LOD in sample FTCH-OWS-GW-01 (8.3 ng/L). The LOD is above the respective SLs of 4 ng/L, 6 ng/L, and 5.9 ng/L. Because the LOD for all other Target PFAS in groundwater were below their respective SLs and none were detected, it is unlikely but possible that PFOS, PFOA, and/or PFNA are present at concentrations above the SL at this AOPI.

6.10.3 CSM

The AOPI is approximately 3 acres in size. The ground surface elevation of the AOPI is approximately 400 ft amsl. The former disposal area footprint is no longer visible. Stormwater runoff from the area likely flows north towards an unnamed tributary of the Arkansas River. The nearest unnamed tributary is located approximately 0.25 miles north of the AOPI.

The primary release mechanism is the disposal of potential PFAS-containing sediments and sludge from the wash rack to the ground surface of the Oil/Water Separator Sludge Disposal Area. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water.

The area is part of the BRAC Surplus property and was transferred to FCRA in the early 2000s. It is zoned for residential use but may also be used for recreational uses. Based on the current land use of the AOPI, it is likely to continue being used as a residential and/or recreational area for the foreseeable future.

There are no potable water wells located at this AOPI, groundwater is not used for drinking water, and there are no Target PFAS specific land use restrictions preventing groundwater use. Target PFAS were not detected in groundwater at the AOPI. However, the LODs for PFOS, PFOA, and PFNA in groundwater are above the SL and so PFOS, PFOA, and PFNA may be present in groundwater. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in groundwater at the AOPI could migrate and discharge to nearby Little Vache Grasse Creek, unnamed tributaries to the Arkansas River, or the Arkansas River surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact.

Soil samples were not collected at the AOPI, which is in accordance with the UFP-QAPP. According to historical reports, there were no visible signs of disposal at the site and no contamination indicating a release was evident at the site. Groundwater conditions are considered representative of surface conditions. The area is zoned for residential use and site workers may access the site. Therefore, soil exposure pathways for onsite residents and site workers are potentially complete. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir. Figure 6-25 presents the CSM for the Oil/Water Separator Sludge Disposal Area.

6.10.4 Recommendation

Target PFAS in groundwater at the Oil/Water Separator Sludge Disposal Area were not detected. However, the LODs for PFOS, PFOA, and PFNA in groundwater are above the respective SLs. This presents as a data gap. Therefore, further investigation is recommended.

Table 6-9. Target PFAS Analytical Results at the Oil/Water Separator Sludge Disposal Area

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Groundwater				Units	ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
				Screening Levels	4		6		600		5.9		39		990		1,800	
FTCH-OWS-GW-01	FTCH-OWS-GW-01-081023	DPT SP	11.9	08/10/2023	8.3	UJ	8.3	UJ	8.3	UJ	8.3	UJ	8.3	UJ	8.3	UJ	17	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
ID = identification
ng/L = nanograms per liter (parts per trillion)
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.11 Sewage Treatment Lagoons (FTCH-011) AOPI

6.11.1 AOPI Background

The Sewage Treatment Lagoons (FTCH-011) include four separate sewage lagoons that were installed in the northern portion of the installation, south of the Arkansas River between 1967 and 1995 as shown on Figure 6-23. The Sewage Treatment Lagoons are identified as an AOPI following records review due to potential presence of PFAS-containing materials from AFFF-related activities as well as other PFAS-related activities such as film processing disposal. The lagoons processed sanitary sewer waste from across the installation and can be a concentration point for potential PFAS-impacted materials from various sources including X-ray and film processing facilities, wash racks, and oil/water separators. These lagoons discharge into the Little Vache Grasse Creek. All wash racks from the installation were routed here following oil/water separator processing. However, it is not confirmed whether wastewater from the New Fire Training Area oil/water separator was routed here, due to the recent nature of its development and a lack of engineering references. It is possible, albeit unlikely that this separator discharge was routed elsewhere.

This AOPI is no longer owned by the Army. This area was transferred to private ownership with no restrictions imposed.

6.11.2 SI Sampling and Results

Soil samples were not proposed at the Sewage Treatment Lagoons. Potentially impacted media does not include soil.

Two groundwater samples were collected from locations in downgradient positions to the AOPI (FTCH-STL-GW-01 and FTCH-STL-GW-03). The Target PFAS analytical results for groundwater samples collected are provided in Table 6-10 and Figure 6-24 and summarized below.

Groundwater

PFOS was detected at a concentration above the SL. PFBS and PFHxS were detected at concentrations below their SLs. PFOA, PFNA, PFHxA, and PFBA were not detected in any groundwater samples collected at the Sewage Treatment Lagoons AOPI.

PFOS was detected at an estimated concentration (J flagged) in groundwater at a concentration above the SL (4 ng/L) at FTCH-STL-GW-03 (84 J ng/L). PFBS and PFHxS were detected at estimated concentrations (J flagged) below their SLs at FTCH-STL-GW-03 (15.8. J and 33.4 J ng/L, respectively).

6.11.3 CSM

The AOPI is approximately 100 acres in size. The ground surface elevation of the AOPI is approximately 390 ft amsl. Little Vache Grasse Creek is located immediately south and east of the AOPI and feeds into the Arkansas River. Stormwater conveyances and historical discharges lead to the Little Vache Grasse Creek which flows to the Arkansas River.

The area is part of the BRAC Surplus property and was transferred to FCRA in the early 2000s. It now belongs to the City of Barling. Based on the historical and current land use of the AOPI, it is likely to continue being used as a sewage treatment lagoon complex for the foreseeable future. Target PFAS specific land use restrictions are not present that would prevent future residential development of this AOPI and future use of this property for commercial or hypothetical residential use is possible. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential historical release of PFAS containing wastewater to treatment lagoons at the Sewage Treatment Lagoons. The secondary contaminant migration and fate and transport considerations include discharge of surface water to the Little Vache Grasse Creek via outfall and/or groundwater to the Little Vache Grasse Creek.

Target PFAS were detected in groundwater samples at the AOPI. Although there are no potable water wells located at this AOPI and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in groundwater at the AOPI could migrate and discharge to nearby Little Vache Grasse Creek, unnamed tributaries to the Arkansas River, or the Arkansas River surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-26 presents the CSM for the Sewage Treatment Lagoons.

6.11.4 Recommendation

Potentially complete human exposure pathways exist, and concentrations of Target PFAS in groundwater at the Sewage Treatment Lagoons exceed the SLs; therefore, further investigation is recommended.

Table 6-10. Target PFAS Analytical Results at the Sewage Treatment Lagoons

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Groundwater				Units	ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
				Screening Levels	4		6		600		5.9		39		990		1,800	
FTCH-STL-GW-01	FTCH-STL-GW-01-072623	TMW	20.1	07/26/2023	**2.4**	**J**	4.8	UJ	4.8	UJ	4.8	UJ	**4**	**J**	4.8	UJ	9.5	UJ
FTCH-STL-GW-03	FTCH-STL-GW-03-080823	TMW	19	08/08/2023	**84**	**J**	13	UJ	**15.8**	**J**	13	UJ	**33.4**	**J**	13	UJ	25	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
-- = not applicable
AOPI = Area of Potential Interest
FD = field duplicate sample
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
ng/L = nanograms per liter (parts per trillion)
TMW – temporary monitoring well
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.12 East Land Application Site (FCH-043) AOPI

6.12.1 AOPI Background

The East Land Application Site (FTCH-043) is located east of the Cantonment Area as shown on Figure 6-27. It is identified as an AOPI due to potentially PFAS-containing soils being disposed of here. It received soils excavated during the removal of petroleum-impacted soils from the Original Fire Training Area in 1990. Soil was treated biologically using a landfarming technique.

This area was taken control of by ARARNG with no restrictions imposed.

6.12.2 SI Sampling and Results

Two surface soil samples were collected from two soil borings (FTCH-ELAS-SO-01 and FTCH-ELAS-SO-02) within the footprint of the East Land Application Site. In addition, one groundwater sample was collected from a location in a downgradient position to the AOPI (FTCH-ELAS-GW-01). The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-11 and Figure 6-28 and summarized below.

Soil

PFOS was detected above the SL (0.013 mg/kg) at FTCH-ELAS-SO-02 (0.017 mg/kg). PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were detected below their respective SLs at FTCH-ELAS-SO-02 (0.00087 J, 0.00042 J, 0.00052 J, 0.0085, 0.0015, and 0.00053 mg/kg, respectively).

Groundwater

PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected in any groundwater samples collected at the East Land Application Site AOPI.

PFOS, PFOA, and PFNA were not detected above the DL or LOD in sample FTCH-ELAS-GW-01 (7.1 ng/L). The LOD is above the respective SLs of 4 ng/L, 6 ng/L, and 5.9 ng/L. Because PFOS was detected at concentrations above the SL (0.013 mg/kg), it is possible that PFOS and other Target PFAS are present in groundwater at concentrations above the SL at this AOPI.

6.12.3 CSM

The AOPI is approximately 9 acres in size. The ground surface elevation of the AOPI is approximately 410 ft amsl. An unnamed tributary to Grayson Creek is located approximately 0.15 miles east of the AOPI. Stormwater conveyances likely follow topography and lead to this unnamed tributary.

The area was taken control of by the ARARNG as a result of BRAC 1995 event. Based on the current land use of the AOPI, it is likely to continue being used as undeveloped land for the foreseeable future and residential development is not a reasonably anticipated future land use. However, Target PFAS-specific land use restrictions are not present that would prevent future residential development of this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the disposal of potential PFAS-containing soils from the Original Fire Training Area AOPI in 1990 at this AOPI. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the AOPI, however as stated previously, stormwater runoff follows topography ultimately leading to an unnamed tributary of Grayson Creek.

Target PFAS were detected in soil samples at the AOPI. There are no current residents at FCJMTC. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use and all exposure pathways for hypothetical future onsite residents are potentially complete. The surface soil exposure pathway at the East Land Application Site AOPI is complete for site workers because workers may access the AOPI and Target PFAS were detected in surface soil at the AOPI.

Target PFAS were not detected in groundwater samples at the AOPI. However, Target PFAS in soil may migrate to groundwater. Additionally, the LODs for PFOS, PFOA, and PFNA in groundwater were greater than the SLs. Therefore, it is possible that PFOS, PFOA, and/or PFNA are present in groundwater. Although there are no potable water wells located at FCJMTC and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents.

Target PFAS in soil at the AOPI could migrate and discharge to the unnamed tributary to Grayson Creek surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-29 presents the CSM for the East Land Application Site.

6.12.4 Recommendation

Complete and potentially complete human exposure pathways exist, and concentrations of Target PFAS in soil at the East Land Application Site exceed the SLs; therefore, further investigation is recommended.

Table 6-11. Target PFAS Analytical Results at the East Land Application Site

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
	Soil			Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-ELAS-SO-01	FTCH-ELAS-SO-01-072123	HA	0-2	07/21/2023	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U
FTCH-ELAS-SO-02	FTCH-ELAS-SO-02-072123	HA	0-2	07/21/2023	**0.017**		**0.00087**	**J**	**0.00042**	**J**	**0.00052**	**J**	**0.0085**		**0.0015**		**0.00053**	
Groundwater				Units	ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
				Screening Levels	4		6		600		5.9		39		990		1,800	
FTCH-ELAS-GW-01	FTCH-ELAS-GW-01-072123	DPT SP	28	07/21/2023	7.1	UJ	7.1	UJ	7.1	UJ	7.1	UJ	7.1	UJ	7.1	UJ	14	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
J = The analyte was positively identified; however the associated numerical value is an estimated concentration only.
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.13 West Land Application Site (FTCH-044) AOPI

6.13.1 AOPI Background

The West Land Application Site (FCH-044) is located east of the Western Cantonment Area and north of the Fort Chaffee Airfield as shown on Figure 6-30. The area is identified as an AOPI due to PFAS-containing soils being disposed of here. It received soils excavated during the removal of petroleum-impacted soils from the Original Fire Training Area in 1990. Soil was treated biologically using a landfarming technique. The West Land Application Site has been partly converted to open space and a supplies warehouse. The area is flat and includes a paved parking area and a grassy field. Stormwater drainage is located west along the property and runs parallel to Chad Colley Boulevard. A pond is located on the eastern portion of the AOPI.

This AOPI is no longer owned by the Army. This area was transferred to private ownership with no restrictions imposed.

6.13.2 SI Sampling and Results

Soil samples were not proposed at the West Land Application Site because the site has since been redeveloped and the land farmed soils may have been reworked or moved during site construction and/or may be under the parking area that covers the western portion of the AOPI.

One groundwater sample was collected within the footprint of the former disposal site footprint (FTCH-WLAS-GW-01). The Target PFAS analytical results for the groundwater sample collected are provided in Table 6-12 and Figure 6-31 and summarized below.

Groundwater

PFOS, PFOA, and PFHxS were detected at concentrations above their SLs. PFBS, PFNA, PFHxA, and PFBA were detected at concentrations below their SLs.

PFOS, PFOA, and PFHxS were detected at estimated concentrations (J flagged) in groundwater above their SLs (4, 6, and 39 ng/L, respectively) at FTCH-WLAS-GW-01 (253 J, 19.9 J, and 230 J ng/L, respectively).

PFBS, PFNA, PFHxA, and PFBA were detected at estimated concentrations (J flagged) below their SLs at FTCH-WLAS-GW-01 (31.9. J, 3.9 J, 73.8 J, and 50.2 J ng/L, respectively).

6.13.3 CSM

The AOPI is approximately 10 acres in size. The ground surface elevation of the AOPI is approximately 440 ft amsl. An unnamed tributary to Little Vache Grasse Creek is located approximately 0.15 miles northeast of the AOPI. Stormwater from the AOPI travels into the pond located on the eastern portion of the AOPI before eventually flowing into the unnamed tributary of Little Vache Grasse Creek. However, this pond did not exist prior to the redevelopment of the AOPI.

The area is part of the BRAC Surplus property and was transferred to FCRA in the early 2000s. The area is zoned for commercial use and is surrounded by commercial properties. There are no

Target PFAS specific land use restrictions at this AOPI. Soil samples were not collected at the AOPI, which is in accordance with the UFP-QAPP. The site has been redeveloped and the land farmed soils may have been reworked or moved during site construction and/or may be under the parking area that covers the western portion of the AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

Similar to the East Land Application Site AOPI, the primary release mechanism is the disposal of potential PFAS-containing soils from the Original Fire Training Area AOPI in 1990 at the West Land Application Site AOPI. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water to the pond on the AOPI, or the unnamed tributary.

Soil samples were not collected at the AOPI because the site has been redeveloped and the landfarmed soils may not be present. The AOPI is zoned for commercial use; there are no Target PFAS specific land use restrictions to prevent residential use of this AOPI. Based on the current land use of the AOPI, it is likely to continue being used as a commercial property for the foreseeable future and residential development is not a reasonably anticipated future land use. However, Target PFAS-specific land use restrictions are not present that would prevent future residential development of this AOPI. Therefore, onsite residential pathways for soil are considered potentially complete. There are current residents in the BRAC Surplus property area so residential use is a potential future land use. Site workers may access the AOPI. The presence of target PFAS in soil at the AOPI is unknown therefore, all exposure pathways for hypothetical future onsite residents and site workers are potentially complete.

Target PFAS were detected in groundwater samples at the AOPI. Although there are no potable water wells located at this AOPI and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Target PFAS in soil and/or groundwater at the AOPI could migrate and discharge at the pond, or the unnamed tributary surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-32 presents the CSM for the West Land Application Site.

6.13.4 Recommendation

Potentially complete human exposure pathways exist, and concentrations of Target PFAS in groundwater at the West Land Application Site exceed the SLs; therefore, further investigation is recommended.

Table 6-12. Target PFAS Analytical Results at the West Land Application Site

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Groundwater				Units	ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
				Screening Levels	4		6		600		5.9		39		990		1,800	
FTCH-WLAS-GW-01	FTCH-WLAS-GW-01-081523	DPT SP	5	08/15/2023	**253**	J	**19.9**	J	**31.9**	J	**3.9**	J	**230**	J	**73.8**	J	**50.2**	J

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
ID = identification
ng/L = nanograms per liter (parts per trillion)
J = The analyte was positively identified; however, the associated numerical value is an estimated concentration only.

6.14 Arrowhead Landing Strip AOPI

6.14.1 AOPI Background

The Arrowhead Landing Strip AOPI is located on the south-central portion of the installation as shown on Figure 6-33. It is identified as an AOPI due to the possibility of nozzle testing or AFFF use in aircraft failure responses. It is 4,500 ft long and was used by C-130 aircraft. Training missions using the landing strip occurred here regularly throughout the JRTC mission. The FCJMTC Fire Department reports to this location on standby, along with firefighting assets from the Little Rock National Guard if fire response support is required. FCJMTC does not presently possess fire trucks with Class B foam support capability. Little Rock Air Force pumpers feature Class B foam (AFFF) capabilities; FCJMTC Fire Department fire trucks provide water capacity for additional assistance, if needed. According to interviews with FCJMTC Fire Department personnel, foam response has not occurred at this landing strip since the installation was transferred to the ARARNG. Foam response records during the time that JRTC was on post and generally prior to 1997 remain a data gap, and if fire department procedures were similar historically (i.e., fire trucks with AFFF capabilities present during exercises), then it is possible that a foam response may have been necessary. Further, nozzle testing could possibly occur while Fort Chaffee Fire Department support awaited landings or takeoff to ensure effective foam response capabilities. Designated nozzle testing location(s) have not been established at the air strip and would likely have been at a convenient access point to the runway (e.g., west end, mid-point, or east end) based on training requirements and landing patterns for a particular day.

This area was taken control of by ARARNG with no restrictions imposed.

6.14.2 SI Sampling and Results

As discussed in Section 3.4.8, the three proposed groundwater samples were not collected at the Arrowhead Landing Strip due to installation-imposed restrictions on access to the AOPI.

Seven surface soil samples were collected from seven soil borings (FTCH-ALS-SO-01 through FTCH-ALS-SO-07) along the airfield and in possible parking/staging areas. The Target PFAS analytical results for the soil samples collected are provided in Table 6-13 and Figure 6-34 and summarized below.

Soil

PFOS, PFOA, PFHxS, PFHxA, and PFBA were detected in soil at concentrations below their respective SLs in the soil samples collected at the Arrowhead Landing Strip AOPI.

Detections of PFOA were below the SL and were highest at FTCH-ALS-SO-02 (0.0025 mg/kg). Detections of PFOA and PFHxS were below the SL and were highest at FTCH-ALS-SO-06 (0.00042 J and 0.0005 J mg/kg, respectively). Detections of PFHxA and PFBA were below the SL and were highest at FTCH-ALS-SO-05 (0.0014 and 0.0006 J mg/kg, respectively).

6.14.3 CSM

The AOPI is approximately 38 acres in size. The ground surface elevation of the AOPI is approximately 810 ft amsl and is located on a topographic high relative to surrounding areas.

Several unnamed tributaries are present that flow north and south from the AOPI and ultimately join Little Vache Grasse Creek and Gin Creek.

The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995 event. This AOPI is currently used as a military landing strip for training purposes. There are no Target PFAS specific land use restrictions are this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical nozzle testing or AFFF use in aircraft failure responses along the runway. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the AOPI, however as stated previously, stormwater runoff follows topography ultimately leading to Little Vache Creek and Gin Creek.

Target PFAS were detected in soil at the AOPI. This AOPI is currently used as a military landing strip for training purposes and will likely continue to be used for the foreseeable future. Therefore, residential development is not a reasonably anticipated future land use at this AOPI. However, all exposure pathways for future onsite residents are potentially complete because there are no Target PFAS-specific land use restrictions precluding residential development. The soil exposure pathway is complete for site workers because workers may access the AOPI and Target PFAS were detected in soil samples at the AOPI.

Groundwater samples were not collected at the AOPI. Although there are no potable water wells located at FCJMTC, groundwater is not used for drinking water, and residential development is not a reasonably anticipated future land use, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents since the presence of target PFAS in groundwater at the AOPI is unknown.

Target PFAS in soil at the AOPI could migrate and discharge to unnamed tributaries to Gin Creek and Little Vache Creek surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-35 presents the CSM for the Arrowhead Landing Strip.

6.14.4 Recommendation

Complete and potentially complete human exposure pathways exist. Although concentrations of Target PFAS in soil at the Arrowhead Landing Strip do not exceed the SLs, further investigation is recommended of the groundwater to resolve the data gap presented by the lack of groundwater data at this AOPI.

Table 6-13. Target PFAS Analytical Results at the Arrowhead Landing Strip

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-ALS-SO-01	FTCH-ALS-SO-01-080823	HA	0-2	08/08/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
	FTCH-FD-07-080823	HA	0-2	08/08/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
FTCH-ALS-SO-02	FTCH-ALS-SO-02-080823	HA	0-2	08/08/2023	**0.0025**		0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
FTCH-ALS-SO-03	FTCH-ALS-SO-03-080823	HA	0-2	08/08/2023	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
FTCH-ALS-SO-04	FTCH-ALS-SO-04-080723	HA	0-2	08/07/2023	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U
FTCH-ALS-SO-05	FTCH-ALS-SO-05-080723	HA	0-2	08/07/2023	0.00061	U	0.00061	U	0.00061	U	0.00061	U	0.00061	U	**0.0014**		**0.0006**	J
FTCH-ALS-SO-06	FTCH-ALS-SO-06-080723	HA	0-2	08/07/2023	**0.00052**	J	**0.00042**	J	0.00056	U	0.00056	U	**0.0005**	J	**0.00038**	J	**0.00045**	J
FTCH-ALS-SO-07	FTCH-ALS-SO-07-080723	HA	0-2	08/07/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
FD = field duplicate sample
HA = hand auger
ID = identification
mg/kg = milligrams per kilogram (parts per million)
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 detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.15 Rattlesnake Landing Strip AOPI

6.15.1 AOPI Background

The Rattlesnake Landing Strip AOPI was developed as an earthen landing strip for C-130 military aircraft and is located in the southeastern corner of the installation as shown on Figure 6-36. It is identified as an AOPI due to the possibility of nozzle testing or AFFF use in aircraft failure responses. The landing strip was in poor condition during the PA site visit; it was indicated that it was used less frequently than the Arrowhead Landing Strip. Foam response records during the time that JRTC was on post and generally prior to 1997 remain a data gap, and if fire department procedures were similar historically (i.e., fire trucks with AFFF capabilities present during exercises), then it is possible that a foam response may have been necessary. Further, nozzle testing could possibly occur while Fort Chaffee Fire Department support awaited landings or takeoff to ensure effective foam response capabilities. Designated nozzle testing location(s) have not been established at the air strip and would likely have been at a convenient access point to the runway (e.g., west end, mid-point, or east end) based on training requirements and landing patterns for a particular day.

This area was taken control of by ARARNG with no restrictions imposed.

6.15.2 SI Sampling and Results

Fifteen surface soil samples and two QC duplicates were collected from 15 soil borings (FTCH-RLS-SO-01 through FTCH-RLS-SO-15) along the airfield and in possible parking/staging areas. In addition, three groundwater samples were collected from locations in downgradient positions to the AOPI (FTCH-RLS-GW-01, FTCH-RLS-GW-02, and FTCH-RLS-GW-03). The Target PFAS analytical results for soil and groundwater samples collected are provided in Table 6-14 and Figure 6-37 and summarized below.

Soil

PFOS was detected below the SL. PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected in any soil samples collected at the Rattlesnake Landing Strip AOPI.

PFOS was detected at estimated concentrations (J flagged) below the SL and were highest at FTCH-RLS-GW-10 (0.00033 J ng/L).

Groundwater

PFOS, PFOA, PFNA, PFHxS, PFHxA, and PFBA were not detected in any groundwater samples collected at the Rattlesnake Landing Strip AOPI.

PFOS was not detected above the DL or LOD in any of the groundwater samples collected. The LOD ranged between 4.8 and 5.9 ng/L and is above the PFOS SL of 4 ng/L. Because the LOD for all other Target PFAS in soil and groundwater were below their respective SLs, it is unlikely but possible that PFOS is present at concentrations above the SL.

6.15.3 CSM

The AOPI is approximately 39 acres in size. The ground surface elevation of the AOPI is approximately 600 ft amsl. Gin Creek is located immediately east and south of the AOPI. Stormwater conveyances likely follow topography and lead to Gin Creek.

The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995 event. This AOPI is currently used as a military landing strip for training purposes. Based on the current and historical land use of the AOPI, it is likely to continue being used as a landing strip in a military training range for the foreseeable future and residential development is not a reasonably anticipated future land use. There are no Target PFAS specific land use restrictions at this AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical nozzle testing or AFFF use in aircraft failure responses along the runway. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the AOPI, however as stated previously, stormwater runoff follows topography ultimately leading to Gin Creek.

Target PFAS were detected in soil at the AOPI. This AOPI is currently used as a military landing strip for training purposes and will likely continue to be used for the foreseeable future. Therefore, residential development is not a reasonably anticipated future land use at this AOPI. However, all exposure pathways for future onsite residents are potentially complete because there are no Target PFAS-specific land use restrictions precluding residential development. The soil exposure pathway is complete for site workers because workers may access the AOPI and Target PFAS were detected in soil samples at the AOPI.

Target PFAS were detected in groundwater at the AOPI. Although there are no potable water wells located at FCJMTC, groundwater is not used for drinking water, and residential development is not a reasonably anticipated future land use, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents.

Target PFAS in soil at the AOPI could migrate and discharge to the unnamed tributary to Gin Creek surface water and sediment. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and

dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-38 presents the CSM for the Rattlesnake Landing Strip.

6.15.4 Recommendation

Complete and potentially complete human exposure pathways exist. The LOD for PFOS in groundwater is above the SL. It is unlikely that PFOS is present at concentrations above the SL at this AOPI because Target PFAS were not detected in groundwater and all Target PFAS concentrations in soil were detected below their respective SLs. However, the PFOS LOD being above SL presents as a data gap and further investigation is therefore recommended.

Table 6-14. Target PFAS Analytical Results at the Rattlesnake Landing Strip

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				**Units**	**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**		**mg/kg**	
				Screening Levels	**0.013**		**0.019**		**1.9**		**0.019**		**0.13**		**3.2**		**7.8**	
FTCH-RLS-SO-01	FTCH-RLS-SO-01-081023	HA	0-2	08/10/2023	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U
	FTCH-FD-07-081023	HA	0-2	08/10/2023	**0.0003**	**J**	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
FTCH-RLS-SO-02	FTCH-RLS-SO-02-081023	HA	0-2	08/10/2023	0.00057	U	0.0029	UJ	0.00057	U	0.00057	UJ	0.00057	U	0.0029	UJ	0.0029	UJ
FTCH-RLS-SO-03	FTCH-RLS-SO-03-081023	HA	0-2	08/10/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	UJ
FTCH-RLS-SO-04	FTCH-RLS-SO-04-081023	HA	0-2	08/10/2023	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U
FTCH-RLS-SO-05	FTCH-RLS-SO-05-081023	HA	0-2	08/10/2023	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U
FTCH-RLS-SO-06	FTCH-RLS-SO-06-081023	HA	0-2	08/10/2023	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U
FTCH-RLS-SO-07	FTCH-RLS-SO-07-081023	HA	0-2	08/10/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
	FTCH-FD-SO-06-081023	HA	0-2	08/10/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
FTCH-RLS-SO-08	FTCH-RLS-SO-08-081023	HA	0-2	08/10/2023	0.00053	U	0.00053	U	0.00053	U	0.00053	U	0.00053	U	0.00053	UJ	0.00053	UJ
FTCH-RLS-SO-09	FTCH-RLS-SO-09-081023	HA	0-2	08/10/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
FTCH-RLS-SO-10	FTCH-RLS-SO-10-081023	HA	0-2	08/10/2023	**0.00033**	**J**	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
FTCH-RLS-SO-11	FTCH-RLS-SO-11-081023	HA	0-2	08/10/2023	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U	0.00056	U
FTCH-RLS-SO-12	FTCH-RLS-SO-12-081023	HA	0-2	08/10/2023	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
FTCH-RLS-SO-13	FTCH-RLS-SO-13-081023	HA	0-2	08/10/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
FTCH-RLS-SO-14	FTCH-RLS-SO-14-081023	HA	0-2	08/10/2023	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U
FTCH-RLS-SO-15	FTCH-RLS-SO-15-081023	HA	0-2	08/10/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
Groundwater				**Units**	**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
				Screening Levels	**4**		**6**		**600**		**5.9**		**39**		**990**		**1,800**	
FTCH-RLS-GW-01	FTCH-RLS-GW-01-081523	DPT SP	30	08/15/2023	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	10	UJ
FTCH-RLS-GW-02	FTCH-RLS-GW-02-081623	DPT SP	29	08/16/2023	5.9	UJ	5.9	UJ	5.9	UJ	5.9	UJ	5.9	UJ	**3.3**	J	12	UJ
FTCH-RLS-GW-03	FTCH-RLS-GW-03-081623	DPT SP	29	08/16/2023	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	4.8	UJ	9.5	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
Grey shaded values indicate the result was detected greater than the residential scenario risk screening levels (OSD 2023).
DPT SP = direct push technology screen point
FD = field duplicate sample
HA = hand auger
ID = identification
mg/kg = milligrams per kilogram (parts per million)
ng/L = nanograms per liter (parts per trillion)
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 detection.
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise.

6.16 Cantonment Area Heliport 1 AOPI

6.16.1 AOPI Background

The Cantonment Area Heliport 1 AOPI includes a heliport located within the Cantonment Area as shown on Figure 6-39. It first appears on a 1980 historical aerial. This heliport was identified as AOPIs due to the possible historical use of AFFF in response to helicopter failures.

This AOPI is no longer owned by the Army. The area containing Heliport 1 was transferred to private ownership with no restrictions imposed.

6.16.2 SI Sampling and Results

Groundwater samples were not collected at the Cantonment Area Heliports based on the UFP-QAPP.

Four surface soil samples were collected from four soil borings (FTCH-CAH1-SO-01 through FTCH-CAH1-SO-04) around the helipad and in a nearby drainage ditch. The Target PFAS analytical results for the soil samples collected are provided in Table 6-15 and Figure 6-40 and summarized below.

Soil

PFOS, PFOA, PFHxS, PFHxA, PFBS, and PFNA were not detected in any of the soil samples collected at the AOPI.

6.16.3 CSM

The AOPI is approximately 0.1 acres in size. The concrete pad is still visible. The ground surface elevation of the AOPI is approximately 430 ft amsl. An unnamed pond is located approximately 430 ft northwest of the AOPI. Stormwater conveyances likely follow topography and lead to this pond.

The area was declared surplus under BRAC 1995 event and now belongs to the Fort Chaffee Redevelopment Trust. This AOPI is currently a vacant mowed grass field located adjacent to commercial offices. The area surrounding this AOPI has been redeveloped for a mix of commercial, industrial, and residential uses. Based on the current and historical land use of the AOPI, it is likely to continue being a vacant field for the foreseeable future. Target PFAS-specific land use restrictions are not present that would prevent future residential development of this AOPI and future use of this property for commercial or residential use is reasonable. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water.

Target PFAS were not detected in soil at the AOPI but may still be present at the AOPI. There are current residents in the BRAC Surplus property area so residential use is a potential future land use. Site workers may access the AOPI. Therefore, future residential development is an anticipated future land use and all exposure pathways for all onsite receptors are potentially complete.

Groundwater samples were not collected at this AOPI. Target PFAS may be present in groundwater. Although there are no potable water wells located at in the BRAC Surplus property area and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents since the presence of target PFAS in groundwater at the AOPI is unknown albeit unlikely.

Surface water and sediment are not present at the Cantonment Area Heliport 1 AOPI, however as stated previously, stormwater drains likely convey stormwater to the unnamed pond. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-41 presents the CSM for Cantonment Area Heliport 1.

6.16.4 Recommendation

Human exposure pathways are potentially complete. Although detected concentrations of Target PFAS in soil were below the SLs, PFAS may be present in groundwater, which was not analyzed. Therefore, further investigation is recommended.

Table 6-15. Target PFAS Analytical Results at Cantonment Area Heliport 1

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-CAH1-SO-01	FTCH-CAH1-SO-01-072323	HA	0-2	07/23/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
	FTCH-FD-04-SO-072323	HA	0-2	07/23/2023	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U
FTCH-CAH1-SO-02	FTCH-CAH1-SO-02-072323	HA	0-2	07/23/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
FTCH-CAH1-SO-03	FTCH-CAH1-SO-03-072323	HA	0-2	07/23/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
FTCH-CAH1-SO-04	FTCH-CAH1-SO-04-072323	HA	0-2	07/23/2023	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
FD = field duplicate sample
HA = hand auger
ID = identification
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection

6.17 Cantonment Area Heliport 3 AOPI

6.17.1 AOPI Background

The Cantonment Area Heliport 3 AOPI includes a heliport located within the southeastern portion of the Cantonment Area as shown on Figure 6-42 and is south of the intersection of 25th Street and 1st Avenue. It first appears on a 1980 historical aerial. This heliport was identified as AOPIs due to the possible historical use of AFFF in response to helicopter failures.

This area was taken control of by ARARNG with no restrictions imposed.

6.17.2 SI Sampling and Results

Groundwater samples were not collected at the Cantonment Area Heliports in accordance with the UFP-QAPP.

Four surface soil samples were collected from four soil borings (FTCH-CAH3-SO-01 through FTCH-CAH3-SO-04) surrounding the former helipad footprint and in a nearby drainage ditch. The Target PFAS analytical results for the soil samples collected are provided in Table 6-16 and Figure 6-43 and summarized below.

Soil

PFOS, PFOA, PFHxS, PFHxA, PFBS, and PFNA were not detected in any of the soil samples collected at the AOPI.

6.17.3 CSM

The AOPI is approximately 0.1 acres in size. The concrete pad is still visible. The ground surface elevation of the AOPI is approximately 440 ft amsl. Stormwater runoff from the area likely flows northwest towards the stormwater drains running along the streets to Grayson Creek, located immediately northeast of the AOPI.

The area was licensed to and then taken control of by the ARARNG as a result of BRAC 1995 event. This AOPI is currently a vacant grass field and the area surrounding this AOPI is on the ARARNG facility and is used for a mix of commercial and industrial purposes. Based on the current and historical land use of the AOPI, it is likely to continue being a vacant field for the foreseeable future. Target PFAS-specific land use restrictions are not present that would prevent future residential development of this AOPI and future use of this property for commercial or hypothetical residential use is possible. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Cantonment Area Heliport 3 AOPI, however as stated previously, stormwater drains likely convey stormwater towards Grayson Creek.

Target PFAS were not detected in soil at the AOPI but may still be present. There are no current residents at FCJMTC. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use and all exposure pathways for all onsite receptors are potentially complete.

Groundwater samples were not collected at this AOPI. Target PFAS may be present in groundwater. Although there are no potable water wells located at FCJMTC and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents since the presence of target PFAS in groundwater at the AOPI is unknown albeit unlikely.

Surface water and sediment are not present at the Cantonment Area Heliport 3 AOPI, however as stated previously, stormwater drains likely convey stormwater to the unnamed pond. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-44 presents the CSM for Cantonment Area Heliport 3.

6.17.4 Recommendation

Human exposure pathways are potentially complete. Although detected concentrations of Target PFAS in soil were below the SLs, PFAS may be present in groundwater, which was not analyzed. Therefore, further investigation is recommended.

Table 6-16. Target PFAS Analytical Results at Cantonment Area Heliport 3

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-CAH3-SO-01	FTCH-CAH3-SO-01-071923	HA	0-2	07/19/2023	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U	0.0006	U
FTCH-CAH3-SO-02	FTCH-CAH3-SO-02-071923	HA	0-2	07/19/2023	0.00059	U	0.00059	U	0.00059	U	0.00059	U	0.00059	U	0.00059	U	0.00059	U
FTCH-CAH3-SO-03	FTCH-CAH3-SO-03-071923	HA	0-2	07/19/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
FTCH-CAH3-SO-04	FTCH-CAH3-SO-04-072023	HA	0-2	07/20/2023	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U	0.00063	U

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
AOPI = Area of Potential Interest
FD = field duplicate sample
HA = hand auger
ID = identification
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection

6.18 Cantonment Area Heliport 4 AOPI

6.18.1 AOPI Background

The Cantonment Area Heliport 4 AOPI includes a heliport located south of the parking lot at the Chaffee Soccer Fields as shown on Figure 6-45. It first appears on a 1980 historical aerial. This heliport was identified as AOPIs due to the possible historical use of AFFF in response to helicopter failures.

This AOPI is no longer owned by the Army. The area containing Heliport 4 was transferred to private ownership with no restrictions imposed.

6.18.2 SI Sampling and Results

Groundwater samples were not proposed at the Cantonment Area Heliports because it was determined unlikely that AFFF would be released in large quantities.

Four surface soil samples were collected from four soil borings (FTCH-CAH4-SO-01 through FTCH-CAH4-SO-04) surrounding the helipad. The Target PFAS analytical results for the soil samples collected are provided in Table 6-17 and Figure 6-46 and summarized below.

Soil

PFOS, PFOA, PFHxS, PFHxA, PFBS, and PFNA were not detected in any of the soil samples collected at the AOPI.

6.18.3 CSM

The AOPI is approximately 0.1 acres in size. The concrete pad is no longer visible and the AOPI area is now used as a soccer field. The ground surface elevation of the AOPI is approximately 400 ft amsl. Stormwater runoff from the area likely flows east towards the stormwater drains running along the streets and continues to flow east towards Little Vache Grasse Creek, located approximately 0.2 miles to the east.

The area was declared surplus under BRAC 1995 and was transferred to FCRA in the early 2000s. It is now used for recreational purposes. The area surrounding this AOPI has been redeveloped for a mix of commercial, industrial, and residential uses. There are no Target PFAS specific land use restrictions at the AOPI. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils and/or paved surfaces related to historical operations. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Cantonment Area Heliport 4 AOPI, however as stated previously, stormwater drains likely convey stormwater towards Little Vache Grasse Creek.

Target PFAS were not detected in soil at the AOPI but may still be present at the AOPI. There are current residents in the BRAC Surplus property area so residential use is a potential future land

use. Site workers may access the AOPI. Therefore, future residential development is an anticipated future land use and all exposure pathways for all onsite receptors are potentially complete.

Groundwater samples were not collected at this AOPI. Target PFAS may be present in groundwater. Although there are no potable water wells located at in the BRAC Surplus property area and groundwater is not used for drinking water, there are no Target PFAS specific land use restrictions preventing groundwater use. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathway is potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, a potentially complete groundwater exposure pathway exists for offsite residents since the presence of target PFAS in groundwater at the AOPI is unknown albeit unlikely.

Surface water and sediment are not present at the Cantonment Area Heliport 4 AOPI, however as stated previously, stormwater drains likely convey stormwater to the unnamed pond. Surface water downgradient of the AOPI is not used for drinking water. Sediment is not a potential exposure medium for residential or drinking water exposures. If present, surface water and sediment pathways are incomplete for residents and drinking water users. If present, surface water exposure pathways for onsite workers and offsite recreational users are conservatively identified as potentially complete for incidental ingestion and dermal contact. Target PFAS in surface water may adsorb to sediment in waterbodies, therefore, if present, sediment exposure pathways for onsite workers and offsite recreational users are also conservatively identified as potentially complete for incidental ingestion and dermal contact. Figure 6-47 presents the CSM for Cantonment Area Heliport 4.

6.18.4 Recommendation

Human exposure pathways are potentially complete. Although detected concentrations of Target PFAS in soil were below the SLs, PFAS may be present in groundwater, which was not analyzed. Therefore, further investigation is recommended.

Table 6-17. Target PFAS Analytical Results at Cantonment Area Heliport 4

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Soil				Units	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
				Screening Levels	0.013		0.019		1.9		0.019		0.13		3.2		7.8	
FTCH-CAH4-SO-01	FTCH-CAH4-SO-01-072223	HA	0-2	07/22/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
FTCH-CAH4-SO-02	FTCH-CAH4-SO-02-072223	HA	0-2	07/22/2023	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U	0.00057	U
FTCH-CAH4-SO-03	FTCH-CAH4-SO-03-072223	HA	0-2	07/22/2023	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U	0.00058	U
FTCH-CAH4-SO-04	FTCH-CAH4-SO-04-072223	HA	0-2	07/22/2023	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U	0.00055	U

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
FD = field duplicate sample
HA = hand auger
ID = identification
ng/L = nanograms per liter (parts per trillion)
U = The analyte was analyzed for but the result was not detected above the limit of detection

6.19 Fort Chaffee Airfield AOPI

6.19.1 AOPI Background

The Fort Chaffee Airfield AOPI is located east of the Western Cantonment Area and south of the West Land Application Site as shown on Figure 6-48. The airfield was primarily used from 1953 to 1965, and then again from 1972 to sometime before 1991. It was used in JRTC trainings primarily as a helicopter drop zone. It began being redeveloped in 2001. It has since been developed into other use buildings; however, it is identified as an AOPI due to the possible historical use of AFFF in response to aircraft fires or nozzle testing.

This AOPI is no longer owned by the Army. This area was transferred to private ownership with no restrictions imposed.

6.19.2 SI Sampling and Results

Soil samples were not proposed at the Fort Chaffee Airfield because the area has undergone significant redevelopment and native surface soils are not likely to be present.

One groundwater sample was collected from a location within the former footprint of the AOPI in a possible parking/staging area for the fire department. AOPI (FTCH-FCA-GW-01). The Target PFAS analytical results for the groundwater sample collected are provided in Table 6-18 and Figure 6-49 and summarized below.

Groundwater

PFOS, PFOA, PFBS, PFNA, PFHxS, PFHxA, and PFBA were not detected in the groundwater sample collected at the Fort Chaffee Airfield AOPI.

PFOS was not detected above the DL or LOD in sample FTCH-FCA-GW-01 (4.5 ng/L). The LOD is above the PFOS SL of 4 ng/L. Because the LOD for all other Target PFAS in groundwater were below their respective SLs and none were detected, it is unlikely but possible that PFOS is present at concentrations above the SL.

6.19.3 CSM

The AOPI is approximately 32 acres in size. The ground surface elevation of the AOPI is approximately 460 ft amsl. An unnamed tributary to Little Vache Gasse Creek is located 0.4 miles south of the AOPI. Stormwater conveyances likely follow topography and lead to this tributary.

The area is part of the BRAC Surplus property and was transferred to FCRA and State of Arkansas in the early 2000s. It now belongs to the City of Fort Smith. Interstate I-49 now runs through a portion of it, and the remaining area is zoned for commercial use. Based on the current land use of the AOPI, it is likely to continue being used for commercial purposes for the foreseeable future. However, there are no Target PFAS specific land use restrictions imposed to prevent residential use of this AOPI. Therefore, future residential development is an unlikely but possibly anticipated future land use. This site has undergone redevelopment and native soils are unlikely to be present. Therefore, soil samples were not collected at this AOPI and all soil pathways were considered

incomplete. The City of Fort Smith provides potable water to the area and withdraws its water from Lake Fort Smith and Lee Creek Reservoir.

The primary release mechanism is the potential release of AFFF to surface soils (which are no longer present) and/or paved surfaces related to historical use of AFFF in response to aircraft fires or nozzle testing. The secondary contaminant migration and fate and transport considerations include downward contaminant migration from surface soil to deeper subsurface soil and groundwater through infiltration, leaching, and percolation and to surface water and sediment via runoff of precipitation or discharge of groundwater to surface water. Surface water and sediment are not present at the Fort Chaffee Airfield AOPI, however as stated previously, stormwater is likely conveyed towards the unnamed tributary of the Little Vache Grasse Creek.

There are no potable water wells located at this AOPI, groundwater is not used for drinking water, and there are no Target PFAS specific land use restrictions preventing groundwater use. PFAS were not detected in groundwater at the AOPI. However, the LOD for PFOS in groundwater is above the SL. Therefore, based on a hypothetical future groundwater use scenario at the AOPI, the onsite groundwater exposure pathways are potentially complete. Groundwater originating in the AOPI could flow offsite and in the absence of Target PFAS specific land use restrictions preventing potable use of groundwater offsite, the groundwater exposure pathway for offsite drinking water receptors is potentially complete.

Since native soil is unlikely to be present, there is no potential source of Target PFAS in soil, or transport mechanism between soil and surface water. Therefore, exposure pathways for soil and surface water are incomplete. Figure 6-50 presents the CSM for the Chaffee Airfield.

6.19.4 Recommendation

Target PFAS in groundwater were not detected. However, the LOD for PFOS in groundwater is above the SL. This presents as a data gap. Therefore, further investigation is recommended.

Table 6-18. Target PFAS Analytical Results at the Fort Chaffee Airfield

Location ID	Sample ID / Duplicate ID	Sample Type	Depth (ft)	Sample Date	PFOS		PFOA		PFBS		PFNA		PFHxS		PFHxA		PFBA	
Groundwater				Units	ng/L		ng/L		ng/L		ng/L		ng/L		ng/L		ng/L	
				Screening Levels	4		6		600		5.9		39		990		1,800	
FTCH-FCA-GW-01	FTCH-FCA-GW-01-072823	TMW	20	07/28/2023	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	4.5	UJ	9.1	UJ

Bolded values indicate the result was detected greater than the limit of detection
Data are compared to the Office of the Secretary of Defense (OSD) risk screening levels for the residential scenario (OSD. 2023. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. August).
FD = field duplicate sample
HA = hand auger
ID = identification
ng/L = nanograms per liter (parts per trillion)
TMW = temporary monitoring well
UJ = The analyte was analyzed for but was not detected. The reported limit of detection is approximate and may be inaccurate or imprecise..

7. CONCLUSIONS AND RECOMMENDATIONS

An SI is conducted when the PA determines an AOPI exists based on probable use, storage, and/or disposal of PFAS-containing materials. The SI includes multi-media sampling at AOPIs to determine whether a release has occurred. The SI may conclude further investigation is warranted, a removal action is required to address immediate threats, or no further action is required (40 CFR 300.420(5)). The SI Report used the findings from the PA in conjunction with soil and groundwater sampling data for each AOPI to determine whether Target PFAS have been released to the environment and whether a release has affected or may affect specific human health targets.

Before the SI sampling, a preliminary CSM was developed in the PA for each AOPI based on an evaluation of existing records, personnel interviews, and site reconnaissance. The preliminary CSMs identified potential human receptors and exposure pathways for groundwater and surface water that is known to be used, or could realistically be used in the future, as a source of drinking water and identified potential soil and sediment exposure pathways. All AOPIs were sampled during the SI at FTCH to further evaluate PFAS-related releases and identify the presence or absence of Target PFAS.

Target PFAS were detected in at least one medium at 14 AOPIs. PFOS, PFOA, PFNA, and/or PFHxS concentrations exceeded SLs for groundwater at four of the AOPIs. PFOS, PFOA, PFNA, and PFHxS concentrations exceeded SLs for surface water at two of the AOPIs. Target PFAS did not exceed SLs for sediment. PFOS, PFOA, and/or PFHxS concentrations exceeded SLs for soil at six AOPIs. As described in Section 3.4.8, due to installation-imposed access restrictions were imposed at Arrowhead Landing Strip, groundwater samples were not collected. Therefore, a data gap concerning Target PFAS presence in groundwater exists. It is recommended that groundwater be sampled in a future investigation to resolve this data gap. Finally, although the Target PFAS were not detected in any of the soil samples collected at the Cantonment Area Heliports 1, 3, and 4, Target PFAS may be present in groundwater, which was not analyzed. Therefore, it is recommended that groundwater be sampled in a future investigation to resolve this data gap.

The CSMs were updated for each AOPI where Target PFAS were detected. The updated CSMs detailed site geological conditions; determined primary and secondary release mechanisms; identified potential human receptors; and detailed complete, potentially complete, and incomplete exposure pathways for current and reasonably anticipated future exposure scenarios. Table 7-1 summarizes the conclusions and recommendations for each AOPI.

The following table summarizes the results of the SI project and presents recommendations for further investigation at all 19 AOPIs.

Table 7-1. Summary of Target PFAS Detected and Recommendations

AOPI Name	Detection of Target PFAS?				Recommendation
	Groundwater	Surface Water	Soil	Sediment	
Original Fire Training Area (FTCH-022)[2] New Fire Training Area[2]	Exceeds SL	Exceeds SL[1]	Exceeds SL	Detected	Further investigation recommended
Central Cantonment Area Fire Station (Building 139)	Detected	NS	Exceeds SL	NS	Further investigation recommended
Airfield Fire Fight and Rescue Station (Building 5850)	Exceeds SL	NS	Exceeds SL	NS	Further investigation recommended
Primary Fire Station (Building 2100)	Detected	NS	Exceeds SL	NS	Further investigation recommended[3]
Cantonment Area Heliports: Heliport 2	NS	NS	Detected	NS	
Fire Station and Warehouse (Building 2360)	No	NS	Detected	NS	Further investigation recommended[4]
Northeast Cantonment Area Fire Station (Building 1852)	Detected	NS	Detected	NS	Further investigation recommended[4]
Hospital Area Fire Station (Building 3799)	ND	NS	Detected	NS	Further investigation recommended[4]
Oil/Water Separator Sludge Disposal Area (FTCH-033)	ND	NS	NS	NS	Further investigation recommended[4]
Sewage Treatment Lagoons (FTCH-011)	Exceeds SL	NS	NS	NS	Further investigation recommended
East Land Application Site (FTCH-043)	ND	NS	Exceeds SL	NS	Further investigation recommended
West Land Application Site (FTCH-044)	Exceeds SL	NS	NS	NS	Further investigation recommended
Arrowhead Landing Strip	NS	NS	Detected	NS	Further investigation recommended[5]
Rattlesnake Landing Strip	Detected	NS	Detected	NS	Further investigation recommended[5]
Cantonment Area Heliports: Heliport 1	NS	NS	ND	NS	Further investigation recommended[6]
Cantonment Area Heliports: Heliport 3	NS	NS	ND	NS	Further investigation recommended[6]
Cantonment Area Heliports: Heliport 4	NS	NS	ND	NS	Further investigation recommended[6]
Fort Chaffee Airfield	ND	NS	NS	NS	Further investigation recommended[4]

Notes:
Highlighted cells are recommended for further investigation.
ND = Non-Detect NS – not sampled
SL – screening level
Target PFAS = PFOA, PFOS, PFBS, PFNA, PFHxS, PFHxA, and/or PFBA

[1]Comparisons of Target PFAS in surface water to residential tap water SLs and in sediment to residential soil SLs are not used on their own to make recommendations on further investigation and are qualitative.

[2] Due to ongoing construction at the Original and New Fire Training Areas, sampling locations were modified and are considered representative of both AOPIs. See Section 3.4.8 for additional details.

[3]Groundwater was not collected at the Cantonment Area Heliport: Heliport 2. However, it is in close proximity to the Primary Fire Station, where soil samples did exceed SLs. Therefore, it is recommended that this heliport be further investigated along with the Primary Fire Station.

[4]At this AOPI, concentrations of Target PFAS were below SLs. However, the limit of detection for least one Target PFAS was above the SL. Although unlikely, Target PFAS could be present at values above the SL. Therefore, it is recommended that groundwater be sampled at this AOPI during a future investigation.

[5]As described in Section 3.4.8, groundwater samples could not be collected from this AOPI due to installation-imposed access restrictions. As a result, there is a data gap presented at this AOPI. Therefore, it is recommended that groundwater be sampled at this AOPI during a future investigation.

[6]Although the Target PFAS were not detected in any of the soil samples collected at these AOPIs, Target PFAS may be present in groundwater, which was not analyzed. Therefore, it is recommended that groundwater be sampled at these AOPIs during a future investigation.

8. REFERENCES

AAR. 2022. Performance Work Statement for Preliminary Assessments and Site Inspections of PFAS at Fort Chaffee, Fort Wingate Depot Activity, Lone Star Army Ammunition Plant, and Red River Army Depot. 22 July.

AAR. 2023a. Uniform Federal Policy-Quality Assurance Project Plan Per- and Polyfluoroalkyl Substances Site Inspection Fort Chaffee, Arkansas. July.

AAR. 2023b. Well Installation Plan Fort Chaffee. May.

Arkansas Water. 2014. County Demographics.

AWWCC. 2022. AWWCC Rules (Updated 2022). https://www.agriculture.arkansas.gov/wp-content/uploads/2022/11/Clean-AWWCC-October-2022.pdf

DoD (U.S. Department of Defense). 2019. *Quality Systems Manual for Environmental Laboratories, Version 5.3*.

DoD. 2020. Data Validation Guidelines Module 3: Data Validation Procedure for Per- and Polyfluoroalkyl Substances Analysis by QSM Table B-15. Environmental Data Quality Workgroup. May.

DoD. 2023. *Memorandum for Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program*. August 24.

Department of the Army. 1996. BRAC 95 Installation Assessment Narratives. April.

ERM Program Management Company. 1996. Fort Chaffee, Arkansas Environmental Baseline Survey at Army BRAC 95 Installations EBS Report with the Community Environmental Response Facilitation Act (CERFA) Report Elin A013. October 7.

ERM Program Management Company. 1997. Fort Chaffee, Arkansas BRAC Cleanup Plan (BCP). Version 2. December.

FCRA. 2022a. Chaffee Crossing Redevelopment Plan. Future Land Use Plan. December 30. Available online at: http://www.chaffeecrossing.com/uploads/docs/maps/Chaffee%20Crossing%20Land%20Use%20Map%20123022.jpg.

FCRA. 2022b. Declaration of Groundwater Restriction. Doc Id: 8223125 Tx:4131408. 16 December.

Fort Chaffee USAG. 1991. Installation Natural Resources Management Plan. July. HDQA. 2019. Legacy BRAC Installations Conveyance Progress Reports. October.

National Guard Bureau. 1995. ARNG Enclave Requirements for BRAC. March 31.

USACE Little Rock District. 1999. Final Environmental Impact Statement Disposal and Reuse of Fort Chaffee, Arkansas. Volume 1 – Main Report. October.

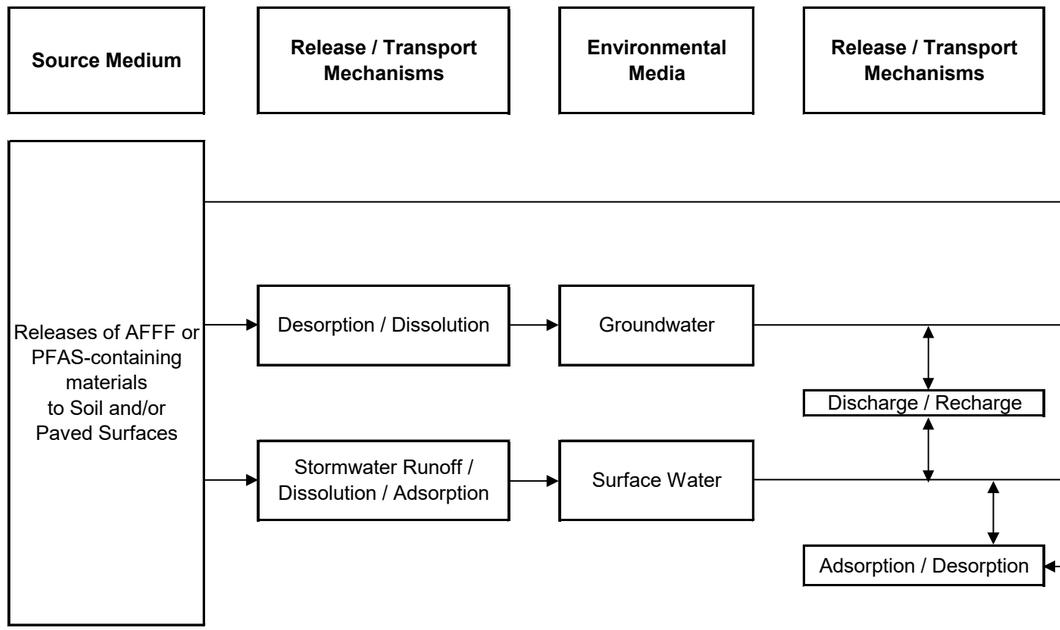
USACE. 2023. Environmental Quality: CSMs, Engineer Manual 200-1-12, CEMP-CE, August 11.

U.S. Army. 2018. Army Guidance for Addressing Releases of PFAS. September 4. Available online at: https://www.fedcenter.gov/admin/itemattachment.cfm?attachmentid=1150.

U.S. Department of Commerce, National Oceanic and Atmospheric Administration. 2022. Fort Smith, Arkansas Climatology. March 2. Available online at: https://www.weather.gov/tsa/climo_fortsmith

USEPA. 1989. Risk Assessment Guidance for Superfund: Volume I. Human Health Evaluation Manual (Part A). Interim Final. Office of Emergency and Remedial Response. US Environmental Protection Agency, Washington, D.C. EPA 540/1-89/002.

FIGURES



Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Onsite [1] Hypothetical Future Resident [2]	Onsite [1] Recreational Users [3]	Offsite [1] Drinking Water Users	Offsite [1] Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	●	●	◐	– [4]	– [4]
					Dermal Contact	●	●	◐	– [4]	– [4]
					Inhalation (dust)	●	●	◐	– [4]	– [4]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐ [5]	◐ [5]	○	◐	N/A
					Dermal Contact	◐ [5]	◐ [5]	○	◐	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water	Discharge / Recharge	Surface Water [6]	Ingestion	●	○	◐	○	◐
					Dermal Contact	●	○	◐	○	◐
			Adsorption / Desorption	Sediment [6]	Ingestion	●	○	◐	N/A	◐
					Dermal Contact	●	○	◐	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area where the AOPIs are located. The AOPIs are under construction for future multi-family housing, therefore, the anticipated future land use of the AOPIs is residential.

[3] Onsite recreational users include visitors of the Janet Huckabee Arkansas River Valley Nature Center who may contact constituents in surface water or sediment.

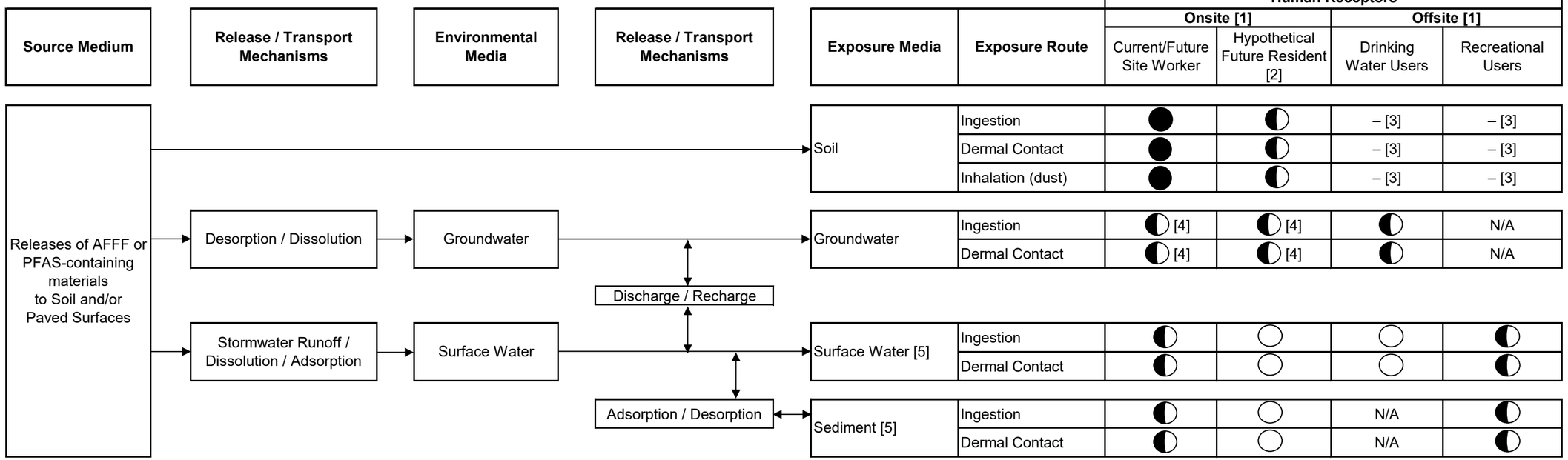
[4] Offsite receptors are not expected to be exposed to soil at the AOPIs.

[5] Currently, there are no potable wells located at the AOPI, groundwater is not and has never been used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[6] Surface water and sediment may be present at these AOPIs and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features. Target PFAS were detected in the surface water sample collected from standing water in a drainage ditch east of the AOPIs.

Human Health Conceptual Site Model for the Original Fire Training Area (FTCH-022) and the New Fire Training Area
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-3



Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Onsite [1] Hypothetical Future Resident [2]	Offsite [1] Drinking Water Users	Offsite [1] Recreational Users
Soil	Ingestion	●	◐	– [3]	– [3]
	Dermal Contact	●	◐	– [3]	– [3]
	Inhalation (dust)	●	◐	– [3]	– [3]
Groundwater	Ingestion	◐ [4]	◐ [4]	◐	N/A
	Dermal Contact	◐ [4]	◐ [4]	◐	N/A
Surface Water [5]	Ingestion	◐	○	○	◐
	Dermal Contact	◐	○	○	◐
Sediment [5]	Ingestion	◐	○	N/A	◐
	Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

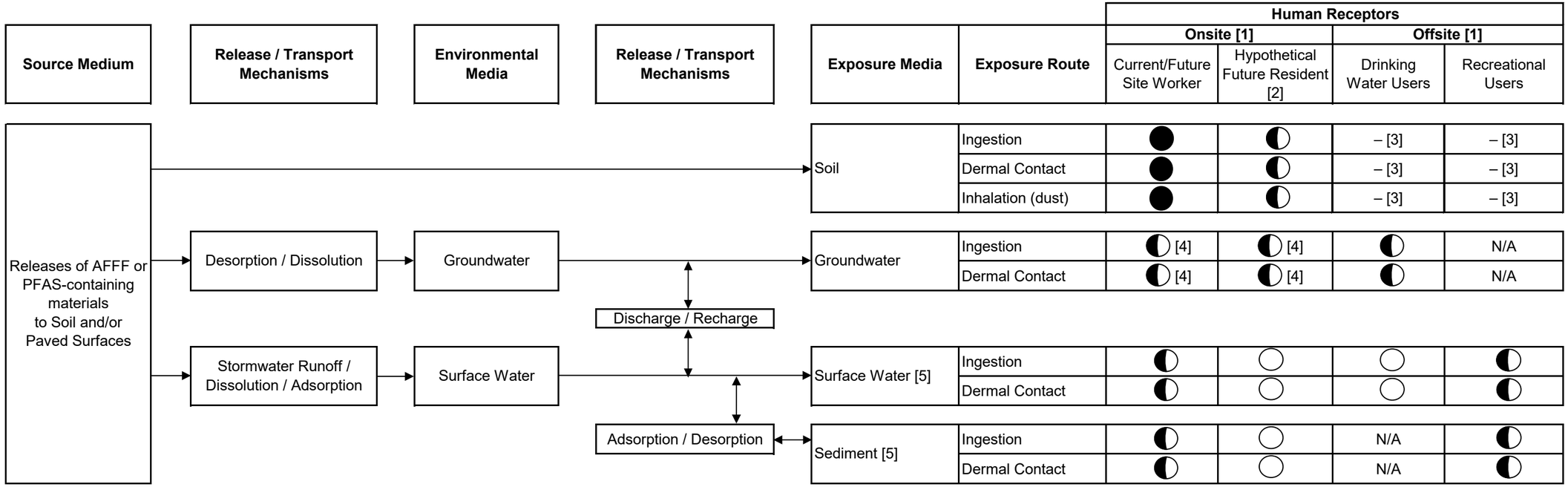
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at the AOPI, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Central Cantonment Area Fire Station (Building 139)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-6



Legend:

- ● = Complete Exposure Pathway
- ◐ = Potentially Complete Exposure Pathway
- ○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

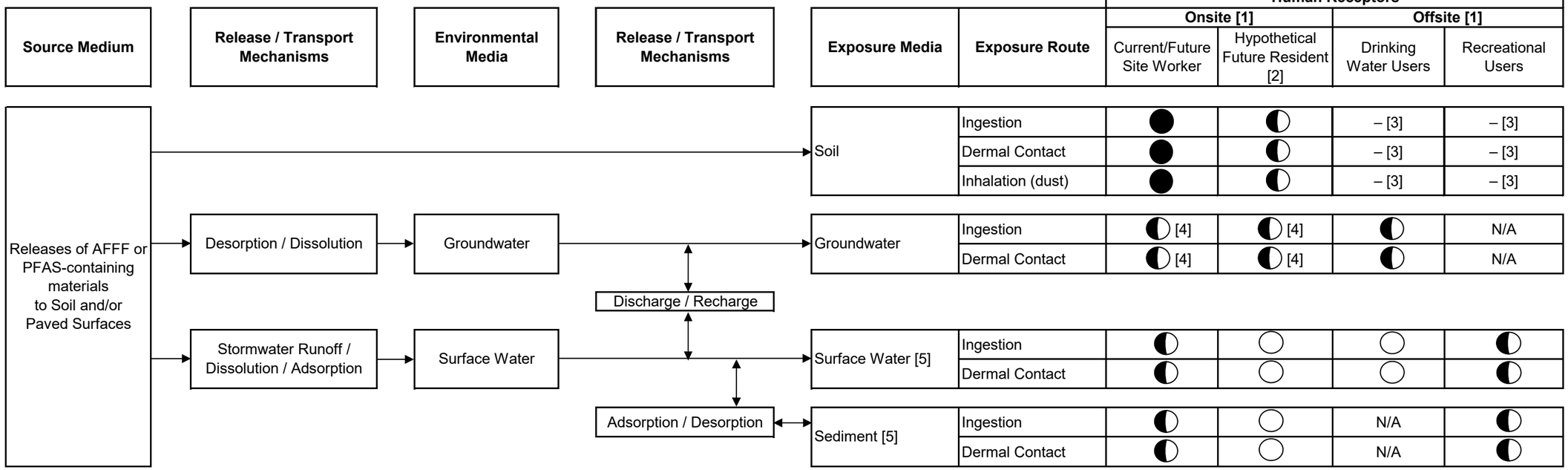
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at the AOPI, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Airfield Fire and Rescue Station (Building 5850)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-9



Legend:

- ● = Complete Exposure Pathway
- ◐ = Potentially Complete Exposure Pathway
- ○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents in the FTCH Joint Maneuver Training Center, however, there are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

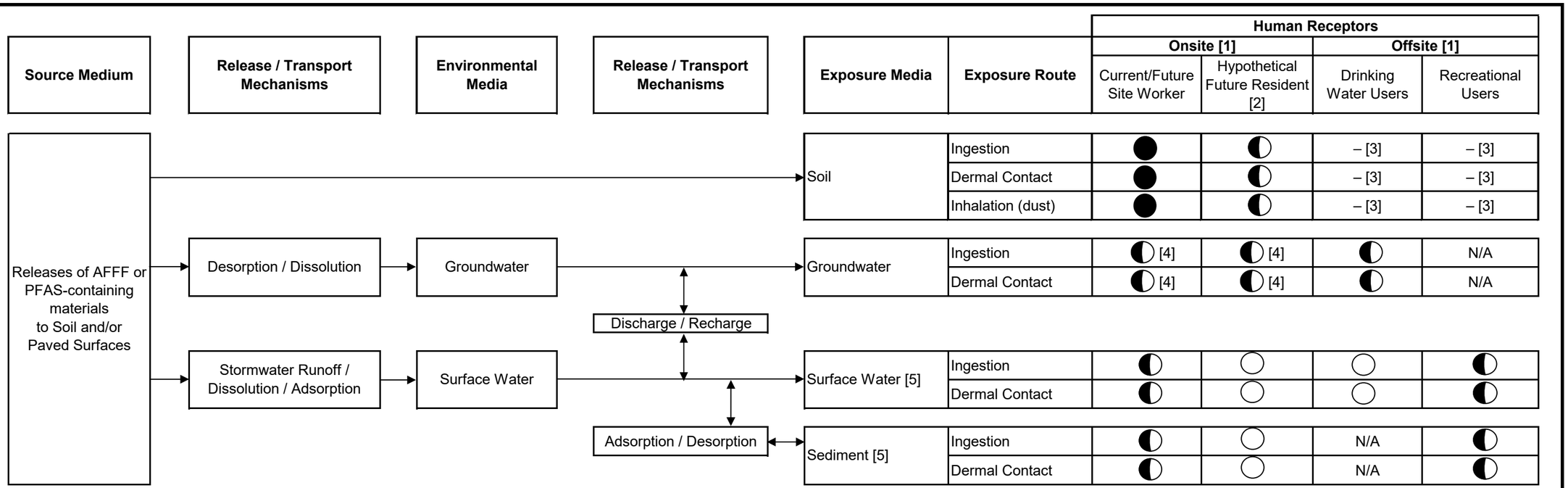
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Primary Fire Station (Building 2100)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-12



Legend:

- ● = Complete Exposure Pathway
- ◐ = Potentially Complete Exposure Pathway
- ○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompasses a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents at FCJMTC and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

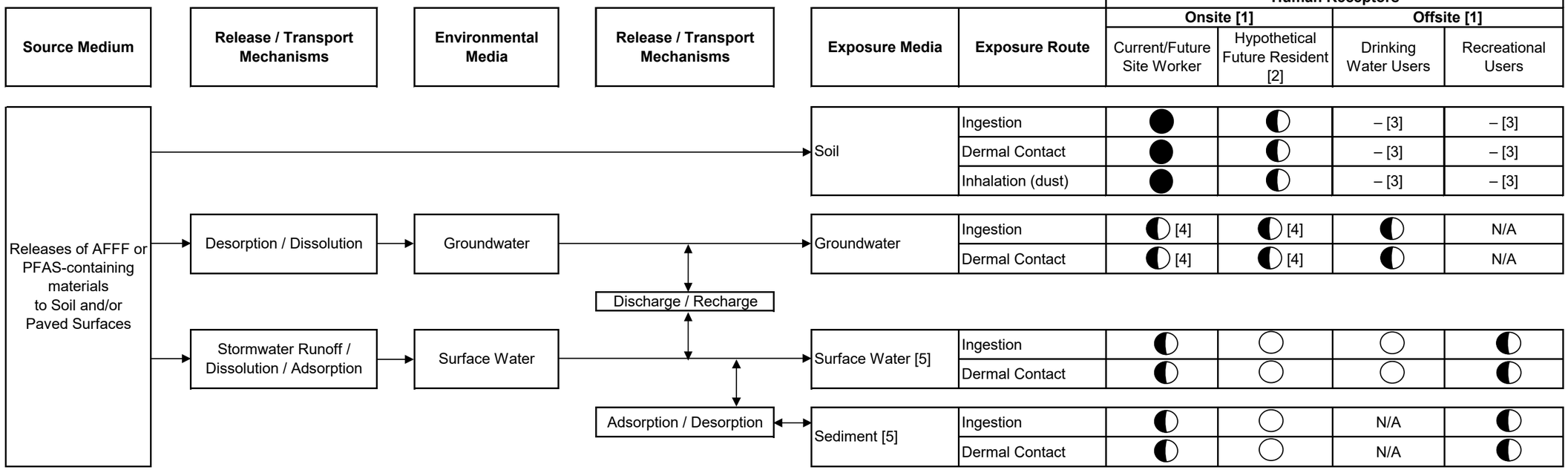
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for Cantonment Area Heliport 2
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-13



Legend:

- ● = Complete Exposure Pathway
- ◐ = Potentially Complete Exposure Pathway
- ○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

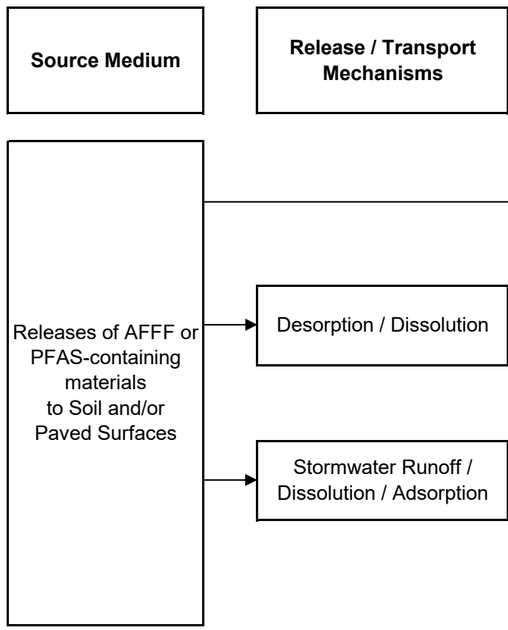
FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:
[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.
[2] There are no current residents in the FTCH Joint Maneuver Training Center, however, there are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.
[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.
[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Fire Station and Warehouse (Building 2360)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-16



Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Human Receptors: Onsite [1] Hypothetical Future Resident [2]	Human Receptors: Offsite [1] Drinking Water Users	Human Receptors: Offsite [1] Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	●	◐	– [3]	– [3]
					Dermal Contact	●	◐	– [3]	– [3]
					Inhalation (dust)	●	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐ [4]	◐ [4]	◐	N/A
					Dermal Contact	◐ [4]	◐ [4]	◐	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [5]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
				Sediment [5]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

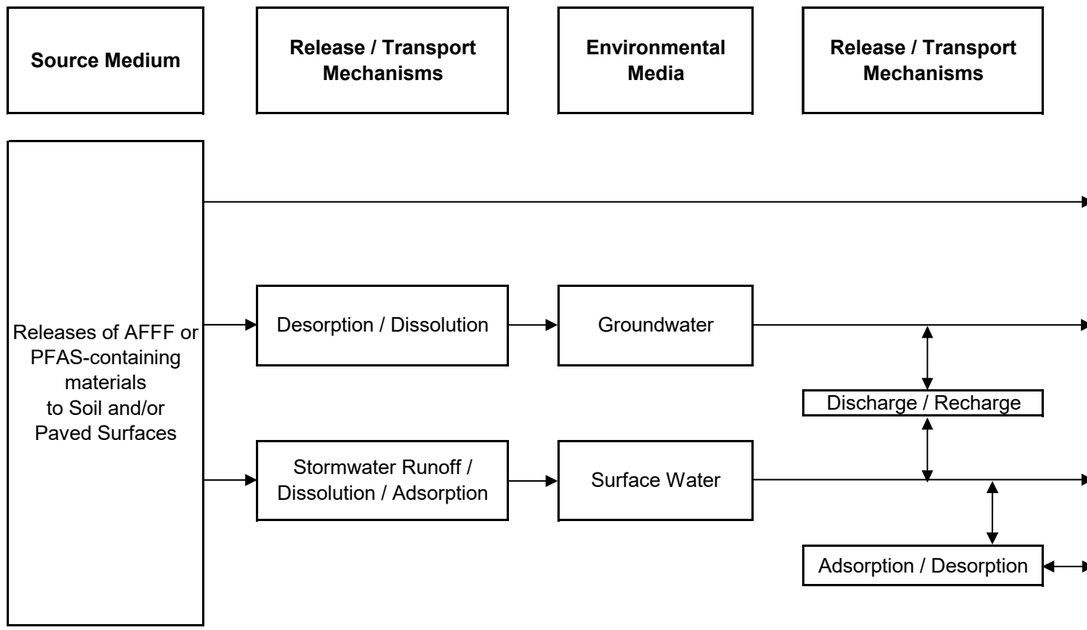
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at the AOPI, groundwater is not used for drinking water, and there are no Target PFAS specific land use controls preventing groundwater use. There is one groundwater use restriction preventing the withdrawal of groundwater for potable purposes, but this restriction is not Target PFAS specific. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Northeast Cantonment Area Fire Station (Building 1852)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-19



Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Human Receptors: Onsite [1] Hypothetical Future Resident [2]	Human Receptors: Offsite [1] Drinking Water Users	Human Receptors: Offsite [1] Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	●	◐	– [3]	– [3]
					Dermal Contact	●	◐	– [3]	– [3]
					Inhalation (dust)	●	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater [4]	Ingestion	◐ [5]	◐ [5]	◐ [5]	N/A
					Dermal Contact	◐ [5]	◐ [5]	◐ [5]	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [6]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
				Sediment [6]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents in the FTCH Joint Maneuver Training Center, however, there are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

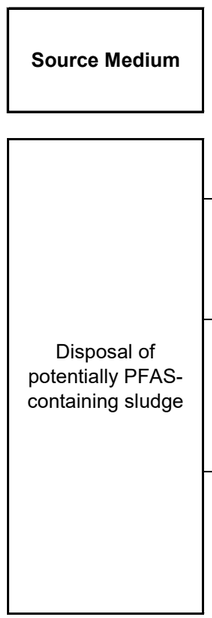
[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

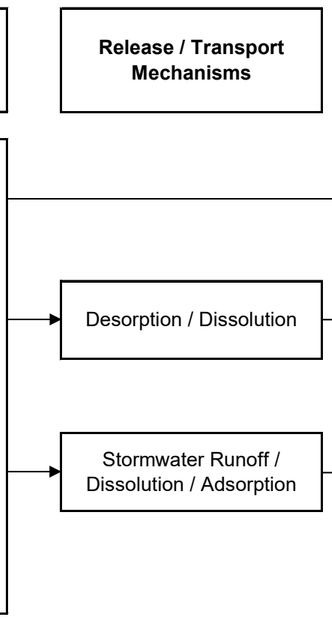
[5] Target PFAS were not detected in groundwater samples at the AOPI. However, the LOD for PFOS in groundwater was greater than the SL. Therefore, it is possible that PFOS is present in groundwater.

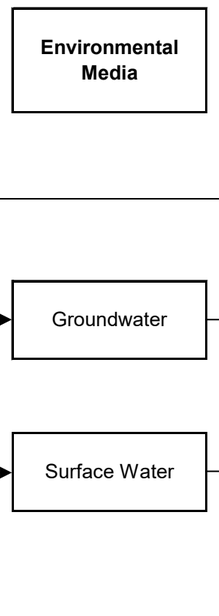
[6] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

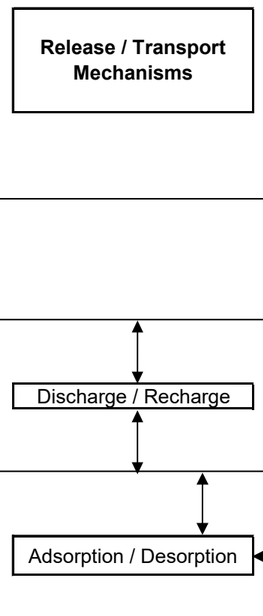
Human Health Conceptual Site Model for the Hospital Area Fire Station (Building 3799)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-22









Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Onsite [1] Hypothetical Future Resident [2]	Offsite [1] Drinking Water Users	Offsite [1] Recreational Users
Disposal of potentially PFAS-containing sludge				Soil [3]	Ingestion	◐	◐	– [4]	– [4]
					Dermal Contact	◐	◐	– [4]	– [4]
					Inhalation (dust)	◐	◐	– [4]	– [4]
	Desorption / Dissolution	Groundwater		Groundwater [5]	Ingestion	◐ [6]	◐ [6]	◐ [6]	N/A
					Dermal Contact	◐ [6]	◐ [6]	◐ [6]	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [7]	Ingestion	◐	◐	○	◐
					Dermal Contact	◐	◐	○	◐
				Sediment [7]	Ingestion	◐	◐	N/A	◐
					Dermal Contact	◐	◐	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] Soil samples were not collected because there were no visible signs of disposal at the site and no contamination indicating a release was evident at the site.

[4] Offsite receptors are not expected to be exposed to soil at the AOPI.

[5] Currently, there are no potable wells located at the AOPI, groundwater is used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[6] Target PFAS were not detected in groundwater at the AOPI. However, the LODs for PFOS, PFOA, and PFNA in groundwater are greater than the SLs. Therefore, it is possible that PFOS, PFOA, and/or PFNA are present in groundwater.

[7] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Oil/Water Separator Sludge Disposal Area (FTCH-033)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-25

Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] — Current/Future Site Worker	Human Receptors: Onsite [1] — Hypothetical Future Resident [2]	Human Receptors: Offsite [1] — Drinking Water Users	Human Receptors: Offsite [1] — Recreational Users
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐ [3]	◐ [3]	◐	N/A
					Dermal Contact	◐ [3]	◐ [3]	◐	N/A
			Discharge / Recharge						
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [4]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Sediment [4]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

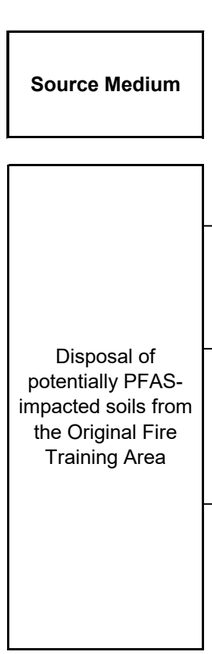
[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] Currently, there are no potable wells located at the AOPI, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[4] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Sewage Treatment Lagoons (FTCH-011)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-26



Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] – Current/Future Site Worker	Human Receptors: Onsite [1] – Hypothetical Future Resident [2]	Human Receptors: Offsite [1] – Drinking Water Users	Human Receptors: Offsite [1] – Recreational Users
Disposal of potentially PFAS-impacted soils from the Original Fire Training Area				Soil	Ingestion	●	◐	– [3]	– [3]
					Dermal Contact	●	◐	– [3]	– [3]
					Inhalation (dust)	●	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater [4]	Ingestion	◐ [5]	◐ [5]	◐ [5]	N/A
					Dermal Contact	◐ [5]	◐ [5]	◐ [5]	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water	Discharge / Recharge	Surface Water [6]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Sediment [6]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompasses a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents at FCJMTC and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

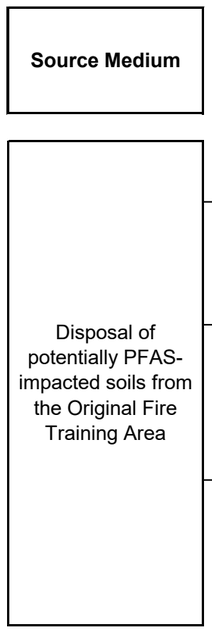
[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Target PFAS were not detected in groundwater at the AOPI. However, the LODs for PFOS, PFOA, and PFNA in groundwater are greater than the SLs. Therefore, it is possible that PFOS, PFOA, and/or PFNA are present in groundwater.

[6] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the East Land Application Site (FTCH-043)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-29



Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] – Current/Future Site Worker	Human Receptors: Onsite [1] – Hypothetical Future Resident [2]	Human Receptors: Offsite [1] – Drinking Water Users	Human Receptors: Offsite [1] – Recreational Users
Disposal of potentially PFAS-impacted soils from the Original Fire Training Area				Soil	Ingestion	◐	◐	– [3]	– [3]
					Dermal Contact	◐	◐	– [3]	– [3]
					Inhalation (dust)	◐	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐ [4]	◐ [4]	◐	N/A
					Dermal Contact	◐ [4]	◐ [4]	◐	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water	Discharge / Recharge	Surface Water [5]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Sediment [5]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompasses a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

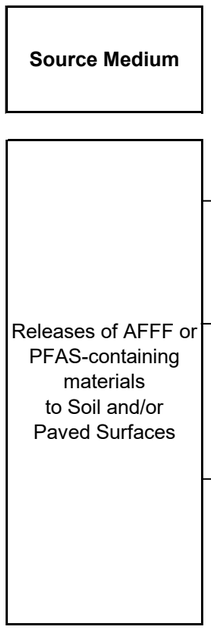
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at the AOPI, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the West Land Application Site (FTCH-044)
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-32



Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] – Current/Future Site Worker	Human Receptors: Onsite [1] – Hypothetical Future Resident [2]	Human Receptors: Offsite [1] – Drinking Water Users	Human Receptors: Offsite [1] – Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	●	◐	– [3]	– [3]
					Dermal Contact	●	◐	– [3]	– [3]
					Inhalation (dust)	●	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐ [4]	◐ [4]	◐	N/A
					Dermal Contact	◐ [4]	◐ [4]	◐	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water	Discharge / Recharge	Surface Water [5]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Sediment [5]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompasses a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents at FCJMTC and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

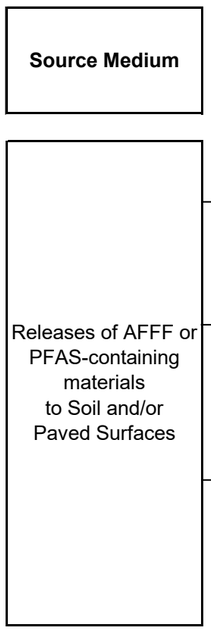
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

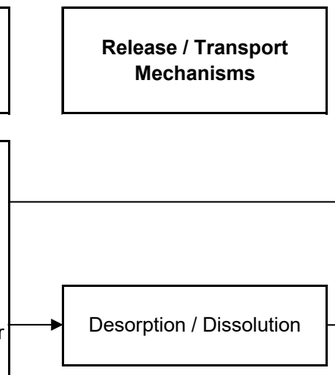
[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

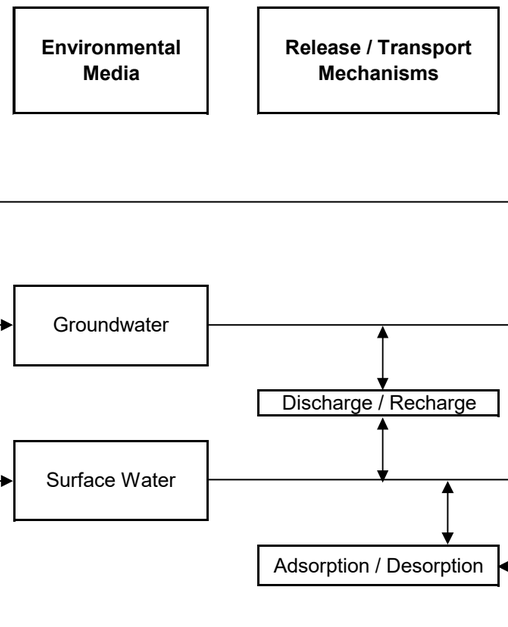
[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for Cantonment Area Arrowhead Landing Strip
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-35







Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] – Current/Future Site Worker	Human Receptors: Onsite [1] – Hypothetical Future Resident [2]	Human Receptors: Offsite [1] – Drinking Water Users	Human Receptors: Offsite [1] – Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	●	◐	– [3]	– [3]
					Dermal Contact	●	◐	– [3]	– [3]
					Inhalation (dust)	●	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐ [4]	◐ [4]	◐	N/A
					Dermal Contact	◐ [4]	◐ [4]	◐	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [5]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
				Sediment [5]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompasses a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents at FCJMTC and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[5] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for Rattlesnake Landing Strip
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-38

Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors			
						Onsite [1]		Offsite [1]	
						Current/Future Site Worker	Hypothetical Future Resident [2]	Drinking Water Users	Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	◐	◐	– [3]	– [3]
					Dermal Contact	◐	◐	– [3]	– [3]
					Inhalation (dust)	◐	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐	◐	◐	N/A
					Dermal Contact	◐	◐	◐	N/A
			Discharge / Recharge						
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [4]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Sediment [4]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

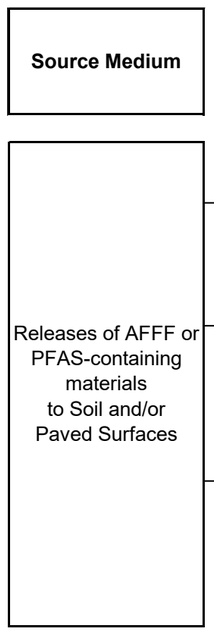
[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

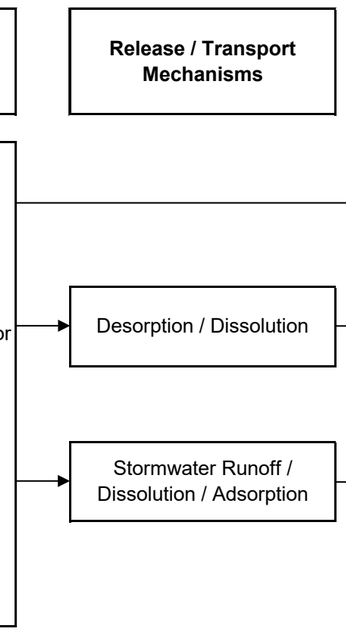
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

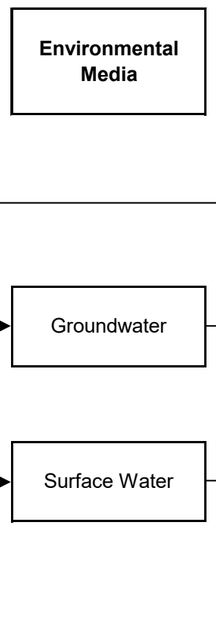
[4] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

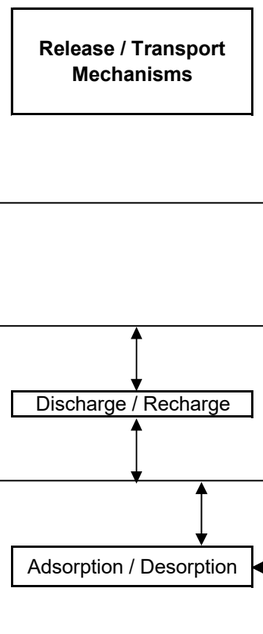
Human Health Conceptual Site Model for Cantonment Area Heliport 1
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-41









Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Human Receptors: Onsite [1] Hypothetical Future Resident [2]	Human Receptors: Offsite [1] Drinking Water Users	Human Receptors: Offsite [1] Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	◐	◐	– [3]	– [3]
					Dermal Contact	◐	◐	– [3]	– [3]
					Inhalation (dust)	◐	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐	◐	◐	N/A
					Dermal Contact	◐	◐	◐	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water	Discharge / Recharge	Surface Water [4]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Surface Water [4]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are no current residents at FCJMTC and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for Cantonment Area Heliport 3
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-44

Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors: Onsite [1] Current/Future Site Worker	Human Receptors: Onsite [1] Hypothetical Future Resident [2]	Human Receptors: Offsite [1] Drinking Water Users	Human Receptors: Offsite [1] Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil	Ingestion	◐	◐	– [3]	– [3]
					Dermal Contact	◐	◐	– [3]	– [3]
					Inhalation (dust)	◐	◐	– [3]	– [3]
	Desorption / Dissolution	Groundwater		Groundwater	Ingestion	◐	◐	◐	N/A
					Dermal Contact	◐	◐	◐	N/A
			Discharge / Recharge						
	Stormwater Runoff / Dissolution / Adsorption	Surface Water		Surface Water [4]	Ingestion	◐	○	○	◐
					Dermal Contact	◐	○	○	◐
			Adsorption / Desorption	Surface Water [4]	Ingestion	◐	○	N/A	◐
					Dermal Contact	◐	○	N/A	◐

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

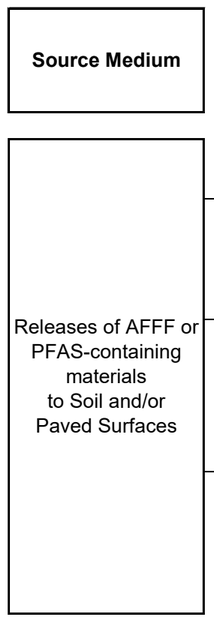
[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

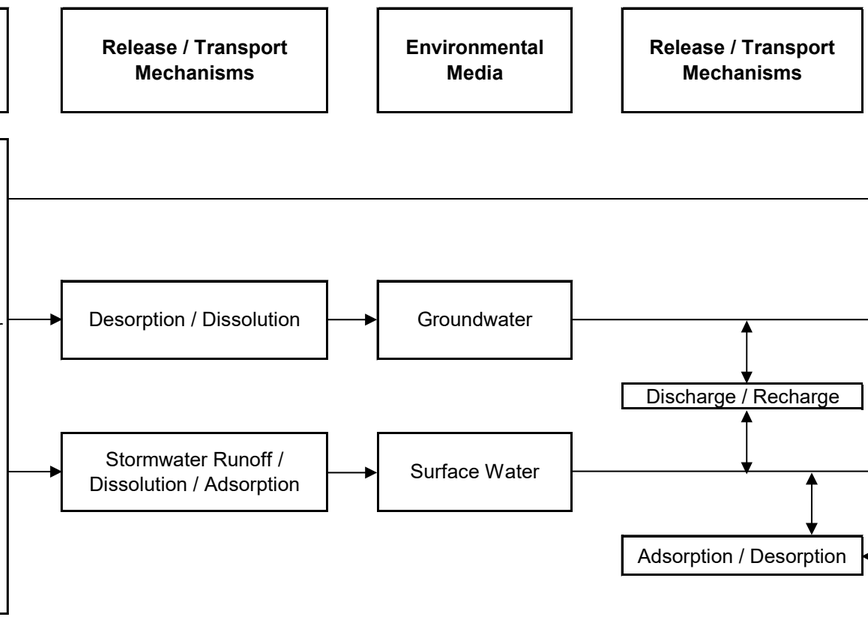
[3] Offsite receptors are not expected to be exposed to soil at the AOPI.

[4] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for Cantonment Area Heliport 4
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-47





Source Medium	Release / Transport Mechanisms	Environmental Media	Release / Transport Mechanisms	Exposure Media	Exposure Route	Human Receptors			
						Onsite [1]		Offsite [1]	
						Current/Future Site Worker	Hypothetical Future Resident [2]	Drinking Water Users	Recreational Users
Releases of AFFF or PFAS-containing materials to Soil and/or Paved Surfaces				Soil [3]	Ingestion	○	○	– [4]	– [4]
					Dermal Contact	○	○	– [4]	– [4]
					Inhalation (dust)	○	○	– [4]	– [4]
	Desorption / Dissolution	Groundwater	Discharge / Recharge	Groundwater [5]	Ingestion	◐ [6]	◐ [6]	◐ [6]	N/A
					Dermal Contact	◐ [6]	◐ [6]	◐ [6]	N/A
	Stormwater Runoff / Dissolution / Adsorption	Surface Water	Discharge / Recharge	Surface Water [7]	Ingestion	○	○	○	○
					Dermal Contact	○	○	○	○
			Adsorption / Desorption	Sediment [7]	Ingestion	○	○	N/A	○
					Dermal Contact	○	○	N/A	○

Legend:

● = Complete Exposure Pathway

◐ = Potentially Complete Exposure Pathway

○ = Incomplete Exposure Pathway

AFFF = aqueous film-forming foam

AOPI = area of potential interest

BRAC - Base Realignment and Closure

N/A = not applicable

FCJMTC = Fort Chaffee Joint Maneuver Training Center

FTCH = Fort Chaffee

PFAS = per- and polyfluoroalkyl substances

Notes:

[1] Onsite refers to the FCJMTC area (64,350 acres) and the BRAC surplus property area (7,050 acres) which encompases a total of approximately 70,400 acres, and offsite refers to the area outside these boundaries.

[2] There are current residents in the BRAC Surplus property area and no Target PFAS specific land use restrictions are imposed to prevent residential use of this AOPI.

[3] This site has undergone redevelopment and native soils are unlikely to be present. Therefore, soil samples were not collected at this AOPI and all soil pathways were considered incomplete.

[4] Offsite receptors are not expected to be exposed to soil at the AOPI.

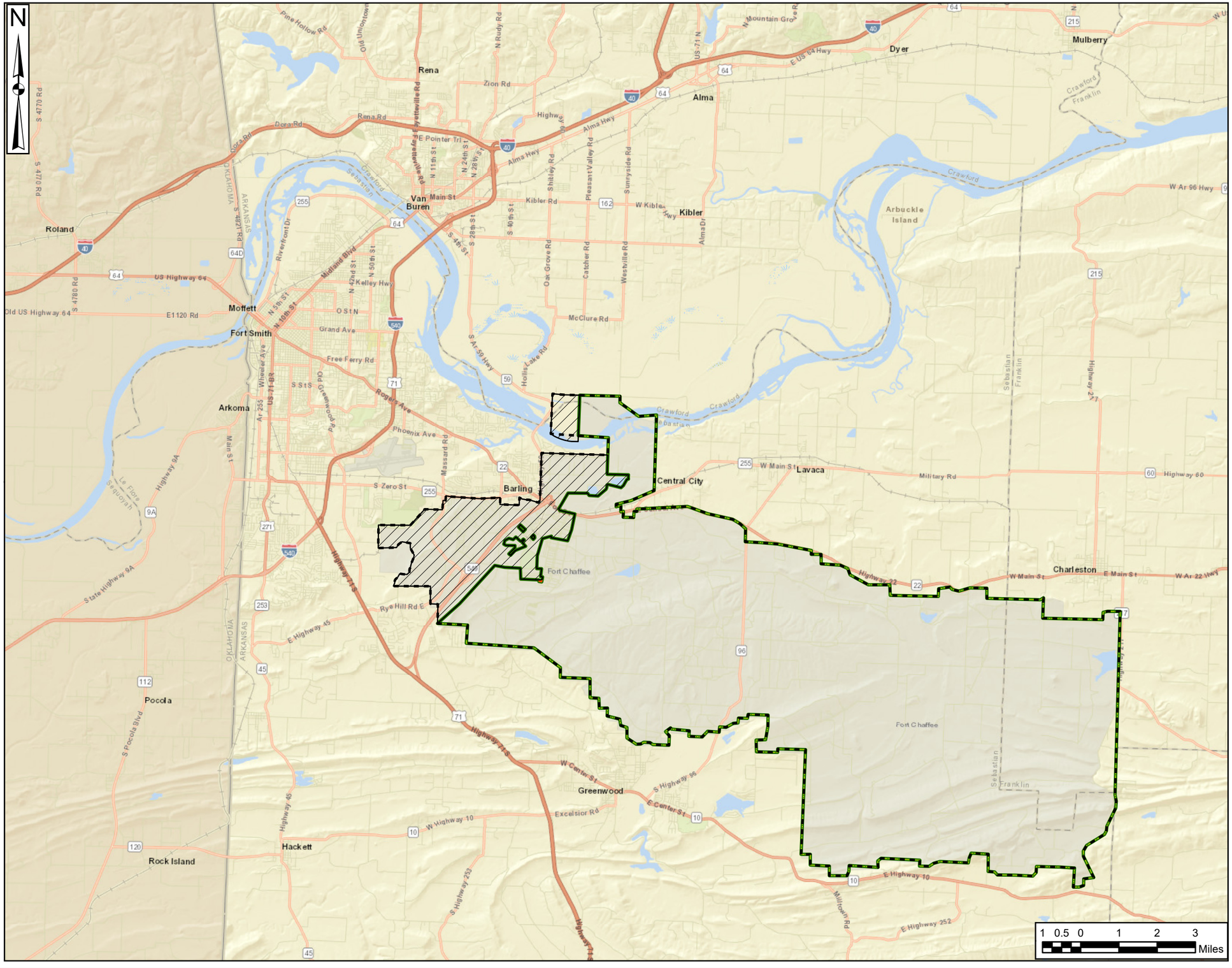
[5] Currently, there are no potable wells located at FCJMTC, groundwater is not used for drinking water, there are no Target PFAS specific land use controls preventing groundwater use. The City of Fort Smith provides potable water to the area, and withdraws its water from Lake Fort Smith and the Lee Creek Reservoir.

[6] Target PFAS were not detected in groundwater samples at the AOPI. However, the LOD for PFOS in groundwater was greater than the SL. Therefore, it is possible that PFOS is present in groundwater.

[7] Surface water and sediment may be present at the AOPI and surrounding areas in stormwater drainage ditches when they are inundated with water, or other water bodies. Surface water and sediment exposure pathways for onsite workers and offsite recreational users describe incidental ingestion and dermal contact exposures in downgradient/downstream surface water features.

Human Health Conceptual Site Model for the Fort Chaffee Airfield
Site Inspection Report for Per- and Polyfluoroalkyl Substances
Fort Chaffee, Arkansas

Figure 6-50



1 in = 221 miles

Legend

- Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
- BRAC Surplus Property
- Historical Fort Chaffee Installation Boundary
- Area Transferred to the United States Department of Energy

Abbreviations:
BRAC = Base Realignment and Closure

Notes:
Monitoring wells (MW) are those identified in historical documents available for review and are not a complete list of the MW which existed or currently remain in the area.

Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery

Coordinate System:
WGS 1984, UTM Zone 15 North

Site Inspections (SI) of Per- and Polyfluoroalkyl Substances (PFAS)

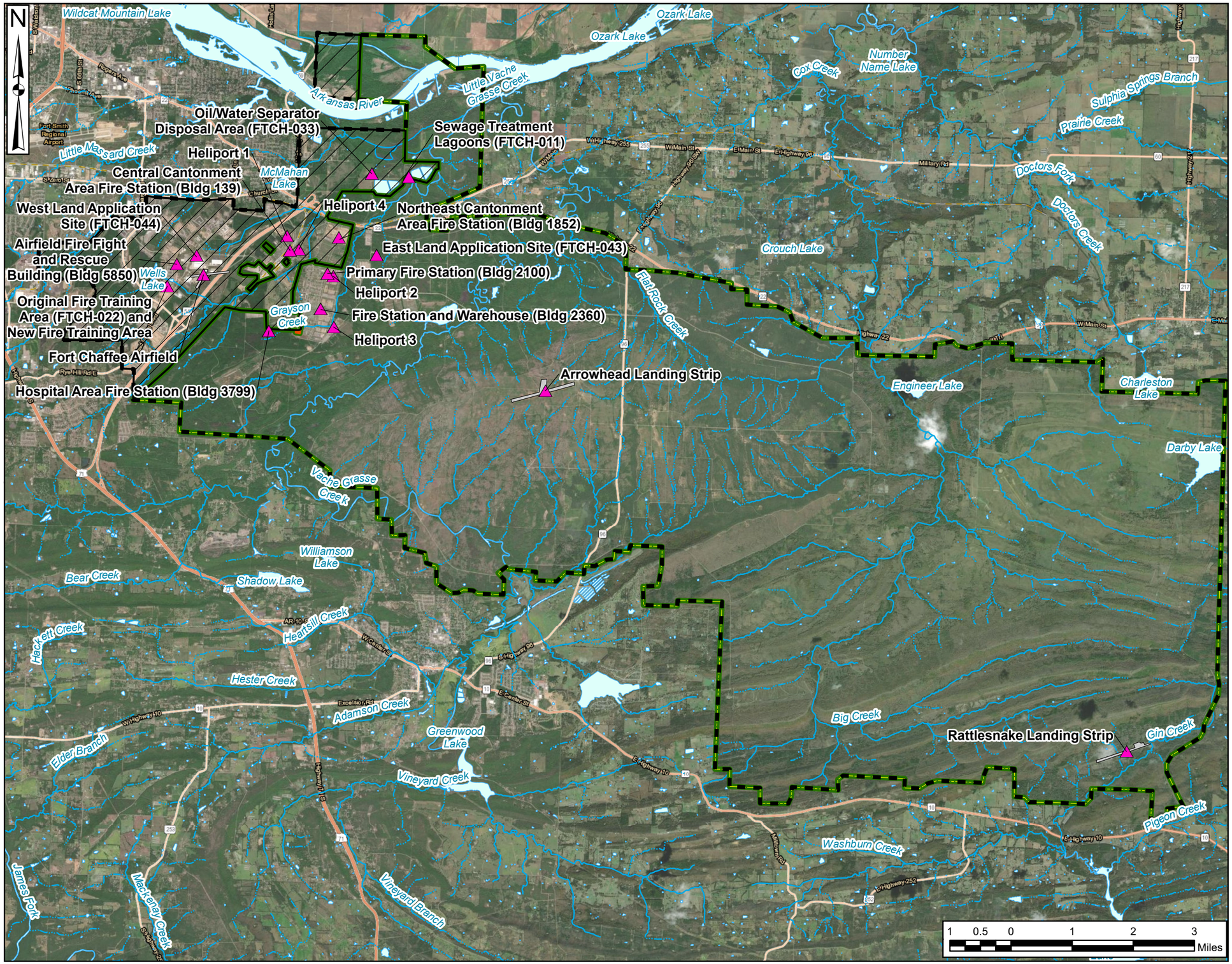
Location: Fort Chaffee, Arkansas

Figure 1-1: Installation Location

Drawn By: K RESTER

M. FLETCHER

Document Path: C:\Users\KyleRester\OneDrive - Aleut Federal\Desktop\Multi-Site GIS Files\Chaffee SI\MXDs\SI Report\Figure 1-1 - Installation Location.mxd



ALEUT

1 in = 221 miles

Legend

- Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
- BRAC Surplus Property
- Historical Fort Chaffee Installation Boundary
- Area Transferred to the United States Department of Energy
- River/Stream (Perennial)
- Stream (Intermittent)
- Water Body
- Airfield
- AOPI

Abbreviations:
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure

Notes:
Monitoring wells (MW) are those identified in historical documents available for review and are not a complete list of the MW which existed or currently remain in the area.

Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery

Coordinate System:
WGS 1984, UTM Zone 15 North

Site Inspections (SI) of Per-and Polyfluoroalkyl Substances (PFAS)

Location: Fort Chaffee, Arkansas

Figure 1-2: AOPI Locations

Drawn By:	
K RESTER	M. FLETCHER

Document Path: C:\Users\KyleRester\OneDrive - Aleut Federal\Desktop\Multi-Site GIS Files\Chaffee SI\MXDs\SI Report\Figure 1-2 - AOPI Locations.mxd