FINAL

SITE INVESTIGATIONS OF PERFLUORINATED COMPOUNDS (PFC) RELEASE AREAS AT MULTIPLE BRAC INSTALLATIONS

INSTALLATION-SPECIFIC WORK PLAN

FORMER GRIFFISS AIR FORCE BASE

Prepared for:

Air Force Civil Engineer Center

Joint Base San Antonio – Lackland, Texas

Prepared by:

Amec Foster Wheeler Environment & Infrastructure, Inc.

Contract FA8903-08-D-8766

Task Order 0218

OCTOBER 2016

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ACRONYMS

AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	Aqueous Film Forming Foam
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
AST	Aboveground Storage Tank
BEC	BRAC Environmental Coordinator
bgs	below ground surface
BRAC	Base Realignment and Closure
CG	Certified Geologist
CO	Contracting Officer
COR	Contracting Officer Representative
CSM	Conceptual Site Model
°F	degrees Fahrenheit
DoD	Department of Defense
DOT	Department of Transportation
DPT	Direct Push Technology
DQO	Data Quality Objective
ERPIMS	Environmental Resources Program Information Management System
EtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid
FAA	Federal Aviation Administration
FDA	Fire Demonstration Area
FPM	FPM Remediations, Inc.
ft	foot/feet
FTA	Fire Training Area
GBTP	Griffiss Business and Technology Park
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSC	Health and Safety Considerations
HSP	Installation-Specific Health and Safety Plan
IDW	Investigation-derived Waste
In	inches
IRP	Installation Restoration Program
ISWP	Installation-Specific Work Plan
LC-MS/MS	Liquid Chromatography and Tandem Mass Spectrometry
LEP	Licensed Environmental Professional

µg/L	micrograms per liter
MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
MS	Matrix Spike
MSL	Mean Sea Level
MSD	Matrix Spike Duplicate
NYANG	New York Air National Guard
NYSDEC	New York State Department of Environmental Conservation
OCIDA	Oneida County Industrial Development Agency
OSHA	Occupational Safety and Health Administration
OWS	Oil Water Separator
PA	Preliminary Assessment
PFBS	Perfluorobutanesulfonic acid
PFC	Perfluorinated Compounds
PFDA	Perfluorodecanoic acid
PFDoA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PFTeDA	Perfluorotetradecanoic acid
PFTrDA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid
PHA	Provisional Health Advisory
PM	Project Manager
PPE	Personal Protective Equipment
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QPP	Quality Program Plan
SI	Site Investigation
SIR	Site Investigation Report
SOP	Standard Operating Procedure
ST	Stormwater
SW	Surface Water
TO	Task Order
UFP	Uniform Federal Policy
USAF	United States Air Force

USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank

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1.0 INTRODUCTION

This Installation-Specific Work Plan (ISWP) presents information regarding perfluorinated compound (PFC) release determination activities at the Former Griffiss Air Force Base (AFB). This document is provided as an addendum to the General Quality Program Plan (QPP) (Amec Foster Wheeler Environment and Infrastructure, Inc. [Amec Foster Wheeler], 2016). This ISWP has been prepared under Contract No. FA8903-08-D-8766, Task Order (TO) 0218 between Amec Foster Wheeler and the Air Force Civil Engineer Center (AFCEC).

This ISWP details site investigation (SI) activities that are being conducted as part of a United States Air Force (USAF)-wide initiative to assess the presence of PFCs at Base Realignment and Closure (BRAC) installations in accordance with Department of Defense (DoD) Instruction 4715.18, Emerging Contaminants (DoD, 2009). The BRAC SI will be conducted in accordance with the 2012 Interim USAF Guidance on Interim Sampling and Response Actions for PFCs at Active and BRAC Installations (USAF, 2012).

Combined, this ISWP and the QPP have been prepared to ensure (1) the SI objectives and data quality objectives (DQOs) for this project are clearly identified, (2) the field sampling protocols are documented and reviewed in a consistent manner, and (3) the data collected are scientifically valid and defensible. Specific Uniform Federal Policy (UFP) - Quality Assurance Project Plan (QAPP) worksheets are provided below to accompany the General QPP (Amec Foster Wheeler, 2016). The Installation-specific Health and Safety Plan (HSP) is provided in **Appendix A** of this ISWP.

1.1 PERFLUORINATED COMPOUNDS OVERVIEW

PFCs are a class of synthetic fluorinated chemicals used in many industrial and consumer products, including non-stick cookware, food packaging, waterproof clothing, fabric stain protectors, lubricants, paints, and firefighting foams such as aqueous film forming foam (AFFF). Several Federal government documents confirm the initial use of AFFF by the USAF beginning in 1970:

- Military Specification for AFFF (MIL-F-24385), formally issued in 1969;
- General Accounting Office determination on sole source award protest to provide AFFF to the Navy in December 1969; and
- A History of USAF Fire Protection Training at Chanute Air Force Base, 1964-1976 (Coates, 1977).

In 1970, the USAF began using AFFF to extinguish petroleum fires. Releases of AFFF to the environment routinely occurred during fire training exercises. From the early 1970s until 2002, the DoD purchased and used AFFF containing perfluorooctane sulfonic acid (PFOS) and/or perfluorooctanoic acid (PFOA) for firefighting and fire training exercises (USAF, 2012).

The United States Environmental Protection Agency (USEPA) Office of Water issued Provisional Health Advisories (PHAs) for PFOS (0.2 micrograms per liter [µg/L]) and PFOA (0.4 µg/L) in 2009 to protect

humans from potential risk of exposure to these chemicals through drinking water (USEPA, 2009). The USEPA Office of Water issued lifetime drinking water Health Advisories (HAs) for PFOS and PFOA in May 2016 that replace the 2009 PHA values. The HAs for PFOS and PFOA are 0.07 µg/L for each constituent. When PFOA and PFOS co-occur at the same time and location in a drinking water source, a conservative and health-protective approach that USEPA recommends is to compare the sum of the concentrations ([PFOA] + [PFOS]) to the HA (0.07 µg/L).

HAs identify the concentration of a contaminant in drinking water at which adverse health effects are not anticipated to occur over specific exposure durations (e.g., one day, ten days, a lifetime). They serve as informal technical guidance to assist federal, state, and local officials, and managers of public or community water systems in protecting public health when emergency spills or other contamination situations occur. USEPA publications 822-R-16-004 and -005 provides information on the environmental properties, health effects, analytical methodology, and treatment technologies for removing PFOS and PFOA from drinking water. HA values are not to be construed as legally enforceable federal standards and are subject to change as new information becomes available (USEPA, 2016).

Table 1 presents the HAs for the area investigations.

Table 1. USEPA HAs for PFOA and PFOS

Method/Instrument	Media	HAs
EPA 537.1 / LC-MS/MS	Groundwater	PFOS 0.07 µg/L PFOA 0.07 µg/L PFOS+PFOA 0.07 µg/L

Notes:
EPA = Environmental Protection Agency
µg/L = micrograms per liter
LC-MS/MS = liquid chromatography-tandem mass spectrometry
HA = Health Advisory
PFOA = Perfluorooctanoic Acid
PFOS = Perfluorooctanesulfonic Acid

1.2 INSTALLATION MISSION AND HISTORY

The former Griffiss AFB is located in Rome, New York and occupied approximately 3,500 acres (**Figure 1**). The installation was in operation from 1942 to 1995. Following installation closure under BRAC in 1995, the New York Air National Guard (NYANG) continued air operations and managed the airfield until October 1998, at which time the military flying mission at Griffiss ended.

Griffiss AFB was established as the Rome Air Depot on 1 February 1942. Construction of the installation began in August 1941 and flying operations on the depot airfield began on 18 February 1942. Prior to construction of the installation, the land was primarily pasture and cropland with scattered farmsteads, except for a small housing subdivision which had been established in the mid-1930s in the western central area of the installation.

During World War II, activities at the installation centered on aircraft engine maintenance and repair, and training of air depot groups in engine repair. These activities were curtailed in the latter part of 1945 (USAF, 1994). In 1949, electronic research activities began at Griffiss AFB, operating as the Watson Laboratory Complex. The Watson Laboratory Complex became the Rome Air Development Center in June 1951 (later known as Rome Laboratory) which became part of the Air Force Research Laboratory in 1997. The original northwest-southeast trending runway was upgraded and extended in the early 1950s to handle jet fighter aircraft stationed at Griffiss AFB. Various fighter interceptor aircraft were also stationed at Griffiss AFB between 1950 and 1987 (USAF, 1994).

In 1956, a major expansion of the existing airfield was initiated, including the construction of a new 11,500-foot (ft) long runway (Runway 15/33) with associated taxiways, Aprons 1 and 2, and an Alert Apron. In 1970, the 416th Bombardment Wing of the Strategic Air Command was activated at Griffiss AFB, requiring construction of support facilities for KC-135 tanker and B-52 bomber aircraft adjacent to Aprons 1 and 2, and the alert apron. These facilities included a series of aircraft maintenance hangars (or nose docks) adjacent to Apron 2 and various industrial shops and administrative buildings southwest of the three aprons. The bulk fuel storage area (the Barge Canal Bulk Fuel Storage Area) and associated hydrant fueling systems at Aprons 1 and 2 were also completed in the late 1950s (USAF, 1994).

The weapons storage area was constructed in the late 1950s in the northeastern portion of the installation and was expanded in the late 1970s and early 1980s with the construction of a number of storage igloos and other support facilities for the air launch cruise missile. The North American Air Defense Command Operational Control Center facilities were added in the early 1980s (USAF, 1994).

Since the closure of Griffiss AFB in 1995, the installation was converted to the Griffiss Business & Technology Park (GBTP) consisting of the Griffiss International Airport and other facilities. The GBTP consists of approximately 3,500 acres, including the 1,680-acre Griffiss International Airport. The airport facilities consist of approximately 20 structures, including: administrative and Flight-Base Operator offices; an aircraft rescue and firefighting building; large conventional hangars for storage and aircraft maintenance; and, a set of five “nose dock” hangars that were once used for maintenance of B-52 aircraft. A Family Dollar Store distribution center has also been constructed at the GBTP in the southeast corner of the former installation at the location of the former alert apron. Other areas of the GBTP are designated for industrial use, office space, high tech industries, golf course and fitness facilities, and future redevelopment.

Other areas of the business park are designated for the USAF. The USAF retained approximately 136 acres of the former Griffiss AFB for use by the Air Force Research Laboratory-Rome, the Northeast Air Defense Sectors, and the Defense Finance and Accounting Service Center.

A Preliminary Assessment (PA) completed by Amec Foster Wheeler in July 2015 (Amec Foster Wheeler, July 2015) identified 17 potential AFFF areas. Additionally, Amec Foster Wheeler conducted a Site

Investigation of the Fire Training Area (Amec Foster Wheeler, December 2015a). That investigation identified PFOS and PFOA above PHAs in soil and groundwater beneath and downgradient of the Fire Training Area (FTA).

PFCs are classified by the USEPA as an emerging contaminant and may become subject to regulation in the future. Effective April 25, 2016, the New York State Department of Environmental Conservation (NYSDEC) filed a Notice of Emergency Adoption and Proposed Rule Making to classify perfluorooctanoic acid (PFOA-acid), ammonium perfluorooctanoate (PFOA-salt), perfluorooctane sulfonic acid (PFOS-acid), and perfluorooctane sulfonate (PFOS-salt) as hazardous substances. The NYSDEC is in the process of finalizing the proposed amendments to Title 6 New York Codes Rules and Regulations Part 597, Hazardous Substances Identification, Release Prohibition, and Release Reporting.

This ISWP describes the activities proposed to investigate the presence or absence of PFCs at each of the 17 potential AFFF source areas identified during the PA. The locations of each of the potential AFFF source areas are shown on **Figure 2**. In addition to those identified during the PA, three additional areas have been added to this work plan based on discussions with the AFCEC to address potential areas and media that may have been impacted by PFCs. Area 18 (Landfill 1) was added based on a determination that fuel contaminated soils that potentially contained PFCs (Area 17 in the PA) had been land farmed on Aprons 1 and 2, and had been used for cover at Landfill 1. Therefore, Area 17 was dropped as a separate area and will be included with the Area 18 investigation. Area 19 (Three Mile Creek) was added to confirm whether PFCs are present in groundwater that discharges to the creek draining the southeastern portion of the base. Area 20 (Fire Training Area - FTA-030P) was added to assess the migration of PFCs in groundwater toward the Mohawk River. Based on the above, there are a total of 19 AFFF areas which will be investigated. **Figure 3** summarizes all of the surface water and sediment sample locations proposed in this ISWP for Three Mile Creek, Six Mile Creek and the Mohawk River.

The potential AFFF source areas are summarized as follows:

- **Area 01 - Building 15**: Facility maintained an AFFF fire suppression system with two 30,000-gallon, single-walled, steel, underground storage tanks (USTs) designed to contain waste AFFF. No documented releases).
- **Area 02 - Building 44 (Former Fire Station)**: Facility stored and transferred AFFF into fire trucks. The AFFF storage containers were located inside the building and no documented releases were identified during the PA.
- **Area 03 – Building 45 (Fire Station):** AFFF storage area and fire truck maintenance area; AFFF was transferred from a UST and overhead lines into fire trucks at this building. The original UST had no secondary containment and was replaced in 1992.
- **Area 04 - North Side of Building 45 (Fire Station):** AFFF was occasionally released to the grass north of the fire station to test fire hose spray nozzles and AFFF systems during maintenance.

- **Area 05 - Building 47:** Vehicle operations and heated parking facility maintained an AFFF fire suppression system with one 25,000-gallon, waste AFFF UST with no secondary containment. No documented releases.
- **Area 06 - Building 100:** Weapons & Release Systems facility maintained an AFFF fire suppression system with two 2,500-gallon AFFF ASTs. The fire suppression system was activated on several occasions, which resulted in AFFF flowing out of the building.
- **Area 07 - Building 101:** Maintenance Hangar maintained an AFFF fire suppression system with two 500,000-gallon waste AFFF USTs and two 7,000-gallon AFFF aboveground storage tanks (ASTs). The fire suppression system was reported to have been activated several times, resulting in AFFF flowing out the hangar doors and discharging into to Six Mile Creek.
- **Area 08 - Building 150:** Former Fighter Alert Hangar stored AFFF; however, there are no documented AFFF releases and storage containers were located inside the building. The building was dismantled in 2007.
- **Area 09 - Building 917 and AFFF Lagoon:** Missile Assembly Shop maintained an AFFF fire suppression system with one 1,400-gallon AFFF AST and an AFFF lagoon designed to contain AFFF if released from the building. Documentation is conflicting on whether or not there were releases of AFFF.
- **Area 10 - Suspect FTA (FT-48):** Reportedly used by Griffiss AFB firefighters to simulate aircraft fuel fires and conduct fire training activities. No documented use of AFFF, but possible because of use as a FTA.
- **Area 11 - Fire Demonstration Area (FDA):** FDA used primarily for demonstrating how to extinguish aircraft fuel fires to the public. Demonstrations reportedly used water; however, AFFF may have been used.
- **Area 12 - Apron 1:** Plane caught on fire on Apron 1 and was reportedly extinguished with AFFF.
- **Area 13 - Nose Docks 1 and 2 and Apron 1 – Trench:** Spark from excavator ignited fuel-contaminated soil between Nose Dock 1, Nose Dock 2, and Apron 1, with the resulting fire potentially extinguished with AFFF.
- **Area 14 - B-52 Crash Site:** B-52 reportedly crashed at the end of the runway; potential AFFF use and the specific location are not well documented.
- **Area 15 - Sanitary Drain Line from FT030P:** Waste AFFF at FT030P was defoamed and discharged to the sanitary drain. There is conflicting information on the presence/location of a sanity drain line that was connected to the FT030P area.
- **Area 16 - Six Mile Creek:** Six Mile Creek received potential AFFF discharge from storm drains from multiple usage, storage and release areas.

- **Area 18 - Landfill 1:** Excavated fuel-contaminated soil from FT030P, potentially containing PFCs from AFFF use at the FTA, was land farmed on Aprons 1 and 2. Soil from the land farm operation was used for cover at Landfill 1.
- **Area 19 - Three Mile Creek:** Groundwater flow from Building 101, the FDA and Building 15 may contain PFCs and discharge to Three Mile Creek, potentially impacting surface water.
- **Area 20 - FTA (FT030P):** This area was investigated in 2014 by Amec Foster Wheeler and PFCs were detected in soil, groundwater and stormwater.

QAPP Worksheet #1 & 2: Title and Approval Page

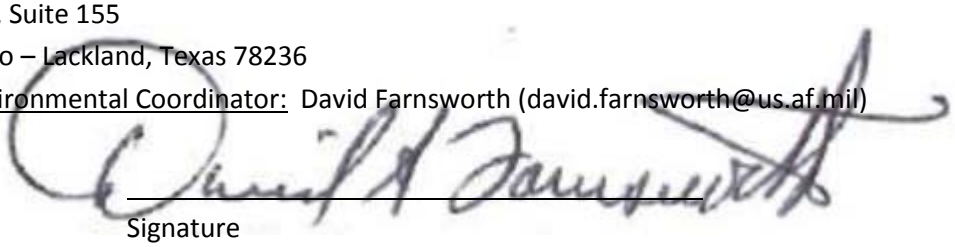
Site Name/Project Name: Site Investigations of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Bases

Site Location: Former Griffiss Air Force Base, NY

Contract Number: FA 8903-08-D-8766

Lead Organization:

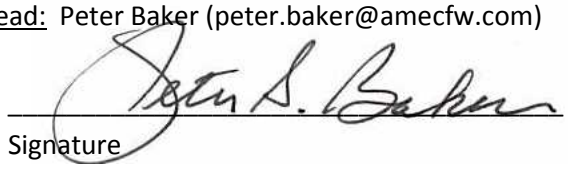
Air Force Civil Engineer Center
2261 Hughes Avenue, Suite 155
Joint Base San Antonio – Lackland, Texas 78236
Installation BRAC Environmental Coordinator: David Farnsworth (david.farnsworth@us.af.mil)



Signature

Preparer:

Amec Foster Wheeler Environment & Infrastructure, Inc.
511 Congress Street, Suite 200
Portland, Maine 04101
Preparer's Regional Technical Lead: Peter Baker (peter.baker@amecfw.com)



Signature

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RELEVANT PLANS AND REPORTS FROM PREVIOUS INVESTIGATIONS

Amec Earth & Environmental, Inc. August 2010. *Final Interim Remedial Action Report, Building 150 Site, Former Griffiss Air Force Base, Rome, New York.*

Amec Foster Wheeler Environment & Infrastructure, Inc., November 2014. *Final Perfluorinated Compounds (PFCs) Release Determination At Multiple BRAC Bases, Installation Specific Work Plan Addendum, Former Griffiss Air Force Base.* Project No. JREZ20147242

Amec Foster Wheeler Environment & Infrastructure, Inc., July 2015. *Final Perfluorinated Compounds (PFCs) Preliminary Assessment. Former Griffiss Air Force Base, Rome, New York*. Project No. JREZ20147242

Amec Foster Wheeler Environment & Infrastructure, Inc., April 2016a. *Final Perfluorinated Compounds (Pfcs) Release Determination At Multiple BRAC Bases, Site Investigation Report, Former Griffiss Air Force Base*. Project No. THWA20147242.

Amec Foster Wheeler Environment & Infrastructure, Inc., April 2016. *Final Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at multiple United States Air Force (USF) Base Realignment and Closure (BRAC) Installations, Quality Program Plan*.

Ecology and Environment Engineering, P.C., January 2015. *Final April 2014 Long-Term Monitoring Data Summary Report, AOC 9 (SD-62) Former Griffiss Air Force Base, Rome, New York.*

FPM Remediations Inc. and Cape, August 2015. *Annual Long Term Monitoring Report Landfill Areas of Concern (LF001 (Landfill 1 AOC), LF002 (Landfill 2/3 AOC), LF003 (Landfill 7 AOC), LF007 (Landfill 5 AOC), and LF009 (Landfill 6 AOC), Former Griffiss Air Force Base.*

FPM Remediations Inc., emailed to Amec Foster Wheeler January 2016. *E Size Topographic Map of Installation Former Griffiss Air Force Base.*

FPM Remediations Inc., emailed to Amec Foster Wheeler January 2016. Well database-2015 Status and Well Inventory0915 excel spreadsheets.

FPM Group, February 2005*. Petroleum Spills LTM Program Report, Building 15 (NYSDEC SPILL #9709366).*

New York State Department of Environmental Conservation, January 12, 2016. *Environmental Resource Mapper,* www.dec.ny.gov/imsmaps/ERM/viewer.

United States Department of the Air Force, Air Force Real Property Agency, July 2011. *Final Record of decision Nosedocks 1 and 2 Area of concern (*Installation Restoration Program *[IRP] Site SD-41), Former Griffiss Air Force Base, Rome, New York.*

United States Air Force, HQ USAF/A7C, 2012. *Interim Air Force Guidance on Sampling and Response Actions for Perfluorinated Compounds at Active and BRAC Installations*.

United States Air Force. *Water-Table Map from the December, 1998 Ground-water Synoptic Measurements at the former Griffiss AFB, Rome, New York.*

United States Air Force, September 1994. US Air Force, *Basewide Environmental Baseline Study* (AR File Number 1543), September, 1994.

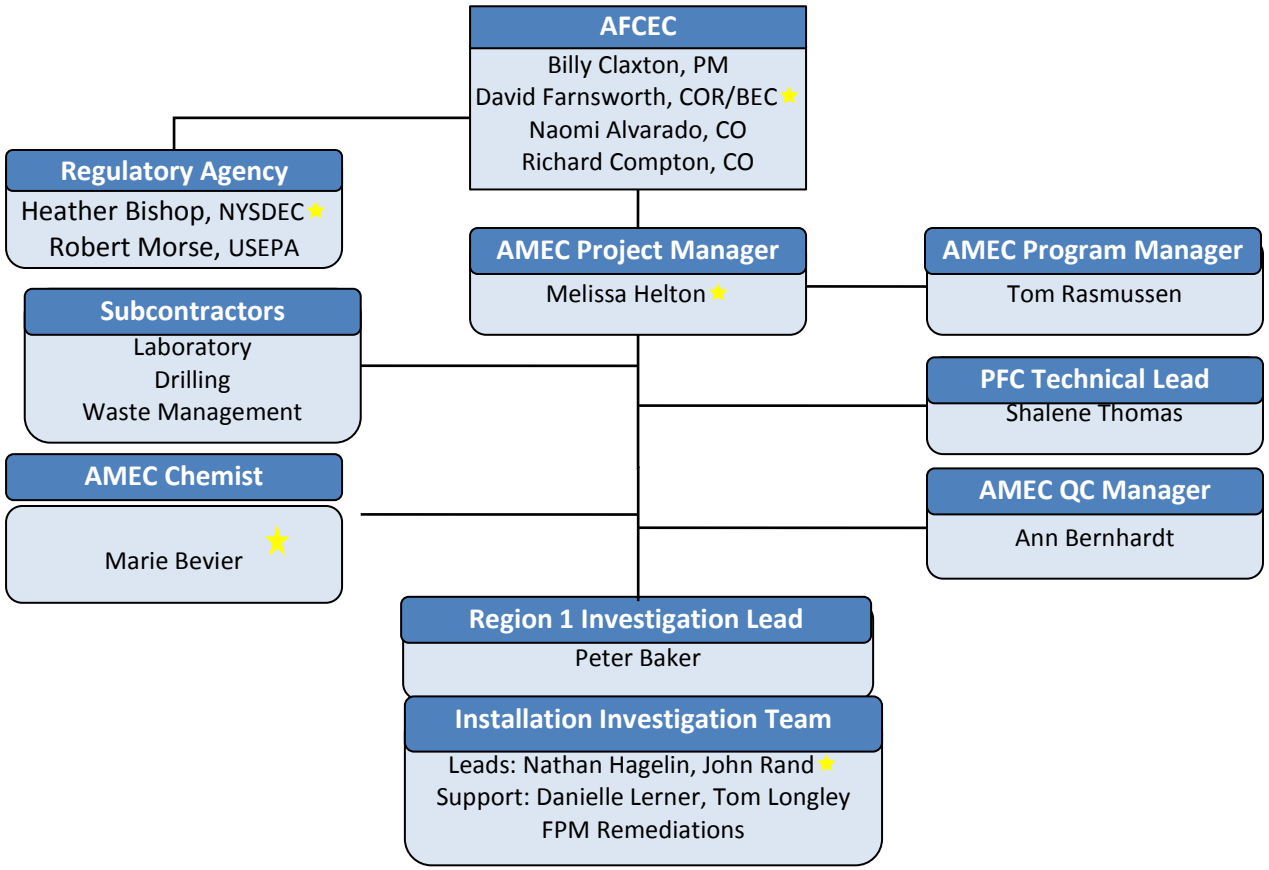
United States Environmental Protection Agency, January 8, 2009. *Provisional Health Advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).*

Woolpert Consultants, September 1993. *Comprehensive Plan Water Supply System, Griffiss Air Force Base, New York.*

Woolpert Consultants, September 1993. *Comprehensive Plan Sanitary Drainage System, Griffiss Air Force Base, New York.*

Woolpert Consultants, September 1993. *Comprehensive Plan Storm Drainage System, Griffiss Air Force Base, New York.*

QAPP Worksheet #3 & 5: Project Organization and QAPP Distribution



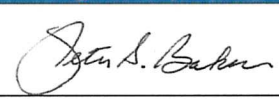
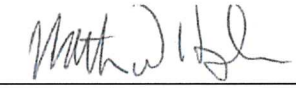
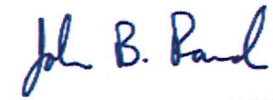
Note:

★ Indicates UFP-QAPP distribution List

BEC – BRAC Environmental Coordinator
COR – Contracting Officer's Representative
CO – Contracting Officer
NYSDEC – New York State Department of Environmental Conservation
PM – Project Manager
QC – Quality Control
USEPA – United States Environmental Protection Agency

QAPP Worksheet #4, 7 & 8: Personnel Qualifications and Sign-off Sheet

Organization: Amec Foster Wheeler.

Name	Project Title/Role	Education/Experience	Specialized Training/ Certifications	Signature/Date*
Peter Baker	Region 1 Investigation Lead	B.A. Geology/34 years	CG, Maine	
Nathan Hagelin	Base Lead	M.S. Geology/31 years	CG, Maine LEP	
John Rand	Technical Lead	B.A. Geology/33 years	CG, Maine	
Rudy Smithwick	Field Team	B.S. Geology/31 years	OSHA HAZWOPER Supervisor	
Tom Longley	Field Team	B.S. Geology/37 years	CG, Maine OSHA HAZWOPER Supervisor	

Notes:
CG – Certified Geologist
LEP– Licensed Environmental Professional
OSHA – Occupational Safety and Health Administration
HAZWOPER – Hazardous Waste Operations and Emergency Response

QAPP Worksheet #9: Project Planning Session Summary

Date of planning session: 10-11 September, 2015.

Location: Griffiss Air Force Base, Rome, New York

Purpose: Scoping Visit

Attendees:

Amec Foster Wheeler: Peter Baker, Nathan Hagelin, John Rand

Air Force: David Farnsworth

Cherokee Nation (USAF Contractor): Sean Eldredge

FPM Environmental (USAF Contractor): Dan Baldyga, Josh Wenzel

The first day of the scoping visit began with a meeting with the USAF and its contractors who provided Amec Foster Wheeler with an overview of installation operations and airport personnel relative to gaining access to the AFFF areas. Following the overview, Amec Foster Wheeler personnel were provided a tour of each of the 17 potential AFFF source areas identified in the PA, except the interior of Buildings 100 and 101 where additional security clearance was required for access. The exterior of Buildings 100 and 101, including the waste UST areas on the south side of Building 101, were inspected.

The FTA (Area 20) could not be accessed due to flight training activities, but a reconnaissance of the golf course immediately downgradient of the FTA was completed. Six Mile Creek was inspected where it flows onto the north end of the base and where it flows offsite on the southeast side of the base. The second day of the scoping visit included a review of installation operations and prior investigations and a review of selected engineering drawings, investigation reports and maps to identify those to be sent electronically to Amec Foster Wheeler.

Three follow-up scoping sessions were conducted via teleconference between Amec Foster Wheeler, the USAF and Cherokee Nation; the meetings were conducted on 5 October, 9 November and 30 November 2015. Amec Foster Wheeler prepared and provided maps and a summary table of proposed sample locations to the attendees prior to each call. Sample rationale was discussed and locations were adjusted to best meet the objectives of identifying presence/absence of PFCs in media at each area. The scoping visit and follow up teleconference provided the technical basis for the scope of work described in the ISWP.

QAPP Worksheet #10: Conceptual Site Model

The Conceptual Site Model (CSM) summarizes the constituents of concern, a description of the physical characteristics, and the migration tendencies of each chemical of interest within the environment. The purpose of the CSM is to guide field activities. Based on data collected during this SI, the CSM will be updated in the SI Report (SIR).

The CSM is provided as an installation-wide summary in **Table 2**. Detailed CSMs for each of the potential AFFF source areas are provided in **Sections 2.1 through 2.20** of this ISWP. The CSMs are based primarily on the PA report that addressed the entire installation (Amec Foster Wheeler, 2015); the SIR that addressed FT030P (Amec Foster Wheeler, 2016a); area specific reports including Landfill 1, Nose Dock 1 and 2, and former Building 150; topographic and engineering drawings provided by FPM Remediations, Inc.; (FPM) and the reconnaissance conducted by Amec Foster Wheeler in September 2015.

Previous test results from the SIR for FT030P have been included in **Section 2.20** to support the basis for the additional investigation proposed relative to FT030P in this ISWP.

Table 2: Preliminary Conceptual Site Model: Installation Wide Summary

Facility Profile	Physical Profile	Release Profile	Land Use and Exposure Profile	Ecological Profile
Installation Description: • Years of operation by the USAF: 1942 – 1995. Following base realignment and closure in 1995, the New York Air National Guard continued its air operations there and managed the airfield until October 1998. • Former Griffiss AFB ~ 3,552 acres • Activities at the former installation included: (1) national defense (fighter and bomber missions) and (2) research, testing and development of electronic communication systems and associated support activities. • Primary mission of the former Griffiss AFB was the maintenance and implementation of both air refueling operations and long-range bombardment capability (Air Force Logistics Command, Strategic Air Command, and Air Combat Command). • The USAF retained and still uses approximately 136 acres of the former Griffiss AFB for use by the Air Force Research Laboratory-Rome, the Northeast Air Defense Sectors, and the Defense Finance and Accounting Service Center.	**Topography:** • The topography of the central portion of the installation ranges from elevation 470 to 490 ft above mean sea level (MSL). Elevations rise to 550 ft along the northern installation boundary and drop to near 460 ft at the Mohawk River west of the installation. **Vegetation:** • Vegetation throughout the installation includes grasses and shrubs, as well as soft and hardwood deciduous and coniferous trees. **Surface Water:** • Two named creeks cross the installation - Six Mile Creek and Three Mile Creek - both flowing southeasterly into the Erie Canal (east flowing), located approximately 2,500 ft south of the installation. The Mohawk River runs along the west side of the installation, flowing south. Wetlands are also present surrounding both Six Mile Creek and Three Mile Creek. **Soils:** • Soils at the installation consist of loams and sands derived from the underlying glaciofluvial and glaciolacustrine deposits. Silts and gravels are abundant and clays are relatively minor in amount. **Geology:** • Deposits lying above the Utica Shale consist of clay, silt, sand, and gravel sediments laid down by glacial, fluvial, and lacustrine processes. A sheet of glacial till overlies the Utica Shale. • Bedrock at the installation consists of the Utica Shale, a gray and black carbonaceous unit with a high/medium organic content, and is encountered at 0 to 130 ft below ground surface (bgs) with the depth to bedrock under the main flightline area being approximately 30 ft. Bedrock beneath the former AFB generally dips from the northeast to the southwest. **Hydrogeology:** • Groundwater is approximately 10 to 20 ft bgs under much of the installation, although groundwater discharges to ground surface in some areas through seeps or streams. • Unconfined conditions occur within the unconsolidated aquifer. • Groundwater flow is southwesterly towards the Mohawk River, but locally flows towards Six Mile Creek and Three Mile Creek. • Hydraulic conductivity measured at the Fire Training Area was 6.0 ft/day; hydraulic gradient was 0.008 ft/ft. Assuming a porosity of 0.2 a groundwater flow rate of 88 ft/year is calculated. • Local drinking water is provided by the City of Rome Public Works Department. The water source for Rome is located 20 miles north of the installation. Active public or private drinking water supply wells have not been identified within 1 mile of the installation boundary. **Meteorology:** • Average Annual Rainfall = 46 inches (in) per year. • Average rainfall per month is approximately 3.75 in with no distinct wet and dry season. • Continental climate characterized by warm, humid, moderately wet summers and cold winters with moderately heavy snowfalls. Average high temperature: 56 degrees Fahrenheit (^{o}F). Average low temperature: 37^{o}F.	**Contaminants of Potential Concern:** • PFCs are the contaminants of potential concern during this investigation. • Fuel-related compounds and chlorinated solvents are historic site contaminants. **Media of Potential Concern:** • Soil, groundwater, surface water, stormwater and sediment. **Confirmed AFFF Releases:** • Confirmed releases at Areas 4, 6, 7, and 12. • Potential AFFF releases at remaining areas. • PFC detections in soil, groundwater and stormwater at the FTA in 2014. **Primary Releases** • PFCs released onto the ground would most likely leach through the soil into groundwater. • PFCs could also be adsorbed to soil particles and remain close to the source. • Surface runoff could transport PFCs to the storm drain system. **Secondary Releases:** • Stormwater and shallow groundwater captured in the drainage system discharges into Thee Mile or Six Mile Creek, ultimately into Mohawk River/Erie Canal • Fuel contaminated soil from across the installation land farmed on Aprons 1 and 2. Soil used as backfill after lab results reported levels below guidance values, but may have contained PFCs. No soil final use documentation identified, however some land farmed soil reportedly placed in Landfill No. 1.	**Current Landowners:** • Griffiss International Airport is owned and operated by Oneida County, New York. • Various owners of buildings and sections of the installation include Oneida County Industrial Development Agency (OCIDA), Oneida County, NY, The USAF, and GBTP. **Current Land Use:** • Land use at Griffiss International Airport is industrial/commercial. **Future Land Use:** • Land use is not expected to change in the foreseeable future. **Potential Receptors:** • Potential receptors associated with current and future land use include ground maintenance workers, utility workers, industrial workers, construction workers and biota. To date, well surveying efforts have not identified public or private wells within a 1-mile radius of the base boundary. The area is served by public water, potential future use of groundwater is possible.	**Potential Ecological Receptors:** • Inland plant species, reptiles, birds, soil invertebrates, and mammals that inhabit or migrate through the site. • Fisheries Assessment to be completed as described in Worksheets 14/16; to include Three Mile Creek, Six Mile Creek, the Mohawk River and the Erie Canal. **Threatened and Endangered Species:** • The NYSDEC Environmental Resource Mapper website indicates much of the installation is mapped as areas of rare plants and animals in New York State, including but not limited to those listed as Endangered or Threatened.

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QAPP Worksheet #11: Project/Data Quality Objectives

The following presents site-specific DQOs for the proposed investigations at the installation. These DQOs were developed using USEPA *Guidance on Systematic Planning Using the Data Quality Objectives Process* USEPA QA/G-4 (USEPA, 2006).

Step 1: State the Problem

AFFF, which contains PFCs, was released at four AFFF areas, and handled, stored potentially used disposed of or discharged to the remaining AFFF areas. PFCs were previously identified at FT030P (Fire Training Area), and groundwater downgradient from FT030P contains PFCs above PHAs. PFCs are an emerging contaminant and may become subject to regulation in the future.

Step 2: Identify the Goals of the Study

The objectives of this investigation are to:

- Assess whether there are PFCs in surface soil, subsurface soil, and groundwater from past releases of AFFF at the 19 areas.
- Assess whether PFCs are in surface water, sediment or drainage areas downgradient from the areas, as a result of surface water runoff, piped stormwater discharge or groundwater discharge.
- Assess whether recreational fishing is present in drainage areas that could be impacted by PFCs.

Step 3: Identify Information Input

The following data and informational needs are required to achieve the project goals:

- Collection and laboratory analysis of soil and groundwater samples from soil borings drilled and monitoring wells installed at areas where AFFF releases may have occurred;
- Collection and laboratory analysis of groundwater samples from existing groundwater monitoring wells within or downgradient from areas where AFFF releases may have occurred;
- Collection and analysis of surface water, and sediment samples including stormwater systems within or downgradient from potential, or confirmed, AFFF release areas; and
- Collection of fishery information for Six Mile Creek, Three Mile Creek, Erie Canal and Mohawk River in the downgradient vicinity of the installation.

Step 4: Define the Boundaries of Data Collection

The investigation boundaries are defined by the sampling locations shown for each AFFF area on the figures provided in **Section 2.0.** The investigation is defined vertically by the depth of shallow groundwater (the top 10 ft of saturated soil groundwater system). The boundaries for collecting fishery information is confined to the areas directly downgradient of potential or confirmed AFFF release areas

(Six Mile Creek, Three Mile Creek, Mohawk River, Erie Canal) as described below in **Worksheets #14/16a.**

Step 5: Develop the Analytical Approach

Analytical data will include the analysis of the following PFCs:

- Perfluorooctanoic Acid (PFOA)
- Perfluorooctane Sulfonic Acid (PFOS)
- Perfluorohexanesulfonic acid (PFHxS)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorononanoic acid (PFNA)
- Perfluorobutanesulfonic acid (PFBS)
- Perfluorohexanoic acid (PFHxA)
- Perfluorotetradecanoic acid (PFTeDA)
- Perfluorotridecanoic acid (PFTrDA)
- Perfluoroundecanoic acid (PFUnA)
- Perfluorodecanoic acid (PFDA)
- Perfluorododecanoic acid (PFDoA)
- N-methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA)
- N-ethyl perfluorooctanesulfonamidoacetic acid (EtFOSAA)

Sampling of soil, groundwater, surface water/stormwater and sediment at potential source areas and along migration pathways is necessary to assess whether PFCs are present at, and downgradient of, the AFFF areas. **Table 1** of this ISWP and **Worksheet #15** of the General QPP (Amec Foster Wheeler, 2015c) identify the PHAs for applicable PFCs in groundwater (PFOS and PFOA). The remaining PFCs do not have established PHAs for groundwater. There are currently no PHAs for soils.

Step 6: Specify Performance or Acceptance Criteria

- A daily standardized PFC personal protective equipment (PPE)/equipment checklist (provided in the PFC protocol standard operating procedure [SOP]) will be completed by the field manager. The quality assurance (QA) manager will review and accept the final checklist.
- QA manager or designee will verify that the field procedures defined in the QPP and ISWP are properly followed through field audits. Any deviations will be promptly communicated, addressed, and documented.

- Analytical laboratories will carry current accreditation in the state of New York.
- The laboratories will analyze proficiency testing samples to demonstrate capability prior to the start of the sampling program. The laboratories will identify and quantify proficiency testing samples within acceptance limits to verify reporting of PFCs. Any findings or recommendations will be addressed prior to analysis of field samples.
- The project chemist will conduct an audit prior to sampling to evaluate laboratory procedures, quality program, and operations to verify the analytical procedure. Any findings or recommendations will be addressed prior to analysis of field samples.
- PFCs by liquid chromatography and Tandem Mass Spectrometry (LC-MS-MS) will provide acceptable detection limits to confirm presence of PFCs at concentrations defined in Step 5 and **QPP Worksheet #15**.
- USEPA Stage 2B data verification will be conducted on 100 percent of the data and USEPA Stage IV data validation will be conducted on 10 percent of the analytical data by an experienced chemist to assess the data usability. The data usability will then be evaluated by the appropriate agencies for final approval. Data completeness of 90 percent usable data is required.
- The SIR will be reviewed and accepted by AFCEC.

Step 7: Develop the Detailed Plan for Obtaining Data

The detailed plan for obtaining the data is presented in the following: **Worksheets #13, #14/16, #17, #18, and #20**. SOPs for collecting environmental samples (groundwater, surface water/stormwater, sediment, and soil) that will be used during this investigation are provided in Appendix D of the General QPP (Amec Foster Wheeler, April 2016).

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QAPP Worksheet #13: Secondary Data Uses and Limitations

Data type	Source	Data uses relative to current project	Factors affecting the reliability of data and limitations on data use
Topographic	FPM, United States Geological Survey (USGS)	Determining ground elevations and surface water runoff drainage pathways. Used in conjunction with installation wide groundwater map to estimate depth to groundwater and depth of borings	No information reviewed that indicate USGS and FPM are unreliable sources of topographic data. Good consistency between ground elevations reported by both sources. Limitations of data are survey resolution (5 foot contours provided by FPM, 10 foot contours provided by USGS). Data being used only for estimates of drilling depths.
Geologic	FPM Remediations, USAF	Determining soil types for input to the CSM at areas that were previously investigated	No information reviewed that indicates boring logs are unreliable. Reasonable consistency between logged soils across the base (silty sands, sands, gravels). Limitations exist at a number of potential AFFF areas that have not been investigated and for which no boring logs exist.
Hydrogeologic – Basewide Groundwater Contour map	USAF	Determining groundwater flow directions at potential AFFF areas and locations for proposed soil borings and monitoring wells	No information reviewed indicates basewide map is unreliable. Map is based on comprehensive synoptic set of water level measurements (an accepted method for creating reliable contour map). Area-specific flow directions based on previous investigations are consistent with basewide map. Map is limited to conditions on date measured.

QAPP Worksheet #13: Secondary Data Uses and Limitations

Data type	Source	Data uses relative to current project	Factors affecting the reliability of data and limitations on data use
Monitoring Well Inventory	FPM Remediations	Determine construction and suitability of existing wells for use in this ISWP	Condition and accessibility of monitoring wells can change since date of inventory (Fall 2015)
Initial PFC results for soils, groundwater, stormwater and sediment associated with FT030P	Amec Foster Wheeler Environment and Infrastructure, Inc., December 2015a. Final PFC Release Determination at Multiple BRAC Bases, Site Investigation Report, Former Griffiss Air Force Base	Data allows for interpretation of PFC distribution in sampled media which has been used to guide proposed additional sampling locations in this ISWP to define the presence/absence of PFCs downgradient of potential AFFF areas	Data not sufficient for delineation of extent of PFC impacts in the various media

Notes:
USGS - United States Geological Survey
USAF - United States Air Force
CSM - Conceptual Site Model
PFC - Perfluorinated Compound
ISWP - Installation Specific Work Plan
AFFF - Aqueous Film Forming Foam
BRAC – Base Realignment and Closure

QAPP Worksheet #14/16: Project Tasks & Schedule

Activity	Responsible party	Planned start date*	Planned completion date	Deliverable(s)	Deliverable due date
Installation scoping visits	Amec Foster Wheeler	See schedule	See schedule	SI scoping worksheet and figures	See schedule
Mobilization/demobilization	Amec Foster Wheeler and subcontractors	See schedule	See schedule	Field notes (included in SIR)	See schedule
Soil boring advancement	Amec Foster Wheeler and subcontractors	See schedule	See schedule	Boring logs and field notes (included in SIR)	See schedule
Sample collection - surface soil	Amec Foster Wheeler	See schedule	See schedule	Field Data Records (included in SIR)	See schedule
Sample collection - subsurface soil	Amec Foster Wheeler and subcontractors	See schedule	See schedule	Field Data Records (included in SIR)	See schedule
Sample collection - sediment	Amec Foster Wheeler and subcontractors	See schedule	See schedule	Field Data Records (included in SIR)	See schedule
Sample collection - surface water	Amec Foster Wheeler and subcontractors	See schedule	See schedule	Field Data Records (included in SIR)	See schedule
Sample collection - groundwater from existing monitoring wells	Amec Foster Wheeler	See schedule	See schedule	Field Data Records (included in SIR)	See schedule
Monitoring Well Installation, development, and sampling	Amec Foster Wheeler and subcontractors	See schedule	See schedule	Monitoring well construction diagrams, well development notes, Field Data Records (included in SIR)	See schedule
Soil boring abandonment	Amec Foster Wheeler	See schedule	See schedule	Field notes (included in SIR)	See schedule

QAPP Worksheet #14/16: Project Tasks & Schedule

Activity	Responsible party	Planned start date*	Planned completion date	Deliverable(s)	Deliverable due date
Utility Clearance for all Subsurface Explorations, and Geophysical Surveys for USTs and Sanitary Line	Amec Foster Wheeler	See Schedule	See Schedule	Field notes (included in SIR)	See Schedule
Fishery Survey	Amec Foster Wheeler	See schedule	See Schedule	Field and interview notes	See Schedule
Analyses	CE2L Vista	See schedule	See schedule	Report of analyses/Data package (included in SIR)	See schedule
Validation	Amec Foster Wheeler	See schedule	See schedule	Validation Summary (included in SIR)	See schedule
Environmental Resources Program Information Management System (ERPIMS) Data Submittal	Amec Foster Wheeler	See schedule	90 days after Sampling Completed	Successful submittal of ERPIMS data for each installation and receipt of AFCEC ERPIMS Data Loading Notification	90 days after Sampling Completed
SIR	Amec Foster Wheeler	See schedule	See schedule	SIR	See schedule

*The project schedule is provided as **Appendix B**. Installation scoping visits were held on 10-11 September 2015.

Notes:
AFCEC - Air Force Civil Engineer Center
SI - Site Investigation
SIR - Site Investigation Report

Installation Scoping Visits

A scoping visit was held on 10-11 September, 2015. See **Worksheet #9** for details.

Health & Safety Plan Preparation

Installation-specific health and safety plan is included in **Appendix A**. The health and safety plan provided in this appendix supplements the General HSP included as Appendix A to the QPP. The HSP will be reviewed and updated, if necessary, prior to field mobilization based on final personnel assignments. The HSP has been prepared in accordance with the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120 CFR).

Utility Clearance

Amec Foster Wheeler will pre-mark proposed boring locations. Utility and UST clearance at each location will be obtained with the following:

- Dig permit approval through the *Dig Safely New York* utility clearance system;
- Request utility plans from BRAC Environmental Coordinator (BEC) and review plans for potential utilities in work areas. This has already been done for sanitary, storm sewer, and water supply piping. Amec Foster Wheeler will request other utilities including gas, electric and communications (phone/cable) prior to mobilizing utility locate contractor;
- Subcontract utility locating services to clear areas where utility configuration is uncertain, or detailed mapping is required to help assure clearance prior to drilling (e.g., use of ground-penetrating radar, electronic line locator, electromagnetic survey). This contractor will also mark out the foot print of USTs at areas where borings/monitoring wells are to be installed in close proximity to tanks, and will be used at Area 15 where transects will be made across the area of a possible sanitary sewer pipe running from the FTA to the Building 220/221 area.
- Hand or "soft" digging (e.g., vacuum excavation) to a depth of 5 ft bgs in areas where utility locations cannot be safely cleared prior to drilling.

Mobilization/Demobilization

Two mobilizations to the installation will be required to complete the work: one for exploration marking and utility clearance and the second for completing the exploration program. Prior to the initial mobilization, the following activities will be conducted:

- Coordination with the BEC for the areas of access, and preparation of a list of personnel and required badges, passes, and vehicle permits to be acquired with proper authority, as applicable.

- Area Access – securing access with Griffiss International Airport Security, OCIDA, Oneida County, property managers and any other parcel ownership entities identified during discussion with Security and the BEC. Goal of access will be to ensure that access onto areas will not be restricted during the proposed work schedule.
- Federal Aviation Administration (FAA) Notice Requirements (Form 7460-1) for work near runway, or written authorization from airport manager.

Environmental Sampling

To confirm releases of PFCs; soil, groundwater, surface water/stormwater and sediment sampling will be conducted at the pre-selected locations at potential AFFF Area 01 through 20. **Worksheet #18-01 through #18-20** provide sampling details for each potential AFFF release area. The General QPP provides the SOPs and descriptions for sampling activities. A summary of the proposed field sampling activities is described in the following sections.

Soil Boring Advancement/Abandonment and Soil Sampling: To identify the presence or absence of PFCs at the 19 potential AFFF areas, soil borings will be advanced to the top of the water table to collect soil samples. Soil boring locations are shown on the figures in **Sections 2.1 through 2.20** (where applicable), and were selected based upon potential PFC release characteristics, area geology and hydrogeology, and site reconnaissance.

Soil cores will be collected continuously, visually screened for evidence of impacts (e.g., discoloring or staining), and logged by a qualified professional in accordance with the Unified Soil Classification System (USCS). During soil boring advancement, discrete soil samples will be collected from each boring at three depth intervals where practicable: (1) surface samples (i.e., less than 2 ft deep); (2) intermediate samples (approximate mid-distance between ground surface and water table; and (3) just above the water table. In locations where the water table is shallow, it may not be feasible to collect three samples and the sampling plan will be adjusted accordingly. In these instances, multiple samples will only be collected when water table depth allows one sample per every 2 ft of drilled soil (for example, a minimum of 6 ft is required for 3 samples; 4 ft for 2 samples and 2 ft for 1 sample). Samples selected for laboratory analysis will be analyzed for the 14-parameter suite of PFC compounds (**QAPP Worksheet #11**).

Worksheets #18-01 through #18-20 provide sample requirements for each potential AFFF release area. Soil samples will be collected in accordance with SOP AFW-02, *Soil Sampling* (Appendix D, General QPP). Borings that will not be completed as temporary or permanent monitoring wells will be abandoned in accordance with the state-specific regulatory requirements and SOP AFW-06, *Borehole Abandonment* (Appendix D, General QPP). Soil sample collection will be recorded in the field log and on soil sample collection forms, and boring details will be recorded on drilling logs (Appendix E, General QPP).

Sediment Sample Collection: Sediment sample locations are shown on the figures in **Sections 2.1 through 2.20** (as applicable), and sample requirements are summarized on **Worksheets #18-01 through**

#18-20 (as applicable), and include samples collected from open channel surface water and from stormwater catch basins. Specific details and procedures related to sediment sample collection can be found in SOP(s) AFW-07 (Appendix D, General QPP). Sediment samples will be collected to determine the presence or absence of PFCs within surface water bodies and catch basins. Sediment samples will be analyzed for the 14-parameter suite of PFC compounds (**QAPP Worksheet #11)**. Sample collection will be recorded in the field log and on sample collection forms (Appendix E, General QPP.

For sediment collected in stormwater catch basins, a stainless steel grab sampler attached to a telescopic extension pole will be employed. For collection of sediment samples below surface water bodies, a hand-driven stainless steel or high density polyethylene core sampler will be used. For this phase of the project it is anticipated that sediment samples will be collected from 0 to 6 inches deep.

Surface Water Sample Collection: A summary of proposed surface water samples is provided in **Worksheets #18-01 through #18-20** (as applicable), and includes samples collected from open channel surface water (SW) and from catch basins within the stormwater (ST) system. Specific details and procedures related to surface water sample collection can be found in SOP AFW-08 (Appendix D, General QPP). Surface water samples will be analyzed for the 14-parameter suite of PFC compounds (refer to **QAPP Worksheet #11**).**Stormwater Sample Collection:** Stormwater sample locations are shown on the figures in **Sections 2.1 through 2.20** (where applicable), and sample requirements are summarized on **Worksheets #18-01 through #18-20** (where applicable).

Samples will be collected from stormwater catch basins using a peristaltic pump with dedicated tubing, or a stainless steel dip cup attached to a telescoping pole will be used. Stormwater samples will be analyzed for the 14-parameter suite of PFC compounds (refer to **QAPP Worksheet #11**).

Monitoring Well Rehabilitation, Installation, Development, and Sampling: The ISWP includes installation of 40 new monitoring wells for analysis of the 14-parameter suite of PFC compounds (**QAPP Worksheet #11**); the locations of the wells are shown on the figures in **Sections 2.1 through 2.20**. The monitoring wells will be installed and developed in accordance with SOP AFW-04 and SOP AFW-05, respectively, and groundwater will be sampled in accordance with SOP AFW-03 (refer to Appendix D, General QPP). Groundwater will also be sampled from 10 existing monitoring wells. These wells will be redeveloped prior to sampling following SOP AFW-05. Conditions of these wells and their suitability for sampling will be evaluated prior to sampling by Amec Foster Wheeler.

Groundwater to Surface Water Discharge Survey – Mohawk River:

A groundwater seepage and temperature survey will be completed along the east shore of the Mohawk River at the location shown on Figure 20-6 in **Section 2.20**. The purpose of the survey is to identify possibly future locations for collection of pore water samples. The survey will include close inspection of the shoreline for active seepage (wet areas) and direct measurement of seepage water and river water temperature to identify groundwater discharge areas. Possible locations for future pore water sampling will be staked and flagged in the field and located with GPS equipment.

Fisheries and Fish Consumption Assessment

Due to the potential for human ingestion of PFCs from fish containing PFCs, an investigation of fisheries and human fish consumption potential associated with watersheds draining the Former Griffiss AFB will be completed. This assessment will include identification of streams, rivers, and ponds that may have fish populations, and gathering information on recreational sport, subsistence, or commercial fishers that may be utilizing the fisheries resources. The following goals are identified for the fisheries assessment:

- Identification and description of fish populations that currently exist within watersheds draining the Former Griffiss AFB. Primary watersheds include the Six Mile Creek and Three Mile Creek which flow through the eastern and southern end of the installation, the Erie Canal south of the installation, and the Mohawk River which flows west of the installation.
- Identification and description of fish populations that may exist in ponds and lakes associated with the Former Griffiss AFB;
- Assessment of fisheries use and the potential for consumption of fish by humans, including an assessment of fisherman access, current status of use by fishermen, and identification of fish species which are targeted; and
- Identification and description of current fisheries stocking programs, fishing regulations, and any fish consumption advisories that may exist within targeted watersheds.

The following investigation activities will be completed during the assessment:

- Complete interviews and gather information from AFCEC at former Griffiss AFB regarding prior fisheries assessments if any;
- Complete interviews and gather information from regional fisheries biologists from the NYSDEC Region 6 offices;
- Identify local sport fishing organizations, shops, or guide services that might utilize fisheries in targeted watersheds and complete interviews to gather information on sport fishing activities; and
- Complete an on-site reconnaissance of the watersheds and surface waters to provide habitat descriptions of watershed and waterbody, identify potential for sport fishing, and identify access points and areas of use.

PFC Sampling Considerations

Given the low detection limits associated with PFC analysis and the many potential sources of trace levels of PFCs, field personnel are advised to err on the side of caution by strictly following protocols to

help mitigate the potential for false detections of PFCs. Specific details and procedures related to sampling for analysis of PFCs can be found in SOP AFW-01 (Appendix D, General QPP).

Surveying

After well installation and sampling activities are completed, newly installed monitoring wells, existing wells (if needed) and surface water/stormwater sample locations will be surveyed by licensed land surveyors. Sample locations will be surveyed to enable accurate placement of locations on a map and to provide data sufficient to calculate groundwater elevations. Horizontal coordinates will be surveyed to the nearest 0.1 ft and referenced to the relevant State Plane Coordinate System using the North American Datum of 1983, as adjusted in 1991. At each of the wells, elevation measurements will be made both at ground surface and at a marked casing measurement point. The measurement point on the monitoring well casing will be marked for future reference with a survey reference point. At surface water sample locations a temporary stake will be installed and the top of the stake will be surveyed; at stormwater locations a measuring point will be marked on the top of the catch basin or structure and surveyed. Elevations will be surveyed to the nearest 0.01 ft and referenced to the 1988 North American Vertical Datum.

Investigation-Derived Waste Management

Investigation Derived Waste (IDW) will consist of soil cuttings from soil boring advancement, decontamination water, well purge water, disposable PPE, and general trash.

PPE and trash will be placed in plastic bags and placed into sanitary trash containers and disposed at a sanitary landfill. Soil IDW will be containerized in Department of Transportation (DOT)-approved 55-gallon drums. Water IDW will also be contained in DOT approved 55-gallon drums. Soil and water IDW will be characterized and taken off-site for proper disposal.

Sampling for waste characterization is expected to consist of two waste streams:

1. Composited samples of soil collected from each of the soil borings at the area; and
2. Composited water samples collected from decontamination water and well development/purge water.

Composited Soil Boring Samples

During drilling, an aliquot of soil media will be collected from every 5 ft interval drilled as the borehole is progressed to total depth. All borehole cuttings will be grouped together to represent a composite IDW sample for the area. The cuttings will be disposed of as a single unit of IDW with appropriate waste characterization sampling. As such, each individual drum (or bin) may contain cutting waste from multiple boreholes within the area. The composite IDW samples will be pulled from the soil cores. Composited soil for IDW analyses will be stored in an appropriately labeled 55-gallon drum or 5-gallon bucket with a designated lid. At the end of the drilling program, the drum or bucket that houses the IDW sample aliquots will be composited (ensuring appropriate representation of all collected media).

The composite sample will be placed into laboratory supplied sample containers and shipped to the laboratory.

Composited Water IDW

During well development activities and associated ground water sampling it is anticipated that water IDW will be generated. IDW water will be containerized in 55-gallon drums. A single composite sample containing aliquots of water from each drum/tank on site will be placed into laboratory supplied sample containers and submitted to the laboratory for analysis at the conclusion of water generating events.

The IDW drums will be staged in a secure area identified by the facility. Based upon characterization results, IDW will be profiled and a disposal determination will be made. Profiles and manifests will be signed by an Air Force representative or by authorize Amec Foster Wheeler personnel. The USAF will issue "Authorization to Sign Waste Classification Letters" to authorize Amec Foster Wheeler personnel to sign profiles and manifests "on behalf of the USAF." Once the waste profiles and draft manifests are approved, Amec Foster Wheeler will return to the site to meet the disposal vendor for waste pickup and sign the non-hazardous manifest "as agent for the USAF."

An Amec Foster Wheeler representative with Resource Conservation and Recovery Act DOT training or equivalent waste management training or certifications will oversee IDW management. In the event an Amec Foster Wheeler trained AFCEC representative signs the waste paperwork, AFCEC will review waste profiles and disposal paperwork prior to signing. Copies of bills of lading/manifests will be included in the SIR.

QAPP Worksheet #17: Sampling Design and Rationale

Amec Foster Wheeler has developed a sampling program that is designed to evaluate the potential for release of PFCs at the potential AFFF source areas at the former Griffiss AFB. The sampling plan is based on:

- Discussions between Amec Foster Wheeler and AFCEC during the Installation visit and scoping meetings on 10-11 September 2015.
- Scope refinement during follow-up teleconferences between Amec Foster Wheeler and AFCEC on 5 October and 9 and 30 November 2015, and 12 May 2016 regarding sampling design and rationale.
- Review of background documents.
- Development of a preliminary basewide CSM (**Worksheet #10**).

Sampling at the former Griffiss AFB will be performed in the locations most likely to have been impacted with PFCs from previous USAF activities. Delineation of PFC impacts is not currently the goal of this sampling plan. The conditions, questions to be resolved, sampling rationale, and sample locations for each of the potential AFFF release areas are provided in **Section 2.1 through 2.20** of this ISWP.

QAPP Worksheet #18: Sampling Locations and Methods

Sample locations and methods for the Installation-wide investigations are listed on the area-specific **Worksheets 18-01 through 18-20** (refer to **Sections 2.1 through 2.20). Appendix C** contains a summary of the field investigation program, and a compilation of the explorations listed in **Worksheets 18-01 through 18.20**. The investigation summary in **Appendix C** lists the sample identifications for field samples and related QA/QC samples (i.e. equipment rinsate blanks and field blanks).

QAPP Worksheet #20: Field Quality Control Summary – Installation-wide

The Installation-wide field QC summary is listed on the table below. Field QC requirements for each of the potential AFFF release areas are included in **Sections 2.1 through 2.20** of this work plan. Equipment rinsate blanks will be collected at a rate of 1 per non-dedicated piece of equipment, per day, per crew. As a result, the number of equipment rinsate blanks will be determined in the field. Field blanks will be determined in the field based on the number of field crews, media sampled, and sources of PFC-free water; the total provided is therefore an estimate. Field sample identifications for equipment rinsate blanks and field blanks are listed in **Worksheet #18** (**Appendix C**).

QAPP Worksheet #20: Field QC Summary - Installation-wide

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Groundwater	PFCs	50	5	0	1	6 (3 pairs)	62
Surface Water	PFCs	15	2	1	1	2 (1 pair)	21
Stormwater	PFCs	17	2	0	1	2 (1 pair)	22
Soil	PFCs	116	12	16	3	12 (6 pairs)	159
Sediment	PFCs	32	3	4	2	4 (2 pairs)	45
Underground Storage Tanks	PFCs	6	1	0	1	2 (1 pair)	10
Grand Total		**230**	**25**	**21**	**10 (estimated)**	**28 (14 pairs)**	**319**

Notes:

PFC – Perfluorinated Compound

MS/MSD – Matrix Spike/Matrix Spike Duplicate

TBD – To be Determined

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2.0 AREA-SPECIFIC WORKSHEETS AND FIGURES

This work plan section includes worksheets and figures for each of the potential AFFF source areas. The worksheets include area-specific CSMs (**Worksheets #10-01 through #10-20**); Sampling Design and Rationale (**Worksheets #17-01 through #17-20**); Sampling Locations and Methods (**Worksheets #18-01 through #18-20**); and Field QC Summaries (**Worksheets #20-01 through #20-20**). The area-specific figures include an overview of each AFFF investigation area and a detailed plan of the proposed investigation activities.

2.1 POTENTIAL AFFF RELEASE AREA 01: BUILDING 15

Area-specific worksheets and figures for potential AFFF Release Area 01 include:

- **Worksheet #10-01**: Preliminary CSM
- **Worksheet #17-01**: Sampling Design and Rationale
- **Figure 01-1**: Potential AFFF Release Area, Area 01 – Building 15
- **Figure 01-2**: Proposed Sample Locations, Area 01 – Building 15
- **Worksheet #18-01**: Sampling Locations and Methods
- **Worksheet #20-01**: Field QC Summary

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Worksheet #10-01

Preliminary Conceptual Site Model

Area #01: Building 15

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Vehicle maintenance and refueling building • Constructed in 1985 and still active to the present day • 4,400 square ft building • PA indicates AFFF deluge system for fire suppression consists of an AST located upstairs in the Building 15 mechanical room • Two 30,000 gallon waste AFFF USTs in ground west of building • Two Oil Water Separators (OWS) and USTs connected to building operations. • Floor drain system tied to OWS and Waste AFFF USTs • No history of PFC releases or fire suppression system activation • OWS and contaminated soil removed in 2000/2001.	• Flat topography, approximate elevation 465 ft. MSL • Paved with grass aprons to north, west, and south • Nearest surface water is Three Mile Creek approximately 2,000 ft southwest • Stormwater catch basins located north and east of Building 15 • Area 01 is located near drainage divide between Three Mile and Six Mile Creek watersheds • Bedrock is Utica Shale at an estimated 50 ft bgs • Deposits overlying the Utica Shale consist of clay, silt, sand, and gravel • Depth to groundwater ranges from 5 to 9 ft bgs • Groundwater flow is southwesterly	• No known releases of PFCs • Potential release from fire suppression system, transfer to USTs through floor drains • Potential release from USTs to soil and groundwater • Potential release to paved areas around building, migration via stormwater system. Stormwater discharge to Six Mile Creek • Groundwater transport to Three Mile or Six Mile Creeks.	• Griffiss International Airport is owned and operated by Oneida County, New York • The area is located in a dense commercial/ industrial section of the airport • Area 01 is owned by OCIDA • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped at Area 1 though specific locations are not identified; Building 15 is not located within 300' of other mapped ecological or water resources that are shown on the Environmental Resource Mapper website • Surface flow captured by stormwater system and discharged to Six Mile Creek to northeast of building

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:

AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
OCIDA – Oneida County Industrial Development Agency
UST – underground storage tank
PFC – perfluorinated compound
OWS – Oil Water Separator

QAPP Worksheet #17-01: Sampling Design and Rationale

Area #01: Building 15

Condition 1: Facility maintained an AFFF fire suppression system.

Facility floor drains formerly led to an OWS (since removed) which was designed to divert an AFFF release to two waste AFFF USTs located west of the building. There were no documented releases of AFFF. An undocumented release of AFFF would have been diverted from the OWS to the waste AFFF USTs and waste AFFF could be present in the USTs. The integrity of the USTs is not known.

Question(s) to be resolved by investigation: Are PFCs present in the waste AFFF USTs west of the building? Are PFCs present in soil and groundwater adjacent to the waste AFFF USTs, near the former OWS, or downgradient of the facility?

> **Resulting Sampling Rationale:** Collect a sample directly from each of the waste AFFF USTs. Conduct geophysical survey to delineate footprint of the USTs beneath the pavement. Based on results and using Direct Push Technology (DPT), install two soil borings on the downgradient (south) side of the USTs and collect soil samples at three depths at each location. Install a monitoring well with a 10 ft well screen at each of the proposed soil borings to allow collection of groundwater samples adjacent to the waste AFFF USTs; the well screens will be placed to allow collection of groundwater samples from the upper eight feet of the saturated zone. Using the same DPT methods, install soil borings and collect soil and groundwater samples in the excavation of the former OWS and south of the building to determine whether PFCs are present in soil and groundwater at these locations

Condition 2: Undocumented releases of AFFF in the building from storage or handling of AFFF and/or releases from the fire suppression system directly to the concrete floor that were not captured by the floor drain system could have flowed outside the building to a stormwater catch basin on the north side of the building, or overland to the north and south of the building.

Question(s) to be resolved by investigation: Are PFCs present in water or sediment collected in the stormwater catch basin adjacent to the north side of Building 15, or in shallow soils (i.e., less than 5 ft deep) in the grassy areas adjacent to paving north and south of the building?

> **Resulting Sampling Rationale:** Collect stormwater and/or sediment samples from catch basin on the north side of building. Collect soil samples from edge of pavement in grassy areas north and south of building to identify presence of PFCs in surface soils where no stormwater catch basin system is present.

The location of Area 01-Building 15 is shown in **Figure 01-1** and proposed sampling locations are shown on **Figure 01-2**. Explorations and media samples for Area 01 are summarized on **Worksheet 18-01**, and a field QC summary is included in **Worksheet 20-01**.

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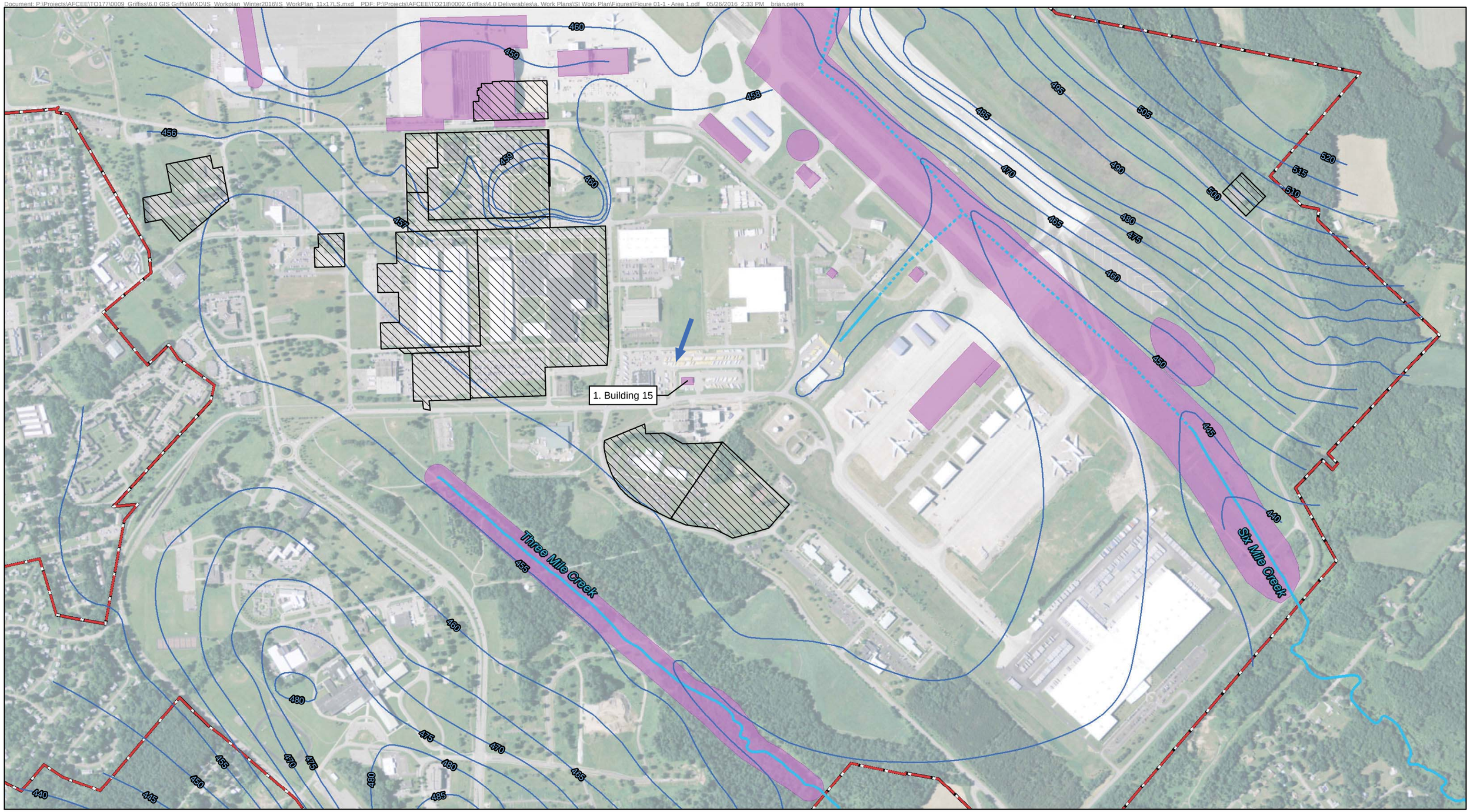


SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Air Force Retained Property
- Former Installation Boundary

Air Force Civil Engineer Center
2261 Hughes Avenue
Building 171, Ste 155
JBSA Lackland, Texas 78236

N

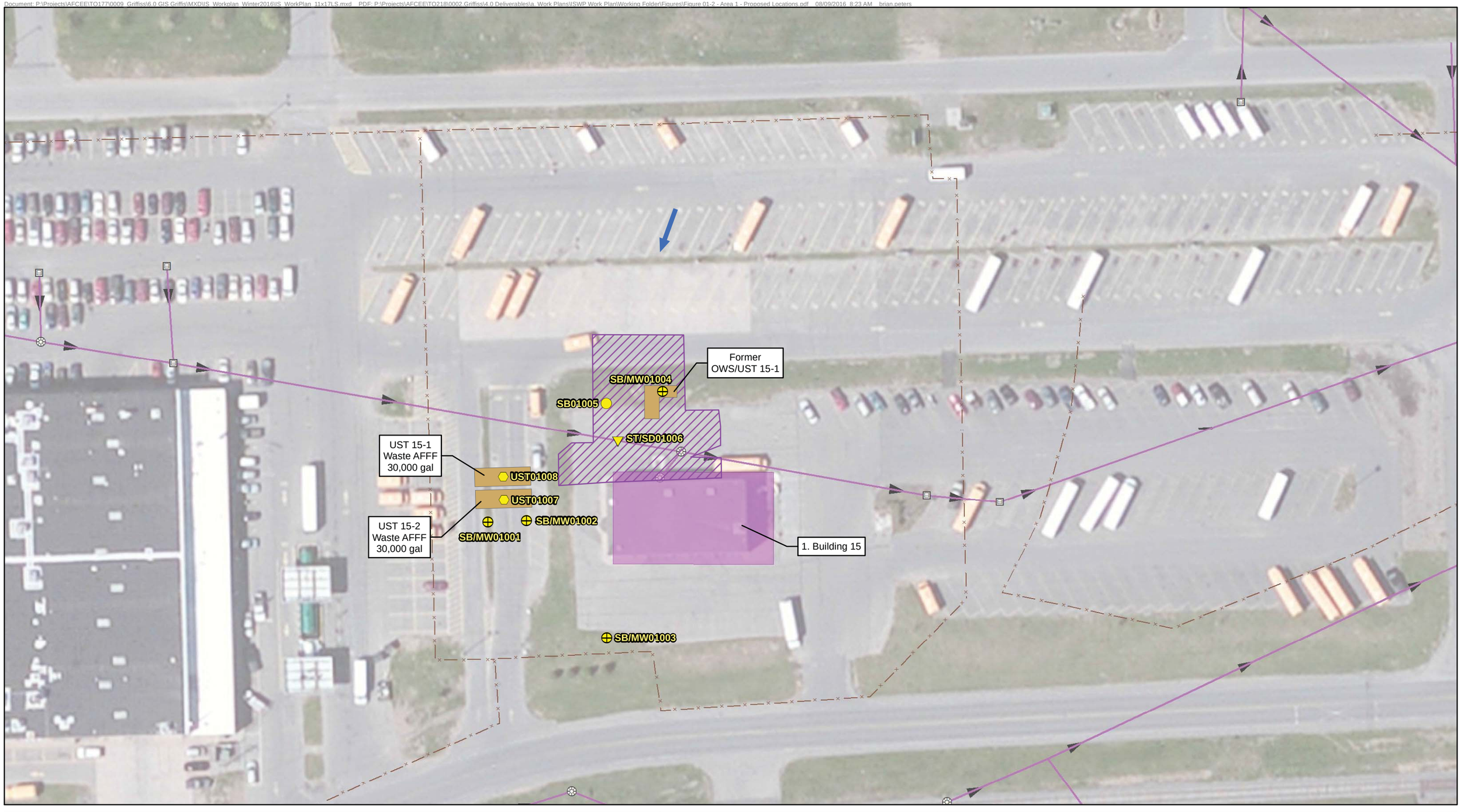
0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 01-1
Potential AFFF Release Area
Area 01 - Building 15

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	



SYMBOL KEY

- Proposed Soil Boring
- Proposed Monitoring Well and Soil Boring
- Proposed Stormwater/Sediment Sample Location
- Proposed UST Sample Location
- Approximate Groundwater Flow Direction, 2005 Building 15 Investigation
- Approximate Historic Excavation
- Approximate UST Location
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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Building 171, Ste 155
JBSA Lackland, Texas 78236

N

0 5 10 20 30 40 Meters
0 30 60 120 180 240 Feet

Figure 01-2
Proposed Sample Locations
Area 01 - Building 15
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS
Drawn: BRP	Chk: TDL	PROJ: 775290218

QAPP Worksheet #18-01: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
1	SB/MW01001	GRIFS-SB01001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil adjacent to waste AFF USTs
1	SB/MW01001	GRIFS-SB01001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01001	GRIFS-SB01001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01001	GRIFS-MW01001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater adjacent to USTs
1	SB/MW01002	GRIFS-SB01002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01002	GRIFS-SB01002-(0-1)FD	Soil	0	1	DPT	New	Field Duplicate
1	SB/MW01002	GRIFS-SB01002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01002	GRIFS-SB01002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs

QAPP Worksheet #18-01: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
1	SB/MW01002	GRIFS-MW01002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater adjacent to USTs
1	SB/MW01003	GRIFS-SB01003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils at grass area south of building
1	SB/MW01003	GRIFS-SB01003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils at grass area south of building
1	SB/MW01003	GRIFS-SB01003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils at grass area south of building
1	SB/MW01003	GRIFS-MW01003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of building
1	SB/MW01004	GRIFS-SB01004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil in former OWS excavation
1	SB/MW01004	GRIFS-SB01004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil in former OWS excavation
1	SB/MW01004	GRIFS-SB01004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil in former OWS

QAPP Worksheet #18-01: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								excavation
1	SB/MW01004	GRIFS-SB01004-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
1	SB/MW01004	GRIFS-SB01004-(WT)MS	Soil	TBD	TBD	DPT	New	Matrix Spike
1	SB/MW01004	GRIFS-SB01004-(WT)MSD	Soil	TBD	TBD	DPT	New	Matrix Spike Duplicate
1	SB/MW01004	GRIFS-MW01004-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater in former OWS excavation
1	SB01005	GRIFS-SB01005-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils at grass area north of building
1	SB01005	GRIFS-SB01005-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils at grass area north of building
1	ST/SD01006	GRIFS-ST01006-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in the storm drain system
1	ST/SD01006	GRIFS-SD01006-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in the storm drain system
1	UST01007	GRIFS-UST01007-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste AFF

QAPP Worksheet #18-01: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								UST
1	UST01008	GRIFS-UST01008-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste AFFF UST

Notes:

AFFF - Aqueous Film Forming Foam
bgs - below ground surface
DPT - Direct Push Technology
FD – Field Duplicate
ft – feet
ID – Identification
MS – Matrix Spike
MSD – Matrix Spike Duplicate
NA – Not Applicable
OWS – Oil Water Separator
QC – Quality Control
TBD – To Be Determined
UST – Underground Storage Tank

QAPP Worksheet #20-01: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	14	2	2	1	2 (1 pair)	21
Groundwater	PFCs	4	0	0	0	0	4
Sediment	PFCs	1	0	1	0	0	2
Stormwater	PFCs	1	0	0	0	0	1
Underground storage tanks	PFCs	2	0	0	0	0	2
Grand Total		**22**	**2**	**3**	**1**	**2 (1 Pair)**	**30**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.2 POTENTIAL AFFF RELEASE AREA 02: BUILDING 44, FORMER FIRE STATION

Area-specific worksheets and figures for potential AFFF Area 02 include:

- **Worksheet #10-02**: Preliminary CSM
- **Worksheet #17-02**: Sampling Design and Rationale
- **Figure 02-1**: Potential AFFF Release Area, Area 02 – Building 44 (Former Fire Station)
- **Figure 02-2**: Proposed Sample Locations, Area 02 – Building 44 (Former Fire Station)
- **Worksheet #18-02**: Sampling Locations and Methods
- **Worksheet #20-02**: Field QC Summary

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Worksheet #10-02
Preliminary Conceptual Site Model
Area #02: Building 44 (Former Fire Station)

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Storage and transfer of AFFF into fire trucks • Operated as fire station from 1960 to 1990 • Building was renovated into administration/operations building before base closure; configuration of building when operated as a fire station is unknown	• Flat topography approximate elevation 467 ft. MSL • Paved with grass aprons to north, west, and south • Culverted Rainbow Creek runs 70 ft northwest of Building 44, drains east to Six Mile Creek 650 ft east of Building 44 • Stormwater catch basins located on all sides of Building 44, drainage is east to Six Mile Creek • Bedrock is Utica Shale at an estimated 30 ft bgs • Deposits above the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater less than 10 ft bgs • Groundwater flow is north to Rainbow Creek	• No known releases of PFCs • Potential release to the ground from handling and transferring • Potential soil, groundwater, surface water run-off, stormwater impacts • Stormwater discharge to Six Mile Creek • Potential discharge of impacted groundwater to storm drains • Groundwater transport to Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 02 is currently part of the Griffiss International Airport • The area is located in a commercial/industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater • Building is scheduled for demolition in near future	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 2 The NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system and discharged to Six Mile Creek to east of building

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-02: Sampling Design and Rationale

Area #02: Building 44, Former Fire Station

Condition 1: Facility stored and transferred AFFF into fire trucks.

There were no documented releases of AFFF. Undocumented releases of AFFF from storage, handling or transfer to fire trucks could have flowed outside the building over paved surfaces to stormwater catch basins on north side of the building that discharge to culverted Rainbow Creek and in turn to Six Mile Creek.

Question(s) to be resolved by investigation: Are PFCs present in water or sediment collected in the stormwater catch basins adjacent to Building 44?

Resulting Sampling Rationale: Collect stormwater and/or sediment samples from downstream catch basin on north side of building.

Condition 2: Any releases of AFFF that were not captured by the stormwater catch basins likely flowed north of the paved areas or west of the building, infiltrating the ground in grass areas and leaching over time into the shallow groundwater.

Question(s) to be resolved by investigation: Are PFCs present in shallow soils and groundwater east, north or west of Building 44?

Resulting Sampling Rationale: Using DPT, install three soil borings (east, north and west of the building), and collect soil samples at three depths at each boring (0-1 ft bgs; 3-5 ft bgs; just above the water table). Install a monitoring well with a 10 ft well screen at each location that intercepts the water table to allow collection of a groundwater sample from the upper most eight feet of the saturated zone at each well. Install an upgradient monitoring well southeast of the building to allow for collection of an upgradient groundwater sample.

The location of Area 02-Building 44 is shown in **Figure 02-1;** the proposed locations for stormwater, sediment, soil and groundwater samples are shown on **Figure 02-2**. Explorations and media samples for Area 02 are summarized on **Worksheet 18-02**, and a field QC summary is included in **Worksheet 20-02**.

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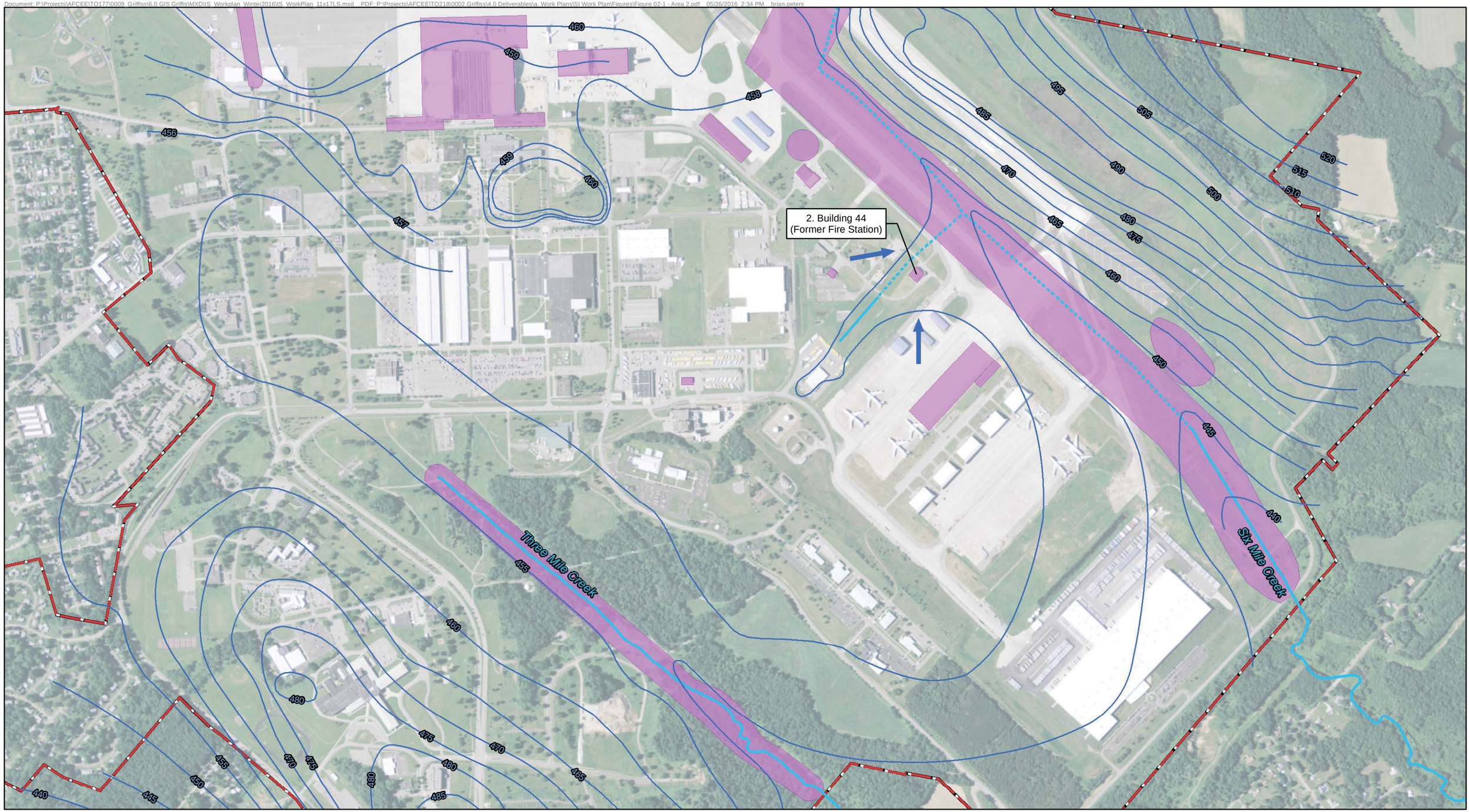

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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JBSA Lackland, Texas 78236

N

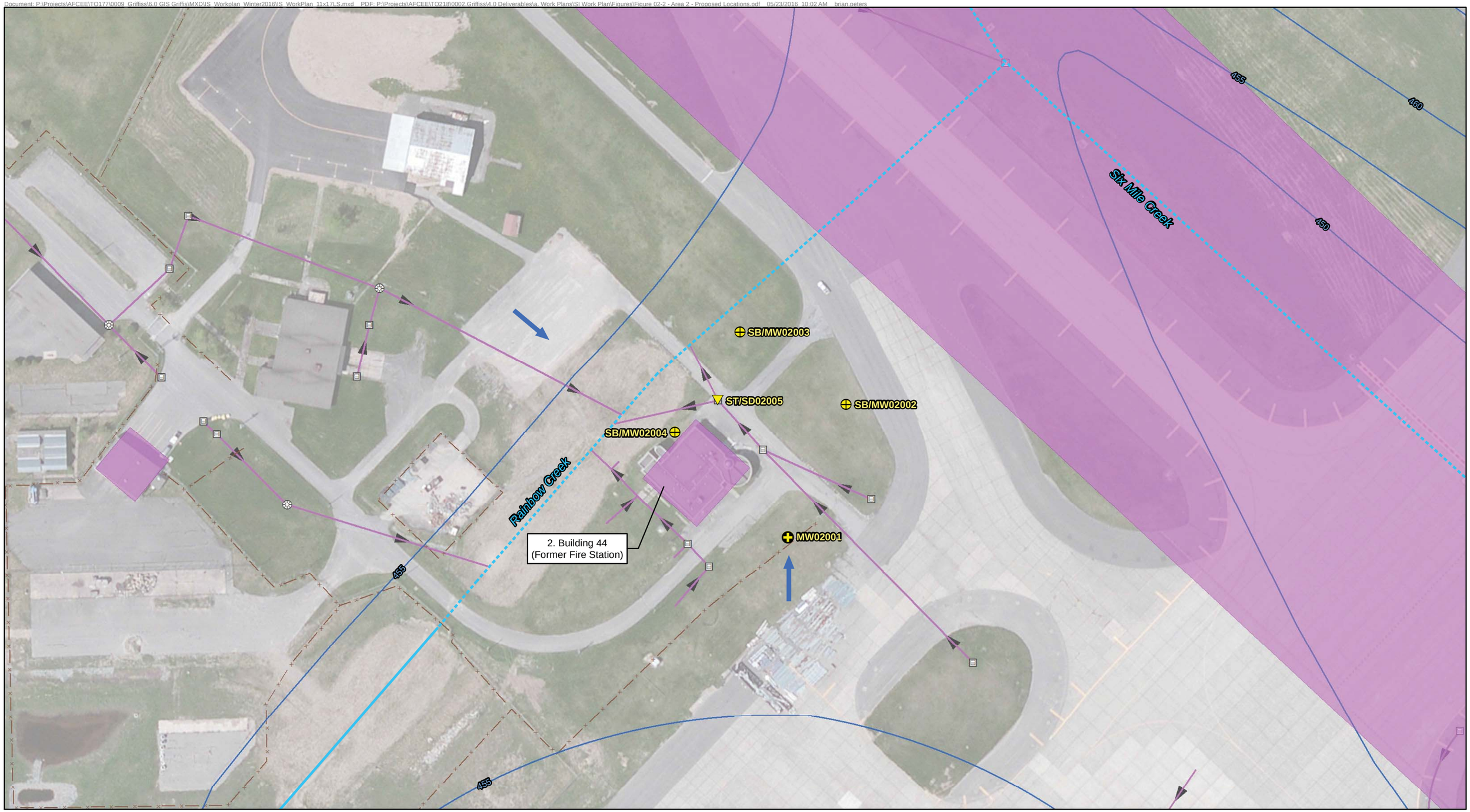
0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 02-1
Potential AFFF Release Area
Area 02 - Building 44 (Former Fire Station)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	



SYMBOL KEY

- Proposed Monitoring Well
- Proposed Monitoring Well and Soil Boring
- Proposed Stormwater/Sediment Sample Location
- Approximate Groundwater Flow Direction
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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N

0 15 30 60 90 120 Meters
0 60 120 240 360 480 Feet

Figure 02-2
Proposed Sample Locations
Area 02 - Building 44 (Former Fire Station)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/23/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: NWH	PROJ: 775290218	

QAPP Worksheet #18-02: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
2	MW02001	GRIFS-MW02001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater upgradient of Area 02
2	SB/MW02002	GRIFS-SB02002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02002	GRIFS-SB02002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02002	GRIFS-SB02002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02002	GRIFS-MW02002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 02
2	SB/MW02003	GRIFS-SB02003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02003	GRIFS-SB02003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of Area 02

QAPP Worksheet #18-02: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
2	SB/MW02003	GRIFS-SB02003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02003	GRIFS-MW02003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
2	SB/MW02004	GRIFS-MW02004-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 02
2	SB/MW02004	GRIFS-MW02004-MMDDYYFD	Groundwater	TBD	TBD	Peristaltic	New	Field Duplicate

QAPP Worksheet #18-02: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
2	ST/SD02005	GRIFS-SD02005-MMDDYY	Sediment	NA	NA	Core Sampler	New	Assess PFC presence in sediment in catch basin that discharges to Rainbow Creek
2	ST/SD02005	GRIFS-ST02005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in stormwater in catch basin that discharges to Rainbow Creek

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
GRIFS – Installation Identification
NA – Not Applicable
ID – Identification
PFC – Perfluorinated Compound
WT – Water Table
MMDDYY – Month Day Year
TBD – To Be Determined

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QAPP Worksheet #20-02: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	9	1	1	0	0	11
Groundwater	PFCs	4	1	0	0	0	5
Sediment	PFCs	1	0	0	0	0	1
Stormwater	PFCs	1	0	0	0	0	1
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**15**	**2**	**1**	**0**	**0**	**18**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.3 POTENTIAL AFFF RELEASE AREA 03: BUILDING 45, FIRE STATION

Area-specific worksheets and figures for potential AFFF Area 03 include:

- **Worksheet #10-03**: Preliminary CSM
- **Worksheet #17-03**: Sampling Design and Rationale
- **Figure 03-1**: Potential AFFF Release Area, Area 03 – Building 45 (Fire Station)
- **Figure 03-2**: Proposed Sample Locations, Area 03 – Building 45 (Fire Station)
- **Worksheet #18-03**: Sampling Locations and Methods
- **Worksheet #20-03**: Field QC Summary

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Worksheet #10-03
Preliminary Conceptual Site Model
Area #03: Building 45 (Fire Station)

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Active Fire Station from 1975 to present • Virgin AFFF storage and fire truck maintenance • 2,000 AFFF UST; the original UST had no secondary containment but was replaced in 1992. Replacement tank still in place • Transfer AFFF to trucks from UST via overhead piping system • PA indicates AFFF is stored in the UST at Building 45 and that it is used as part of the fire deluge system	• Flat topography; ground surface elevation ranges from 465 and 470 ft. MSL • Paved on northeast, southeast and southwest sides, grass on northwest side and beyond paved areas • Nearest surface water is culverted section of Six Mile Creek 800 ft northeast • Stormwater catch basins north, east, and south of Building 45 • Area 03 is located in the Six Mile Creek watershed • Bedrock is Utica Shale at an estimated 30 ft bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 10 ft bgs • Groundwater flow is easterly	• PFCs are the contaminants of potential concern during this investigation • No known releases of PFCs • Potential release from UST and distribution system to soil and groundwater • Potential transport by stormwater to storm drain and surface water • Potential impacted groundwater discharge to storm drains and Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 03 is currently part of the Griffiss International Airport • The area is located in a commercial/industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 3; the NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system and discharged to Six Mile Creek to east of building

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft. - feet
PFC – perfluorinated compound
UST – underground storage tank

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QAPP Worksheet #17-03: Sampling Design and Rationale

Area #03: Building 45 (Fire Station)

Condition 1: Virgin AFFF was stored in the UST west of the building and transferred to fire trucks from overhead piping.

There are no documented releases. Undocumented releases may have been occurred from the UST into the surrounding soil and groundwater.

Question(s) to be resolved by investigation: Are PFCs present in the virgin AFFF UST west of the building? Has there been a release of PFCs into soil and groundwater adjacent to the AFFF UST west of the building?

> **Resulting Sampling Rationale:** Collect a liquid sample directly from virgin AFFF UST through an existing tank port. Conduct a geophysical survey to delineate the footprint of the UST beneath the pavement. Based on geophysical results and using DPT, install soil borings on two sides of the UST and collect soil samples at three depths at each location. Install a monitoring well with 10 ft well screen at each boring to allow collection of groundwater samples adjacent to the UST.

Condition 2: AFFF was stored, handled, and transferred within the overhead piping system. Paved surfaces, stormwater catch basins and grassed areas are located downslope of the main doors on the northeast and southwest sides of the building.

Question(s) to be resolved by investigation: Has an undocumented release of AFFF from the overhead piping system resulted in the presence of PFCs in water or sediment collected in the stormwater catch basins adjacent to Building 45, or in shallow soils in grassed areas adjacent to paved areas?

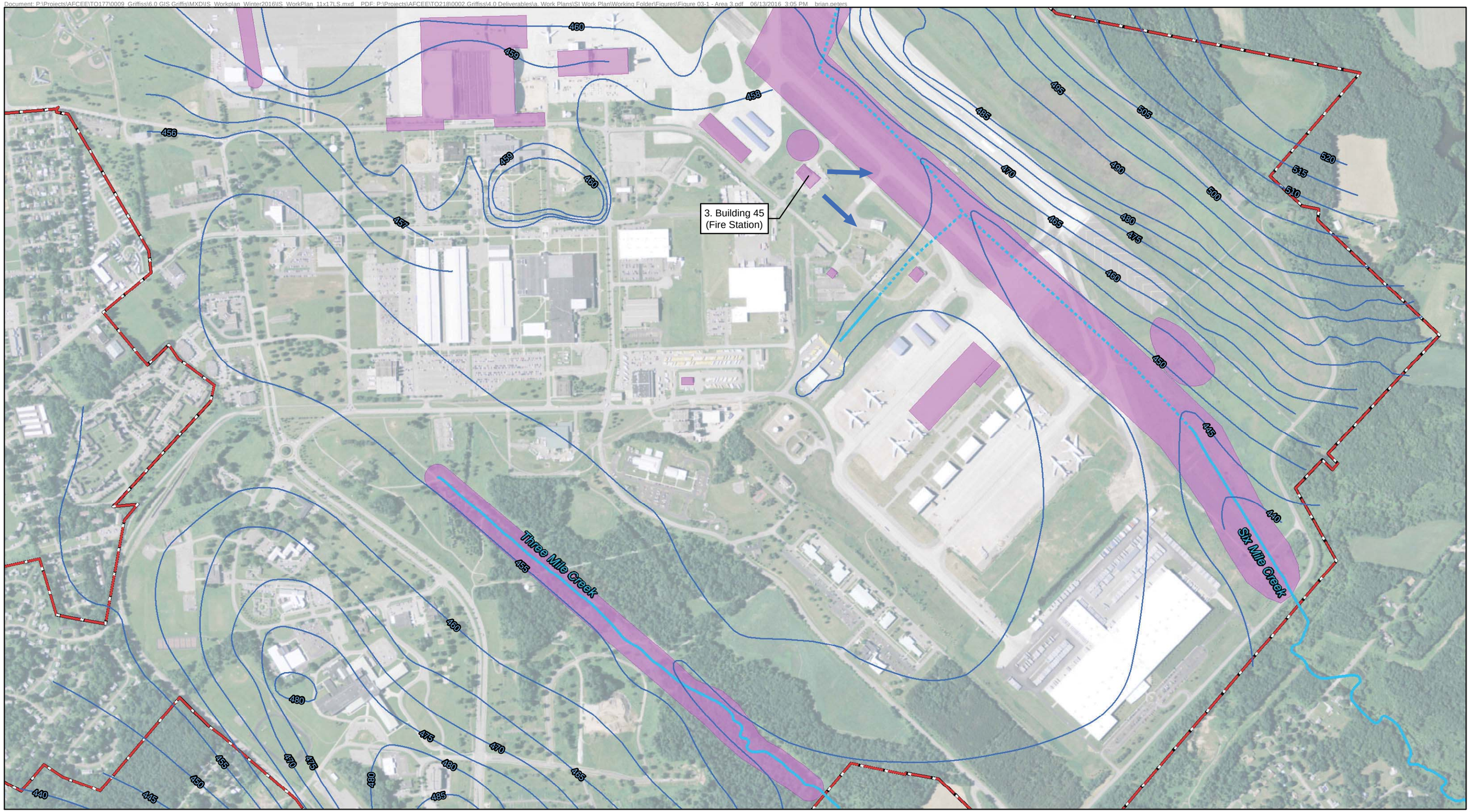
> **Resulting Sampling Rationale:** Collect stormwater and sediment samples (if present) from the downstream catch basin east of the building. Collect soil samples from two depths at the edge of pavement in grassy area northeast and southwest of the building to identify presence of PFCs in surface soil.

Condition 3: Groundwater (estimated at less than 15 ft bgs) underlies the former fire station and the UST west of the fire station building.

Question(s) to be resolved by investigation: Are PFCs present in shallow groundwater downgradient of Building 45?

> **Resulting Sampling Rationale:** Install two monitoring wells downgradient of Building 45. Soil samples will be collected only for geologic classification; at each location a monitoring well with 10 ft well screen will be installed with the top two feet of the screen above the water table to allow collection of a groundwater sample.

The location of Area 03-Building 45 is shown in **Figure 03-1,** and proposed locations for UST, soil, groundwater, stormwater and sediment samples are shown on **Figure 03-2**. Explorations and media samples for Area 03 are summarized on **Worksheet 18-03**, and a field QC summary is included in **Worksheet 20-03**.



SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 03-1
Potential AFFF Release Area
Area 03 - Building 45 (Fire Station)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

6/13/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	

SYMBOL KEY

- Proposed Monitoring Well
- Proposed Monitoring Well and Soil Boring
- Proposed Soil Boring
- Proposed Stormwater/Sediment Sample Location
- Proposed UST Sample Location
- Approximate UST Location
- Approximate Groundwater Flow Direction,1998 Basewide Survey
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin

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N

0 5 10 20 30 40 Meters
0 25 50 100 150 200 Feet

Figure 03-2
Proposed Sample Locations
Area 03 - Building 45 (Fire Station)
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS
Drawn: BRP	Chk: TDL	PROJ: 775290218

QAPP Worksheet #18-03: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
3	MW03001	GRIFS-MW03001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in downgradient groundwater
3	MW03002	GRIFS-MW03002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in downgradient groundwater
3	SB/MW03003	GRIFS-SB03003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03003	GRIFS-SB03003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03003	GRIFS-SB03003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03003	GRIFS-MW03003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
3	SB/MW03004	GRIFS-SB03004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03004	GRIFS-SB03004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03004	GRIFS-SB03004-(3-5)FD	Soil	3	5	DPT	New	Field Duplicate
3	SB/MW03004	GRIFS-SB03004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils near UST

QAPP Worksheet #18-03: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
3	SB/MW03004	GRIFS-MW03004-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
3	SB/MW03004	GRIFS-MW03004-MMDDYYFD	Groundwater	TBD	TBD	Peristaltic	New	Field Duplicate
3	SB/MW03004	GRIFS-MW03004-MMDDYYMS	Groundwater	TBD	TBD	Peristaltic	New	Matrix Spike
3	SB/MW03004	GRIFS-MW03004-MMDDYYMSD	Groundwater	TBD	TBD	Peristaltic	New	Matric Spike Duplicate
3	SB03005	GRIFS-SB03005-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	SB03005	GRIFS-SB03005-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	SB03006	GRIFS-SB03006-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	SB03006	GRIFS-SB03006-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	ST/SD03007	GRIFS-ST03007-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in the stormwater system

QAPP Worksheet #18-03: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
3	ST/SD03007	GRIFS-SD03007-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
3	UST03008	GRIFS-UST03008-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of UST

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
WT – Water Table
GRIFS – Installation Identification
NA – Not Applicable
ID – Identification
MS – Matrix Spike
PFC – Perfluorinated Compound
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
UST – Underground Storage Tank
TBD – To Be Determined

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QAPP Worksheet #20-03: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	10	1	2	0	0	13
Groundwater	PFCs	4	1	0	1	2 (1 pair)	8
Sediment	PFCs	1	0	0	0	0	1
Stormwater	PFCs	1	0	0	0	0	1
Underground storage tanks	PFCs	1	0	0	0	0	1
Grand Total		**17**	**2**	**2**	**1**	**2 (1 pair)**	**24**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.4 POTENTIAL AFFF RELEASE AREA 04: NORTH SIDE OF BUILDING 45, FIRE STATION

Area-specific worksheets and figures for potential AFFF Area 04 include:

- **Worksheet #10-04**: Preliminary CSM
- **Worksheet #17-04**: Sampling Design and Rationale
- **Figure 04-1**: Potential AFFF Release Area, Area 04 – North Side of Building 45 (Fire Hose Nozzle Test Area)
- **Figure 04-2**: Proposed Sample Locations, Area 04 – North Side of Building 45 (Fire Hose Nozzle Test Area)
- **Worksheet #18-04**: Sampling Locations and Methods
- **Worksheet #20-04**: Field QC Summary

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Worksheet #10-04
Preliminary Conceptual Site Model
Area #04: North Side of Building 45 (Fire Station)

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Testing of fire hose nozzles in grassy area north of the Building 45 Fire Station • Also known as the Nozzle Test Area • Operated from 1975 to present	• Flat topography; elevation approximately 470 ft. MSL • Unpaved grassy area • Nearest surface water is culverted section of Six Mile Creek 500 ft northeast • Stormwater catch basins located southeast of Area 04 outlet to Six Mile Creek • Area 04 is located in the Six Mile Creek watershed • Bedrock is Utica Shale, estimated 30 ft bgs • Deposits overlying the Utica Shale consist of clay, silt, sand, and gravel • Depth to groundwater is approximately 13 ft bgs • Groundwater flow is southeasterly	• AFFF released periodically to the ground during hose nozzle testing • Potential migration through soil to groundwater • Potential transport by stormwater to storm drain and surface water (Six Mile Creek) • Potential groundwater migration to surface water (Six Mile Creek)	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 04 is currently part of the Griffiss International Airport • The area is located in a commercial/ industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 4; the NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system discharges to Six Mile Creek to east of area

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-04: Sampling Design and Rationale

Area #04: North Side of Building 45 (Fire Station)

Condition 1: AFFF was applied to the ground surface during periodic testing of fire hose nozzles.

Question(s) to be resolved by investigation: Are PFCs present in the soils and/or groundwater beneath the nozzle test area?

> **Resulting Sampling Rationale:** Install three soil borings at Area 04, collecting soil samples at three depths at each location (0-1 ft bgs; 3-5 ft bgs; and just above the water table). Install a monitoring well with a 10 ft well screen at each boring with the top of the screen 2 ft above the water table to allow collection of groundwater samples.

The location of Area #04 – North Side of Building 45 (Fire Station), is shown in **Figure 04-1,** and proposed locations for soil and groundwater samples are shown on **Figure 04-2**. Explorations and media samples for Area #04 are summarized on **Worksheet 18-04**, and a field QC summary is included in **Worksheet 20-04.**

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4. North Side of Building 45 (Fire Station)

Three Mile Creek

Six Mile Creek

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 04-1
Potential AFFF Release Area
Area 04 - North Side of Building 45 (Fire Station)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	

SYMBOL KEY

- Proposed Monitoring Well and Soil Boring
- Approximate Groundwater Flow Direction,1998 Basewide Survey
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin

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N

0 5 10 20 30 40 Meters

0 25 50 100 150 200 Feet

Figure 04-2
Proposed Sample Locations
Area 04 - North Side of Building 45 (Fire Station)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: TDL	PROJ: 775290218	

QAPP Worksheet #18-04: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
4	SB/MW04001	GRIFS-SB04001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04001	GRIFS-SB04001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04001	GRIFS-SB04001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04001	GRIFS-MW04001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater beneath Area 04
4	SB/MW04002	GRIFS-SB04002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04002	GRIFS-SB04002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04002	GRIFS-SB04002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04002	GRIFS-MW04002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater beneath Area 04
4	SB/MW04003	GRIFS-SB04003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04003	GRIFS-SB04003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence

QAPP Worksheet #18-04: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								in Area 04 soils
4	SB/MW04003	GRIFS-SB04003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04003	GRIFS-MW04003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater beneath Area 04

Notes:
ft. – feet
bgs - below ground surface
DPT – direct push technology
TBD – To Be Determined
GRIFS – Installation Identification
NA – Not Applicable
ID – Identification
WT – Water Table
MMDDYY – Month Day Year
PFC – Perfluorinated Compound

QAPP Worksheet #20-04: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	9	0	1	0	0	10
Groundwater	PFCs	3	0	0	0	0	3
Sediment	PFCs	0	0	0	0	0	0
Stormwater	PFCs	0	0	0	0	0	0
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**12**	**0**	**1**	**0**	**0**	**13**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.5 POTENTIAL AFFF RELEASE AREA 05: BUILDING 47

Area-specific worksheets and figures for potential AFFF Area 05 include:

- **Worksheet #10-05**: Preliminary CSM
- **Worksheet #17-05**: Sampling Design and Rationale
- **Figure 05-1**: Potential AFFF Release Area, Area 05 – Building 47 (Vehicle Operations and Parking)
- **Figure 05-2**: Proposed Sample Locations Area 05, Building 47 (Vehicle Operations and Parking)
- **Worksheet #18-05**: Sampling Locations and Methods
- **Worksheet #20-05**: Field QC Summary

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Worksheet #10-05
Preliminary Conceptual Site Model
Area #05: Building 47

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Vehicle operations area, unknown dates of operation • AFFF fire suppression system • Small indoor AFFF AST • 25,000 waste AFFF UST located near east corner of Building 47, no secondary containment • PA indicates two-2,000 gallon AFFF ASTs are located inside Building 47 and are currently used for fire suppression system	• Flat topography; approximate ground elevation of 465 ft. MSL • Paved areas to north and south, with grassy area to the east • Nearest surface water is culverted section of Six Mile Creek 1,200 ft northeast • Stormwater catch basins east of Area 05 • Area 05 is located in the Six Mile Creek watershed • Bedrock is Utica Shale at an estimated 35 ft bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 10 ft bgs • Groundwater flow is southeasterly	• PFCs are the contaminants of potential concern during this investigation • No documented releases • Potential release from fire suppression system to ground and UST • Potential migration through soil to groundwater • Potential release to groundwater from UST • Potential transport by stormwater to storm drain and surface water (Six Mile Creek) • Potential groundwater migration Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 05 is located within the Griffiss International Airport • Area 05 is Owned by Oneida County Industrial Development Agency and is currently used as a vehicle garage • The area is located in a commercial/industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future us of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 5; the NYSDEC Environmental. Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system and discharges to culverted Rainbow Creek which outlets to culverted section of Six Mile Creek east of building

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
AST – aboveground storage tank
bgs – below ground surface
ft - feet
PFC – perfluorinated compound
UST – underground storage tank

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QAPP Worksheet #17-05: Sampling Design and Rationale

Area #05: Building 47

Condition 1: Facility maintained an AFFF fire suppression system and there is a 25,000 gallon waste AFFF UST east of the building and two 2,000 AFFF ASTs inside the building.

There were no documented releases at the facility. An undocumented release from the waste AFFF UST could impact soil and groundwater adjacent to the UST.

Question(s) to be resolved by investigation: Are PFCs present in the waste AFFF UST east of the building? Has there been a release of PFCs into soil and groundwater adjacent to the UST? Are PFCs present in the two 2,000 gallon AFFF ASTs inside the building and do these tanks, if present, show signs of leaking/release?

> **Resulting Sampling Rationale:** Collect a liquid sample directly from waste AFFF UST through an existing tank port. Conduct a geophysical survey to delineate the footprint of the UST beneath the pavement. Based on results and using DPT, install soil borings on the downgradient side of the UST, collecting soil samples at three depths at each location. Install a monitoring well with 10 ft well screen at each boring adjacent to the UST to allow collection of groundwater samples adjacent to the UST. Confirm the presence and current condition of the two 2,000 gallon AFFF ASTs inside the building, provided safe access to the building is obtained from the owner. Interview the current owner, if available, to determine the current status of the ASTs.

Condition 2: Exterior to a doorway in Building 47, the ground surface slopes toward stormwater catch basins to the east, and grass-covered areas to the west.

Question(s) to be resolved by investigation: Are PFCs present in water or sediment collected in the stormwater catch basins east of the building, or in shallow soils in grassy areas adjacent to paving west of the building?

> **Resulting Sampling Rationale:** Collect stormwater and/or sediment samples from the catch basin east of the building. Collect soil samples from edge of pavement in grass-covered area west of building to investigate presence or absence of PFCs in these media.

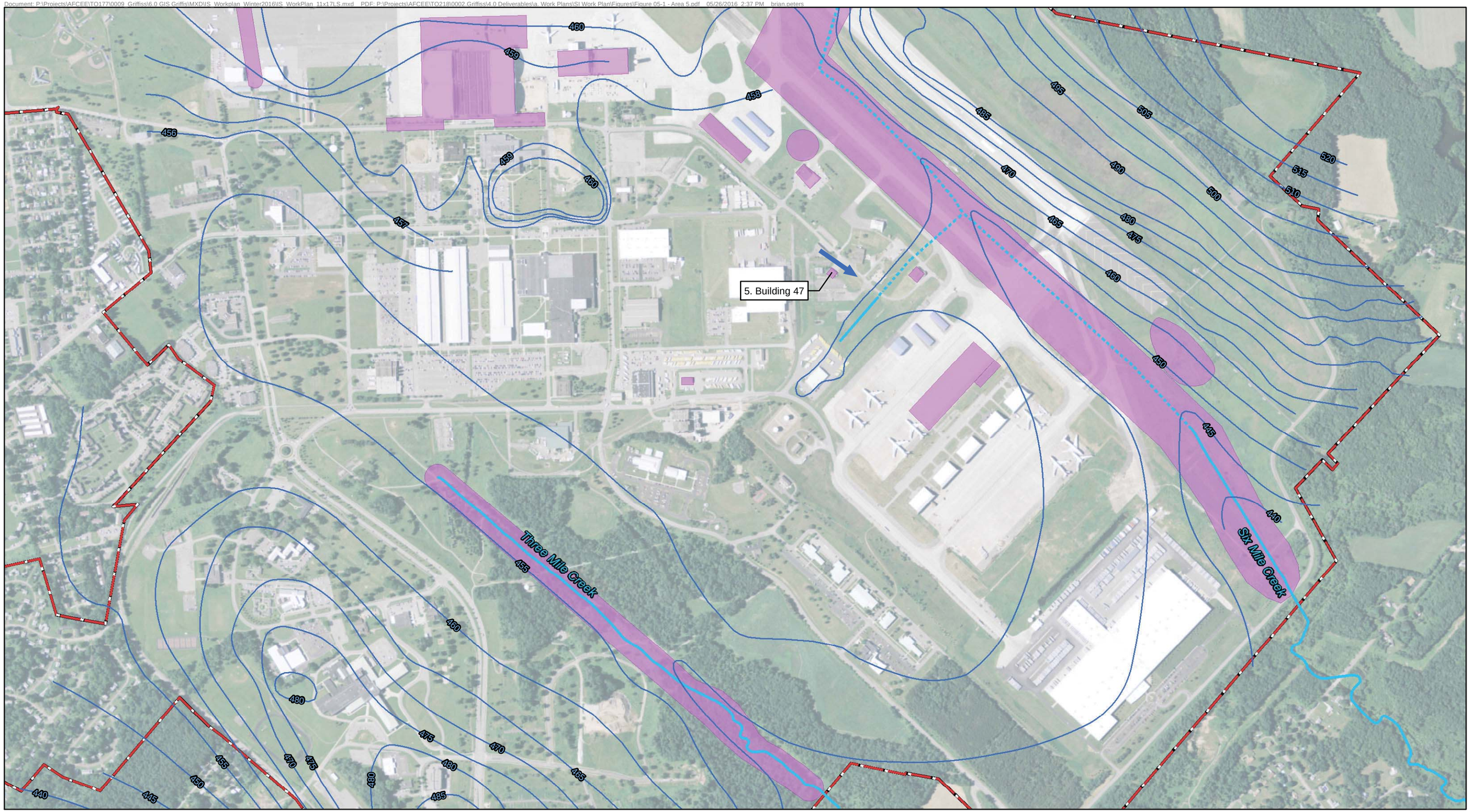
Condition 3: Groundwater is less than 15 ft bgs beneath Building 47 and is interpreted to flow to the east/southeast.

Question(s) to be resolved by investigation: Are PFCs present in groundwater downgradient (east) of Building 47 as a result of an undocumented release of AFFF from the fire suppression system or UST?

> **Resulting Sampling Rationale:** Install one soil boring (downgradient to the southeast of the UST), collect soil samples for geologic characterization only, and install a monitoring well with 10

ft well screen with the top of the screen 2 ft above the water table to allow collection of a groundwater sample.

The location of Area 05-Building 47 is shown in **Figure 05-1,** and proposed locations for UST, soil, groundwater, stormwater and sediment samples are shown on **Figure 05-2**. Explorations and media samples for Area 05 are summarized on **Worksheet 18-05**, and a field QC summary is included in **Worksheet 20-05**.



SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 05-1
Potential AFFF Release Area
Area 05 - Building 47
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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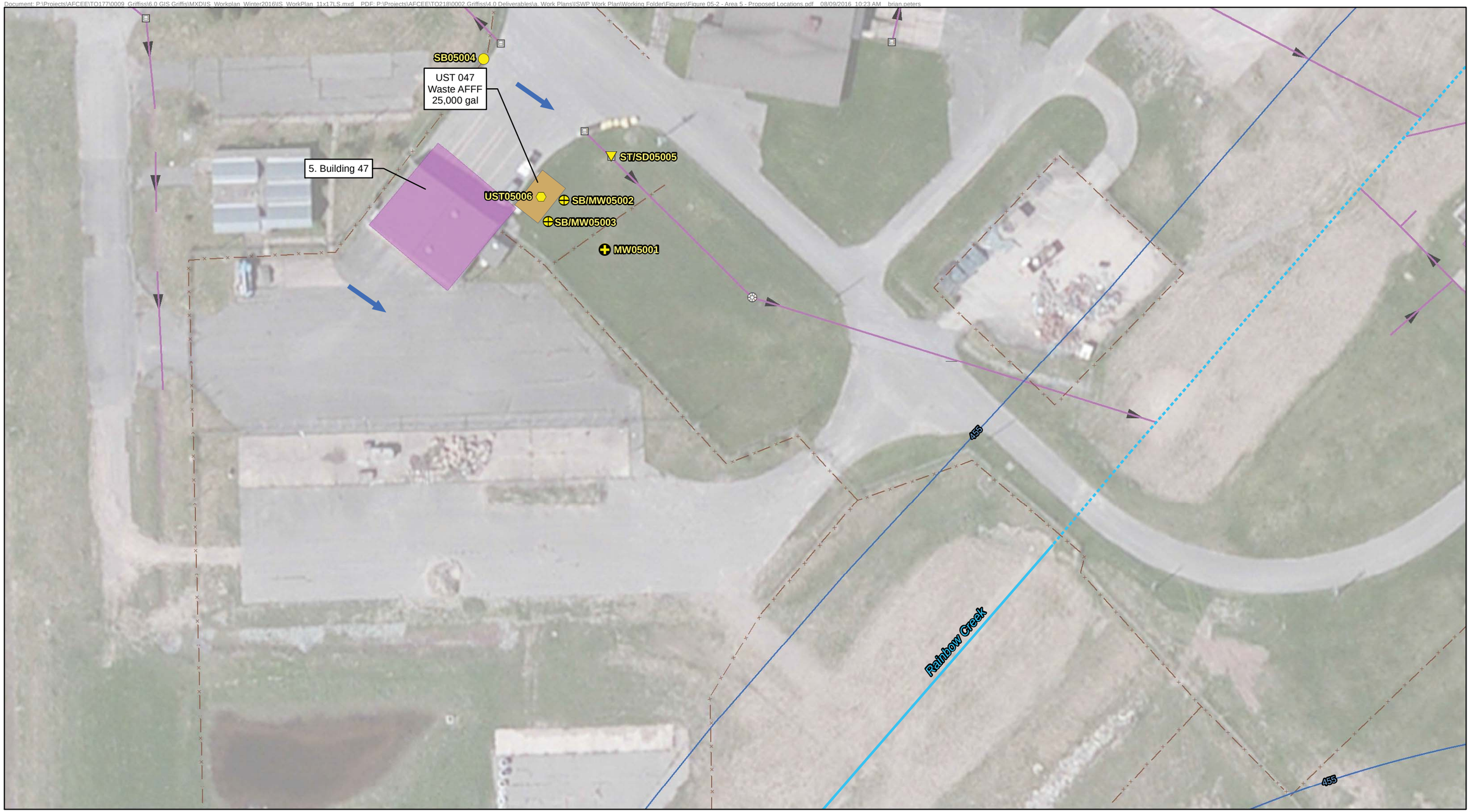

SYMBOL KEY

- Proposed Monitoring Well
- Proposed Monitoring Well and Soil Boring
- Proposed Stormwater/Sediment Sample Location
- Proposed UST Sample Location
- Proposed Soil Boring
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Approximate Groundwater Flow Direction
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate UST Location
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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N

0 5 10 20 30 40 Meters

0 30 60 120 180 240 Feet

Figure 05-2
Proposed Sample Locations
Area 05 - Building 47

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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QAPP Worksheet #18-05: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
5	MW05001	GRIFS-MW05001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of building and UST
5	MW05001	GRIFS-MW05001-MMDDYYFD	Groundwater	TBD	TBD	Peristaltic	New	Field Duplicate
5	SB/MW05002	GRIFS-SB05002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05002	GRIFS-SB05002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05002	GRIFS-SB05002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05002	GRIFS-MW05002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
5	SB/MW05003	GRIFS-SB05003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05003	GRIFS-SB05003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05003	GRIFS-SB05003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near UST

QAPP Worksheet #18-05: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
5	SB/MW05003	GRIFS-MW05003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
5	SB05004	GRIFS-SB05004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low lying grassy area
5	SB05004	GRIFS-SB05004-(0-1)FD	Soil	0	1	DPT	New	Field Duplicate
5	SB05004	GRIFS-SB05004-(0-1)MS	Soil	0	1	DPT	New	Matrix Spike
5	SBO5004	GRIFS-SB05004-(0-1)MSD	Soil	0	1	DPT	New	Matrix Spike Duplicate
5	SB05004	GRIFS-SB05004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low lying grassy area
5	ST/SD05005	GRIFS-ST05005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in storm water/ground water in storm water system
5	ST/SD05005	GRIFS-SD05005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm water system
5	UST05006	GRIFS-UST05006-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in waste UST

Notes:

ft. – feet
bgs - below ground surface
PFC – Perfluorinated Compound
UST – Underground Storage Tank
MS – Matrix Spike
GRIFS – Installation Identification
NA – Not Applicable
DPT – direct push technology
WT – Water Table
TBD – To Be Determined
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
ID – Identification
FD – Field Duplicate

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QAPP Worksheet #20-05: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	8	1	1	0	2 (1 pair)	12
Groundwater	PFCs	3	1	0	0	0	4
Sediment	PFCs	1	0	0	0	0	1
Stormwater	PFCs	1	0	0	0	0	1
Underground storage tanks	PFCs	1	0	0	0	0	1
Grand Total		**14**	**2**	**1**	**0**	**2**	**19**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.6 POTENTIAL AFFF RELEASE AREA 06: BUILDING 100

Area-specific worksheets and figures for potential AFFF Area 06 include:

- **Worksheet #10-06**: Preliminary CSM
- **Worksheet #17-06**: Sampling Design and Rationale
- **Figure 06-1**: Potential AFFF Release Area, Area 06 – Building 100
- **Figure 06-2**: Proposed Sample Locations, Area 06 – Building 100
- **Worksheet #18-06**: Sampling Locations and Methods
- **Worksheet #20-06**: Field QC Summary

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Worksheet #10-06
Preliminary Conceptual Site Model
Area #06: Building 100

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Formerly used as weapons and release systems facility; not retained by air force at base closure • Operated 1982 to present • AFFF fire suppression system PA indicates two 2,500 gallon indoor AFFF ASTs located along south side of Building 100, and are used for fire deluge system	• Flat topography; elevation between 470 -475 ft. MSL • Paved area on airfield apron with grassy areas 500 ft to north and northeast • Nearest surface water is culverted section of Six Mile Creek 2,000 ft northeast • Area 06 is located at the surface watershed divide between the Mohawk River to the west and Six Mile Creek to the east • Stormwater catch basins north, east, and south of Area 06 • Storm drains north of the building flow west to Mohawk River; storm drains east and south of the building flow east to Six Mile Creek • Bedrock is Utica Shale at estimated depth of 30 ft • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is estimated between 10 and 15 ft bgs • Groundwater flow is south	• Several documented releases from fire suppression system which activated on several occasions • AFFF reported to have flowed out of the building onto adjacent concrete surfaces • Potential overland migration to storm drains and adjacent grassy areas • Potential migration through soil to groundwater • Potential transport by stormwater and surface water • Potential migration in groundwater and discharge to Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • The majority of Area 06 is part of the Griffiss International Airport. A parcel south of the building parking area is owned by Oneida County Industrial Development Agency • Building has been used for aircraft maintenance since base closure; currently vacant • The area is located in a commercial/industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 6; the NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow on north side of building is captured by stormwater system and discharged to Mohawk River. East and south of building storm water flows are captured and discharged to Six Mile Creek

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
AST – aboveground storage tank
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-06: Sampling Design and Rationale

Area #06: Building 100

Condition 1: AFFF released from the fire suppression system on several occasions flowed out of the large bay doors to the north onto paved apron areas and may have flowed into catch basins on the north side of the building. AFFF that did not flow into catch basins may have flowed north and east onto grassy areas beyond the paved apron. It is unknown if the above releases or other incidental releases resulted in AFFF migrating east or south of the building on pavement.

Question(s) to be resolved by investigation: Are PFCs present in water or sediment collected in the stormwater catch basins adjacent to Building 100, or in shallow soils in grassy areas adjacent to paved areas?

> **Resulting Sampling Rationale:** Collect stormwater (if present) and sediment samples from central receiving catch basin north of the building, and from catch basins on the east and south side of the building. Collect soil samples from two depths from borings at the edge of pavement in grass-covered area north and northeast of the building to investigate the presence or absence of PFCs in surface soil.

Condition 2: Groundwater is less than 15 ft bgs beneath Building 100 and is interpreted to flow generally to the south-southeast.

Question to be resolved by investigation: Are PFCs present in groundwater south and downgradient of Building 100?

> **Resulting Sampling Rationale:** Using DPT, install two soil borings south of the building, collecting soil samples at three depths at each boring (0-1 ft bgs; 3-5 ft bgs; just above the water table). Install a monitoring well with 10 ft well screen at each location with the top of the screen 2 ft above the water table to allow collection of a groundwater sample from each well. Groundwater quality upgradient of Building 100 will be characterized using monitoring wells installed at Area 11 - Fire Demonstration Area (see **Section 2.11**).

The location of Area #06 – Building 100 is shown in **Figure 06-1,** and proposed locations for stormwater, sediment, soil and groundwater samples are shown on **Figure 06-2**. Explorations and media samples for Area #06 are summarized on **Worksheet 18-06**, and a field QC summary is included in **Worksheet 20-06.**

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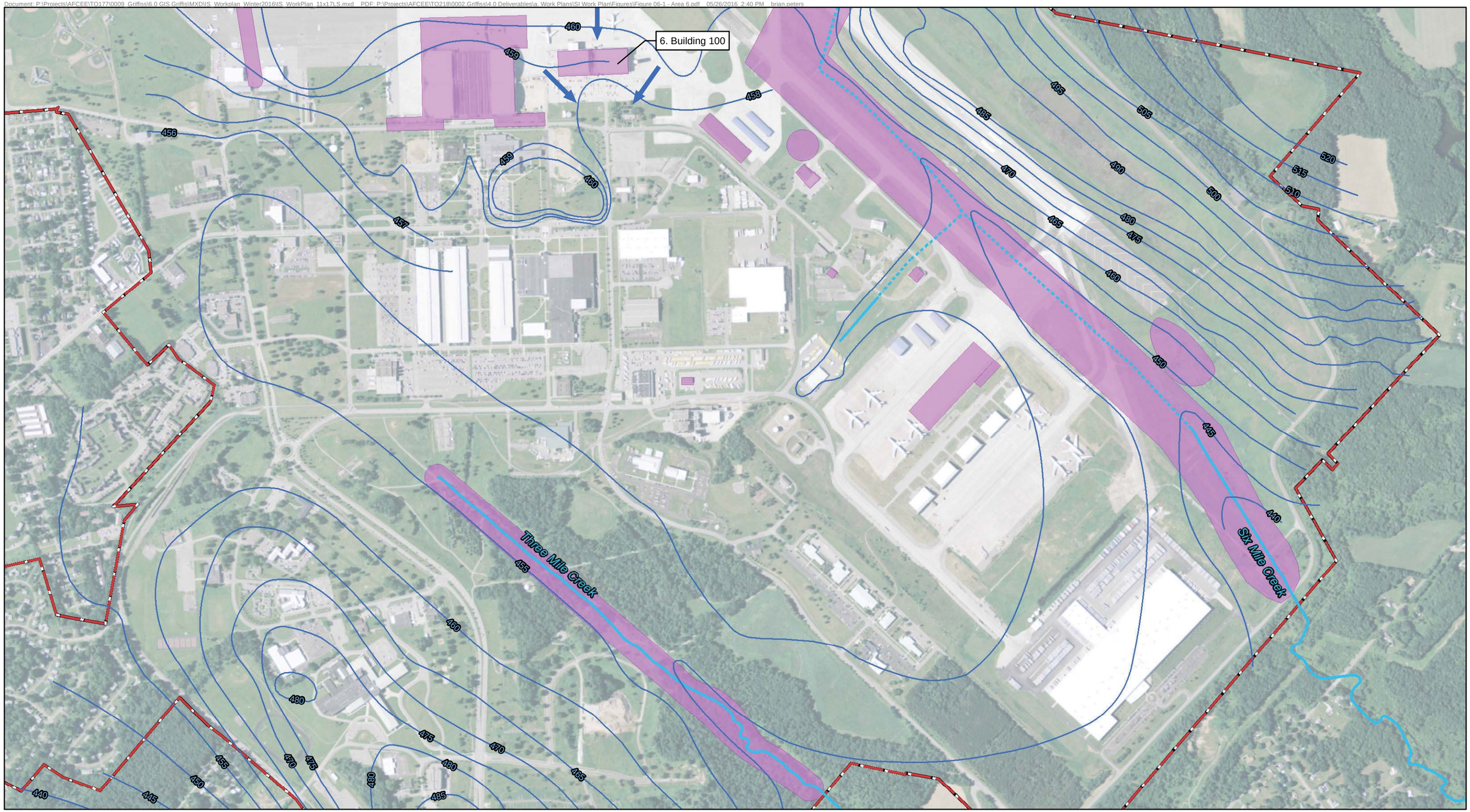

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 06-1
Potential AFFF Release Area
Area 06 - Building 100

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	

SYMBOL KEY

- Proposed Monitoring Well and Soil Boring
- Proposed Soil Boring
- Proposed Stormwater/Sediment Sample Location
- Approximate Groundwater Flow Direction
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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N

0 20 40 80 120 160 Meters
0 75 150 300 450 600 Feet

Figure 06-2
Proposed Sample Locations
Area 06 - Building 100

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: TDL	PROJ: 775290218	

QAPP Worksheet #18-06: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
6	SB/MW06001	GRIFS-SB06001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06001	GRIFS-SB06001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06001	GRIFS-SB06001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06001	GRIFS-MW06001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 06
6	SB/MW06002	GRIFS-SB06002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06002	GRIFS-SB06002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06002	GRIFS-SB06002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06002	GRIFS-MW06002-MMDDYY	Groundwater	TBD	TBD	Peristalti	New	Assess PFC presence in

QAPP Worksheet #18-06: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
						c		groundwater downgradient of Area 06
6	SB06003	GRIFS-SB06003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06003	GRIFS-SB06003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06004	GRIFS-SB06004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06004	GRIFS-SB06004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06004	GRIFS-SB06004-(3-5)FD	Soil	3	5	DPT	New	Field Duplicate
6	ST/SD06005	GRIFS-ST06005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
6	ST/SD06005	GRIFS-SD06005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
6	ST/SD06006	GRIFS-ST06006-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
6	ST/SD06006	GRIFS-ST06006-MMDDYYFD	Stormwater	NA	NA	Grab	New	Field Duplicate

QAPP Worksheet #18-06: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
6	ST/SD06006	GRIFS-ST06006-MMDDYYMS	Stormwater	NA	NA	Grab	New	Matrix Spike
6	ST/SD06006	GRIFS-ST06006-MMDDYYMSD	Stormwater	NA	NA	Grab	New	Matrix Spike Duplicate
6	ST/SD06006	GRIFS-SD06006-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
6	ST/SD06006	GRIFS-SD06006-MMDDYYFD	Sediment	0	1	Core sampler	New	Field Duplicate
6	ST/SD06006	GRIFS-SD06006-MMDDYYMS	Sediment	0	1	Core sampler	New	Matrix Spike
6	ST/SD06006	GRIFS-SD06006-MMDDYYMSD	Sediment	0	1	Core sampler	New	Matrix Spike Duplicate
6	ST/SD06007	GRIFS-ST06007-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
6	ST/SD06007	GRIFS-SD06007-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain

Notes:

ft. – feet
PFC – Perfluorinated Compound
MMDDYY – Month Day Year
TBD – To Be Determined
GRIFS – Installation Identification
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
MSD – Matrix Spike Duplicate
NA – Not Applicable
ID – Identification
MS – Matrix Spike

QAPP Worksheet #20-06: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	10	1	2	0	0	13
Groundwater	PFCs	2	0	0	0	0	2
Sediment	PFCs	3	1	1	0	2 (1 pair)	7
Stormwater	PFCs	3	1	0	0	2 (1 pair)	6
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**18**	**3**	**3**	**0**	**4 (2 pairs)**	**28**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.7 POTENTIAL AFFF RELEASE AREA 07: BUILDING 101

Area-specific worksheets and figures for potential AFFF Area 07 include:

- **Worksheet #10-07**: Preliminary CSM
- **Worksheet #17-07**: Sampling Design and Rationale
- **Figure 07-1**: Potential AFFF Release Area, Area 07 – Building 101
- **Figure 07-2**: Proposed Sample Locations, Area 07 – Building 101
- **Worksheet #18-07**: Sampling Locations and Methods
- **Worksheet #20-07**: Field QC Summary

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Worksheet #10-07
Preliminary Conceptual Site Model
Area #07: Building 101

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Former maintenance hangar • Operated 1980 to present • AFFF fire suppression system on site • Two 7,000 indoor AFFF ASTs • Two 500,000 gallon waste AFFF USTs	• Flat topography between approximately 470 and 475 ft. MSL • Building is surrounded by concrete apron with grassy areas 500 ft north, 100 ft south and 300 west of the building • Area 07 includes land areas within the Six Mile Creek, Mohawk River, and Three Mile Creek watersheds • The nearest surface water is culverted section of Six Mile Creek 2,500 ft northeast • Stormwater catch basins on each side of Building 101 • Catch basins on the north side of building direct storm water via drains to the Mohawk River, basins on the west and south side of the building drain to Three Mile Creek, and basins on the east side of the building drain to Six Mile Creek • Bedrock is Utica Shale at estimated depth of 40 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is estimated between 10 and 15 ft bgs • Groundwater flow is south	• Fire suppression system was reported to have been activated several times, resulting in AFFF flowing out the hangar doors on east and west side of building onto concrete apron and discharged to Six Mile Creek • Potential overland migration to storm drains and adjacent grassy areas • Potential migration through soil to groundwater • Potential transport in stormwater via storm drains to surface water • Potential groundwater migration to Three Mile Creek and Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 07 is currently owned by a private entity except for the southeast bay of Building 101 which has been retained by the USAF (Rome Laboratories) • The area is located in a commercial/industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 7; The NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system discharges to Mohawk River, Three Mile Creek and Six Mile Creek

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
AST – aboveground storage tank
bgs – below ground surface
ft - feet
PFC – perfluorinated compound
USAF – United States Air Force
UST – underground storage tank

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QAPP Worksheet #17-07: Sampling Design and Rationale

Area #07: Building 101

Condition 1: AFFF released from the fire suppression system on several occasions flowed out of the large bay doors on the east and west sides of building onto concrete aprons, reportedly into Six Mile Creek. These releases would have flowed into catch basins adjacent to the building. AFFF that did not flow into catch basins could have flowed east, west and north onto grassy areas beyond the concrete apron. It is unknown if the above releases or other incidental releases resulted in AFFF migrating south of the building.

Question(s) to be resolved by investigation: Are PFCs present in water or sediment collected in the stormwater catch basins adjacent to Building 101, or in shallow soils in grass-covered areas adjacent to the concrete apron?

> **Resulting Sampling Rationale:** Collect stormwater (if present) and sediment samples from receiving catch basins east, southwest and north of the building. Collect soil samples from two depths from borings at the edge of concrete in grassed areas east, west and north of the building to identify presence of PFCs in surface soil.

Condition 2: Waste AFFF reported to be stored in two 500,000 gallon USTs at the southwest and southeast corners of the building may have been released from the USTs into the surrounding soil and groundwater.

Question(s) to be resolved by investigation: Are PFCs present in the waste AFFF USTs? Have PFCs been released from the USTs into soil and groundwater adjacent to the waste AFFF USTs?

> **Resulting Sampling Rationale:** Collect a liquid sample directly from each waste AFFF UST through an existing tank port. Conduct geophysical surveys to delineate the footprint of the USTs beneath the ground surface. Based on results and using DPT, install soil borings on the two downgradient sides of each UST and collect soil samples at three depths at each location. Install a monitoring well with 10 ft well screen at each boring adjacent to each UST with the top of the screen two feet above the water table to allow collection of groundwater samples.

The location of Area #07 – Building 101 is shown in **Figure 07-1,** and proposed locations for stormwater, sediment, soil and groundwater and UST samples are shown on **Figure 07-2**. Explorations and media samples for Area #07 are summarized on **Worksheet 18-07**, and a field QC summary is included in **Worksheet 20-07.**

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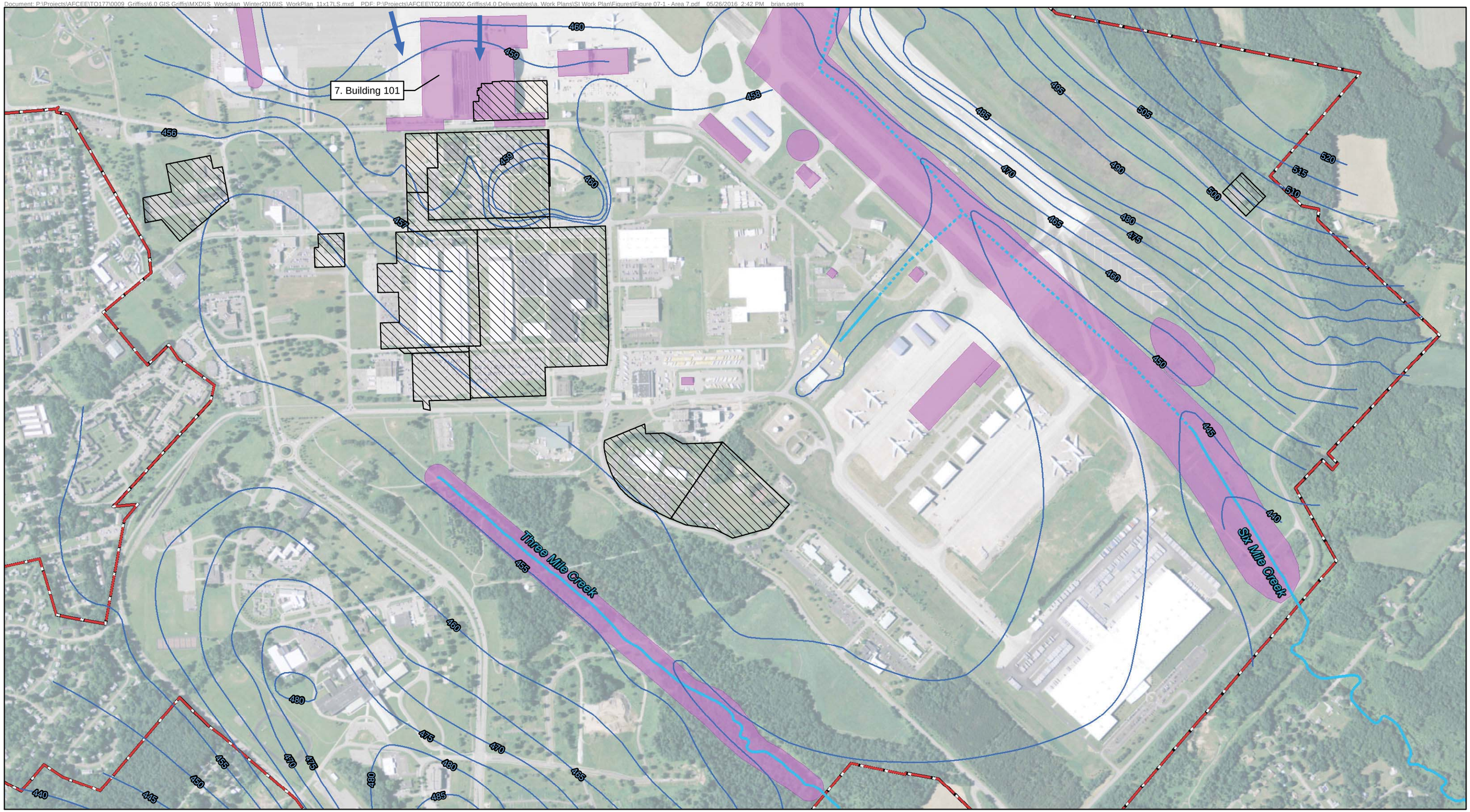

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Air Force Retained Property
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 07-1
Potential AFFF Release Area
Area 07 - Building 101

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	

SB07006
ST/SD07010
ST/SD07009
460
7. Building 101
459
SB07007
UST 101-3
Waste AFFF
500,000 gal
458
UST07012
SB/MW07002
ST/SD07011
SB/MW07001
457
ST/SD07008
SB07005
SB/MW07003
UST07013
SB/MW07004
UST 101-2
Waste AFFF
500,000 gal
459
459

SYMBOL KEY

- Proposed Monitoring Well and Soil Boring
- Proposed Soil Boring
- Proposed UST Sample Location
- Proposed Stormwater/Sediment Sample Location
- Air Force Retained Property
- Approximate UST Location
- Approximate UST Vault Location
- Approximate Groundwater Flow Direction
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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N

0 20 40 80 120 160 Meters
0 85 170 340 510 680 Feet

Figure 07-2
Proposed Sample Locations
Area 07 - Building 101
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: TDL	PROJ: 775290218	

QAPP Worksheet #18-07: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
7	SB/MW07001	GRIFS-SB07001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07001	GRIFS-SB07001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07001	GRIFS-SB07001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07001	GRIFS-MW07001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB/MW07002	GRIFS-SB07002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07002	GRIFS-SB07002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07002	GRIFS-SB07002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST

QAPP Worksheet #18-07: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
7	SB/MW07002	GRIFS-SB07002-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
7	SB/MW07002	GRIFS-SB07002-(WT)MS	Soil	TBD	TBD	DPT	New	Matrix Spike
7	SB/MW07002	GRIFS-SB07002-(WT)MSD	Soil	TBD	TBD	DPT	New	Matrix Spike Duplicate
7	SB/MW07002	GRIFS-MW07002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB/MW07003	GRIFS-SB07003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07003	GRIFS-SB07003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07003	GRIFS-SB07003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07003	GRIFS-MW07003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST

QAPP Worksheet #18-07: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
7	SB/MW07004	GRIFS-SB07004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07004	GRIFS-SB07004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07004	GRIFS-SB07004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07004	GRIFS-MW07004-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB07005	GRIFS-SB07005-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07005	GRIFS-SB07005-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07006	GRIFS-SB07006-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low spot in grass

QAPP Worksheet #18-07: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								area
7	SB07006	GRIFS-SB07006-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07006	GRIFS-SB07006-(3-5)FD	Soil	3	5	DPT	New	Field duplicate
7	SB07007	GRIFS-SB07007-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07007	GRIFS-SB07007-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low spot in grass area
7	ST/SD07008	GRIFS-SD07008-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07008	GRIFS-ST07008-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
7	ST/SD07009	GRIFS-SD07009-	Sediment	0	1	Core	New	Assess PFC

QAPP Worksheet #18-07: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		MMDDYY				sampler		presence in sediment in storm drain
7	ST/SD07009	GRIFS-ST07009-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
7	ST/SD07010	GRIFS-SD07010-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07010	GRIFS-ST07010-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
7	ST/SD07010	GRIFS-ST07010-MMDDYYFD	Stormwater	NA	NA	Grab	New	Field duplicate
7	ST/SD07011	GRIFS-SD07011-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07011	GRIFS-SD07011-MMDDYYFD	Sediment	0	1	Core sampler	New	Field Duplicate
7	ST/SD07011	GRIFS-ST07011-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain

QAPP Worksheet #18-07: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
7	UST07012	GRIFS-UST07012-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste UST
7	UST07013	GRIFS-UST07013-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste UST
7	UST07013	GRIFS-UST07013-MMDDYYFD	Aqueous	NA	NA	Grab	New	Field Duplicate
7	UST07013	GRIFS-UST07013-MMDDYYMS	Aqueous	NA	NA	Grab	New	Matrix Spike
7	UST07013	GRIFS-UST07013-MMDDYYMSD	Aqueous	NA	NA	Grab	New	Matrix Spike Duplicate

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
GRIFS – Installation Identification
NA – Not Applicable
ID – Identification
MS – Matrix Spike
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
UST – Underground Storage Tank
TBD – To Be Determined
WT – Water Table
PFC – Perfluorinated Compound

QAPP Worksheet #20-07: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	18	2	2	1	2 (1 pair)	5
Groundwater	PFCs	4	0	0	0	0	4
Sediment	PFCs	4	1	0	0	0	5
Stormwater	PFCs	4	1	0	0	0	5
Underground storage tanks	PFCs	2	1	0	0	2 (1 pair)	5
Grand Total		**32**	**5**	**2**	**0**	**4 (2 pairs)**	**44**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.8 POTENTIAL AFFF RELEASE AREA 08: FORMER BUILDING 150

Area-specific worksheets and figures for potential AFFF Area 08 include:

- **Worksheet #10-08**: Preliminary CSM
- **Worksheet #17-08**: Sampling Design and Rationale
- **Figure 08-1**: Potential AFFF Release Area, Area 08 – Former Building 150
- **Figure 08-2**: Proposed Sample Locations, Area 08 – Building 150
- **Worksheet #18-08**: Sampling Locations and Methods
- **Worksheet #20-08**: Field QC Summary

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Worksheet #10-08

Preliminary Conceptual Site Model

Area #08: Former Building 150, Former Fighter Alert Hanger

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Former aircraft storage area • Operated until 1995 • AFFF was stored in containers in Building 150 • Building 150 demolished in 2007 • Soil and groundwater remediation conducted in 2009/2010 for petroleum contamination; soil remediation for petroleum included soil excavation and sorting, on-site re-use for backfill of excavation for material meeting NYSDEC requirements, and offsite disposal of material at the Oneida-Herkimer Waste Authority facility. Groundwater treatment included oxidation of groundwater in open pit excavation and ground injection through Geoprobe borings	• Flat topography at approximately 470 ft. MSL • Currently grassy area in location of former building with concrete apron to northeast and north • Nearest surface water is culverted section of Six Mile Creek 1,000 ft northeast • Stormwater catch basins on southwest side of former building which discharge southwest to open drainage ditch which flows to culverted section of Rainbow Creek which discharges to Six Mile Creek • Area 08 is located in the Six Mile Creek watershed • Bedrock is Utica Shale at estimated depth of 25 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is 12 and 15 ft bgs • Groundwater flow is south toward Rainbow Creek	• No documented PFC releases at Area 08, though petroleum contamination was found and remediated • Storage and handling practices over time could have resulted in releases to the building floor or surrounding grounds • Potential migration through soil to groundwater for any release • Potential transport by stormwater to drainage ditch • Potential groundwater migration to Rainbow Creek and Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 08 is currently part of the Griffiss International Airport • The area is located in a commercial/industrial section of the airport • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 8; the NYSDEC Environmental Resource Mapper presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system and discharged to Rainbow Creek and in turn to Six Mile Creek east of building

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-08: Sampling Design and Rationale

Area #08: Former Building 150

Condition 1: AFFF was reportedly stored in Building 150.

There were no documented releases. Undocumented releases from handling associated with AFFF container storage may have resulted in PFC discharges on the building floor or outside the building and could potentially have migrated through soils and impacted shallow groundwater.

Question(s) to be resolved by investigation: Are PFCs present in groundwater on the downgradient side of Former Building 150?

> **Resulting Sampling Rationale:** Based on the absence of documented releases or bulk storage tanks or a fire suppression system, and numerous surface water and sediment samples being collected at other downgradient AFFF areas, confirmation groundwater sampling will be used to identify whether significant releases have occurred at Area #08. Three monitoring wells will be installed downgradient of Area #08. Soil samples will be collected only for geologic classification; at each location a monitoring well with a 10 ft well screen will be installed with the top of the screen 2 ft above the water table to allow collection of groundwater samples.

The location of Area #08 – Building 150 is shown in **Figure 08-1,** and proposed locations for groundwater samples are shown on **Figure 08-2**. Explorations and media samples for Area #08 are summarized on **Worksheet 18-08**, and a field QC summary is included in **Worksheet 20-08.**

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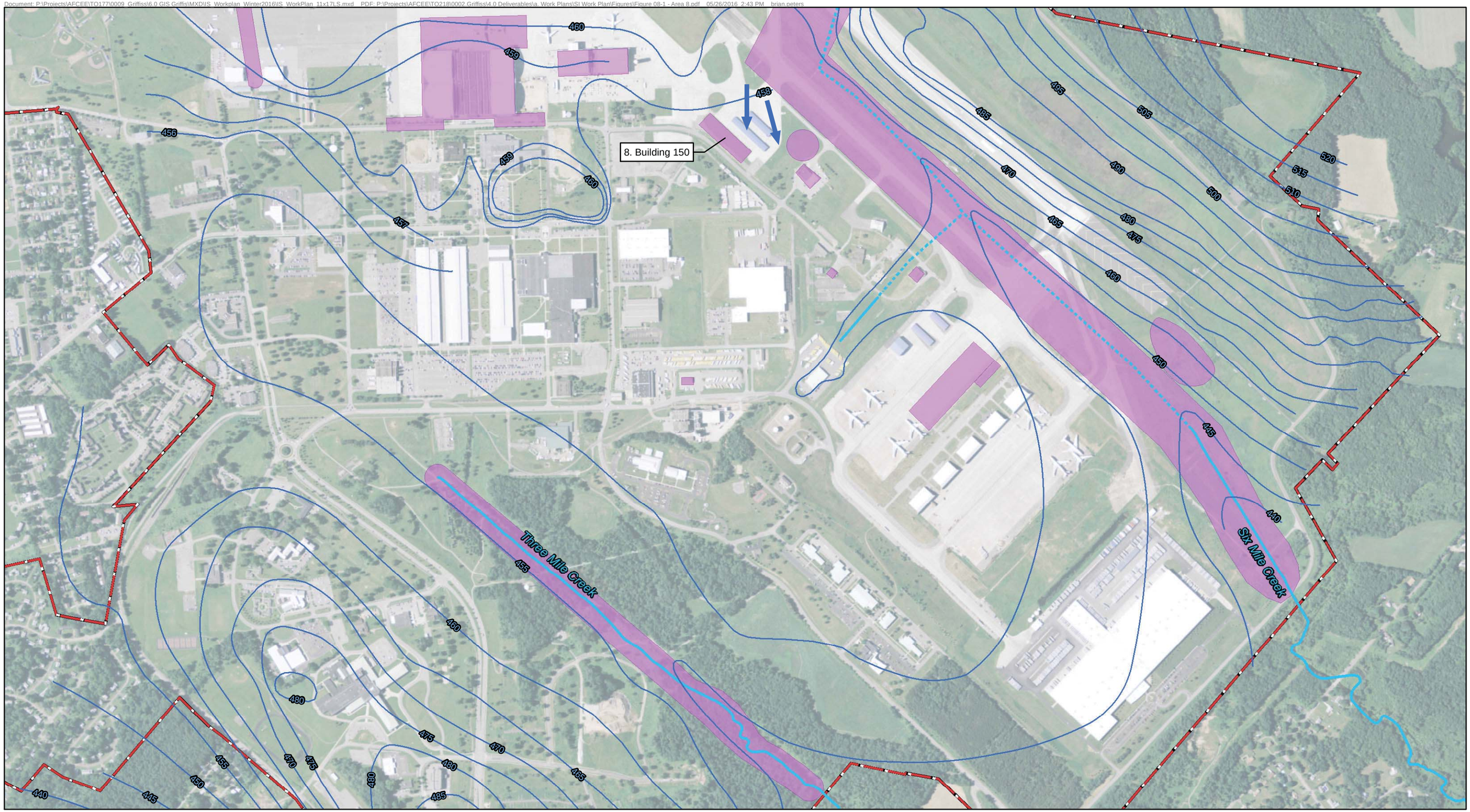

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 08-1
Potential AFFF Release Area
Area 08 - Building 150

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	

SYMBOL KEY

- Proposed Monitoring Well
- Approximate Groundwater Flow Direction, 2010 Building 150 Site IRA Report
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Potential AFFF Release Area
- Fence
- Buried Gas Line in Trench
- Storm Sewer
- Catch Basin

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N

0 10 20 40 60 80 Meters
0 35 70 140 210 280 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

Figure 08-2
Proposed Sample Locations
Area 08 - Building 150
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: TDL	PROJ: 775290218	

QAPP Worksheet #18-08: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
8	MW08001	GRIFS-MW08001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 08
8	MW08002	GRIFS-MW08002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 08
8	MW08003	GRIFS-MW08003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 08

Notes:
ft. – feet
bgs - below ground surface
ID – Identification
MMDDYY – Month Day Year
GRIFS – Installation Identification
PFC – Perfluorinated Compound
TBD – To Be Determined

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QAPP Worksheet #20-08: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	0	0	0	0	0	0
Groundwater	PFCs	3	0	0	0	0	3
Sediment	PFCs	0	0	0	0	0	0
Stormwater	PFCs	0	0	0	0	0	0
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**3**	**0**	**0**	**0**	**0**	**3**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.9 POTENTIAL AFFF RELEASE AREA 09: BUILDING 917 AND AFFF LAGOON

Area-specific worksheets and figures for potential AFFF Area 09 include:

- **Worksheet #10-09**: Preliminary CSM
- **Worksheet #17-09**: Sampling Design and Rationale
- **Figure 09-1**: Potential AFFF Release Area, Area 09 – Building 917 and AFFF Lagoon
- **Figure 09-2**: Proposed Sample Locations, Area 09 – Building 917 and AFFF Lagoon
- **Worksheet #18-09**: Sampling Locations and Methods
- **Worksheet #20-09**: Field QC Summary

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Worksheet #10-09
Preliminary Conceptual Site Model
Area #09: Building 917 and AFFF Lagoon

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Former missile assembly shop located east of runway and Six Mile Creek; Building 917 is currently used for storage • Former AFFF fire suppression system operated beginning in 1982 • Former 1,400 AFFF AST located in east corner of Building 917 • September 2015 site visit indicated AFFF ceiling piping had been terminated in mechanical room and AFFF tank had been removed • AFFF Lagoon located 700 ft southwest of, and connected to, Building 917 via drain designed to contain AFFF if released from the building • Septic system located on northwest side of Building 917 historically connected to floor drains	• Topography slopes gently to the southwest, ground elevation ranges between 530 ft. MSL at Building 917 to less than 400 ft. MSL at Six Mile Creek • Area surrounding Building 917 is mostly unpaved, grassy, with paved areas on the north, east and south sides of the building for vehicle access; there is no developed land use adjacent to the lagoon; at time of visit in September 2015, there was less than 1' of water in lagoon • Nearest surface water is a small tributary to Six Mile Creek 800 ft southwest of building which converges with Six Mile Creek 1,300 ft southwest of building • Area 09 is located in the Six Mile Creek watershed • Bedrock is Utica Shale at estimated depth of 30 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is 5 to 10 ft bgs near Building 917 and 0 to 1 ft bgs near Six Mile Creek • Groundwater flow is southwest toward Six Mile Creek	• Potential release of AFFF from the fire suppression system at Area 09 • Potential for transfer to AFFF Lagoon via storm drain • Potential migration into on-site septic system • Potential impacts to surface water and sediment in AFFF Lagoon • Potential infiltration to soil and groundwater from AFFF Lagoon • Potential groundwater migration to Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 09 is owned by Oneida County Industrial Development Agency • Area 09 is currently part of the Griffiss Business and Technology Park • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater .	• The area is located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped over a majority of the installation, including Area 9; the NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively; Resource Mapper also indicates that AFFF lagoon is within 100 feet of a wetland check zone (only existing wells will be sampled within this zone) • Surface flow captured by stormwater system and discharged to Six Mile Creek to southwest of building. Groundwater flow and discharge to Six Mile Creek

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-09: Sampling Design and Rationale

Area #09: Building 917 and AFFF Lagoon

Condition 1: Building 917 maintained a fire suppression system containing AFFF.

Documentation is not clear that there was a release of AFFF. Undocumented releases of AFFF would have flowed to floor drains which were piped to the septic system on the northwest side of the building. Valving also allowed this material to be diverted to an AFFF Lagoon located southwest of the building where AFFF would have collected and infiltrated the soils to the shallow groundwater.

Question(s) to be resolved by investigation: Are PFCs present in shallow groundwater downgradient of the septic system on the northwest side of the building?

> **Resulting Sampling Rationale:** Install a monitoring well with a 10-foot screen that intercepts the water table on the southwest (downgradient) side of the septic system leach fields, and install a monitoring well on the downgradient side of the septic tanks; these wells will serve to identify the presence or absence of PFCs in groundwater downgradient of the septic system.

Condition 2: Floor drains inside Building 917, which contains an AFFF fire suppression system, drain to a lagoon located southwest of the building.

Question(s) to be resolved by investigation: Are PFCs present in surface water, sediment or groundwater downgradient of the AFFF lagoon?

> **Resulting Sampling Rationale:** Collect samples of surface water and sediment (if present) from the bottom of the AFFF lagoon to identify whether PFCs are present in these media. Collect groundwater samples from two existing monitoring wells; one on the downgradient side of the lagoon and the second further downgradient and southwest of Perimeter Road. Collect a surface water and sediment sample in the drainage ditch on the north side of the Perimeter Road which receives seepage from the lagoon.

The location of Area 09-Building 917 is shown in **Figure 09-1**, and proposed locations for groundwater, stormwater and sediment samples are shown on **Figure 09-2**. Explorations and media samples for Area 01 are summarized on **Worksheet 18-09**, and a field QC summary is included in **Worksheet 20-09.**

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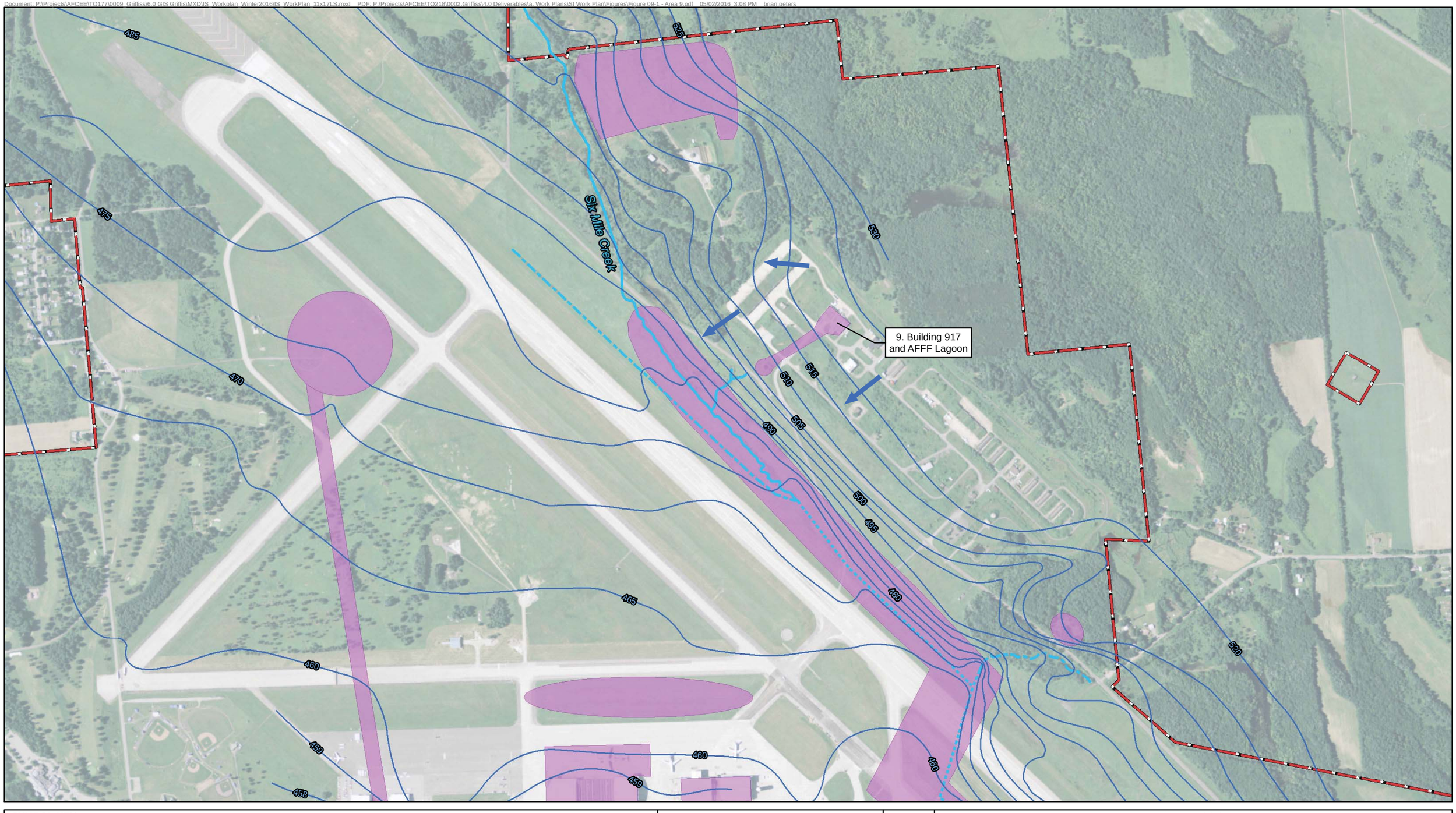

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 09-1
Potential AFFF Release Area
Area 09 - Building 917 and AFFF Lagoon

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/2/2016	Rev:	IS_WorkPlan_11x17LS	
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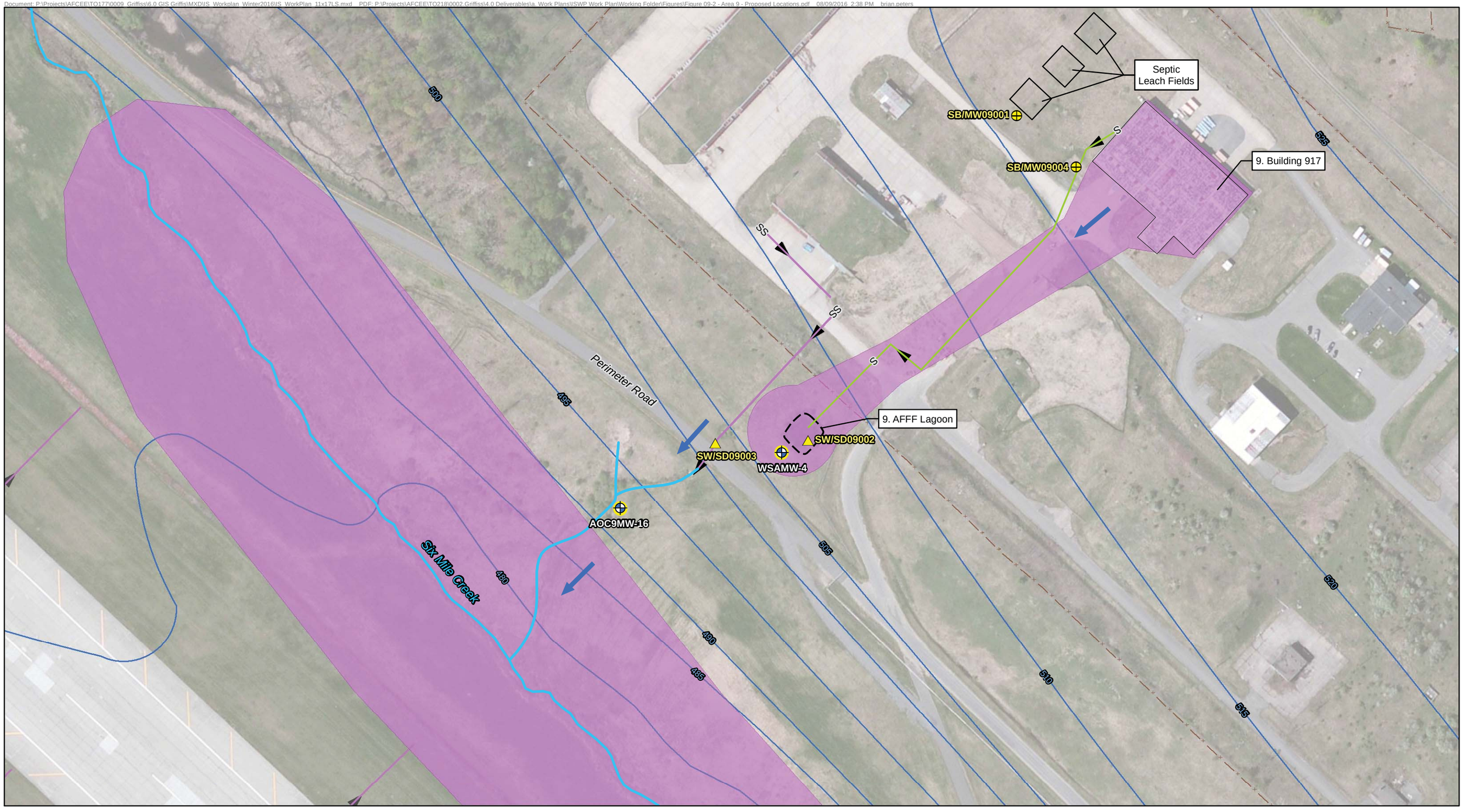

SYMBOL KEY

- Proposed Surface Water/Sediment Sample Location
- Proposed Monitoring Well and Soil Boring
- Existing Monitoring Well to be Sampled
- Approximate Groundwater Flow Direction, AOC 9 2014 LTM Report
- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- S — Approx. AOC 9 Sanitary Sewer Line to Former AFFF Lagoon
- SS — Approx. AOC 9 Storm Sewer Culvert
- Stream/Surface Drainage
- Potential AFFF Release Area
- Fence
- Storm Sewer

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N

0 20 40 80 120 160 Meters
0 75 150 300 450 600 Feet

Figure 09-2
Proposed Sample Locations
Area 09 - Building 917 and AFFF Lagoon
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
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QAPP Worksheet #18-09: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
9	SB/MW09001	GRIFS-SB09001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of leach fields
9	SB/MW09001	GRIFS-SB09001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of leach fields
9	SB/MW09001	GRIFS-SB09001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of leach fields
9	SB/MW09001	GRIFS-MW09001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of leach fields
9	SW/SD09002	GRIFS-SW09002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in the Former Lagoon
9	SW/SD09002	GRIFS-SD09002-MMDDYY	Sediment	NA	NA	Grab	New	Assess PFC presence in sediment in the Former Lagoon
9	SW/SD09003	GRIFS-SW09003-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downgradient from Area 09
9	SW/SD09003	GRIFS-SD09003-MMDDYY	Sediment	NA	NA	Grab	New	Assess PFC presence in sediment downgradient from Area 09
9	SB/MW09004	GRIFS-SB09004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of septic tank
9	SB/MW09004	GRIFS-SB09004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of septic tank
9	SB/MW09004	GRIFS-SB09004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of septic tank

QAPP Worksheet #18-09: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
9	SB/MW09004	GRIFS-MW09004-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of septic tank
9	WSAMW-4	GRIFS-WSAMW-4-MMDDYY	Groundwater	7.1	17.1	Peristaltic	Existing	Assess PFC presence in groundwater downgradient of Area 09
9	AOC9MW-16	GRIFS-AOC9MW-16-MMDDYY	Groundwater	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient of Area 09

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
TBD – To Be Determined
NA – Not Applicable
ID – Identification
WT – Water Table
MMDDYY – Month Day Year
GRIFS – Installation Identification
PFC – Perfluorinated Compound

QAPP Worksheet #20-09: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	6	0	1	1	0	8
Groundwater	PFCs	4	0	0	0	0	4
Sediment	PFCs	2	0	0	0	0	2
Surface Water	PFCs	2	0	0	0	0	2
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**14**	**0**	**1**	**0**	**0**	**16**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.10 POTENTIAL AFFF RELEASE AREA 10: SUSPECT FTA, FT-48

Area-specific worksheets and figures for potential AFFF Area 10 include:

- **Worksheet #10-10**: Preliminary CSM
- **Worksheet #17-10**: Sampling Design and Rationale
- **Figure 10-1**: Potential AFFF Release Area, Area 10 – Suspect FTA, FT-48
- **Figure 10-2**: Proposed Sample Locations, Area 10 – Suspect FTA, FT-48
- **Worksheet #18-10**: Sampling Locations and Methods
- **Worksheet #20-10**: Field QC Summary

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Worksheet #10-10
Preliminary Conceptual Site Model
Area #10: Suspect FTA (FT-48)

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Located on high ground along eastern installation boundary • Reportedly used by Griffiss AFB firefighters to conduct fire training • Operated from unknown starting date until 1973 or 1974	• Located on small topographic high east of Perimeter Road, approximate elevation 530 ft. MSL • Area is wooded with a grassy clearing and ditch on the southwest side of the area • Nearest surface water is a small tributary to Six Mile Creek 100 ft southwest of area which joins Six Mile Creek 900 ft to the southwest. • Area 10 is located in the Six Mile Creek watershed • Bedrock is Utica Shale at estimated depth of 45 ft bgs. • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 15 ft bgs • Groundwater flow is southwest toward Six Mile Creek	• No documented release of AFFF but historic releases are possible because the area was used for fire training exercises. Low levels of petroleum, VOCs and SVOCs were detected in monitoring wells installed at this area in the 1990s. • Potential for overland runoff to surface water • Potential for impacts to soil and groundwater • Potential groundwater migration to Six Mile Creek and tributary	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 10 is owned by Oneida County Industrial Development Agency • Area 10 is currently part of the Griffiss Business and Technology Park • area is vacant with open grassed area in the middle and a mix of smaller and mature trees around the perimeter • Potential receptors include ground maintenance workers, utility workers, construction workers, and trespassers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area. • Rare plants and animals have been mapped over a majority of the installation, including Area 10; the NYSDEC Environmental Resource Mapper website presents generalized data only, but shows the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively. • Overland runoff to tributary to Six Mile Creek to southwest of Area

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-10: Sampling Design and Rationale

Area #10: Suspect FTA

Condition 1: The area was used for fire training exercises.

There was no documented use of AFFF at Area #10, but AFFF use is possible because area was used for fire training. If applied to the ground surface during periodic fire training exercises, AFFF may have infiltrated soils and impacted the groundwater beneath the area.

Question(s) to be resolved by investigation: Are PFCs present in the soils and/or groundwater beneath Area 10?

> **Resulting Sampling Rationale:** Install three soil borings within Area 10, collecting soil samples at three depths at each location (0-1 ft bgs; 3-5 ft bgs; and just above the water table) to determine if PFCs are present in area soils. Install a monitoring well with a 10 foot well screen at each boring with the top of the screen two feet above the water table to allow collection of groundwater samples.

Condition 2: Surface water flows southwest from the fire training area into a ditch and toward a tributary to Six Mile Creek.

Question(s) to be resolved by investigation: Are PFCs present in surface water and/or sediment downgradient of Area 10?

> **Resulting Sampling Rationale:** Collect surface water and sediment samples from one location downgradient of Area 10 to confirm whether PFCs are present in these media.

The location of Area #10 – Suspect FTA is shown in **Figure 10-1,** and proposed locations for soil, groundwater, surface water and sediment samples are shown on **Figure 10-2**. Explorations and media samples for Area #10 are summarized on **Worksheet 18-10**, and a field QC summary is included in **Worksheet 20-10.**

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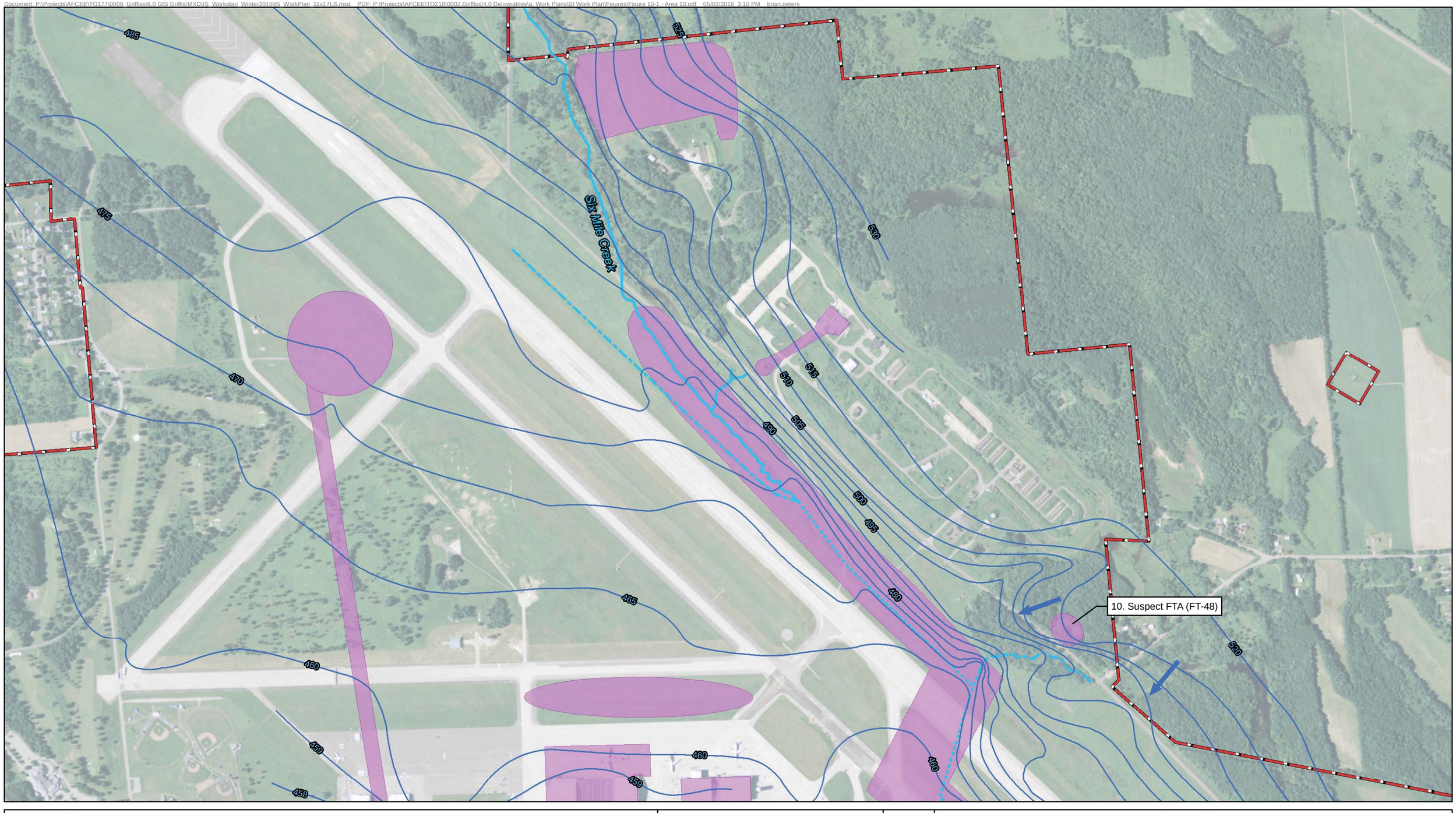

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 10-1
Potential AFFF Release Area
Area 10 - Suspect FTA (FT-48)
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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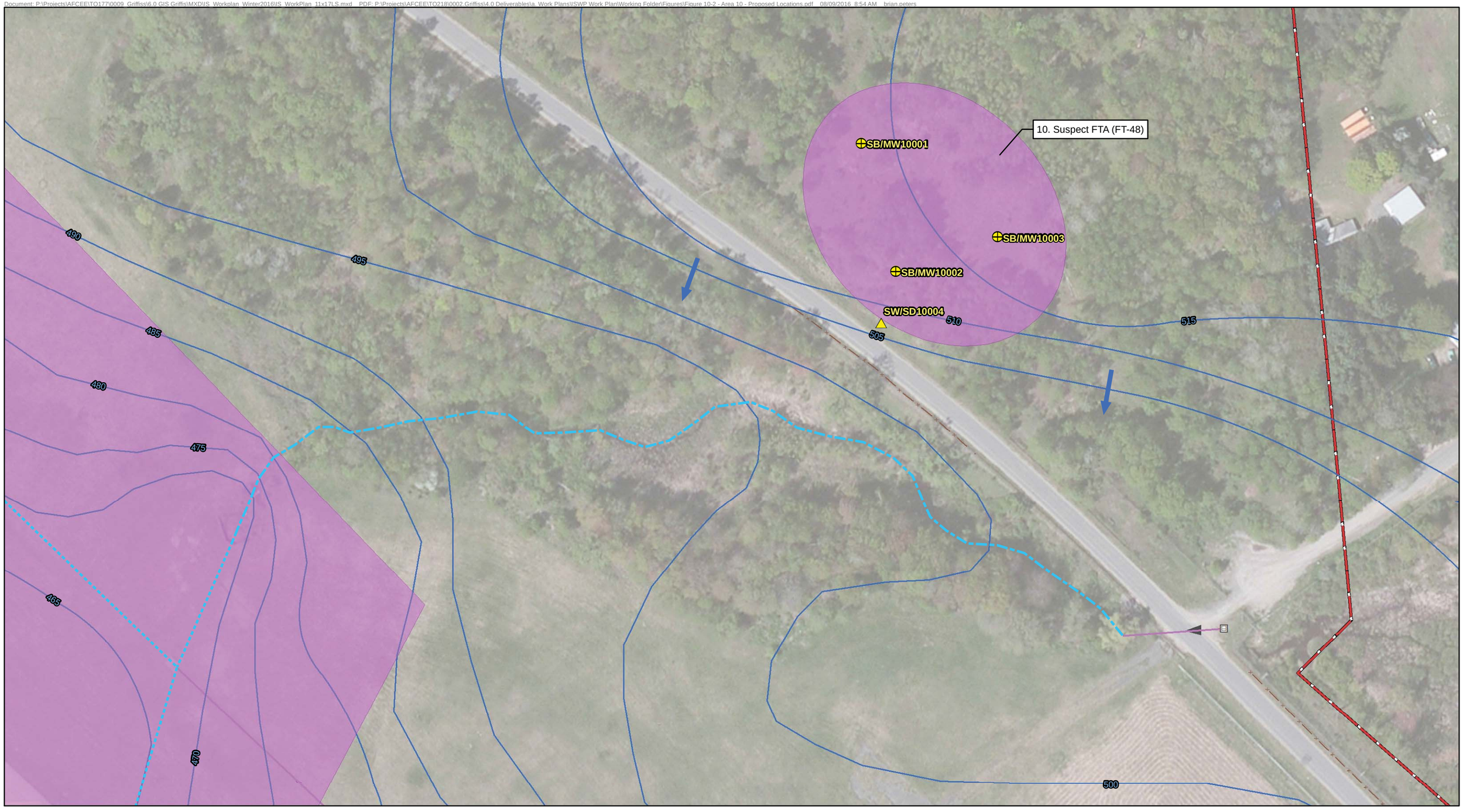

SYMBOL KEY

- Proposed Monitoring Well and Soil Boring
- Proposed Surface Water/Sediment Sample Location
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Former Installation Boundary

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N

0 10 20 40 60 80 Meters
0 50 100 200 300 400 Feet

Figure 10-2
Proposed Sample Locations
Area 10 - Suspect FTA (FT-48)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
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QAPP Worksheet #18-10: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
10	SB/MW10001	GRIFS-SB10001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10001	GRIFS-SB10001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10001	GRIFS-SB10001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10001	GRIFS-MW10001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in Area 10 groundwater
10	SB/MW10002	GRIFS-SB10002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10002	GRIFS-SB10002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10002	GRIFS-SB10002-(3-5)FD	Soil	3	5	DPT	New	Field Duplicate
10	SB/MW10002	GRIFS-SB10002-(3-5)MS	Soil	3	5	DPT	New	Matrix Spike
10	SB/MW10002	GRIFS-SB10002-(3-5)MSD	Soil	3	5	DPT	New	Matrix Spike Duplicate

QAPP Worksheet #18-10: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
10	SB/MW10002	GRIFS-SB10002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10002	GRIFS-MW10002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in Area 10 groundwater
10	SB/MW10003	GRIFS-SB10003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10003	GRIFS-SB10003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10003	GRIFS-SB10003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10003	GRIFS-MW10003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in Area 10 groundwater
10	SW/SD10004	GRIFS-SD10004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in ditch downgradient of Area 10

QAPP Worksheet #18-10: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
10	SW/SD10004	GRIFS-SW10004-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in ditch downgradient of Area 10

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
GRIFS – Installation Identification
NA – Not Applicable
ID – Identification
MS – Matrix Spike
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
TBD – To Be Determined
WT – Water Table
PFC – Perfluorinated Compound

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QAPP Worksheet #20-10: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	9	1	1	0	2 (1 pair)	13
Groundwater	PFCs	3	0	0	0	0	3
Sediment	PFCs	1	0	0	0	0	1
Surface Water	PFCs	1	0	0	0	0	1
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**14**	**1**	**1**	**0**	**2 (1 pair)**	**18**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.11 POTENTIAL AFFF RELEASE AREA 11: FIRE DEMONSTRATION AREA

Area-specific worksheets and figures for potential AFFF Area 11 include:

- **Worksheet #10-11**: Preliminary CSM
- **Worksheet #17-11**: Sampling Design and Rationale
- **Figure 11-1**: Potential AFFF Release Area, Area 11 – Fire Demonstration Area
- **Figure 11-2**: Proposed Sample Locations, Area 11 – Fire Demonstration Area
- **Worksheet #18-11**: Sampling Locations and Methods
- **Worksheet #20-11**: Field QC Summary

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Worksheet #10-11
Preliminary Conceptual Site Model
Area #11: Fire Demonstration Area

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile
• Located on the grass apron north of Building 100 and Building 101 and south of the airfield taxiway • Used for demonstrating to the public how to extinguish aircraft fuel fires • Operated from 1974 to 1982 • A metal trough was used to hold the fuels that were burned which was removed in 1992	• Flat grassy area approximately 2000 ft by 400 ft at elevations ranging between 475 ft and 480 ft. MSL • Concrete areas located on each side of Area 11 • Nearest surface water is a culverted section of Six Mile Creek 1,500 ft northeast • Area 11 is located in the Mohawk River watershed • A small portion on the east end is located in the Six Mile Creek watershed • Stormwater catch basis are located within Area 11 and drain via storm drains to the Mohawk River • Bedrock is Utica Shale at estimated depth of 30 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 10 to 15 ft bgs • Groundwater flow is south to Three Mile Creek	• Fire demonstration was conducted with water; however, AFFF may have been used • Potential direct discharge into storm drains • Potential for impacts to soil and groundwater • Potential groundwater migration to Three Mile Creek • Site Closure was achieved for the FDA (IRP ID #SS024) in March 2016	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 11 is currently part of the Griffiss International Airport • The area is located in a commercial/industrial section of the airport, within the airfield, between aircraft parking and the taxi way • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • The NYSDEC Environmental Resource Mapper website indicates Rare Plants and Animals are mapped over a majority of the installation including at Area 11 (Fire Demonstration Area). The website indicates the mapped areas are generalized but show the vicinity of confirmed observations of rare plants and animals since 1980 and 1970, respectively • Surface flow captured by stormwater system and discharged to Mohawk River

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-11: Sampling Design and Rationale

Area #11: Fire Demonstration Area (FDA)

Condition 1: Fires were extinguished during public demonstrations.

AFFF may have been used to extinguish fires at the fire demonstration area. If AFFF was used, soil and groundwater at Area #11 could be impacted with PFCs.

Question(s) to be resolved by investigation: Are PFCs present in soils and/or groundwater beneath Area 11?

> **Resulting Sampling Rationale:** Install three soil borings within Area 11, collecting soil samples from three depths at each location (0-1 ft bgs; 3-5 ft bgs; and just above the water table) to determine if PFCs are present in area soils. Install a monitoring well at each boring with a 10 ft well screen with the top of the screen 2 ft above the water table to allow collection of groundwater samples and determination if PFCs are present in groundwater.

Condition 2: Surface water from the fire demonstration area is captured by a series of catch basins along the northerly and southerly sides of the grassed area of the FDA. The catch basins route flow via storm drains to the Mohawk River.

Question(s) to be resolved by investigation: Are PFCs present in stormwater and/or sediment in catch basins within or downgradient of Area 11?

> **Resulting Sampling Rationale:** Collect surface water and sediment samples from catch basins at the northeast and southwest ends of the grassy area of the FDA to confirm whether PFCs are present in these media.

The location of Area #11 – Fire Demonstration Area is shown in **Figure 11-1,** and proposed locations for soil, groundwater, surface water and sediment samples are shown on **Figure 11-2**. Explorations and media samples for Area #11 are summarized on **Worksheet 18-11**, and a field QC summary is included in **Worksheet 20-11.**

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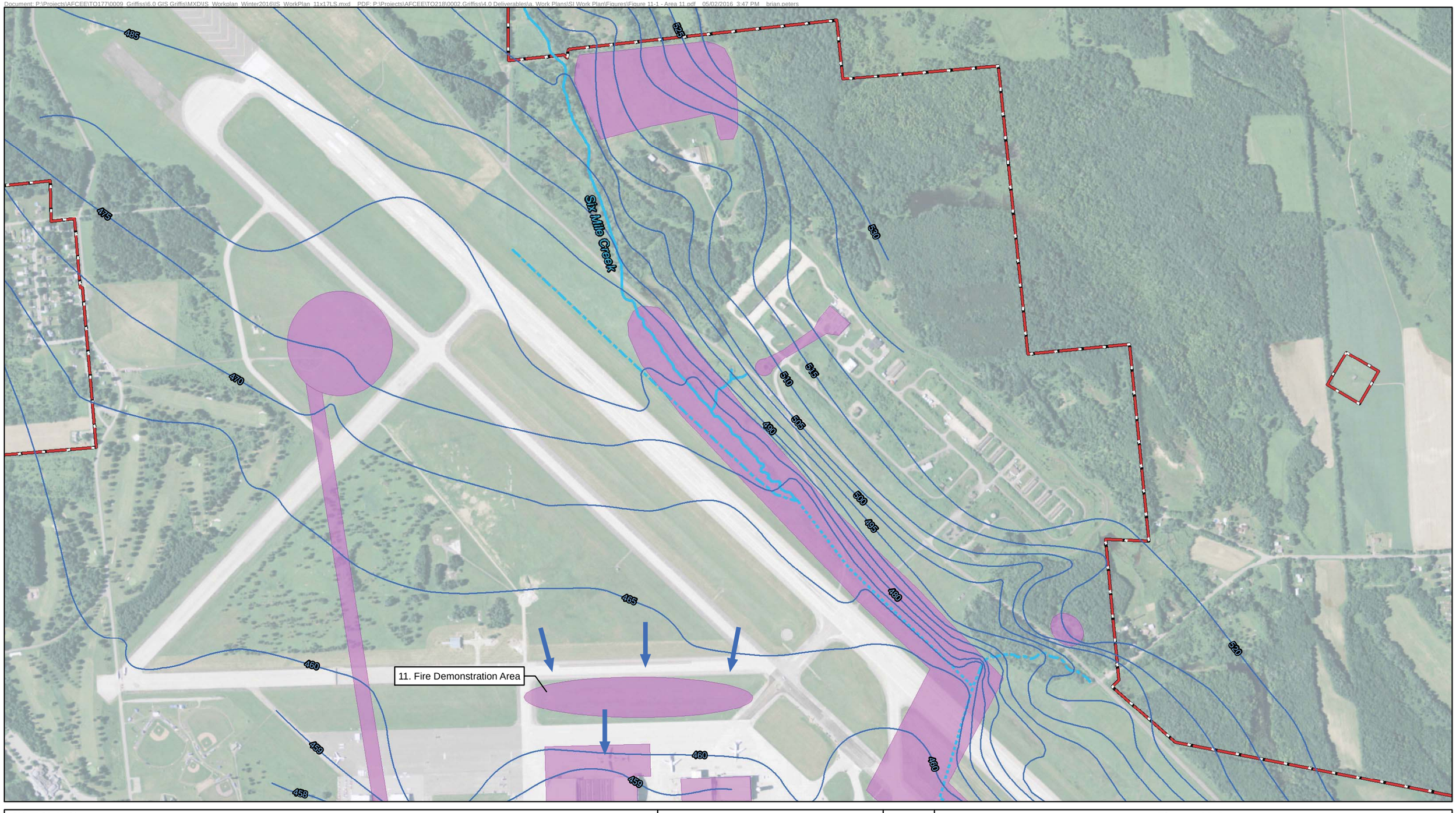

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

Figure 11-1
Potential AFFF Release Area
Area 11 - Fire Demonstration Area
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

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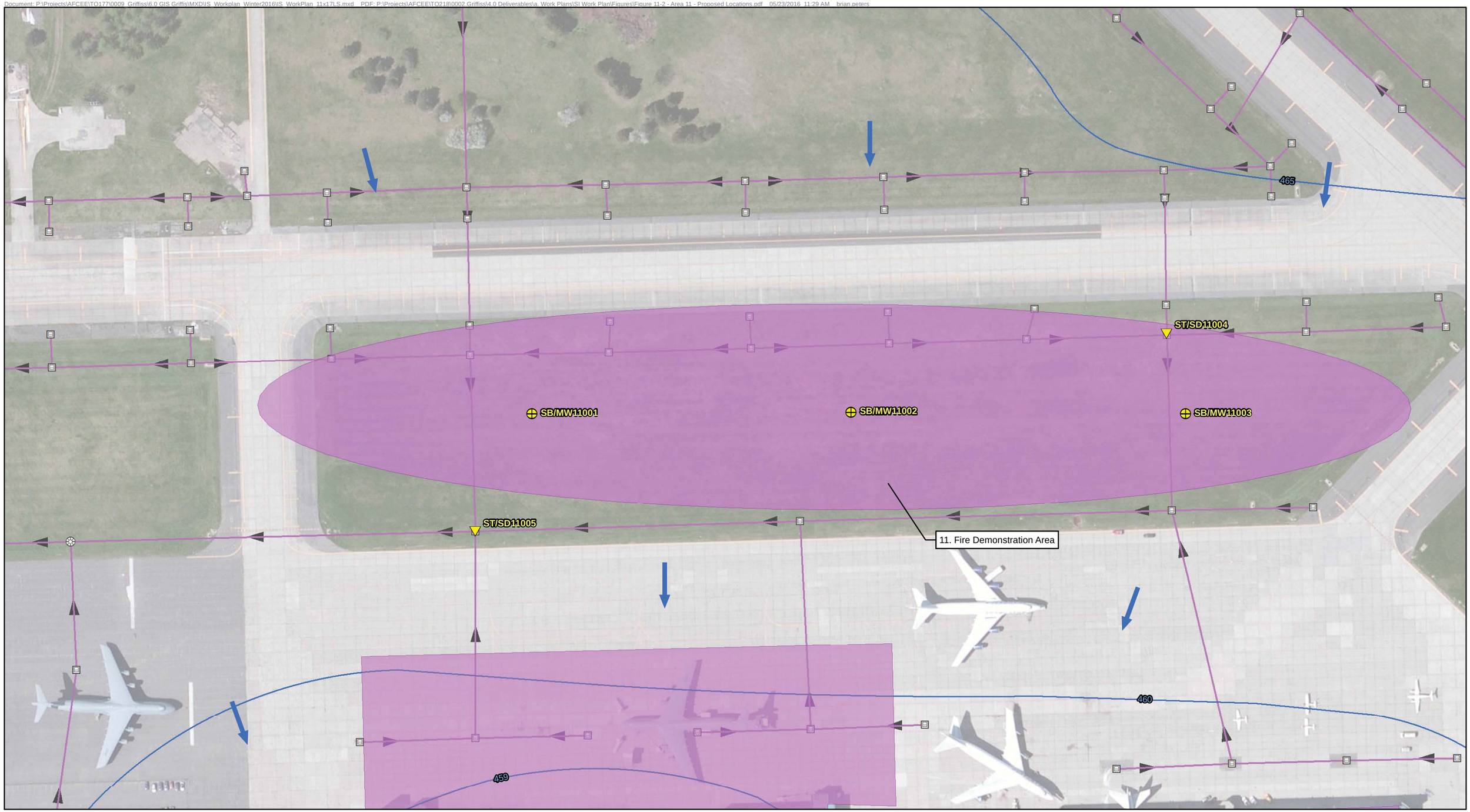

SYMBOL KEY

- Proposed Monitoring Well and Soil Boring
- Proposed Stormwater/Sediment Sample Location
- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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N

0 20 40 80 120 160 Meters
0 80 160 320 480 640 Feet

Figure 11-2
Proposed Sample Locations
Area 11 - Fire Demonstration Area

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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QAPP Worksheet #18-11: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
11	SB/MW11001	GRIFS-SB11001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
11	SB/MW11001	GRIFS-SB11001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
11	SB/MW11001	GRIFS-SB11001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
11	SB/MW11001	GRIFS-MW11001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
11	SB/MW11002	GRIFS-SB11002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
11	SB/MW11002	GRIFS-SB11002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
11	SB/MW11002	GRIFS-SB11002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
11	SB/MW11002	GRIFS-MW11002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
11	SB/MW11003	GRIFS-SB11003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
11	SB/MW11003	GRIFS-SB11003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils

QAPP Worksheet #18-11: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
11	SB/MW11003	GRIFS-SB11003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
11	SB/MW11003	GRIFS-SB11003-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
11	SB/MW11003	GRIFS-SB11003-(WT)MS	Soil	TDD	TBD	DPT	New	Matrix Spike
11	SB/MW11003	GRIFS-SB11003-(WT)MSD	Soil	TBD	TBD	DPT	New	Matrix Spike Duplicate
11	SB/MW11003	GRIFS-MW11003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
11	ST/SD11004	GRIFS-SD11004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain system
11	ST/SD11004	GRIFS-ST11004-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain system
11	ST/SD11005	GRIFS-SD11005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain system
11	ST/SD11005	GRIFS-ST11005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain system

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
GRIFS – Installation Identification
NA – Not Applicable
ID – Identification
MS – Matrix Spike
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
TBD – To Be Determined
WT – Water Table
PFC – Perfluorinated Compound

QAPP Worksheet #20-11: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	9	1	1	0	2 (1 Pair)	13
Groundwater	PFCs	3	0	0	0	0	3
Sediment	PFCs	2	0	0	0	0	2
Stormwater	PFCs	2	0	0	0	0	2
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**16**	**1**	**1**	**0**	**2 (1 pair)**	**20**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.12 POTENTIAL AFFF RELEASE AREA 12 & 13: APRON 1 (AREA 12) AND NOSE DOCK 1 AND 2 AND APRON 1 TRENCH (AREA 13)

Area-specific worksheets and figures for potential AFFF Area 12 & 13 include:

- **Worksheet #10-12&13**: Preliminary CSM
- **Worksheet #17-12&13**: Sampling Design and Rationale
- **Figure 12/13-1**: Potential AFFF Release Area, Areas 12 (Apron 1) and 13 (Nose Dock 1 and 2 and Apron 1 Trench)
- **Figure 12/13-2**: Proposed Sample Locations, Areas 12 (Apron 1) and 13 (Nose Dock 1 and 2 and Apron 1 Trench)
- **Worksheet #18-12&13**: Sampling Locations and Methods
- **Worksheet #20-12&13**: Field QC Summary

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Worksheet #10-12&13
Preliminary Conceptual Site Model
Area #1213: Apron 1 (Area 12) and Nose Dock 1 and 2 and Apron 1 Trench (Area 13)

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile
• Areas 12 and 13 are located near south end of airfield southwest of the runway • Aircraft fire in 1977 in Apron 1 (Area 12) • "Trench Fire" occurred in 1990 associated with utility excavation near Nose Dock 1 • Prior VOC soil and groundwater remediation in these Areas, NFA ROD in 2011 and NYSDEC petroleum spill closure • Excavated soils from Areas 12 and 13 were landfarmed and used for backfill at locations at the base including Landfill 1	• Flat area at approximate elevation 480 to 485 ft. MSL • Areas 12 and 13 are paved, drainage area is open and grassy • Nearest surface water is culverted section of Six Mile Creek under runway, 600 ft. northeast. • Areas 12 and 13 area located in the Six Mile Creek watershed • Stormwater catch basis are present throughout the Area and discharge to Six Mile Creek • Bedrock is Utica Shale at estimated depth of 55 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 20 to 25 ft. bgs • Groundwater flow is east/southeast toward Six Mile Creek	• AFFF may have been used to extinguish the 1977 aircraft fire • AFFF may have been used to extinguish the trench fire in 1990 • Potential direct discharge to the ground • Potential discharge to storm drains and migration to Six Mile Creek • Potential for impacts to soil and groundwater • Potential groundwater infiltration to storm drains and migration to Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York. • Owned by Oneida County, New York • Area 1213 is currently part of the Griffiss International Airport. • The area is located in a commercial/industrial section of the airport, within the airfield parking and maintenance areas • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater.	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • The NYSDEC Environmental Resource Mapper website indicates Rare Plants and Animals areas are mapped over a majority of the installation including at Areas 12/13; however, wells to be sampled at Areas 12/13 are not located over or within 300 feet of other mapped ecological or water resources available on the website • Surface flow captured by stormwater system and discharged to 6-mile Creek to east of area

Notes:
AFFF – Aqueous Film Forming Foam
bgs – below ground surface
ft. - feet
MSL – mean sea level
PFC – perfluoronated compound

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QAPP Worksheet #17-12&13: Sampling Design and Rationale

Areas 12 and 13: Apron 1 (Area 12) and Nose Dock 1 and 2 and Apron 1 Trench (Area 13)

Condition 1: AFFF was used to extinguish the aircraft fire on Apron 1 in 1977 and potentially used to extinguish the trench fire between Nose Dock 1 and 2 in 1990.

As a result of AFFF being applied (or possibly applied) to these areas, PFCs may have migrated downward through soils in grassy areas to impact the shallow groundwater, and may have leaked from the stormwater system to groundwater following the fires. PFCs may also still be present in sediment in catch basins and serve as an ongoing source of PFCs to stormwater that discharges to Six Mile Creek.

Question(s) to be resolved by investigation: Are PFCs present in shallow groundwater downgradient of Areas 12 and 13? Are PFCs present in water and sediment collecting in downstream catch basins?

> **Resulting Sampling Rationale:** Collect a groundwater sample from one existing monitoring well upgradient of the area and four existing monitoring wells downgradient of the area to identify presence or absence of PFCs in groundwater. Collect samples of stormwater and sediment (if present) from two catch basins downgradient of the area to identify whether PFCs are present in these media.
>
> Based on the presence or absence of PFCs above PHAs in groundwater as measured at existing monitoring wells, the need for collecting soil samples in possible release areas as a follow-on effort will be assessed.

The location of Areas 12 and 13 is shown in **Figure 12/13-1**, and proposed locations for groundwater, stormwater and sediment samples are shown on **Figure 12/13-2**. Explorations and media samples for Areas 12 and 13 are summarized on **Worksheet 18-12&13**, and a field QC summary is included in **Worksheet 20-12&13.**

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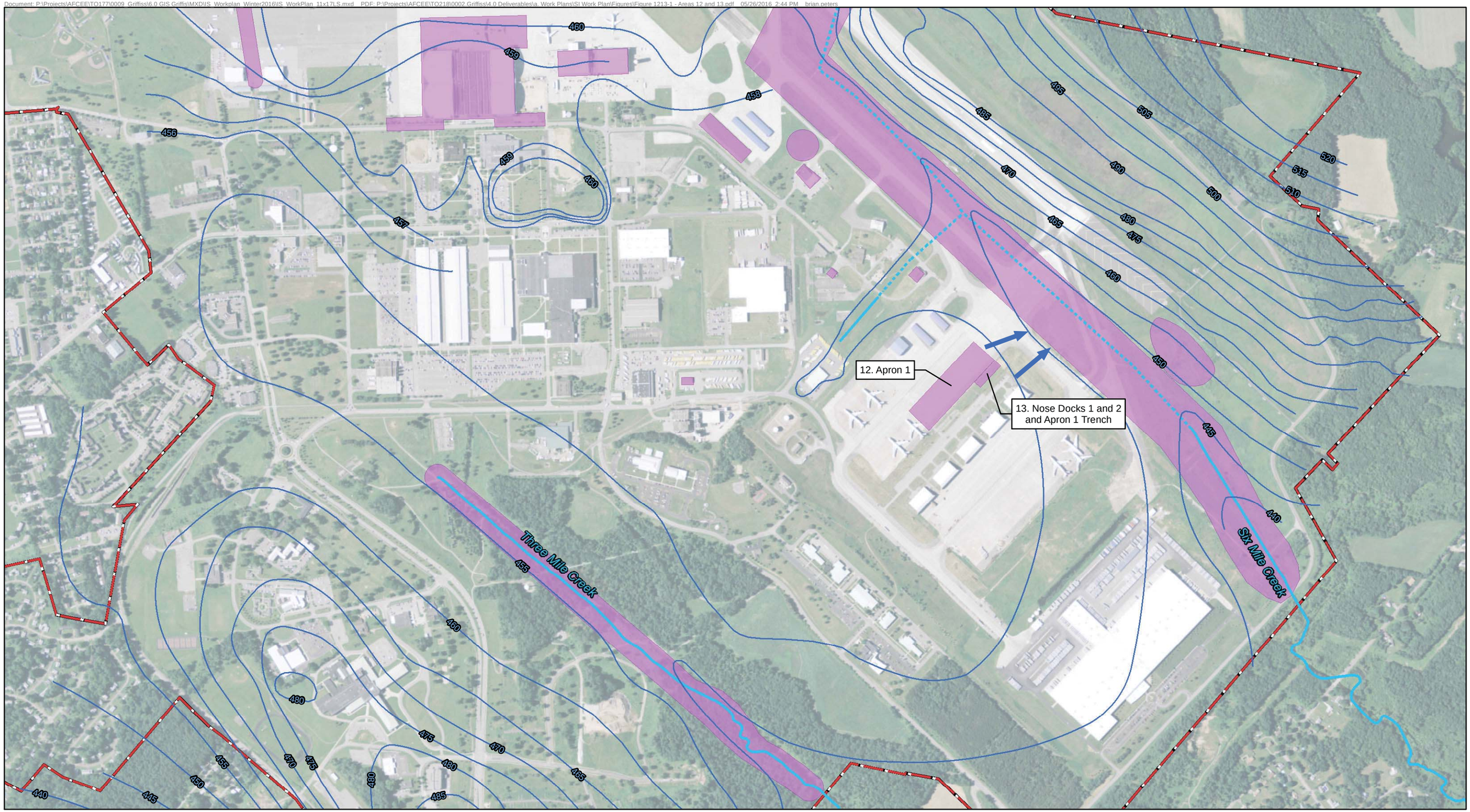

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 12/13-1
Potential AFFF Release Area
Areas 12 (Apron 1) and 13 (Nose Dock 1 and 2 and Apron 1 - Trench)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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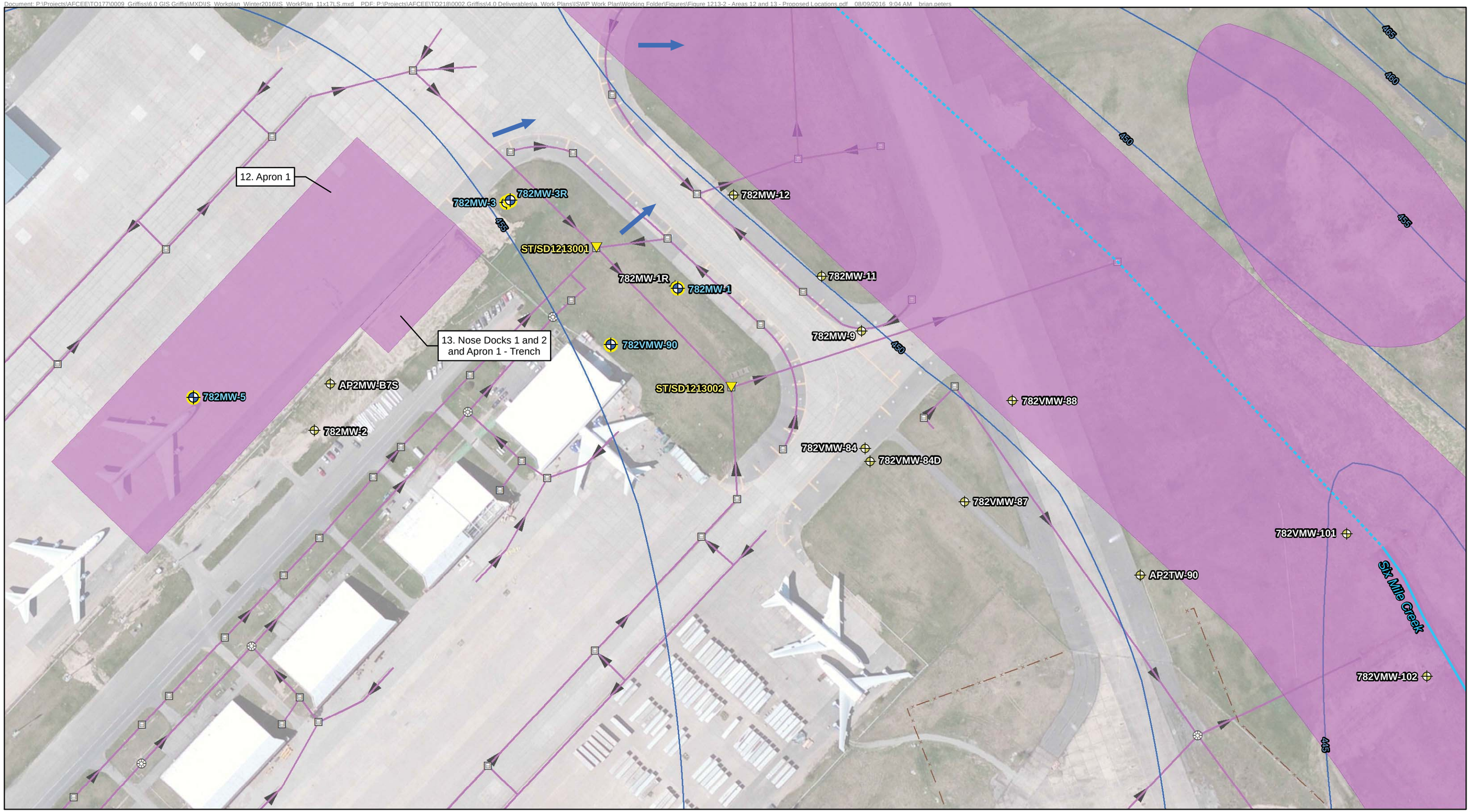

SYMBOL KEY

- 782MW-3 — Existing Monitoring Well Proposed for Sampling
- 782MW-2 — Existing Monitoring Well
- Proposed Stormwater/Sediment Sample Location
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Approximate Groundwater Flow Direction
- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Manhole

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N

0 20 40 80 120 160 Meters
0 85 170 340 510 680 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

Figure 12/13-2
Proposed Sample Locations
Areas 12 (Apron 1) and 13 (Nose Dock 1 and 2 and Apron 1 - Trench)

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

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QAPP Worksheet #18-12&13: Sampling Locations and Methods

Area	Location	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
12 and 13	SW/SD1213001	GRIFS-SD1213001-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment in storm drain
12 and 13	SW/SD1213001	GRIFS-SW1213001-MMDDYY	Stormwater	NA	NA	Grab	Existing	Assess PFC presence in storm water/groundwater in storm drain
12 and 13	SW/SD1213002	GRIFS-SD1213002-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment in storm drain
12 and 13	SW/SD1213002	GRIFS-SW1213002-MMDDYY	Stormwater	NA	NA	Grab	Existing	Assess PFC presence in storm water/groundwater in storm drain
12 and 13	782MW-5	GRIFS-782MW-5-MMDDYY	Groundwater	15	25	Peristaltic	Existing	Assess PFC presence in groundwater upgradient from Areas 12 and 13
12 and 13	782MW-3	GRIFS-782MW-3-MMDDYY	Groundwater	9	19	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
12 and 13	782MW-3R	GRIFS-782MW-3R-MMDDYY	Groundwater	16.6	31.6	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
12 and 13	782VMW-90	GRIFS-782VMW-90-MMDDYY	Groundwater	20	30	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
12 and 13	782MW-1	GRIFS-782MW-1-MMDDYY	Groundwater	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient

Notes:

ft. – feet
bgs - below ground surface
ID – Identification
GRIFS – Installation Identification
NA – Not Applicable
PFC – Perfluorinated Compound
MMDDYY – Month Day Year

QAPP Worksheet #20-12&13 Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	0	0	0	0	0	0
Groundwater	PFCs	5	0	0	0	0	5
Sediment	PFCs	2	0	0	0	0	2
Stormwater	PFCs	2	0	0	0	0	2
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**9**		**0**	**0**	**0**	**9**

Notes:
TBD - to be determined
MS - matrix spike
MSD - matrix spike duplicate
PFC – Perfluorinated Compound

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2.14 POTENTIAL AFFF RELEASE AREA 14: B-52 CRASH SITE

Area-specific worksheets and figures for potential AFFF Area 14 include:

- **Worksheet #10-14**: Preliminary CSM
- **Worksheet #17-14**: Sampling Design and Rationale
- **Figure 14-1**: Potential AFFF Release Area, Area 14 – B-52 Crash Site
- **Figure 14-2**: Proposed Sample Locations, Area 14 – B-52 Crash Site
- **Worksheet #18-14**: Sampling Locations and Methods
- **Worksheet #20-14**: Field QC Summary

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Worksheet #10-14
Preliminary Conceptual Site Model
Area #14: B-52 Crash Site

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile
• Located at the southeast end of the runway • Crash occurred in 1972, photographs provide approximate locations	• Flat area at approximate elevation 495 ft. MSL; Terrain elevates to the east and decreases to the west toward Six Mile Creek • Area is open, grassy • Nearest surface water is Six Mile Creek 300 ft. southwest at the outfall of the culverted section under the runway • Area 14 is located in the Six Mile Creek watershed • Stormwater runoff is to the southwest toward Six Mile Creek • Bedrock is Utica Shale at estimated depth of 50 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is less than 15 ft. bgs • Groundwater flow is southwest toward Six Mile Creek	• AFFF may have been used to extinguish the 1972 B-52 crash • Potential direct discharge to the ground • Potential for impacts to soil and groundwater • Potential groundwater migration to Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York. • Owned by US Government • Area 14 is currently part of the Griffiss International Airport. • Potential receptors include ground maintenance workers, utility workers, construction workers, and trespassers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Potential future use of groundwater.	• The area is located over a state-regulated freshwater wetland and wetland check zone • Significant natural communities have not been mapped in the area • The NYSDEC Environmental Resource Mapper website indicates Rare Plants and Animals areas are mapped over a majority of the installation including at Area 14 • Overland runoff to 6-mile Creek to southwest

Notes:
AFFF – Aqueous Film Forming Foam
bgs – below ground surface
ft. - feet
MSL – mean sea level
PFC – perfluoronated compound

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QAPP Worksheet #17-14: Sampling Design and Rationale

Area #14: B-52 Crash Site

Condition 1: A B-52 airplane crashed in this area in 1972, a time during which AFFF containing PFCs was in use at the Installation.

Question(s) to be resolved by investigation: Are PFCs present in the soils and/or groundwater beneath or downgradient of Area 14 as a result of the potential application of AFFF in this area?

> **Resulting Sampling Rationale:** Install three soil borings within Area 14, collecting soil samples at three depths at each location (0-1 ft bgs; 3-5 ft. bgs; and just above water table). Install a monitoring well with a 10 ft. well screen at each boring with the top of the screen 2 ft. above the water table to allow for collection of groundwater samples and a determination if PFCs are present beneath Area 14. Install three soil borings in former Holding Ponds and Dry Ponds, and two monitoring wells downgradient of these area to allow collection of soil samples (two from each boring) and groundwater samples (one from each well) and a determination if PFCs are present downgradient of Area 14.

The location of Area #14 – B-52 Crash Site is shown in **Figure 14-1,** and proposed locations for soil and groundwater samples are shown on **Figure 14-2**. Explorations and media samples for Area #14 are summarized on **Worksheet 18-14**, and a field QC summary is included in **Worksheet 20-14.**

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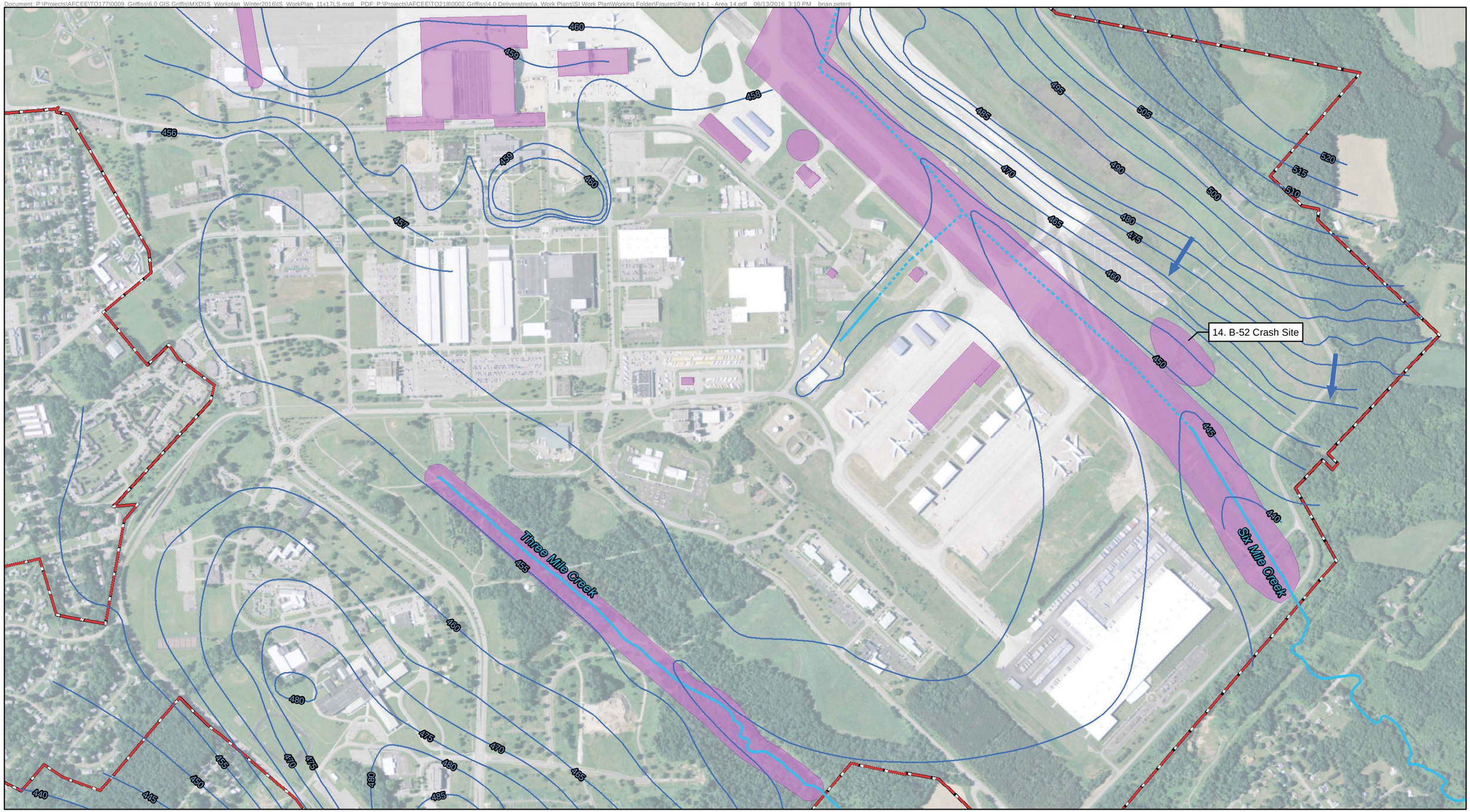

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

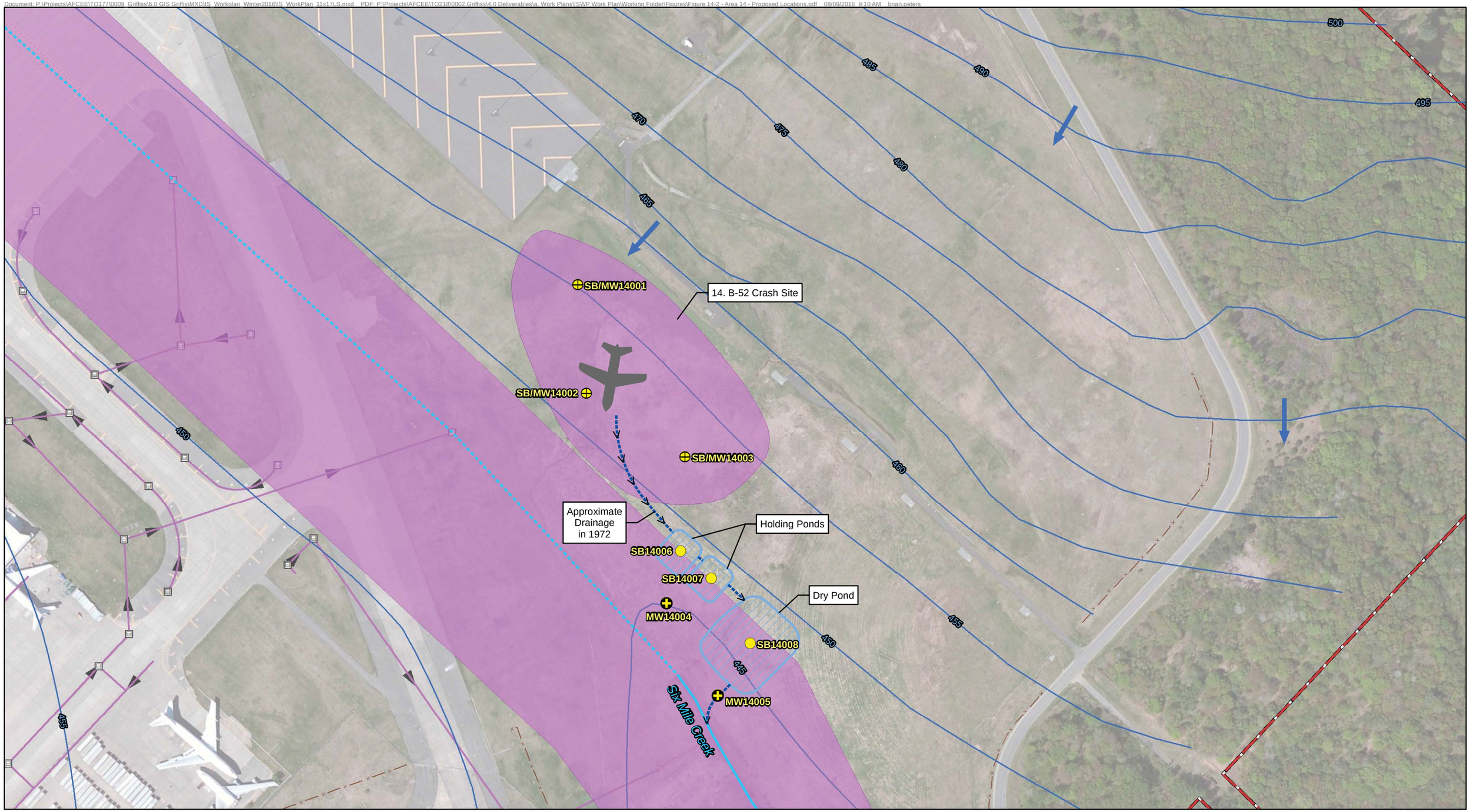
0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 14-1
Potential AFFF Release Area
Area 14 - B-52 Crash Site

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

6/13/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: JBR	PROJ: 775290218	



SYMBOL KEY

- Proposed Monitoring Well
- Proposed Monitoring Well and Soil Boring
- Proposed Soil Boring
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Approximate Groundwater Flow Direction
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Potential AFFF Release Area
- Fence
- Storm Sewer
- Catch Basin
- Former Installation Boundary

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N

0 25 50 100 150 200 Meters

0 100 200 400 600 800 Feet

Figure 14-2
Proposed Sample Locations
Area 14 - B-52 Crash Site

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

8/9/2016	Rev:	IS_WorkPlan_11x17LS	
Drawn: BRP	Chk: TDL	PROJ: 775290218	

QAPP Worksheet #18-14: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
14	SB/MW14001	GRIFS-SB14001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-SB14001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-SB14001-(3-5)FD	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-SB14001-(3-5)MS	Soil	3	5	DPT	New	Matrix Spike
14	SB/MW14001	GRIFS-SB14001-(3-5)MSD	Soil	3	5	DPT	New	Matrix Spike Duplicate
14	SB/MW14001	GRIFS-SB14001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-MW14001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
14	SB/MW14002	GRIFS-SB14002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
14	SB/MW14002	GRIFS-SB14002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14002	GRIFS-SB14002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
14	SB/MW14002	GRIFS-MW14002-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in

QAPP Worksheet #18-14: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								groundwater
14	SB/MW14003	GRIFS-SB14003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
14	SB/MW14003	GRIFS-SB14003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14003	GRIFS-SB14003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
14	SB/MW14003	GRIFS-MW14003-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
14	SB/MW14003	GRIFS-MW14003-MMDDYYFD	Groundwater	TBD	TBD	Peristaltic	New	Field duplicate
14	SB/MW14003	GRIFS-MW14003-MMDDYYMS	Groundwater	TBD	TBD	Peristaltic	New	Matrix spike
14	SB/MW14003	GRIFS-MW14003-MMDDYYMSD	Groundwater	TBD	TBD	Peristaltic	New	Matrix spike duplicate
14	MW14004	GRIFS-MW14004-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Holding Ponds at Area 14
14	MW14005	GRIFS-MW14005-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Dry Pond at Area 14
14	SB14006	GRIFS-SB14006-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Holding Pond soils
14	SB14006	GRIFS-SB14006-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in

QAPP Worksheet #18-14: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								Holding Pond soils
14	SB14006	GRIFS-SB14006-(3-5)FD	Soil	3	5	DPT	New	Field duplicate
14	SB14007	GRIFS-SB14007-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Holding Pond soils
14	SB14007	GRIFS-SB14007-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Holding Pond soils
14	SB14008	GRIFS-SB14008-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Dry Pond soils
14	SB14008	GRIFS-SB14008-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Dry Pond soils

Notes:

ft. – feet
bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
GRIFS – Installation Identification
ID – Identification
MS – Matrix Spike
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
PFC – Perfluorinated Compound
TBD – To Be Determined
WT – Water Table

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QAPP Worksheet #20-14: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	15	2	2	0	2 (1 pair)	21
Groundwater	PFCs	5	1	0	0	2 (1 pair)	8
Sediment	PFCs	0	0	0	0	0	0
Stormwater	PFCs	0	0	0	0	0	0
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**20**	**3**	**2**	**0**	**4 (2 pairs)**	**29**

Notes:
TBD - to be determined
MS - matrix spike
MSD - matrix spike duplicate
PFC – Perfluorinated Compound

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2.15 POTENTIAL AFFF RELEASE AREA 15: SANITARY SEWER LINE FROM FT030P

Area-specific worksheets and figures for potential AFFF Area 15 include:

- **Worksheet #10-15**: Preliminary CSM
- **Worksheet #17-15**: Sampling Design and Rationale
- **Figure 15-1**: Potential AFFF Release Area, Area 15 – Sanitary Sewer Line from FT030P
- **Figure 15-2**: Proposed Sample Locations, Area 15 – Sanitary Sewer Line from FT030P

Because there are no samples proposed at this time for Area 15, there are no **Worksheets 18-15 or 20-15.**

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Worksheet #10-15
Preliminary Conceptual Site Model
Area #15: Sanitary Sewer Line from FT030P

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile
• The suspected sewer line runs from FT030P south approximately 4,000 ft. toward Buildings 220 and 221 • The existence and exact location of this sewer line is unknown (not shown on facility sewer plan); if present, the location of a sanitary sewer line will be identified by proposed geophysical and reconnaissance efforts	• Ground elevation decreases from approximately 490 to 470 ft. MSL from FT030P to Buildings 220 and 221 • Area 15 crosses the flightline and apron as well as grassy and lightly vegetated areas • Area 15 runs between Six Mile Creek and the Mohawk River and is located in the Mohawk River watershed • Bedrock is Utica Shale at estimated depth of 60 ft. bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater ranges from 10 to 15 ft. bgs along the Area 15 drain line. • Groundwater flow is southwest toward the Mohawk River	• AFFF released at FT030P may have infiltrated to groundwater and subsequently into the sanitary sewer system, if present • Impacts to sanitary sewer may impact waste water treatment system and outfall • As indicated in the PA, waste AFFF at FT030P (Fire Training Area) was reportedly defoamed and discharge to the sanitary sewer, however, there are no lines are shown on the sanitary sewer map for the base in the vicinity of the FTA. The PA also provided a phone interview record that indicated discharge was to the storm sewer and to the Mohawk River. The Storm drainage system map for the base does show a storm water line running through the FTA to the Mohawk River.	• Griffiss International Airport is owned and operated by Oneida County, New York. • Owned by Oneida County, New York • Area 15 is currently part of the Griffiss International Airport. • Potential receptors include ground maintenance workers, utility workers, and construction workers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Area is served by public water currently, potential future use of groundwater.	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and rare animals have been mapped in the area

Notes:

AFFF – Aqueous Film Forming Foam
bgs – below ground surface
PFC – perfluoronated compound
MSL – mean sea level
ft. - feet

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QAPP Worksheet #17-15: Sampling Design and Rationale

Area #15: Sanitary Sewer Line from FT030P

Condition 1: AFFF was reportedly de-foamed and may have been discharged to this drain line which is believed to have run from the FTA (FT030P) to the south toward Buildings 220 and 221. The specific location and existence of this line is unknown.

Question(s) to be resolved by investigation: Is there field evidence of a sanitary drain line that runs south from FTA FT030P?

> **Resulting Sampling Rationale:** Complete a geophysical survey of the area where the line is suspected to be. Ground penetrating radar in combination with an electronic locator survey will be used to identify the presence or absence of the line and connection or termination points at either end of the line. At least three transects will be completed across the suspected line area with both instruments to determine whether there are subsurface features indicative of a sewer line. In addition, inspection of the paved areas on the north side (and inside if accessible) of Building 201 and 221will be completed to identify manholes or other indications of a sewer line connection. If the geophysical investigation indicates a sewer line does exist in this area and ready access can be obtained to the line, a sample of the sewer line content will be collected as part of the SI. If the line is located and ready access is not evident, recommendations will be made for additional investigation of this area.

The location of Area #15 – Sanitary Sewer Line from FT030P is shown in **Figure 15-1,** and proposed location for the geophysical survey is shown on **Figure 15-2**. Due to the unlikeliness of locating the line and finding ready access, no placeholder for sample collection is included in the work plan.

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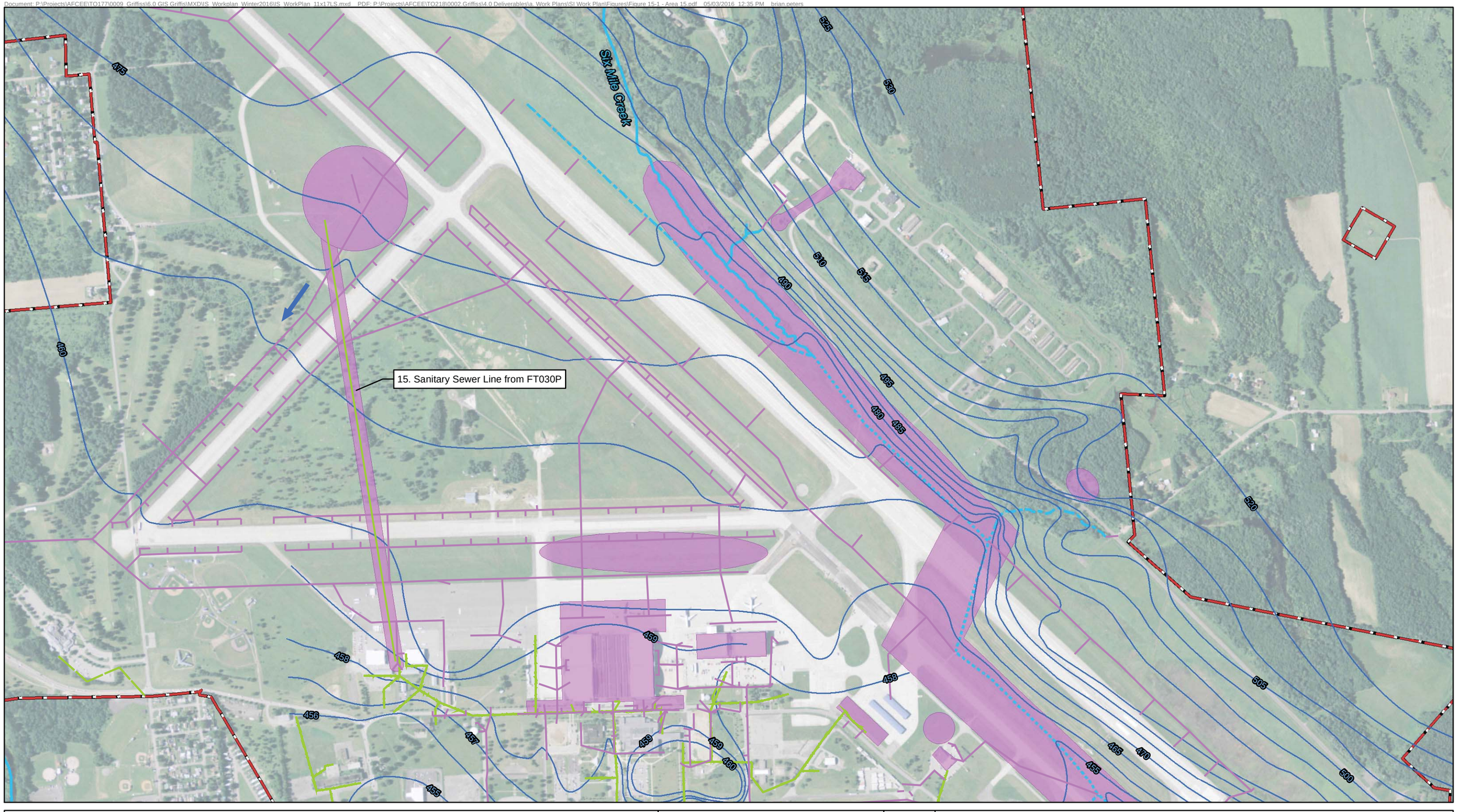

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Sanitary Sewer
- Storm Sewer
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 15-1
Potential AFFF Release Area
Area 15 - Sanitary Sewer Line from FT030P

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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SYMBOL KEY

- Approximate Groundwater Flow Direction
- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- T1 — Geophysics Transect
- Sanitary Sewer
- Storm Sewer
- Potential AFFF Release Area

T1

T2

T3

15. Sanitary Sewer Line from FT030P

465

475

470

460

459

458

457

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Figure 15-2
Area 15 - Sanitary Sewer Line from FT030P

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 50 100 200 300 400 Meters
0 175 350 700 1,050 1,400 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/23/2016	Rev:	IS_WorkPlan_11x17P
Drawn: BRP	Chk: NWH	PROJ: 775290218

2.16 POTENTIAL AFFF RELEASE AREA 16: SIX MILE CREEK

Area-specific worksheets and figures for potential AFFF Area 16 include:

- **Worksheet #10-16**: Preliminary CSM
- **Worksheet #17-16**: Sampling Design and Rationale
- **Figure 16-1**: Potential AFFF Release Area, Area 16 – Six Mile Creek
- **Figure 16-2**: Proposed Sample Locations, Area 16 – Six Mile Creek
- **Worksheet #18-16**:Sampling Locations and Methods
- **Worksheet #20-16**:Field QC Summary

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Worksheet #10-16
Preliminary Conceptual Site Model
Area #16: Six Mile Creek

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Six Mile Creek enters the former Griffiss AFB from the north and exits to the south; Six Mile Creek spans approximately 14,300 ft across the base • Approximately 8,000 ft. of Six Mile Creek is culverted beneath the main runway • Six Mile Creek is the principal drainage for the runway and the southeast portion of the base • Eleven AFFF areas are located in the Six Mile Creek watershed • Storm drains from the runway and southeast portion of the base discharge to Six Mile Creek	• Ground elevation is approximately 520 ft. MSL at the point where Six Mile Creek enters the base and approximately 440 ft. MSL at the point where Six Mile Creek exits the base • Six Mile Creek traverses wooded terrain before crossing Perimeter Road and entering the flightline area and culvert. It daylights 1,500 ft. upstream of the southern installation boundary • Through its course across the base, Six Mile Creek collects stormwater from approximately 15 discharges and surface water from two small tributaries to the east • Many of the stormwater inputs to Six Mile Creek drain the identified AFFF Areas	• Several known or suspected AFFF release areas are located within the Six Mile Creek watershed • Groundwater and stormwater impacted with PFCs may discharge to Six Mile Creek • Six Mile Creek ultimately discharges to the Erie Canal south of the installation • Six Mile Creek was an IRP site (#SD032) and was approved for site closure in August 2014	• Griffiss International Airport is owned and operated by Oneida County, New York • Six Mile Creek crosses several ownership parcels within the base boundary including Oneida County and US Government Air Depot • Potential receptors include utility workers on base and waders and fishermen in surface water downstream from the base, and trespassers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Potential future use of groundwater.	• The area is located over a state-regulated freshwater wetland or wetland check zone • Six Mile Creek is a NYS Classified Water Body based on the NYSDEC Environmental Resource Mapper website • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped in the area • Downgradient areas include Residential, commercial and agricultural properties • Fisheries Assessment to be completed as described in **Worksheets #14/16**

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFB – Air Force Base
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-16: Sampling Design and Rationale

Area 16: Six Mile Creek

Condition 1: Six Mile Creek collects groundwater seepage and receives stormwater inputs at numerous locations along its course through Griffiss AFB. Eleven potential AFFF areas drain to Six Mile Creek via groundwater and/or stormwater discharges.

Question(s) to be resolved by investigation: Are PFCs present in the surface water (open channel sections of the creek), stormwater (culverted sections) or sediment of Six Mile Creek?

> **Resulting Sampling Rationale:** Collect surface water, stormwater and sediment samples at six locations along the creek. The samples include a background location upgradient of influence of potential AFFF areas, two locations downgradient of Landfill 1 (Area 18), a location at the confluence of Six Mile Creek with the tributary from Building 917 (Area 9), a stormwater catch basin in the central culverted section of the creek, and a location downgradient of potential AFFF areas at the base boundary.

The location of Area 16 – Six Mile Creek is shown in **Figure 16-1**, and proposed locations for surface water/stormwater and sediment samples are shown on **Figure 16-2** and summarized on **Worksheet 18-16**, with a field QC summary is included in **Worksheet 20-16**.

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SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

Six Mile Creek

525 530 505 510 515 490 500 485 495 480 520 460 459 458 459 460 470 465 475 450 445 440 455 460 465 455 450

16. Six Mile Creek

Three Mile Creek

Six Mile Creek

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Figure 16-1
Potential AFFF Release Area
Area 16 - Six Mile Creek
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/26/2016	Rev:	IS_WorkPlan_11x17P	
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Document: P:\Projects\AFCEEITO1777\0009_Griffiss\6.0 GIS Griffiss\MXD\IS_Workplan_Winter2016\IS_WorkPlan_11x17P.mxd PDF: P:\Projects\AFCEEITO2180002.Griffiss\4.0 Deliverables\a. Work Plans\IS\ Work Plan\Figures\Figure 16-1 - Area 16.pdf 05/26/2016 2:24 PM brian.peters

SYMBOL KEY

- Proposed Surface Water/Sediment Sample Location
- Proposed Storm Water/Sediment Sample Location
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Junction of Tributary or Storm Sewer with Six Mile Creek
- Approximate Groundwater Flow Direction
- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Storm Sewer
- Potential AFFF Release Area
- Former Installation Boundary

SW/SD16001
SW/SD16002
SW/SD16003
SW/SD16004
ST/SD16005
SW/SD16006
Six Mile Creek
Rainbow Creek
Three Mile Creek
16. Six Mile Creek

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Figure 16-2
Proposed Sample Locations
Area 16 - Six Mile Creek
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 100 200 400 600 800 Meters
0 500 1,000 2,000 3,000 4,000 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

9/1/2016	Rev:	IS_WorkPlan_11x17P
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QAPP Worksheet #18-16: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
16	SW/SD16001	GRIFS-SD16001-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment upgradient from the Installation
16	SW/SD16001	GRIFS-SW16001-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water upgradient from the Installation
16	SW/SD16002	GRIFS-SD16002-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment downstream from Landfill 1
16	SW/SD16002	GRIFS-SW16002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downstream from Landfill 1
16	SW/SD16003	GRIFS-SD16003-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment downstream from Landfill 1
16	SW/SD16003	GRIFS-SW16003-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downstream from Landfill 1
16	SW/SD16004	GRIFS-SD16004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in

QAPP Worksheet #18-16: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								sediment at junction of tributary from Building 917 and Six Mile Creek
16	SW/SD16004	GRIFS-SW16004-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water at junction of tributary from Building 917 and Six Mile Creek
16	ST/SD16005	GRIFS-SD16005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in catch basin at junction of flight line swale and culverted Six Mile Creek
16	ST/SD16005	GRIFS-ST16005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in stormwater at junction of flight line swale and culverted Six Mile Creek
16	SW/SD16006	GRIFS-SD16006-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in Six Mile Creek at downstream base boundary
16	SW/SD16006	GRIFS-SW16006-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in Six Mile Creek at downstream base boundary

QAPP Worksheet #18-16: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
16	SW/SD16004	GRIFS-SW16004-MMDDYYFD	Surface Water	NA	NA	Grab	New	Field Duplicate
16	SW/SD16004	GRIFS-SW16004-MMDDYYMS	Surface Water	NA	NA	Grab	New	Matrix Spike
16	SW/SD16004	GRIFS-SW16004-MMDDYYMSD	Surface Water	NA	NA	Grab	New	Matrix Spike Duplicate

Notes:

ft. – feet
bgs - below ground surface
ID – Identification
FD – Field Duplicate
GRIFS – Installation Identification
NA – Not Applicable
MS – Matrix Spike
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
PFC – Perfluorinated Compound

QAPP Worksheet #20-16: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	0	0	0	0	0	0
Groundwater	PFCs	0	0	0	0	0	0
Sediment	PFCs	6	0	1	1	0	8
Stormwater	PFCs	1	0	0	0	0	1
Surface Water	PFCs	5	1	0	0	2 (1 pair)	8
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**12**	**1**	**1**	**1**	**2 (1 pair1)**	**17**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

2.18 POTENTIAL AFFF RELEASE AREA 18: LANDFILL 1

Area 18 was added to address the possibility that final grading materials for Landfill 1 may have been incorporated land-farmed soils from Area 12/13 which may have contained PFCs.

Area-specific worksheets and figures for potential AFFF Area 18 include:

- **Worksheet #10-18**: Preliminary CSM
- **Worksheet #17-18**: Sampling Design and Rationale
- **Figure 18-1**: Potential AFFF Release Area, Area 18 – Landfill 1
- **Figure 18-2**: Proposed Sample Locations, Area 18 – Landfill 1
- **Worksheet #18-18**:Sampling Locations and Methods
- **Worksheet #20-18**: Field QC Summary

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Worksheet #10-18

Preliminary Conceptual Site Model

Area #18: Landfill 1

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Located in the northeast corner of the installation Received excavated soils from Areas 12 and 13 that may have been impacted by AFFF • Landfill was capped in 2003 with cap including a 40 mil polyethelene geomembrane liner, 12 inch barrier layer and 6 inches of top soil	• Ground elevation at top of landfill is approximately 530 ft. MSL • Topography slopes to the west/southwest to Six Mile Creek at elevation approximately 500 ft. MSL • The landfill is open and grassy • Bedrock is Utica Shale at estimated depth of 30 feet bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 25 to 30 ft bgs • Groundwater flow is southwest toward Six Mile Creek	• Soils used for final grading prior to capping in Area 18 may have been impacted by AFFF used to extinguish the Areas 12 and 13 trench fire in 1990 • Potential for impacts to soil and groundwater • Potential for impacted groundwater migration and discharge to Six Mile Creek	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 18 is owned by Griffiss International Airport • Potential receptors include trespassers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Potential future use of groundwater	• The area is located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped in the area • Overland runoff to Six Mile Creek to south

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 12, 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
PFC – perfluorinated compound

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QAPP Worksheet #17-18: Sampling Design and Rationale

Area #18: Landfill 1

Condition 1: Excavated soils form Areas 12 and 13 were placed at Landfill 1. AFFF was used to extinguish one or more fires at Areas 12 and 13. The landfill was capped with 40 mil polyethelene liner and barrier layers eliminated direct contact with any PFC impacted soils.

Question(s) to be resolved by investigation: Are PFCs present in shallow groundwater downgradient of Area 18 as a result of disposal of potential AFFF-contaminated soil at the landfill?

> **Resulting Sampling Rationale:** Collect a groundwater sample from each of three existing monitoring wells downgradient of the area to identify presence or absence of PFCs in groundwater downgradient of Area 18. Two surface water and sediment samples collected from Area 16 (Six Mile Creek) located downgradient of Landfill 1 will be used to identify presence or absence of PFCs in those media.

The location of Area 18 is shown in **Figure 18-1**, and proposed locations for groundwater samples are shown on **Figure 18-2**. Groundwater samples for Area 18 are summarized on **Worksheet 18-18**, and a field QC summary is included in **Worksheet 20-18.**

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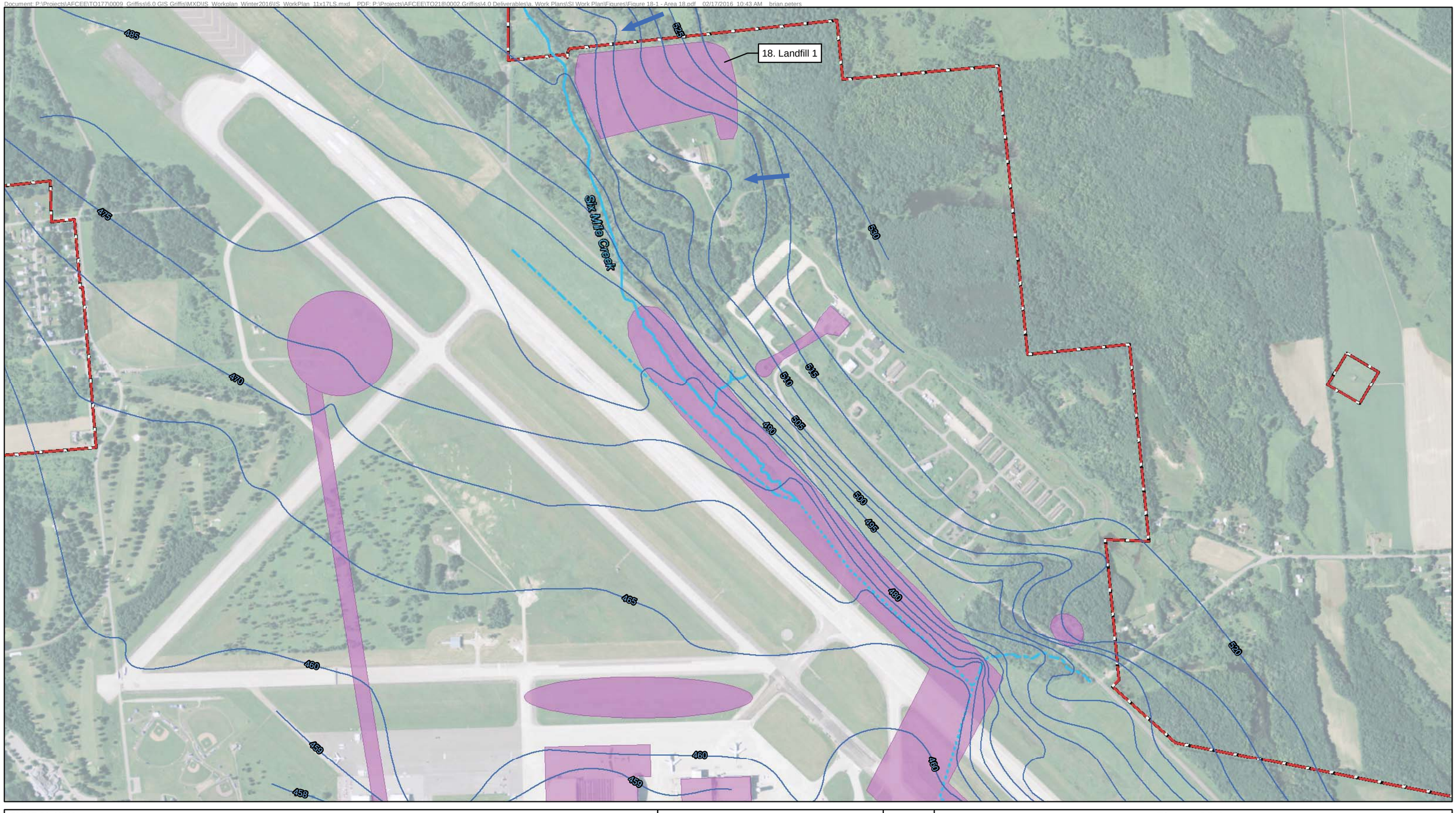

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

Figure 18-1
Potential AFFF Release Area
Area 18 - Landfill 1
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

2/17/2016	Rev:	IS_WorkPlan_11x17LS
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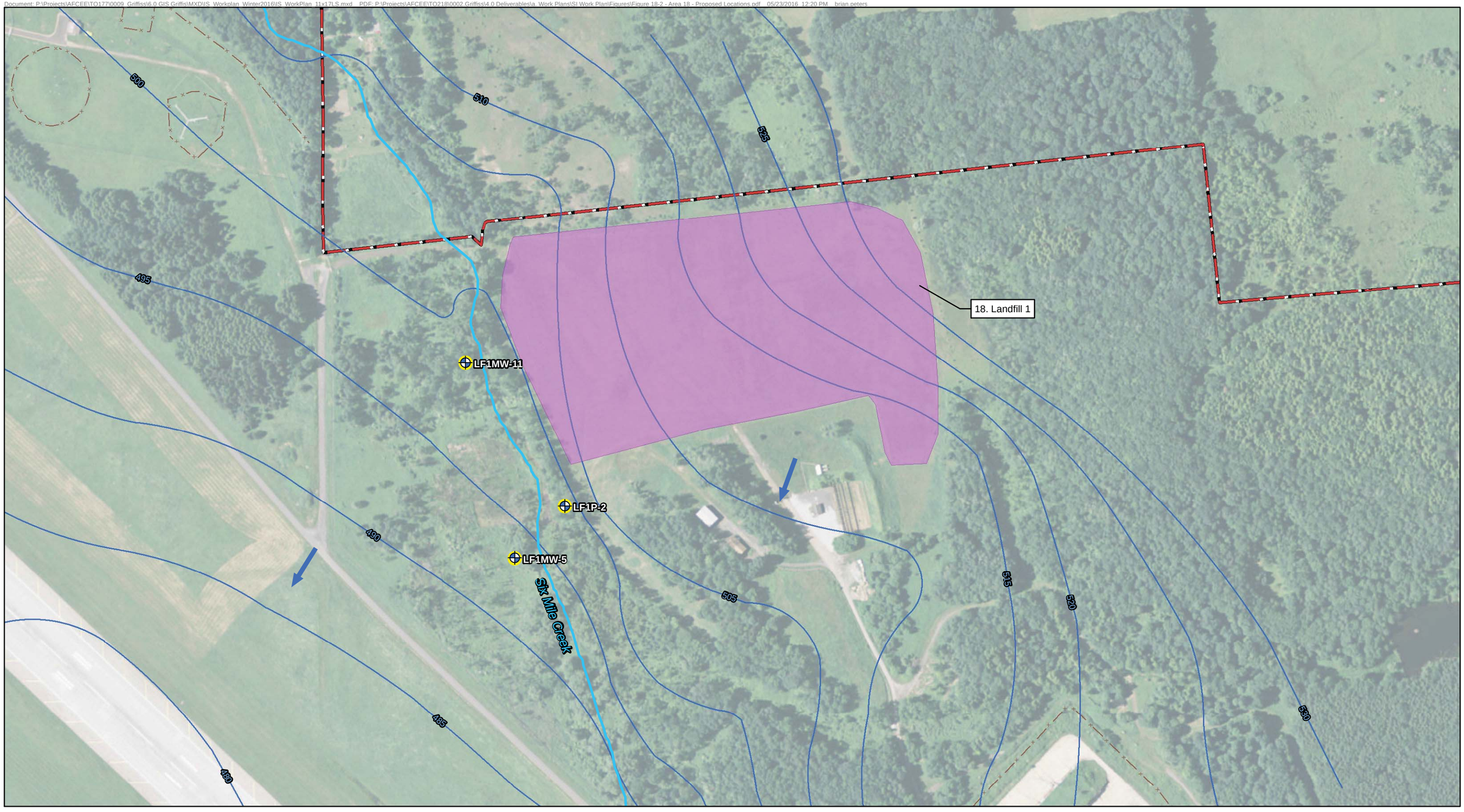

SYMBOL KEY

- Existing Monitoring Well to be Sampled
- Stream/Surface Drainage
- Approximate Groundwater Flow Direction
- 450 Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Potential AFFF Release Area
- Fence
- Former Installation Boundary

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N

0 30 60 120 180 240 Meters
0 150 300 600 900 1,200 Feet

NOTES:
-Aerial Imagery obtained through ESRI Online Services

Figure 18-2
Proposed Sample Locations
Area 18 - Landfill 1

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

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QAPP Worksheet #18-18: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYY	Groundwater	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYYFD	Groundwater	NA	NA	Peristaltic	Existing	Field Duplicate
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYYMS	Groundwater	NA	NA	Peristaltic	Existing	Matrix Spike
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYYMSD	Groundwater	NA	NA	Peristaltic	Existing	Matrix Spike Duplicate
18	LF1P-2	GRIFS-LF1P-2-MMDDYY	Groundwater	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
18	LF1MW-5	GRIFS-LF1MW-5-MMDDYY	Groundwater	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient

Notes:

ft. – feet
bgs - below ground surface
ID – Identification
GRIFS – Installation Identification
NA – Not Applicable
FD – Field Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
MMDDYY – Month Day Year
PFC – Perfluorinated Compound

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QAPP Worksheet #20-18: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	0	0	0	0	0	0
Groundwater	PFCs	3	1	0	0	2 (1 pair)	6
Sediment	PFCs	0	0	0	0	0	0
Stormwater	PFCs	0	0	0	0	0	0
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**3**	**1**	**0**	**0**	**2**	**6**

Notes:

MS/MSD – Matrix Spike/Matrix Spike Duplicate

PFC – Perfluorinated Compound

TBD – To Be Determined

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2.19 POTENTIAL AFFF RELEASE AREA 19: THREE MILE CREEK

Area 19 was added to address the possibility that groundwater moving beneath Areas 01 and 07 (Buildings 15 and 101, respectively) likely flows toward, and discharges to, Three Mile Creek.

Area-specific worksheets and figures for potential AFFF Area 19 include:

- **Worksheet #10-19**: Preliminary CSM
- **Worksheet #17-19**: Sampling Design and Rationale
- **Figure 19-1**: Potential AFFF Release Area, Area 19 – Three Mile Creek
- **Figure 19-2**: Proposed Sample Locations, Area 19 – Three Mile Creek
- **Worksheet #18-19**: Sampling Locations and Methods
- **Worksheet #20-19**: Field QC Summary

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Worksheet #10-19
Preliminary Conceptual Site Model
Area #19: Three Mile Creek

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Three Mile Creek originates at the former Griffiss AFB in the southwest portion of the Installation • Three Mile Creek flows approximately 4,400 ft from northwest to southeast, and exits the Installation to the south • Three Mile Creek is the principal drainage for the southwest portion of the Installation • Two AFFF areas are located in the Three Mile Creek watershed • Storm drains discharge to the headwater of Three Mile Creek and several other downstream locations	• Ground elevation is approximately 465 ft. MSL at the headwater outfall to Three Mile Creek, 445 ft. MSL where it exits the base, and 425 ft. MSL at the outfall to the Erie Canal located approximately 2,000 ft south of the installation boundary • Three Mile Creek is an open channel that traverses mostly wooded terrain • This Area is located outside of the active airfield	• AFFF was released from one or more source areas within the Three Mile Creek watershed • Groundwater and stormwater impacted with PFCs may discharge to Three Mile Creek. • Three Mile Creek ultimately discharges to the Erie Canal south of the installation • Three Mile Creek was an IRP site (#SD031) where sediment excavation was completed in 2005 and site closure was approved in August 2014	• Griffiss International Airport is owned and operated by Oneida County, New York • Three Mile Creek crosses several ownership parcels within the base boundary including OCIDA, US Government Air Depot • Potential receptors include utility workers on base and waders and fishermen in surface water downstream from the base, and trespassers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Potential future use of groundwater	• The area is located over a state-regulated freshwater wetland or wetland check zone • Three Mile Creek is a NYS Classified Water Body based on the NYSDEC Environmental Resource Mapper website • Significant natural communities have not been mapped in the area • Rare plants and animals have been mapped in the area • Downgradient areas include commercial and agricultural properties Fisheries Assessment to be completed as described in Worksheets 14/16

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 2016.

Notes:
AFB – Air Force Base
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
bgs – below ground surface
ft - feet
OCIDA – Oneida County Industrial Development Agency
PFC – perfluorinated compound

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QAPP Worksheet #17-19: Sampling Design and Rationale

Area 19: Three Mile Creek

Condition 1: Stormwater collected from AFFF Area 7 – Building 101 is routed toward and discharges to Three Mile Creek. Most of the groundwater flow from Areas 1 and 7 discharges to Three Mile Creek. Releases of AFFF were reported at Area 7. Three Mile Creek receives stormwater discharges from other areas of the former base and is adjacent to LF009 Landfill 6 where sediments excavated from Three Mile Creek in 2005 were placed.

Question(s) to be resolved by investigation: Are PFCs present in the surface water or sediment of Three Mile Creek as a result of stormwater or groundwater discharges from Area 7 and/or adjacent LF009 Landfill 6?

> **Resulting Sampling Rationale:** Collect surface water and sediment samples at the headwaters of the creek where it originates from culvert discharges, at two locations downstream to confirm the absence of PFC contributions from other stormwater inputs and from LF009 Landfill 6 located east of the creek, and collect a surface water and sediment sample at the downgradient installation boundary.

The location of Area 19 – Three Mile Creek is shown in **Figure 19-1**, and proposed locations for surface water and sediment samples are shown on **Figure 19-2**. Explorations and media samples for Area 19 are summarized on **Worksheet 18-19**, and a field QC summary is included in **Worksheet 20-19.**

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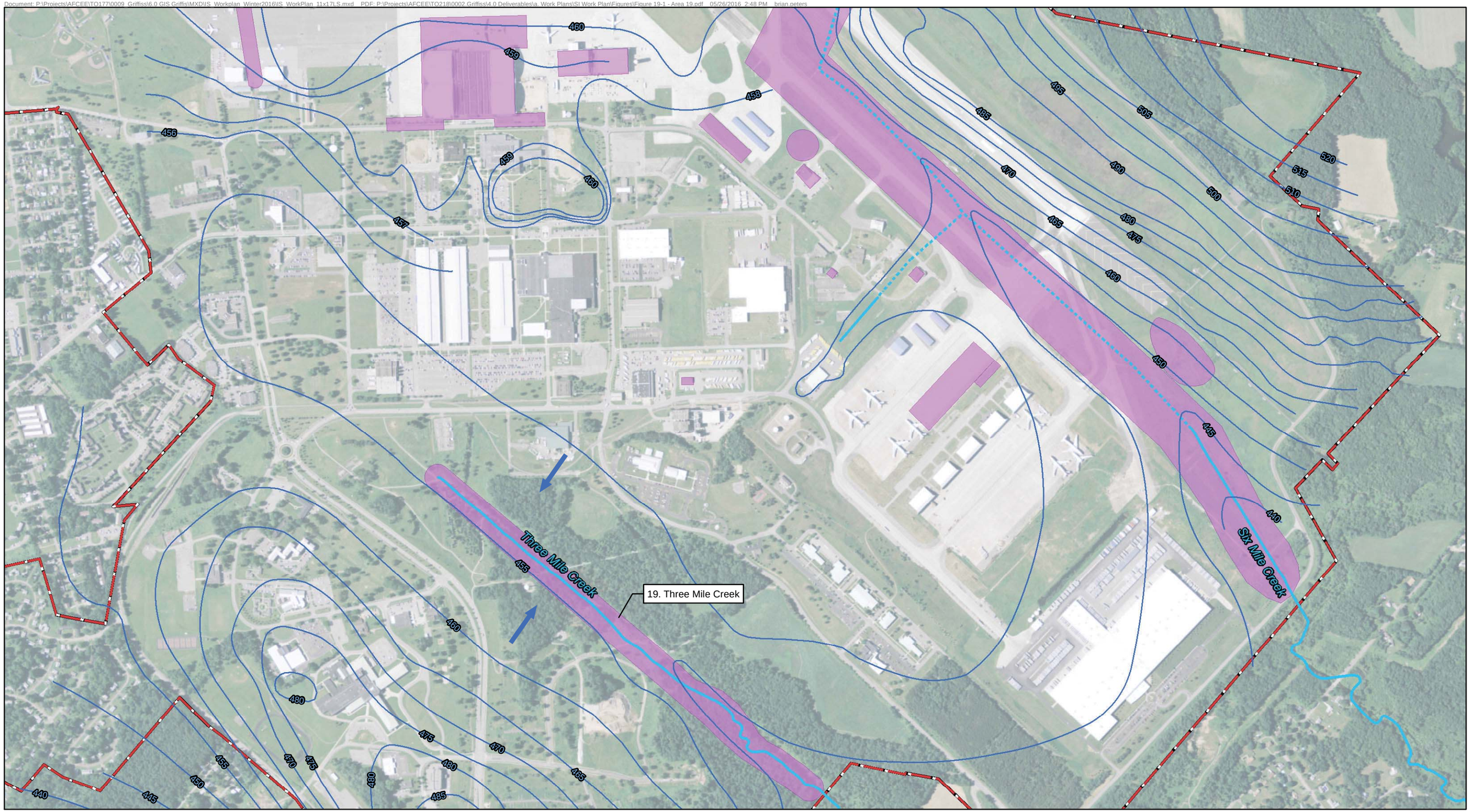

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 19-1
Potential AFFF Release Area
Area 19 - Three Mile Creek

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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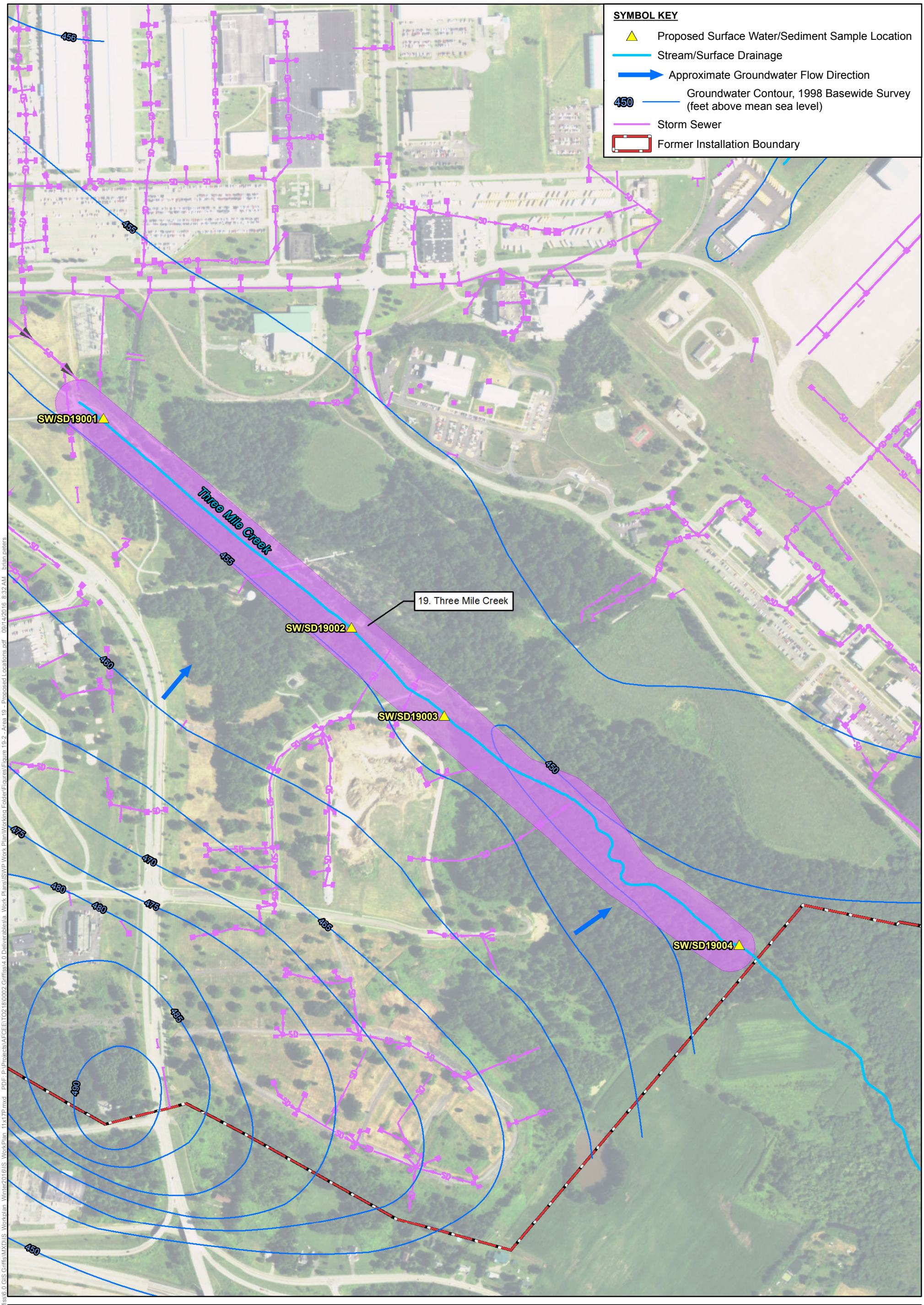

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Figure 19-2
Proposed Sample Locations
Area 19 - Three Mile Creek
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 50 100 200 300 400 Meters
0 225 450 900 1,350 1,800 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

9/14/2016	Rev:	IS_WorkPlan_11x17P
Drawn: BRP	Chk: TDL	PROJ: 775290218

QAPP Worksheet #18-19: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
19	SW/SD19001	GRIFS-SD19001-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment at headwater to Three Mile Creek
19	SW/SD19001	GRIFS-SW19001-MMDDYY	Surface Water	NA	NA	Grab	Existing	Assess PFC presence in surface water at headwater to Three Mile Creek
19	SW/SD19002	GRIFS-SD19002-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in Three Mile Creek upstream of stormwater inputs from west
19	SW/SD19002	GRIFS-SW19002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in Three Mile Creek upstream of stormwater inputs from west
19	SW/SD19003	GRIFS-SD19003-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in Three Mile Creek upstream of Landfill 6
19	SW/SD19003	GRIFS-SW19003-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in Three Mile Creek upstream of Landfill 6

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
19	SW/SD19004	GRIFS-SD19004-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment in Three Mile Creek at downstream Installation boundary
19	SW/SD19004	GRIFS-SW19004-MMDDYY	Surface Water	NA	NA	Grab	Existing	Assess PFC presence in surface water in Three Mile Creek at downstream Installation boundary

Notes:
ft. – feet
bgs - below ground surface
NA – Not Applicable
ID – Identification
GRIFS – Installation Identification
MMDDYY – Month Day Year
PFC – Perfluorinated Compound

QAPP Worksheet #20-19: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	0	0	0	0	0	0
Groundwater	PFCs	0	0	0	0	0	0
Sediment	PFCs	4	0	1	0	0	5
Surface Water	PFCs	4	0	0	0	0	4
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**8**	**0**	**1**	**0**	**0**	**9**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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2.20 POTENTIAL AFFF RELEASE AREA 20: FTA (FT030P)

Area-specific worksheets and figures for potential AFFF Area 20 include:

- **Worksheet #10-20**: Preliminary CSM
- **Worksheet #17-20**: Sampling Design and Rationale
- **Figure 20-1**: Potential AFFF Release Area, Area 20 – FTA (FT030P)
- **Figure 20-2**: Groundwater Flow and Area Features
- **Figure 20-3**: Groundwater Results - PFOS/PFOA
- **Figure 20-4**: Surface Water (Stormwater) Results – PFOS/PFOA
- **Figure 20-5**: Soil Boring Results – PFOS/PFOA
- **Figure 20-6**: Proposed Sample Locations - FTA (FT030P)
- **Worksheet #18-20**: Sampling Locations and Methods
- **Worksheet #20-20**: Field QC Summary

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Worksheet #10-20
Preliminary Conceptual Site Model
Area #20: Fire Training Area FT030P

Source Area Profile	Physical Profile	Release Profile	Land Use and Human Exposure Profile	Ecological Profile[1]
• Located west of the northwest end of the main runway • Fire training activities were conducted from 1960s through 1995 on bare soil • Fire training pit 200 ft in diameter • Three USTs, one AST, one OWS • Waste fuel burned in pit and extinguished with AFFF • August 2015 SIR indicates the concentration of PFOS exceeded the PHA at all nine groundwater sampling locations and one stormwater location • This Area was investigated in November 2014 and the results were presented in the August 2015 Draft Report, which has since been issued as final	• Approximate 8 acre area, relatively flat topography at approximate elevation 490 ft. MSL • Area is open grassland • Nearest surface water bodies are Six Mile Creek 2,000 ft northeast and the Mohawk River 4,000 ft to the southwest • Stormwater catch basins located in Area 20 and flow to the Mohawk River • Area 20 is in the Mohawk River watershed • Bedrock is Utica Shale at approximately 50 ft bgs • Deposits overlying the Utica Shale are clay, silt, sand, and gravel • Depth to groundwater is approximately 10 to 15 ft bgs • Groundwater flow is southwesterly toward the Mohawk River under Mohawk Glen Golf Course	• AFFF was released to the ground during fire training exercises • PFCs are known to have impacted soil, stormwater, and groundwater at Area 20 • Potential stormwater transport to the Mohawk River • Potential groundwater transport to the Mohawk River • Potential groundwater transport beneath residential areas off base to the west • Detections in site media are shown in Figures 20-3, 20-4, and 20-5.	• Griffiss International Airport is owned and operated by Oneida County, New York • Area 20 is currently part of the Griffiss International Airport • Potential receptors include ground maintenance workers, utility workers, construction workers and trespassers via direct contact or inhalation • Potential inhalation or direct contact exposure to future site occupants if area redeveloped • Potential future use of groundwater	• The area is not located over a state-regulated freshwater wetland or wetland check zone • Significant natural communities have not been mapped in the area • Rare plants and rare animals have been mapped in the area • Downgradient areas include Mohawk Glen Golf Course and residential areas • Overland runoff to downgradient areas to the southwest • Fisheries Assessment to be completed as described in Worksheets 14/16

1. New York State Department of Environmental Conservation, *Environmental Resource Mapper*, January 12, 2016.

Notes:
AFFF – Aqueous Film Forming Foam
MSL – mean sea level
AST – aboveground storage tank
bgs – below ground surface
ft - feet
OWS – oil water separator
PFC – perfluorinated compound
PFOA – Perfluorooctanoic Acid
PFOS – Perfluorooctanesulfonic Acid
SIR – Site Investigation Report

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QAPP Worksheet #17-20: Sampling Design and Rationale

Area 20: FTA (FT030P)

Condition 1: AFFF was applied to the ground surface during fire training exercises; PFCs have infiltrated soils and impacted the groundwater beneath the area. PFCs may have migrated downgradient in groundwater toward the Mohawk River.

Condition 1: Releases of AFFF have impacted shallow soils and groundwater, and were detected in a stormwater drain which discharges to the Mohawk River.

Question(s) to be resolved by investigation: Are PFCs present in surface water, stormwater and/or sediment downgradient of Area 20 as a result of surface water or groundwater discharges from the Fire Training Area?

> **Resulting Sampling Rationale:** Collect surface water and sediment samples from two locations along the stormwater drain downgradient of Area 20 to confirm whether PFCs are present in these media. One storm water/sediment sample will be collected from the storm drain at a manhole located near the perimeter road to test the contribution of storm water runoff from the east-west trending taxiway north of Areas 06 and 07, and one surface water/sediment sample will be collected at the storm water outfall to the Mohawk River.

Condition 2: PFC-contaminated groundwater at Area 20 flows downgradient and southwest toward the Mohawk River.

Question(s) to be resolved by investigation: Are PFCs present in the Mohawk River, downgradient of Area 20?

> **Resulting Sampling Rationale:** Collect surface water and sediment samples in the Mohawk River upgradient and downgradient of the stormwater outfall from the FTA. Complete a temperature survey and seep inspection along the east shore of the Mohawk River to identify locations for future pore water sampling to confirm whether PFCs are present in pore water discharging to the river.

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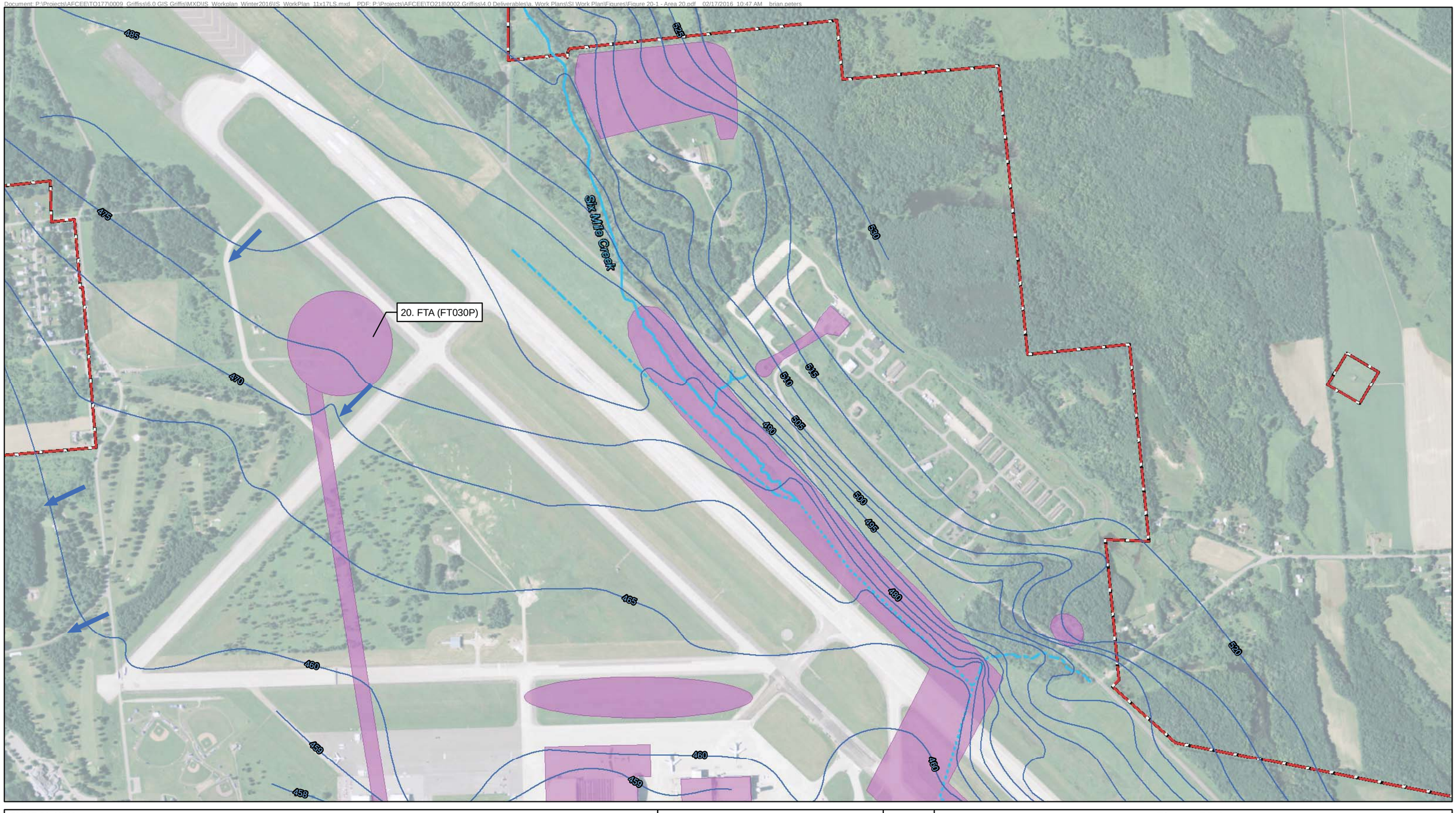

SYMBOL KEY

- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Approximate Groundwater Flow Direction
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Potential AFFF Release Area
- Former Installation Boundary

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N

0 100 200 400 600 800 Meters
0 400 800 1,600 2,400 3,200 Feet

Figure 20-1
Potential AFFF Release Area
Area 20 - FTA (FT030P)
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

NOTES:
-Aerial Imagery obtained through ESRI Online Services

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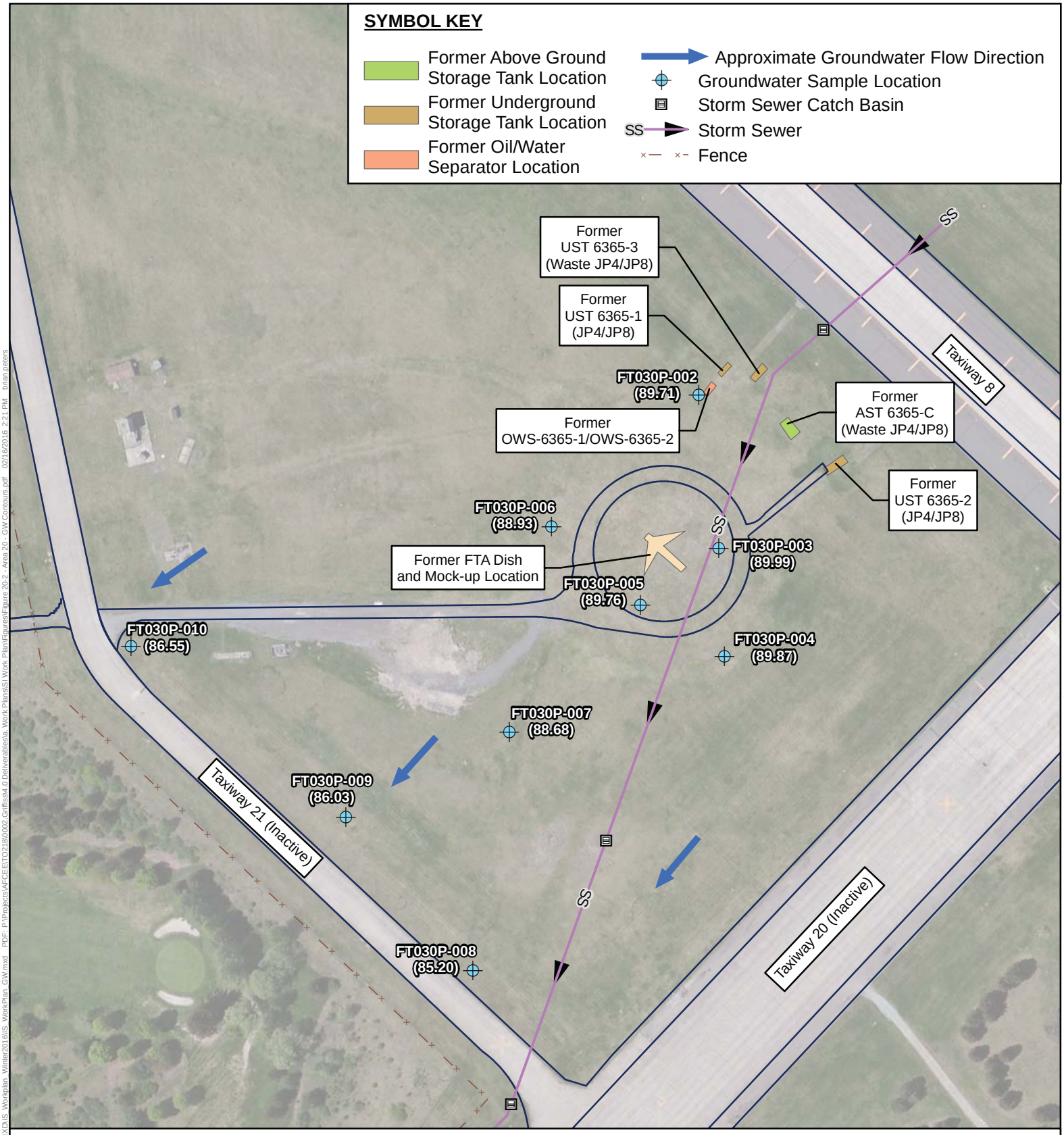

Source: 2011 Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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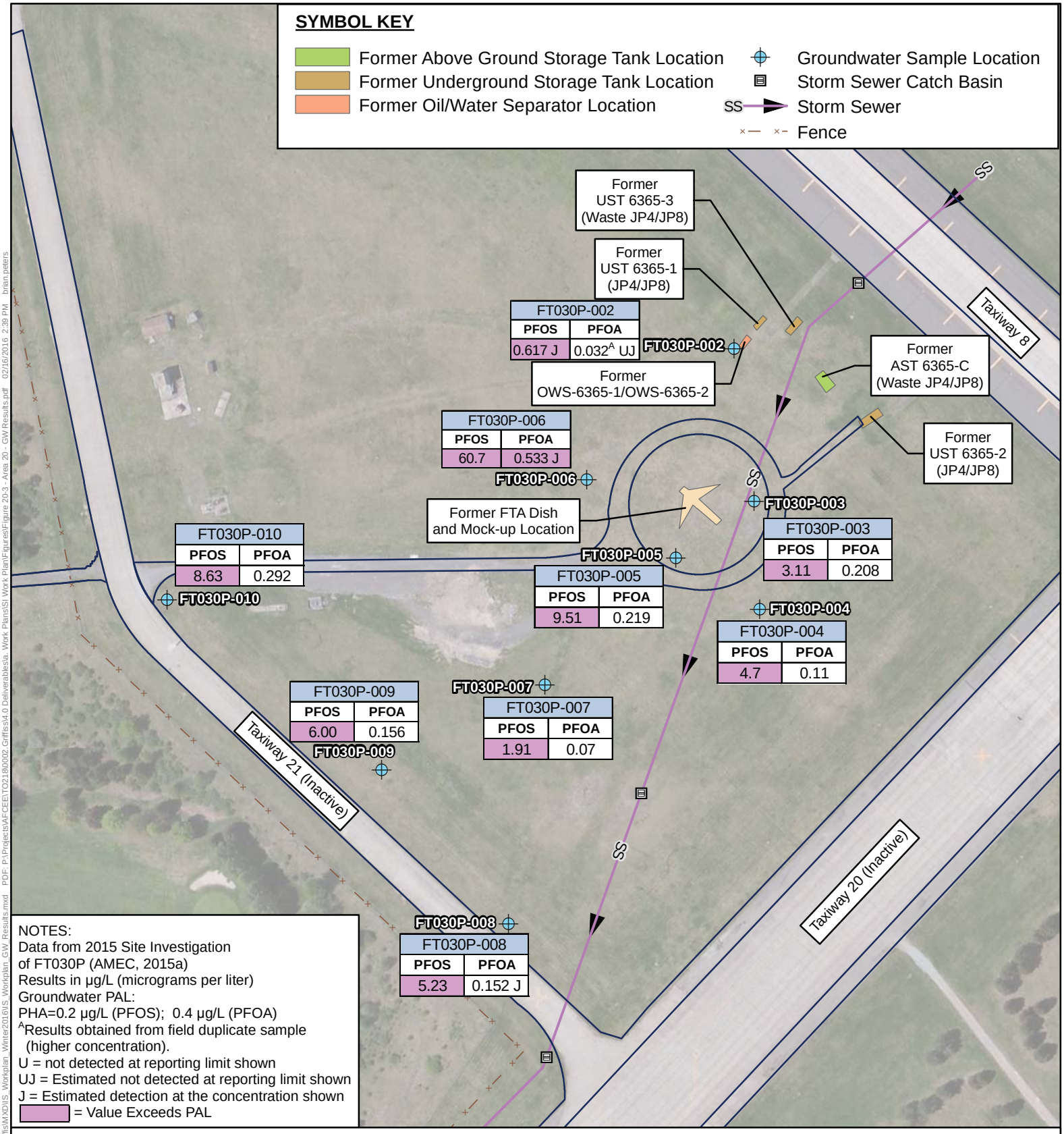
N

Figure 20-2
Area 20 - Groundwater Flow and Area Features
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 25 50 100 150 200 250 Meters
0 200 400 600 800 Feet

01/21/2016	IS_WorkPlan_GW	
PROJ: 775290218	Drawn: BRP	Chk: JBR



NOTES:
Data from 2015 Site Investigation of FT030P (AMEC, 2015a)
Results in µg/L (micrograms per liter)
Groundwater PAL:
PHA=0.2 µg/L (PFOS); 0.4 µg/L (PFOA)
[A]Results obtained from field duplicate sample (higher concentration).
U = not detected at reporting limit shown
UJ = Estimated not detected at reporting limit shown
J = Estimated detection at the concentration shown
= Value Exceeds PAL

Source: 2011 Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Figure 20-3
Area 20 - Groundwater Results - PFOS/PFOA
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 25 50 100 150 200 250 Meters
0 200 400 600 800 Feet

02/16/2016	IS_Workplan_GW_Results	
PROJ: 775290218	Drawn: BRP	Chk: JBR

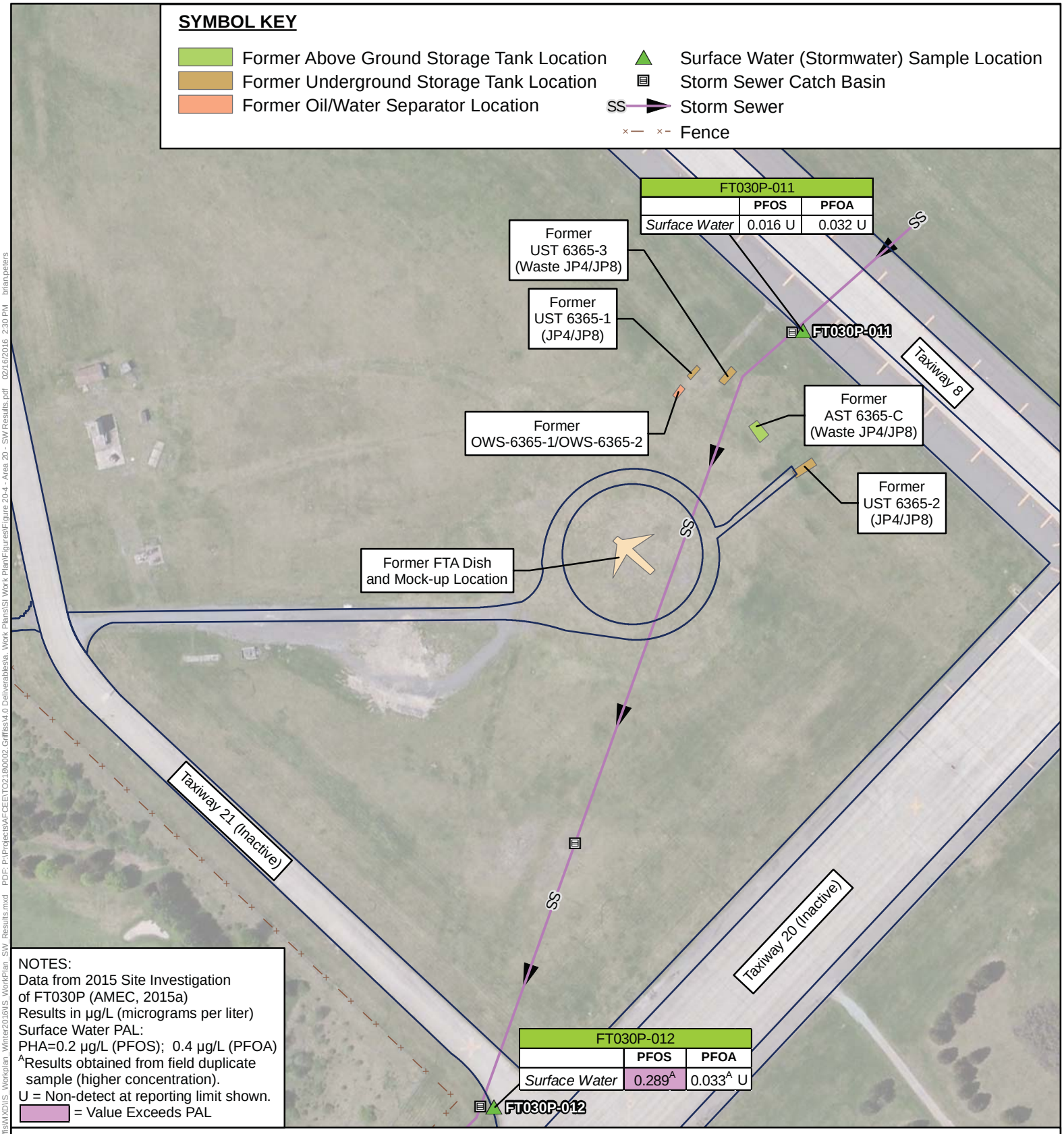

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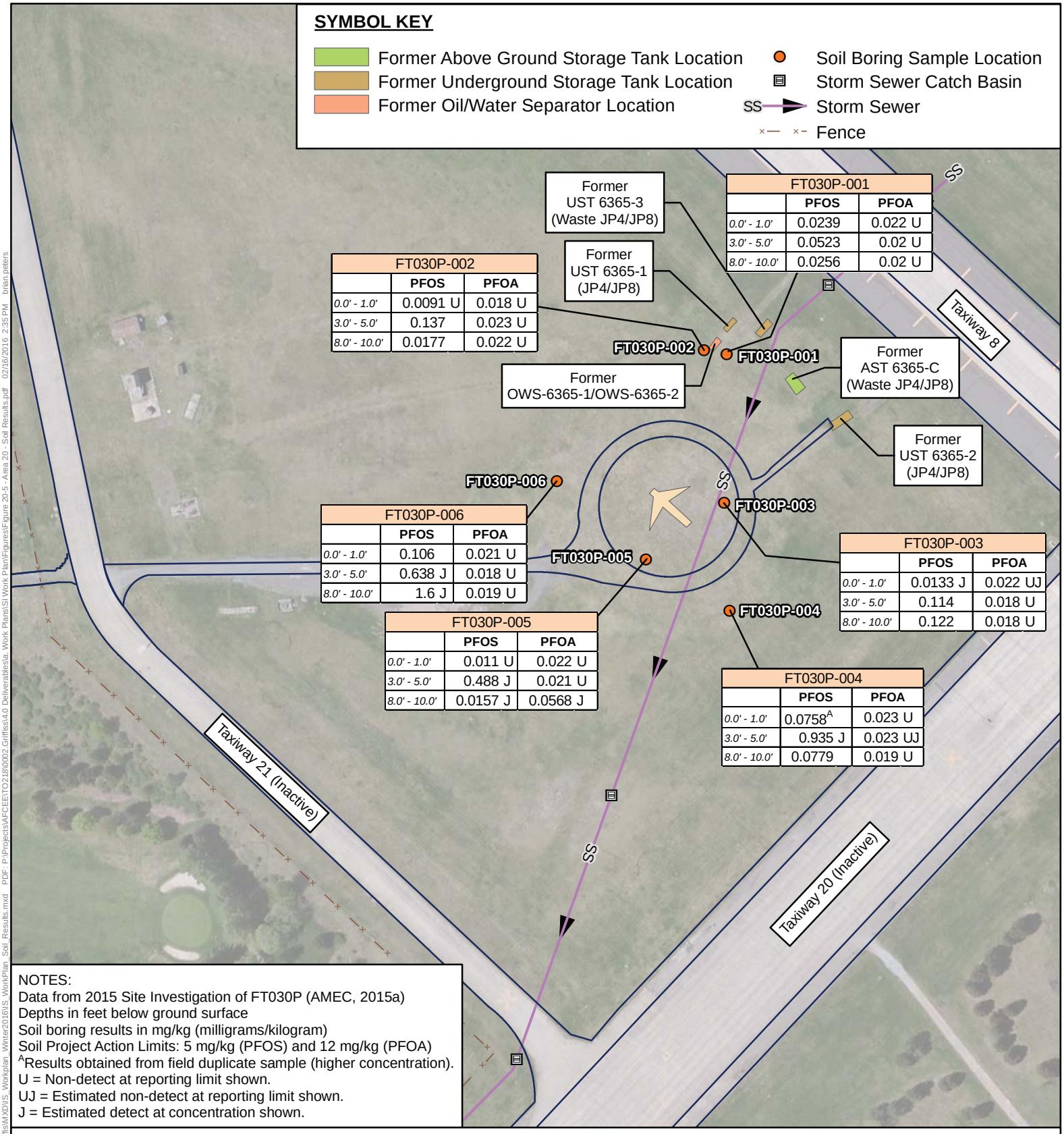
Figure 20-4
Area 20 - Surface Water (Stormwater) Results - PFOS/PFOA
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 25 50 100 150 200 250 Meters
0 200 400 600 800 Feet

02/16/2016	IS_WorkPlan_SW_Results	
PROJ: 775290218	Drawn: BRP	Chk: JBR



FT030P-001	PFOS	PFOA
0.0' - 1.0'	0.0239	0.022 U
3.0' - 5.0'	0.0523	0.02 U
8.0' - 10.0'	0.0256	0.02 U

FT030P-002	PFOS	PFOA
0.0' - 1.0'	0.0091 U	0.018 U
3.0' - 5.0'	0.137	0.023 U
8.0' - 10.0'	0.0177	0.022 U

FT030P-003	PFOS	PFOA
0.0' - 1.0'	0.0133 J	0.022 UJ
3.0' - 5.0'	0.114	0.018 U
8.0' - 10.0'	0.122	0.018 U

FT030P-004	PFOS	PFOA
0.0' - 1.0'	0.0758[A]	0.023 U
3.0' - 5.0'	0.935 J	0.023 UJ
8.0' - 10.0'	0.0779	0.019 U

FT030P-005	PFOS	PFOA
0.0' - 1.0'	0.011 U	0.022 U
3.0' - 5.0'	0.488 J	0.021 U
8.0' - 10.0'	0.0157 J	0.0568 J

FT030P-006	PFOS	PFOA
0.0' - 1.0'	0.106	0.021 U
3.0' - 5.0'	0.638 J	0.018 U
8.0' - 10.0'	1.6 J	0.019 U

NOTES:
Data from 2015 Site Investigation of FT030P (AMEC, 2015a)
Depths in feet below ground surface
Soil boring results in mg/kg (milligrams/kilogram)
Soil Project Action Limits: 5 mg/kg (PFOS) and 12 mg/kg (PFOA)
[A]Results obtained from field duplicate sample (higher concentration).
U = Non-detect at reporting limit shown.
UJ = Estimated non-detect at reporting limit shown.
J = Estimated detect at concentration shown.

Source: 2011 Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Figure 20-5
Area 20 - Soil Boring Results - PFOS/PFOA
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 25 50 100 150 200 250 Meters
0 200 400 600 800 Feet

02/16/2016	IS_WorkPlan_Soil_Results	
PROJ: 775290218	Drawn: BRP	Chk: JBR

SYMBOL KEY

- Proposed Surface Water/Sediment Sample Location
- Proposed Storm Water/Sediment Sample Location
- Proposed Area of Groundwater to Surface Water Discharge Survey
- 450 — Groundwater Contour, 1998 Basewide Survey (feet above mean sea level)
- Previous Groundwater Sample Location
- Storm Sewer Catch Basin
- Storm Sewer Manhole
- Storm Sewer
- Fence
- Stream/Surface Drainage
- Approximate Groundwater Flow Direction
- Former Above Ground Storage Tank Location
- Former Underground Storage Tank Location
- Former Oil/Water Separator Location
- Potential AFFF Release Area
- Former Installation Boundary

480
475
470
465
460
459
458
Taxiway 8
Former AST 6365-C (Waste JP4/JP8)
Former UST 6365-3 (Waste JP4/JP8)
Former UST 6365-1 (JP4/JP8)
Former OWS-6365-1/OWS-6365-2
FT030P-002
FT030P-006
FT030P-003
Former FTA Dish and Mock-up Location
Former UST 6365-2 (JP4/JP8)
FT030P-010
FT030P-005
FT030P-004
FT030P-007
Taxiway 21 (Inactive)
FT030P-009
Taxiway 20 (Inactive)
FT030P-008
SW/SD20004
Proposed Area of Groundwater to Surface Water Discharge Survey
SW/SD20002
ST/SD20001
SW/SD20003

Document: P:\Projects\AFCEE\TO17\00009 Griffiss\6.0 GIS Griffiss\MXD\IS Workplan Winter2016\IS_WorkPlan_11x17P.mxd PDF: P:\Projects\AFCEE\TO21\80002.Griffiss\4.0 Deliverables\a. Work Plans\SI Work Plan\Figures\Figure 20-6 - Area 20 - Proposed Locations.pdf 05/23/2016 12:28 PM brian.peters

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Figure 20-6
Proposed Sample Locations
Area 20 - FTA (FT030P)
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 50 100 200 300 400 Meters
0 200 400 800 1,200 1,600 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

5/23/2016	Rev:	IS_WorkPlan_11x17P	
Drawn: BRP	Chk: NWH	PROJ: 775290218	

QAPP Worksheet #18-20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
20	ST/SD20001	GRIFS-ST20001-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in stormwater/groundwater in storm drain
20	ST/SD20001	GRIFS-SD20001-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
20	SW/SD20002	GRIFS-SW20002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water at stormwater outfall
20	SW/SD20002	GRIFS-SD20002-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment at stormwater outfall
20	SW/SD20003	GRIFS-SW20003-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downstream from Area 20
20	SW/SD20003	GRIFS-SW20003-MMDDYYFD	Surface Water	NA	NA	Grab	New	Field duplicate
20	SW/SD20003	GRIFS-SD20003-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment downstream from Area 20

QAPP Worksheet #18-20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
20	SW/SD20004	GRIFS-SW20004-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water upstream from Area 20
20	SW/SD20004	GRIFS-SD20004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment upstream from Area 20
20	SW/SD20004	GRIFS-SD20004-MMDDYYFD	Sediment	0	1	Core sampler	New	Filed duplicate
20	SW/SD20004	GRIFS-SD20004-MMDDYYMS	Sediment	0	1	Core sampler	New	Matrix spike
20	SW/SD20004	GRIFS-SD20004-MMDDYYMSD	Sediment	0	1	Core sampler	New	Matrix spike duplicate

Notes:

ft. – feet
FD – Field Duplicate
ID – Identification
MSD – Matrix Spike Duplicate
GRIFS – Installation Identification
MMDDYY – Month Day Yea
bgs - below ground surface
FTA – Fire Training Area
MS – Matrix Spike
NA – Not Applicable
PFC – Perfluorinated Compound
QC – Quality Control

QAPP Worksheet #20-20: Field QC Summary

Matrix	Analytes	Regular Samples	Field Duplicates (1:10)	Equipment Rinsates (1 per non-dedicated piece of equipment, per day, per crew)	Field Blanks (1 per lot of PFC-free water)	MS/MSDs (1:20)	Total Samples
Soil	PFCs	0	0	0	0	0	0
Groundwater	PFCs	0	0	0	0	0	0
Sediment	PFCs	4	1	1	1	2 (1 pair)	9
Stormwater	PFCs	1	0	0	0	0	1
Surface Water	PFCs	3	1	0	0	0	4
Underground storage tanks	PFCs	0	0	0	0	0	0
Grand Total		**8**	**2**	**1**	**1**	**2 (1 pair)**	**14**

Notes:
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PFC – Perfluorinated Compound
TBD – To Be Determined

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FIGURES

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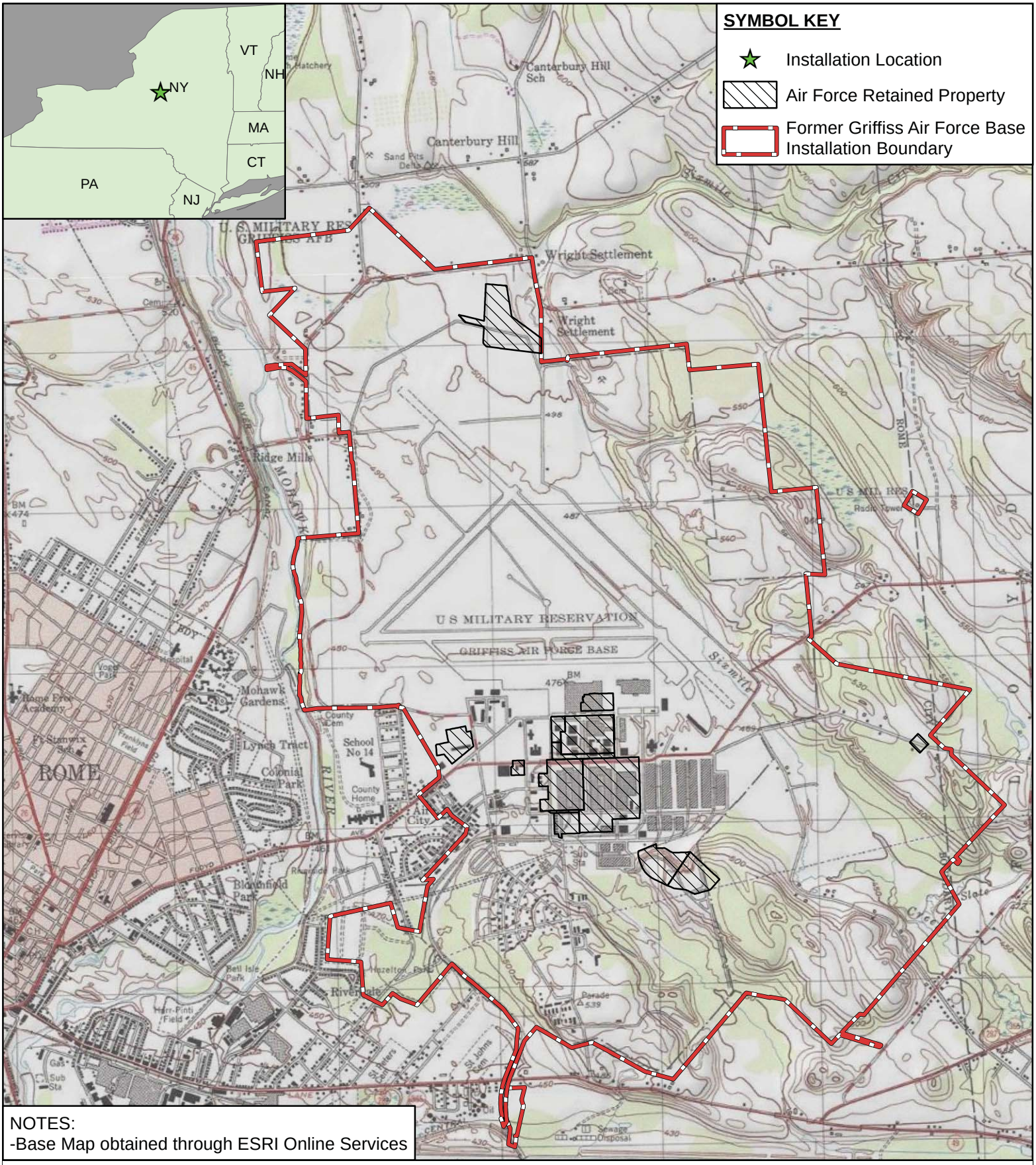

NOTES:
-Base Map obtained through ESRI Online Services

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N

Figure 1
Installation Location
Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas
at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 250 500 1,000 1,500 2,000 2,500 Meters
0 2,600 5,200 7,800 10,400 Feet

05/03/2016	Site_Location_8.5x11P	
PROJ: 775290218	Drawn: BRP	Chk: JBR

SYMBOL KEY

- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Sanitary Sewer Line
- Air Force Retained Property
- Potential AFFF Release Area
- Former Installation Boundary

18. Landfill 1

Six Mile Creek

Mohawk River

20. FTA (FT030P)

Approximate Drain Line Location

9. Building 917 and AFFF Lagoon

16. Six Mile Creek

15. Sanitary Sewer Line from (FT030P)

10. Suspect FTA (FT-48)

11. Fire Demonstration Area

6. Building 100

8. Building 150

7. Building 101

4. North Side of Building 45 (Fire Station)

3. Building 45 (Fire Station)

14. B-52 Crash Site

5. Building 47

2. Building 44 (Former Fire Station)

1. Building 15

12. Apron 1

19. Three Mile Creek

Three Mile Creek

13. Nose Docks 1 and 2 and Apron 1 - Trench

Six Mile Creek

Erie Canal (New York State Barge Canal)

Mohawk River

NOTE:
See Figure 3 and Area Specific Figures for Stormwater System.

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Figure 2
Site Layout Map - Potential AFFF Release Areas

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 200 400 800 1,200 1,600 Meters

0 750 1,500 3,000 4,500 6,000 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

6/13/2016	Rev:	IS_WorkPlan_11x17P
Drawn: BRP	Chk: TDL	PROJ: 775290218

SYMBOL KEY

- Proposed Surface Water/Sediment Sample Location
- Proposed Storm Water/Sediment Sample Location
- Stream/Surface Drainage
- Stream/Surface Intermittent Drainage
- Stream/Surface Drainage in Pipe
- Storm Sewer
- Former Installation Boundary

SW/SD16001
SW/SD16002
SW/SD16003
SW/SD09003
SW/SD09002
SW/SD16004
SW/SD20004
SW/SD20002
SW/SD20003
SW/SD10004
ST/SD16005
SW/SD19001
SW/SD19002
SW/SD19003
SW/SD19004
SW/SD16006
Six Mile Creek
Mohawk River
Three Mile Creek
Six Mile Creek
Erie Canal (New York State Barge Canal)
Mohawk River

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Figure 3
Basewide Surface Water and Sediment Sampling Locations

Site Investigation of Potential Perfluorinated Compound (PFC) Release Areas at Multiple BRAC Installations
Installation Specific Work Plan - Former Griffiss Air Force Base, Rome, New York

0 200 400 800 1,200 1,600 Meters
0 750 1,500 3,000 4,500 6,000 Feet

N

NOTES:
-Aerial Imagery obtained through ESRI Online Services

9/14/2016	Rev:	IS_WorkPlan_11x17P
Drawn: BRP	Chk: TDL	PROJ: 775290218

APPENDIX A

INSTALLATION-SPECIFIC HEALTH AND SAFETY PLAN

The site-specific health and safety Plan provided in this appendix, supplements the General HSP included as Appendix A to the QPP. Refer to the HSP and QPP for all job hazard analyses, site control requirements, personal protective equipment needs, safety mitigation measures, and standard operating procedures.

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Site: Former Griffiss AFB, Rome, NY

Prepared by: Thomas Longley Date: 7/13/16

Reviewed by: John Rand 7/13/16

Dates of Required Training and Medical Surveillance:

Name	Thomas Longley	Rudy Smithwick	John Rand	Nathan Hagelin
Job duties	Field Team Lead	Field Team HSO	Technical Lead	Base Lead
First Aid	03/14/2018	-	-	-
CPR	03/14/2018	-	-	-
Hazard Communication	11/30/2016	11/30/2016	11/30/2016	11/30/2016
HAZWOPER	07/21/2016	11/21/2016	11/18/2016	11/18/2016

At least one worker must be trained in First Aid/CPR and should receive blood borne pathogen training

Known or Suspected Contaminants (include permissible exposure limits [PELs]/threshold limit values [TLVs]:

Contaminants of Concern (COC) (Attach Fact Sheets*)	Maximum Concentrations		PEL/TLV
	Soil (mg/kg)	Water/Groundwater (µg/L)	
Perfluorinated Compounds	Unknown	Unknown	N/A
Benzene	<Remediation Goals	<Remediation Goals	1 ppm[a]
Toluene	<Remediation Goals	<Remediation Goals	200 ppm
Ethylbenzene	<Remediation Goals	<Remediation Goals	100 ppm
Xylenes	<Remediation Goals	<Remediation Goals	100 ppm
cis 1,2-Dichloroethene	<Remediation Goals	<Remediation Goals	100 ppm
Trichloroethene	<Remediation Goals	<Remediation Goals	100 ppm
Vinyl Chloride	<Remediation Goals	<Remediation Goals	1 ppm

[a] ppm – parts per million

EMERGENCY CONTACTS

NAME	TELEPHONE NUMBERS		DATE OF PRE-EMERGENCY NOTIFICATION (if applicable)
Fire Department:	911		
Hospital: **Rome Memorial Hospital** **1500 N. James St.** **Rome, NY 13440**	(315)338-7000		
Police/Ambulance/Fire:	911		
Client Contact: **David Farnsworth**	(O): 518-563-2871	(C): 518-420-2179	
Griffiss International Airport Security: **Ed Arcuri**	(O): 315-356-1180	(C): 315-734-5406	
Regional Lead: **Peter Baker**	(O): 207-828-3692	(C): 207-232-5037	
Site Health And Safety Officer: **Danielle Lerner**	(O): 207-828-3535	(C): 203-494-6385	
Group HSE Manager: **John Mazur**	(O): 910-452-1185	(C): 910-431-2330 (H): 910-681-0538	

EMERGENCY PROCEDURES

- The health and safety officer (HSO) or alternate should be immediately notified via the on-site communication system. The HSO assumes control of the emergency response.
- The HSO notifies the project manager and client contact of the emergency. The HSO shall then contact the group health, safety and environment (HSE) manager who will then contact the corporate HSE manager.
- If applicable, the HSO shall notify off-site emergency responders (e.g. fire department, hospital, police department, etc.) and shall inform the response team as to the nature and location of the emergency on-site.
- If applicable, the HSO evacuates the site. Site workers should move to the predetermined evacuation point (labeled as "Airfield Access Gate on Figure 2\).
- For small fires, flames should be extinguished using the fire extinguisher. Large fires should be handled by the local fire department.
- In an unknown situation or if responding to toxic gas emergencies, appropriate PPE, including self-contained breathing apparatus (SCBA) if available, should be donned. If appropriate PPE is unavailable, site workers should evacuate and call in emergency personnel.
- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and wash affected area. Site worker should shower as soon as possible after incident.
- If a worker is injured, first aid shall be administered by certified first aid provider. See AMEC Triage Program below
- If the emergency involves toxic gases, workers will back off and reassess. Prior to re-entering the work zone, the area must be determined to be safe. Entry will be using Level B PPE and utilize appropriate monitoring equipment to verify that the site is safe.
- Within 24 hours after any emergency response, the Incident Analysis Report (and Vehicle Incident Report if vehicle incident) shall be completed and returned to the group HSE manager, who will forward a copy to the corporate HSE manager. Injuries requiring medical treatment beyond first aid (as well as work-related vehicle incidents) will require the employee to submit a post incident drug and alcohol test.

AMEC WorkCare Program

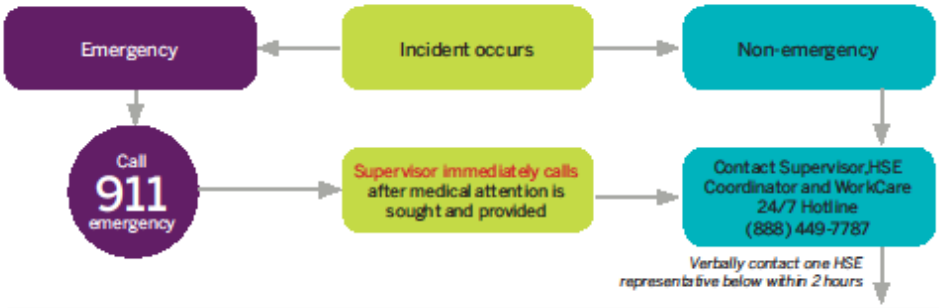
- If the emergency involves an injury to an AMEC employee, the local HSE coordinator, field lead are to implement the AMEC WorkCare program. Employees whose injuries are true emergencies and who need immediate medical attention will initially bypass this program and are to be immediately sent/taken to the hospital identified in the routes to emergency medical facilities section below.
- For non-emergency injuries, the supervisor field lead and the injured employee will contact the AMEC WorkCare 24/7 Hotline at 1-888-449-7787 and speak to a nurse case manager. The nurse case manager will perform the intake process and ask for information including the following:
    - Explain the process to the caller
    - Determine the nature of the concern
    - Provide appropriate medical advice to the caller
    - Determine the appropriate path forward with the caller
    - Maintain appropriate medical confidentiality
    - Help caller to execute path forward – including a referral to the appropriate local medical facility
    - Send an email notification to the corporate safety contact
- From this, a collaborative decision will be made between the nurse case manager and the injured employee on the most appropriate place for treatment; either the hospital, the clinic, or onsite first aid
- If the employee is to be sent to a clinic or hospital, the nurse will call ahead to explain the situation, the need for testing, and advises options to avoid OSHA recordable & considerations for return to work & transitional/modified duty. The nurse will also arrange for drug and alcohol testing to be conducted at the hospital/clinic. If the employee is to be treated on site (First Aid), the nurse will advise the employee to call if injury gets worse. Attached is a flow diagram that describes this procedure.

AMEC PROGRAM FLOW DIAGRAM

Incident flow chart

Call immediately

amec foster wheeler



E&I Corporate HSE department contact list

Name/email	Office location	Contact information
Bruce Voss bruce.voss@amecfw.com	Cathedral City, CA	760.202.3737 (office) 951.897.6381 (cell)
Chad Barnes chad.barnes@amecfw.com	Phoenix, AZ	602.733.6000 (office) 480.495.9846 (cell)
Cindy Sundquist cynthia.sundquist@amecfw.com	Portland, ME	207.828.3309 (office) 207.650.7593 (cell) 207.892.4402 (home)
Gabe Sandholm gabe.sandholm@amec.com	Minneapolis, MN	612.252.3785 (office) 206.683.9190 (cell)
John Mazur john.mazur@amec.com	Wilmington, NC	910.444.2978 (office) 910.431.2330 (cell) 910.681.0538 (home)
Lori Dowling lori.dowling@amec.com	Prince George, BC	250.564.3243 (office)
Philip Neville philip.neville@amec.com	Thorold, ON	905.687.6616 (office) 905.380.4465 (cell)
Tim Kihn tim.kihn@amec.com	Edmonton, AB	780.944.6363 (office) 780.717.5058 (cell)
Vladimir Ivensky (can call 24/7) vladimir.ivensky@amec.com	Plymouth Meeting, PA	610.877.6144 (office) 484.919.5175 (cell) 215.947.0393 (home)
Kirby Lastinger kirby.lastinger@amec.com	Lakeland, FL	836-667-2345 x207 (office) 863-272-4775 (cell)

*High potential near misses, subcontractor incidents, regulatory inspections, spills, and property damage should be reported within 60 minutes to one of the above HSE Representatives.
WITHIN 24 HOURS - Local Supervisor, HSE Coordinator, Project HSE Officer, and any applicable safety committees must complete preliminary investigation, along with the initial Incident Analysis Report Form and forward it to the Corporate HSE Department

Rev. Feb15-Hb

Name:		Date:	
Name:		Date:	
Name:		Date:	
Name:		Date:	
Name:		Date:	

FIELD TEAM REVIEW: I acknowledge that I understand the requirements of this HSP, and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions regarding the HSP and its requirements answered prior to performing field activities. Health and safety training and medical surveillance requirements applicable to my fieldactivities at this site are current and will not expire during on-site activities.

ROUTES TO EMERGENCY MEDICAL FACILITIES

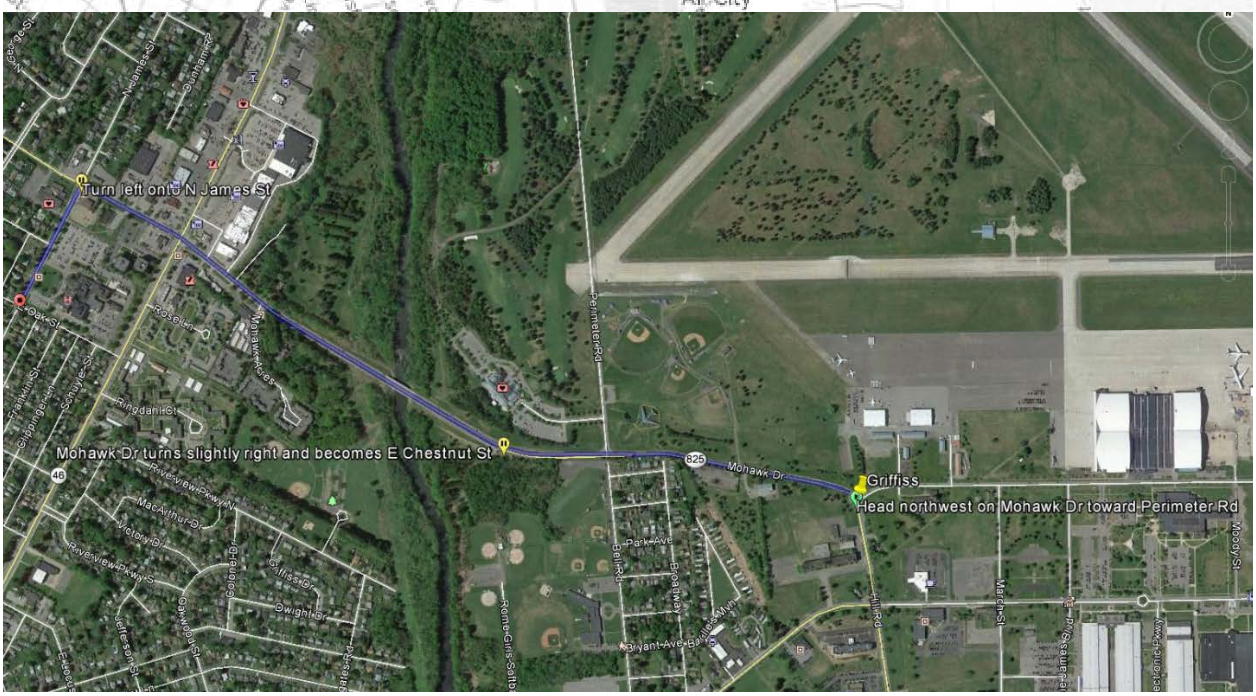
HOSPITAL (for immediate emergency treatment):

Facility Name:	Rome Memorial Hospital
Address:	1500 N. James St, Rome, NY 13440
Telephone Number:	315-338-7000

DIRECTIONS TO PRIMARY HOSPITAL

- From the intersection of Mohawk Drive, Hill Road, and Hangar Road drive Northwest on Mohawk Road toward Perimeter Road
- Mohawk Drive turns slightly right and becomes E Chestnut St.
- Continue onto E Chestnut St
- Turn left onto N James St


26
Ridge Mills
Mohawk Glen
Golf Course
1500 N
James St
W Chestnut St
W Cedar St
W Oak St
W Pine St
Black River Blvd N
Mohawk River
Lynch Tract
Victory Dr
Lyndale Dr
DeLutis Field
Mohawk Dr
Hangar Rd
Hill Rd
March St
Broadway
Bell Rd S
Bell Rd N
Air City
RME -
Griffiss
International
Airport


Turn left onto N James St
Mohawk Dr turns slightly right and becomes E Chestnut St
Mohawk Dr
Griffiss
Head northwest on Mohawk Dr toward Perimeter Rd
Perimeter Rd
Hill Rd
March St

APPENDIX B

PROJECT SCHEDULE

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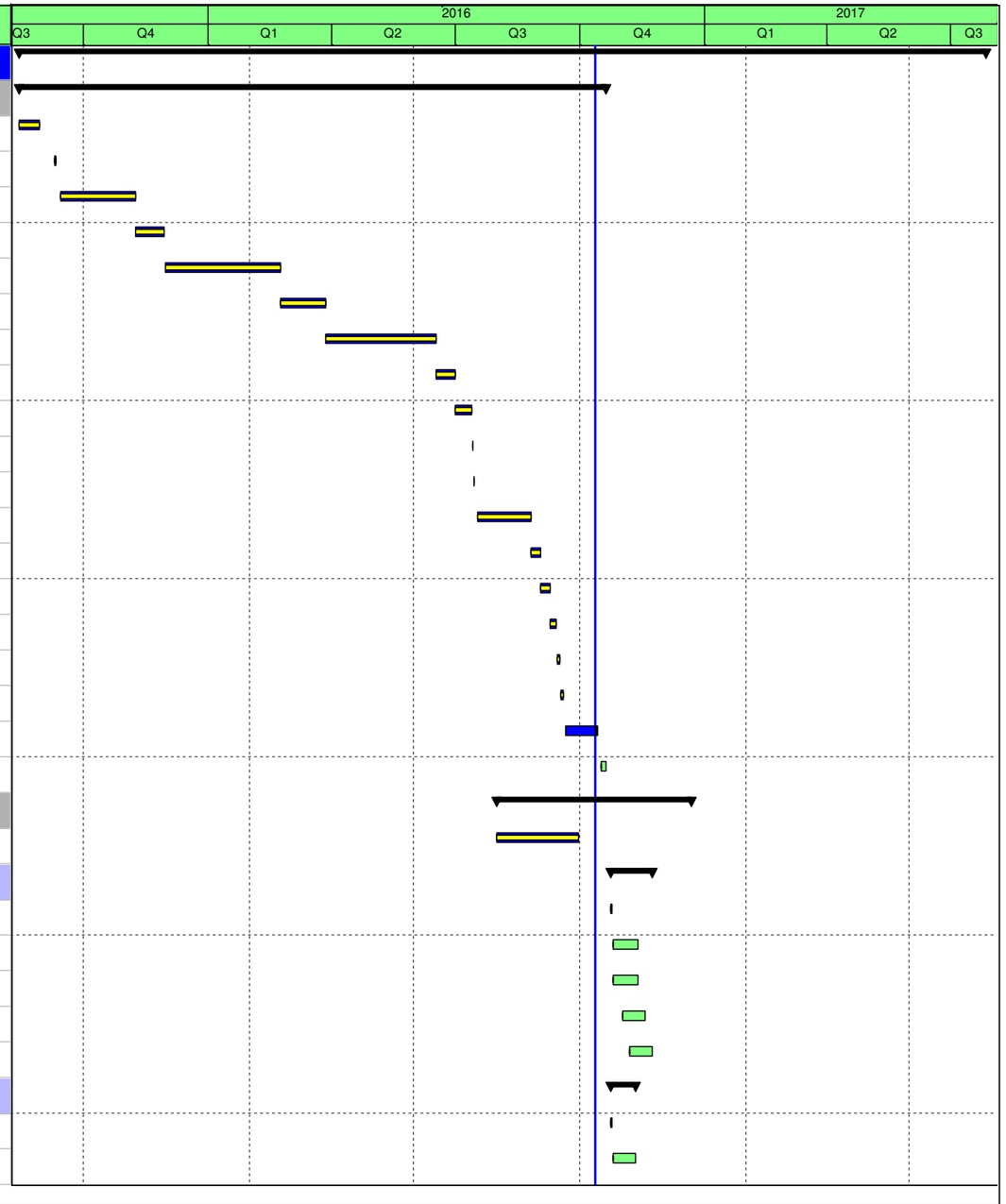
Activity ID	Activity Name	Original Duration	Start	Finish	Physical % Complete
Griffiss AFB, NY		407d	15-Aug-15 A	27-Jul-17	
Installation Specific Work Plan		127d	15-Aug-15 A	20-Oct-16	
471	Coordinate Site Scoping Visit	15d	15-Aug-15 A	30-Aug-15 A	100%
472	Initial Meeting and Scoping	4d	10-Sep-15 A	11-Sep-15 A	100%
473	Draft Scope	30d	15-Sep-15 A	09-Nov-15 A	100%
474	Post Scoping Meeting	1d	09-Nov-15 A	30-Nov-15 A	100%
475	Prepare and Submit Working Copy - ISWP	29d	01-Dec-15 A	24-Feb-16 A	100%
476	Air Force Review Working Copy - ISWP	20d	24-Feb-16 A	28-Mar-16 A	100%
477	Prepare and Submit Working Copy Rev 1 - ISWP	12d	28-Mar-16 A	17-Jun-16 A	100%
478	Air Force Back Check Working Copy Rev 1 - ISWP	26d	17-Jun-16 A	01-Jul-16 A	100%
479	Prepare and Submit Working Copy Rev 2 - ISWP	13d	01-Jul-16 A	13-Jul-16 A	100%
C1750	Air Force Back Check Working Copy Rev 2 - ISWP	1d	14-Jul-16 A	14-Jul-16 A	100%
C1751	Prepare and Submit Draft - ISWP	1d	15-Jul-16 A	15-Jul-16 A	100%
C1752	Regulatory Review Draft - ISWP	20d	18-Jul-16 A	26-Aug-16 A	100%
C1760	Prepare and Submit Response to Comments - ISWP	7d	26-Aug-16 A	02-Sep-16 A	100%
C2560	Air Force Review of AmecFW Comments	0d	02-Sep-16 A	09-Sep-16 A	100%
C2570	Prepare and Submit Response to Comments 2 - ISWP	0d	09-Sep-16 A	14-Sep-16 A	100%
C2580	Air Force back check AmecFW response	0d	15-Sep-16 A	16-Sep-16 A	100%
C2590	Prepare and Submit Pre-Final - ISWP	0d	17-Sep-16 A	19-Sep-16 A	100%
C2600	Regulatory review pre-final - ISWP	15d	20-Sep-16 A	14-Oct-16	0%
C2630	Prepare and Submit Final - ISWP	4d	17-Oct-16	20-Oct-16	0%
Investigations and Monitoring		144d	01-Aug-16 A	22-Dec-16	
482	Coordinate Site Access	61d	01-Aug-16 A	30-Sep-16 A	100%
Soil Sampling and Wells		31d	24-Oct-16	23-Nov-16	
483	Mobilization of Soil Boring and Monitoring Well Installation Team	1d	24-Oct-16	24-Oct-16	0%
484	Soil Boring Advancement and Well Installation	19d	25-Oct-16	12-Nov-16	0%
485	Sample Collection - Surface and Subsurface Soil	19d	25-Oct-16	12-Nov-16	0%
490	Soil Boring Abandonment	18d	01-Nov-16	18-Nov-16	0%
486	Monitoring Well Development & Sampling of New and Existing Monitoring Wells	17d	07-Nov-16	23-Nov-16	0%
Sediment and SW Sampling		19d	24-Oct-16	11-Nov-16	
488	Mobilization of Surface Water, Storm Water and Sediment Team	1d	24-Oct-16	24-Oct-16	0%
489	Sample Collection - Surface Water, Storm Water and Sediment	18d	25-Oct-16	11-Nov-16	0%

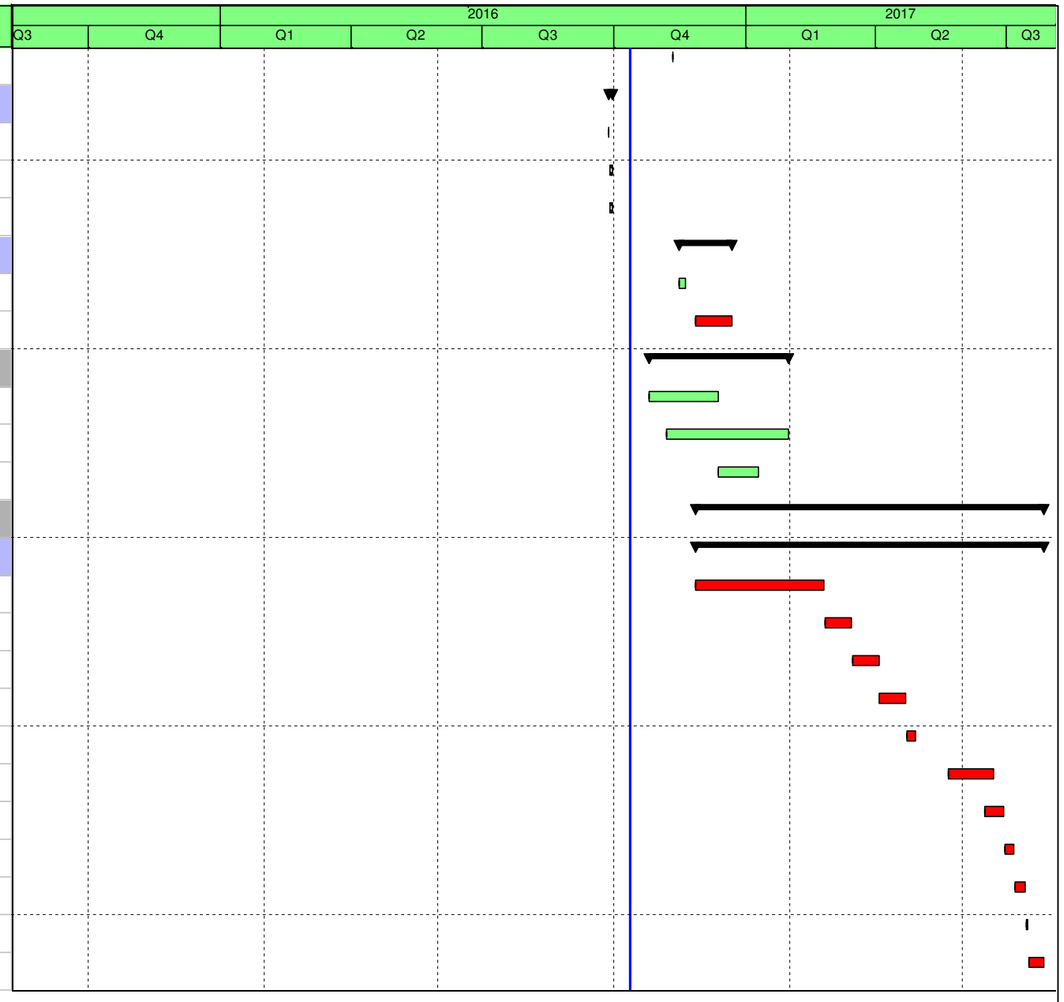


Remaining Level of Effort
Milestones
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
% Complete
% Complete (LOE)
Summary

A/E Services for PFCs Release at Multiple BRAC Bases - Griffiss

Data Date: 13-Oct-16

Activity ID	Activity Name	Original Duration	Start	Finish	Physical % Complete
491	Demob Sampling Team	1d	11-Nov-16	11-Nov-16	0%
Fishery Survey		3d	28-Sep-16 A	30-Sep-16 A	
494	Mobilization of Fish Survey Personel	1d	28-Sep-16 A	28-Sep-16 A	100%
495	Interviews of Local Fishery Organizations, AFCEC, and Regional Biologists	2d	29-Sep-16 A	30-Sep-16 A	100%
496	On-Site Reconnaissance of Watersheds and Surface Waters	2d	29-Sep-16 A	30-Sep-16 A	100%
IDW Handling, Disposal, & Survey		38d	15-Nov-16	22-Dec-16	
492	Survey of New Monitoring Wells	5d	15-Nov-16	19-Nov-16	0%
493	Investigation Derived Waste (IDW) Handling and Disposal	26d	27-Nov-16	22-Dec-16	0%
Sample, Analysis and Validation		98d	25-Oct-16	30-Jan-17	
A1000	Sample Analysis	49d	25-Oct-16	12-Dec-16	0%
A1010	Environmental Resources Program Information Management System (ERPIMS) Data Submittal	85d	07-Nov-16	30-Jan-17	0%
A1020	Data Validation	28d	13-Dec-16	09-Jan-17	0%
Documentation		243d	27-Nov-16	27-Jul-17	
Site Investigation Report		243d	27-Nov-16	27-Jul-17	
C2130	Prepare and Submit Working Copy - Investigation Report	90d	27-Nov-16	24-Feb-17	0%
C2140	Air Force Review Working Copy - Investigation Report	19d	25-Feb-17	15-Mar-17	0%
C2150	Prepare and Submit Working Copy Rev 1 - Investigation Report	19d	16-Mar-17	03-Apr-17	0%
C2160	Air Force Back Check Working Copy Rev 1 - Investigation Report	19d	04-Apr-17	22-Apr-17	0%
C2181	Prepare and Submit Draft - Investigation Report	7d	23-Apr-17	29-Apr-17	0%
C2182	Regulatory Review Draft - Investigation Report	32d	22-May-17	22-Jun-17	0%
C2183	Prepare and Submit Response to Comments - Investigation Report	14d	16-Jun-17	29-Jun-17	0%
C2720	Regulatory Concurrence Response to Comments - Investigation Report	7d	30-Jun-17	06-Jul-17	0%
C2750	Prepare and Submit Pre-Final - Investigation Report	8d	07-Jul-17	14-Jul-17	0%
C2760	Air Force Back Check Pre-Final - Investigation Report	2d	15-Jul-17	16-Jul-17	0%
C2790	Prepare and Submit Final - Investigation Report	9d	17-Jul-17	27-Jul-17	0%



Remaining Level of Effort
Milestones
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work
% Complete
% Complete (LOE)
Summary

A/E Services for PFCs Release at Multiple BRAC Bases - Griffiss

Data Date: 13-Oct-16

APPENDIX C
QAPP Worksheet #18: SAMPLING LOCATIONS AND METHODS

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QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
1	SB/MW01001	GRIFS-SB01001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil adjacent to waste AFF USTs
1	SB/MW01001	GRIFS-SB01001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01001	GRIFS-SB01001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01001	GRIFS-MW01001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater adjacent to USTs
1	SB/MW01002	GRIFS-SB01002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01002	GRIFS-SB01002-(0-1)FD	Soil	0	1	DPT	New	Field Duplicate
1	SB/MW01002	GRIFS-SB01002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01002	GRIFS-SB01002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil adjacent to waste AFFF USTs
1	SB/MW01002	GRIFS-MW01002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater adjacent to USTs

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
1	SB/MW01003	GRIFS-SB01003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils at grass area south of building
1	SB/MW01003	GRIFS-SB01003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils at grass area south of building
1	SB/MW01003	GRIFS-SB01003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils at grass area south of building
1	SB/MW01003	GRIFS-MW01003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of building
1	SB/MW01004	GRIFS-SB01004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil in former OWS excavation
1	SB/MW01004	GRIFS-SB01004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil in former OWS excavation
1	SB/MW01004	GRIFS-SB01004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil in former OWS excavation
1	SB/MW01004	GRIFS-SB01004-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
1	SB/MW01004	GRIFS-SB01004-	Soil	TBD	TBD	DPT	New	Matrix Spike

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		(WT)MS						
1	SB/MW01004	GRIFS-SB01004-(WT)MSD	Soil	TBD	TBD	DPT	New	Matrix Spike Duplicate
1	SB/MW01004	GRIFS-MW01004-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater in former OWS excavation
1	SB01005	GRIFS-SB01005-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils at grass area north of building
1	SB01005	GRIFS-SB01005-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils at grass area north of building
1	ST/SD01006	GRIFS-ST01006-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in the storm drain system
1	ST/SD01006	GRIFS-SD01006-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in the storm drain system
1	UST01007	GRIFS-UST01007-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste AFF UST
1	UST01008	GRIFS-UST01008-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste AFFF UST
2	MW02001	GRIFS-MW02001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater upgradient of

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								Area 02
2	SB/MW02002	GRIFS-SB02002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02002	GRIFS-SB02002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02002	GRIFS-SB02002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02002	GRIFS-MW02002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 02
2	SB/MW02003	GRIFS-SB02003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02003	GRIFS-SB02003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02003	GRIFS-SB02003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02003	GRIFS-MW02003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-	Soil	3	5	DPT	New	Assess PFC presence in soils

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		(3-5)						downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of Area 02
2	SB/MW02004	GRIFS-SB02004-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
2	SB/MW02004	GRIFS-MW02004-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 02
2	SB/MW02004	GRIFS-MW02004-MMDDYYFD	Ground water	TBD	TBD	Peristaltic	New	Field Duplicate
2	ST/SD02005	GRIFS-SD02005-MMDDYY	Sediment	NA	NA	Core Sampler	New	Assess PFC presence in sediment in catch basin that discharges to Rainbow Creek
2	ST/SD02005	GRIFS-ST02005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in stormwater in catch basin that discharges to Rainbow Creek
3	MW03001	GRIFS-MW03001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in downgradient groundwater
3	MW03002	GRIFS-MW03002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in downgradient groundwater
3	SB/MW03003	GRIFS-SB03003-	Soil	0	1	DPT	New	Assess PFC presence in soils

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		(0-1)						near UST
3	SB/MW03003	GRIFS-SB03003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03003	GRIFS-SB03003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03003	GRIFS-MW03003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
3	SB/MW03004	GRIFS-SB03004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03004	GRIFS-SB03004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03004	GRIFS-SB03004-(3-5)FD	Soil	3	5	DPT	New	Field Duplicate
3	SB/MW03004	GRIFS-SB03004-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils near UST
3	SB/MW03004	GRIFS-MW03004-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
3	SB/MW03004	GRIFS-MW03004-MMDDYYFD	Ground water	TBD	TBD	Peristaltic	New	Field Duplicate
3	SB/MW03004	GRIFS-MW03004-MMDDYYMS	Ground water	TBD	TBD	Peristaltic	New	Matrix Spike

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
3	SB/MW03004	GRIFS-MW03004-MMDDYYMSD	Ground water	TBD	TBD	Peristaltic	New	Matric Spike Duplicate
3	SB03005	GRIFS-SB03005-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	SB03005	GRIFS-SB03005-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	SB03006	GRIFS-SB03006-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	SB03006	GRIFS-SB03006-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil at low spot in grassy area next to apron
3	ST/SD03007	GRIFS-ST03007-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in the stormwater system
3	ST/SD03007	GRIFS-SD03007-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
3	UST03008	GRIFS-UST03008-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of UST
4	SB/MW04001	GRIFS-SB04001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 04 soils

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
4	SB/MW04001	GRIFS-SB04001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04001	GRIFS-SB04001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04001	GRIFS-MW04001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater beneath Area 04
4	SB/MW04002	GRIFS-SB04002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04002	GRIFS-SB04002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04002	GRIFS-SB04002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04002	GRIFS-MW04002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater beneath Area 04
4	SB/MW04003	GRIFS-SB04003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04003	GRIFS-SB04003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 04 soils
4	SB/MW04003	GRIFS-SB04003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 04 soils

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
4	SB/MW04003	GRIFS-MW04003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater beneath Area 04
5	MW05001	GRIFS-MW05001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of building and UST
5	MW05001	GRIFS-MW05001-MMDDYYFD	Ground water	TBD	TBD	Peristaltic	New	Field Duplicate
5	SB/MW05002	GRIFS-SB05002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05002	GRIFS-SB05002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05002	GRIFS-SB05002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05002	GRIFS-MW05002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
5	SB/MW05003	GRIFS-SB05003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05003	GRIFS-SB05003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near UST
5	SB/MW05003	GRIFS-SB05003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near UST

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
5	SB/MW05003	GRIFS-MW05003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
5	SB05004	GRIFS-SB05004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low lying grassy area
5	SB05004	GRIFS-SB05004-(0-1)FD	Soil	0	1	DPT	New	Field Duplicate
5	SB05004	GRIFS-SB05004-(0-1)MS	Soil	0	1	DPT	New	Matrix Spike
5	SBO5004	GRIFS-SB05004-(0-1)MSD	Soil	0	1	DPT	New	Matrix Spike Duplicate
5	SB05004	GRIFS-SB05004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low lying grassy area
5	ST/SD05005	GRIFS-ST05005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in storm water/ground water in storm water system
5	ST/SD05005	GRIFS-SD05005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm water system
5	UST05006	GRIFS-UST05006-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in waste UST
6	SB/MW06001	GRIFS-SB06001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil downgradient from Area 06

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
6	SB/MW06001	GRIFS-SB06001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06001	GRIFS-SB06001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06001	GRIFS-MW06001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 06
6	SB/MW06002	GRIFS-SB06002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06002	GRIFS-SB06002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06002	GRIFS-SB06002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil downgradient from Area 06
6	SB/MW06002	GRIFS-MW06002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 06
6	SB06003	GRIFS-SB06003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06003	GRIFS-SB06003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06004	GRIFS-SB06004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil in low-lying grassy area

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
6	SB06004	GRIFS-SB06004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil in low-lying grassy area
6	SB06004	GRIFS-SB06004-(3-5)FD	Soil	3	5	DPT	New	Field Duplicate
6	ST/SD06005	GRIFS-ST06005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
6	ST/SD06005	GRIFS-SD06005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
6	ST/SD06006	GRIFS-ST06006-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
6	ST/SD06006	GRIFS-ST06006-MMDDYYFD	Stormwater	NA	NA	Grab	New	Field Duplicate
6	ST/SD06006	GRIFS-ST06006-MMDDYYMS	Stormwater	NA	NA	Grab	New	Matrix Spike
6	ST/SD06006	GRIFS-ST06006-MMDDYYMSD	Stormwater	NA	NA	Grab	New	Matrix Spike Duplicate
6	ST/SD06006	GRIFS-SD06006-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
6	ST/SD06006	GRIFS-SD06006-MMDDYYFD	Sediment	0	1	Core sampler	New	Field Duplicate
6	ST/SD06006	GRIFS-SD06006-	Sedimen	0	1	Core	New	Matrix Spike

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		MMDDYYMS	t			sampler		
6	ST/SD06006	GRIFS-SD06006-MMDDYYMSD	Sediment	0	1	Core sampler	New	Matrix Spike Duplicate
6	ST/SD06007	GRIFS-ST06007-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
6	ST/SD06007	GRIFS-SD06007-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	SB/MW07001	GRIFS-SB07001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07001	GRIFS-SB07001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07001	GRIFS-SB07001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07001	GRIFS-MW07001-MMDDYY	Groundwater	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB/MW07002	GRIFS-SB07002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07002	GRIFS-SB07002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07002	GRIFS-SB07002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
7	SB/MW07002	GRIFS-SB07002-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
7	SB/MW07002	GRIFS-SB07002-(WT)MS	Soil	TBD	TBD	DPT	New	Matrix Spike
7	SB/MW07002	GRIFS-SB07002-(WT)MSD	Soil	TBD	TBD	DPT	New	Matrix Spike Duplicate
7	SB/MW07002	GRIFS-MW07002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB/MW07003	GRIFS-SB07003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07003	GRIFS-SB07003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07003	GRIFS-SB07003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07003	GRIFS-MW07003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB/MW07004	GRIFS-SB07004-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07004	GRIFS-SB07004-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soil near waste UST
7	SB/MW07004	GRIFS-SB07004-	Soil	TBD	TBD	DPT	New	Assess PFC presence in soil

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		(WT)						near waste UST
7	SB/MW07004	GRIFS-MW07004-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater near UST
7	SB07005	GRIFS-SB07005-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07005	GRIFS-SB07005-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07006	GRIFS-SB07006-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07006	GRIFS-SB07006-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07006	GRIFS-SB07006-(3-5)FD	Soil	3	5	DPT	New	Field duplicate
7	SB07007	GRIFS-SB07007-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils in low spot in grass area
7	SB07007	GRIFS-SB07007-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils in low spot in grass area
7	ST/SD07008	GRIFS-SD07008-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07008	GRIFS-ST07008-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
7	ST/SD07009	GRIFS-SD07009-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07009	GRIFS-ST07009-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
7	ST/SD07010	GRIFS-SD07010-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07010	GRIFS-ST07010-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
7	ST/SD07010	GRIFS-ST07010-MMDDYYFD	Stormwater	NA	NA	Grab	New	Field duplicate
7	ST/SD07011	GRIFS-SD07011-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain
7	ST/SD07011	GRIFS-SD07011-MMDDYYFD	Sediment	0	1	Core sampler	New	Field Duplicate
7	ST/SD07011	GRIFS-ST07011-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain
7	UST07012	GRIFS-UST07012-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste UST
7	UST07013	GRIFS-UST07013-MMDDYY	Aqueous	NA	NA	Grab	New	Assess PFC presence in contents of waste UST
7	UST07013	GRIFS-UST07013-	Aqueous	NA	NA	Grab	New	Field Duplicate

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		MMDDYYFD						
7	UST07013	GRIFS-UST07013-MMDDYYMS	Aqueous	NA	NA	Grab	New	Matrix Spike
7	UST07013	GRIFS-UST07013-MMDDYYMSD	Aqueous	NA	NA	Grab	New	Matrix Spike Duplicate
8	MW08001	GRIFS-MW08001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 08
8	MW08002	GRIFS-MW08002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 08
8	MW08003	GRIFS-MW08003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Area 08
9	SB/MW09001	GRIFS-SB09001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in soils downgradient of leach fields
9	SB/MW09001	GRIFS-SB09001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in soils downgradient of leach fields
9	SB/MW09001	GRIFS-SB09001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in soils downgradient of leach fields
9	SB/MW09001	GRIFS-MW09001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								of leach fields
9	SW/SD09002	GRIFS-SW09002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in the Former Lagoon
9	SW/SD09002	GRIFS-SD09002-MMDDYY	Sediment	NA	NA	Grab	New	Assess PFC presence in sediment in the Former Lagoon
9	SW/SD09003	GRIFS-SW09003-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downgradient from Area 09
9	SW/SD09003	GRIFS-SD09003-MMDDYY	Sediment	NA	NA	Grab	New	Assess PFC presence in sediment downgradient from Area 09
9	AOC9TW-65	GRIFS-AOC9TW-65-MMDDYY	Ground water	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater near septic system
9	WSAMW-4	GRIFS-WSAMW-4-MMDDYY	Ground water	7.1	17.1	Peristaltic	Existing	Assess PFC presence in groundwater downgradient of Area 09
9	AOC9MW-16	GRIFS-AOC9MW-16-MMDDYY	Ground water	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient of Area 09

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
10	SB/MW10001	GRIFS-SB10001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10001	GRIFS-SB10001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10001	GRIFS-SB10001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10001	GRIFS-MW10001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in Area 10 groundwater
10	SB/MW10002	GRIFS-SB10002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10002	GRIFS-SB10002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10002	GRIFS-SB10002-(3-5)FD	Soil	3	5	DPT	New	Field Duplicate
10	SB/MW10002	GRIFS-SB10002-(3-5)MS	Soil	3	5	DPT	New	Matrix Spike
10	SB/MW10002	GRIFS-SB10002-(3-5)MSD	Soil	3	5	DPT	New	Matrix Spike Duplicate
10	SB/MW10002	GRIFS-SB10002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10002	GRIFS-MW10002-	Ground	TBD	TBD	Peristalt	New	Assess PFC presence in Area

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		MMDDYY	water			ic		10 groundwater
10	SB/MW10003	GRIFS-SB10003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10003	GRIFS-SB10003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10003	GRIFS-SB10003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in Area 10 soils
10	SB/MW10003	GRIFS-MW10003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in Area 10 groundwater
10	SW/SD10004	GRIFS-SD10004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in ditch downgradient of Area 10
10	SW/SD10004	GRIFS-SW10004-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in ditch downgradient of Area 10
11	SB/MW11001	GRIFS-SB11001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
11	SB/MW11001	GRIFS-SB11001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
11	SB/MW11001	GRIFS-SB11001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
11	SB/MW11001	GRIFS-MW11001-	Ground	TBD	TBD	Peristalt	New	Assess PFC presence in

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		MMDDYY	water			ic		groundwater
11	SB/MW11002	GRIFS-SB11002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
11	SB/MW11002	GRIFS-SB11002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
11	SB/MW11002	GRIFS-SB11002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
11	SB/MW11002	GRIFS-MW11002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
11	SB/MW11003	GRIFS-SB11003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
11	SB/MW11003	GRIFS-SB11003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
11	SB/MW11003	GRIFS-SB11003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
11	SB/MW11003	GRIFS-SB11003-(WT)FD	Soil	TBD	TBD	DPT	New	Field Duplicate
11	SB/MW11003	GRIFS-SB11003-(WT)MS	Soil	TDD	TBD	DPT	New	Matrix Spike
11	SB/MW11003	GRIFS-SB11003-(WT)MSD	Soil	TBD	TBD	DPT	New	Matrix Spike Duplicate

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
11	SB/MW11003	GRIFS-MW11003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
11	ST/SD11004	GRIFS-SD11004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain system
11	ST/SD11004	GRIFS-ST11004-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain system
11	ST/SD11005	GRIFS-SD11005-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain system
11	ST/SD11005	GRIFS-ST11005-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in water in storm drain system
12 and 13	SW/SD1213001	GRIFS-SD1213001-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment in storm drain
12 and 13	SW/SD1213001	GRIFS-SW1213001-MMDDYY	Stormwater	NA	NA	Grab	Existing	Assess PFC presence in storm water/groundwater in storm drain
12 and 13	SW/SD1213002	GRIFS-SD1213002-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment in storm drain
12 and 13	SW/SD1213002	GRIFS-	Stormw	NA	NA	Grab	Existing	Assess PFC presence in storm

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		SW1213002-MMDDYY	ater					water/groundwater in storm drain
12 and 13	782MW-5	GRIFS-782MW-5-MMDDYY	Ground water	15	25	Peristaltic	Existing	Assess PFC presence in groundwater upgradient from Areas 12 and 13
12 and 13	782MW-3	GRIFS-782MW-3-MMDDYY	Ground water	9	19	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
12 and 13	782MW-3R	GRIFS-782MW-3R-MMDDYY	Ground water	16.6	31.6	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
12 and 13	782VMW-90	GRIFS-782VMW-90-MMDDYY	Ground water	20	30	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
12 and 13	782MW-1	GRIFS-782MW-1-MMDDYY	Ground water	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
14	SB/MW14001	GRIFS-SB14001-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-SB14001-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-SB14001-(3-5)FD	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-SB14001-(3-5)MS	Soil	3	5	DPT	New	Matrix Spike
14	SB/MW14001	GRIFS-SB14001-	Soil	3	5	DPT	New	Matrix Spike Duplicate

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
		(3-5)MSD						
14	SB/MW14001	GRIFS-SB14001-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
14	SB/MW14001	GRIFS-MW14001-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
14	SB/MW14002	GRIFS-SB14002-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
14	SB/MW14002	GRIFS-SB14002-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14002	GRIFS-SB14002-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
14	SB/MW14002	GRIFS-MW14002-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater
14	SB/MW14003	GRIFS-SB14003-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in source area soils
14	SB/MW14003	GRIFS-SB14003-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in source area soils
14	SB/MW14003	GRIFS-SB14003-(WT)	Soil	TBD	TBD	DPT	New	Assess PFC presence in source area soils
14	SB/MW14003	GRIFS-MW14003-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
14	SB/MW14003	GRIFS-MW14003-MMDDYYFD	Ground water	TBD	TBD	Peristaltic	New	Field duplicate
14	SB/MW14003	GRIFS-MW14003-MMDDYYMS	Ground water	TBD	TBD	Peristaltic	New	Matrix spike
14	SB/MW14003	GRIFS-MW14003-MMDDYYMSD	Ground water	TBD	TBD	Peristaltic	New	Matrix spike duplicate
14	MW14004	GRIFS-MW14004-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Holding Ponds at Area 14
14	MW14005	GRIFS-MW14005-MMDDYY	Ground water	TBD	TBD	Peristaltic	New	Assess PFC presence in groundwater downgradient of Dry Pond at Area 14
14	SB14006	GRIFS-SB14006-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Holding Pond soils
14	SB14006	GRIFS-SB14006-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Holding Pond soils
14	SB14006	GRIFS-SB14006-(3-5)FD	Soil	3	5	DPT	New	Field duplicate
14	SB14007	GRIFS-SB14007-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Holding Pond soils
14	SB14007	GRIFS-SB14007-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Holding Pond soils

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
14	SB14008	GRIFS-SB14008-(0-1)	Soil	0	1	DPT	New	Assess PFC presence in Dry Pond soils
14	SB14008	GRIFS-SB14008-(3-5)	Soil	3	5	DPT	New	Assess PFC presence in Dry Pond soils
16	SW/SD16001	GRIFS-SD16001-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment upgradient from the Installation
16	SW/SD16001	GRIFS-SW16001-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water upgradient from the Installation
16	SW/SD16002	GRIFS-SD16002-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment downstream from Landfill 1
16	SW/SD16002	GRIFS-SW16002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downstream from Landfill 1
16	ST/SD16003	GRIFS-SD16003-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment at junction of flight line swale and Six Mile Creek
16	ST/SD16003	GRIFS-ST16003-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in stormwater at storm drain

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
								outlet to Six Mile Creek
16	SW/SD16004	GRIFS-SD16004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in Six Mile Creek at downstream base boundary
16	SW/SD16004	GRIFS-SW16004-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water in Six Mile Creek at downstream base boundary
16	SW/SD16004	GRIFS-SW16004-MMDDYYFD	Surface Water	NA	NA	Grab	New	Field Duplicate
16	SW/SD16004	GRIFS-SW16004-MMDDYYMS	Surface Water	NA	NA	Grab	New	Matrix Spike
16	SW/SD16004	GRIFS-SW16004-MMDDYYMSD	Surface Water	NA	NA	Grab	New	Matrix Spike Duplicate
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYY	Ground water	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYYFD	Ground water	NA	NA	Peristaltic	Existing	Field Duplicate
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYYMS	Ground water	NA	NA	Peristaltic	Existing	Matrix Spike
18	LF1MW-11	GRIFS-LF1MW-11-MMDDYYMSD	Ground water	NA	NA	Peristaltic	Existing	Matrix Spike Duplicate

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
18	LF1P-2	GRIFS-LF1P-2-MMDDYY	Ground water	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
18	LF1MW-5	GRIFS-LF1MW-5-MMDDYY	Ground water	NA	NA	Peristaltic	Existing	Assess PFC presence in groundwater downgradient
19	SW/SD19001	GRIFS-SD19001-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment at headwater to Three Mile Creek
19	SW/SD19001	GRIFS-SW19001-MMDDYY	Surface Water	NA	NA	Grab	Existing	Assess PFC presence in surface water at headwater to Three Mile Creek
19	SW/SD19002	GRIFS-SD19002-MMDDYY	Sediment	0	1	Core sampler	Existing	Assess PFC presence in sediment in Three Mile Creek at downstream Installation boundary
19	SW/SD19002	GRIFS-SW19002-MMDDYY	Surface Water	NA	NA	Grab	Existing	Assess PFC presence in surface water in Three Mile Creek at downstream Installation boundary
20	ST/SD20001	GRIFS-ST20001-MMDDYY	Stormwater	NA	NA	Grab	New	Assess PFC presence in stormwater/groundwater in storm drain
20	ST/SD20001	GRIFS-SD20001-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment in storm drain

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Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
20	SW/SD20002	GRIFS-SW20002-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water at stormwater outfall
20	SW/SD20002	GRIFS-SD20002-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment at stormwater outfall
20	SW/SD20003	GRIFS-SW20003-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water downstream from Area 20
20	SW/SD20003	GRIFS-SW20003-MMDDYYFD	Surface Water	NA	NA	Grab	New	Field duplicate
20	SW/SD20003	GRIFS-SD20003-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment downstream from Area 20
20	SW/SD20004	GRIFS-SW20004-MMDDYY	Surface Water	NA	NA	Grab	New	Assess PFC presence in surface water upstream from Area 20
20	SW/SD20004	GRIFS-SD20004-MMDDYY	Sediment	0	1	Core sampler	New	Assess PFC presence in sediment upstream from Area 20
20	SW/SD20004	GRIFS-SD20004-MMDDYYFD	Sediment	0	1	Core sampler	New	Filed duplicate

QAPP Worksheet #18-01 thru 20: Sampling Locations and Methods

Area	Location ID	Sample ID	Matrix	Start Depth ft. bgs	End Depth ft. bgs	Method	New or Existing Location	Sample Purpose
20	SW/SD20004	GRIFS-SD20004-MMDDYYMS	Sediment	0	1	Core sampler	New	Matrix spike
20	SW/SD20004	GRIFS-SD20004-MMDDYYMSD	Sediment	0	1	Core sampler	New	Matrix spike duplicate

Notes:

bgs - below ground surface
DPT – direct push technology
FD – Field Duplicate
ft. – feet
FTA – Fire Training Area
GRIFS – Installation Identification
ID – Identification
MMDDYY – Month Day Year
MS – Matrix Spike
MSD – Matrix Spike Duplicate
NA – Not Applicable
PFC – Perfluorinated Compound
TBD – To Be Determined
UST – Underground Storage Tank
WT – Water Table