



DEPARTMENT OF THE AIR FORCE

AIR FORCE CIVIL ENGINEER CENTER
Joint Base McGuire-Dix-Lakehurst

09 June 2021

MEMORANDUM FOR: New York State DEC
ATTN: Jenelle Gaylord
625 Broadway
Albany, NY 12233

FROM: Lindsay Mairs
AFCEC/CZOE
2405 Franklin Drive
Niagara Falls, NY 14304

SUBJECT: *Addendum to Final Site Inspections Report of Fire Fighting Foam Usage at Air Force Research Laboratory-Rome, May 2021, Rome, New York*

1. The Air Force submits the *Addendum to Final Site Inspections Report of Fire Fighting Foam Usage at Air Force Research Laboratory-Rome, May 2021, Rome, New York*, as a courtesy copy for your files. This document describes the perfluorooctane sulfonate/perfluorooctanoic acid (PFOS/PFOA) installation-specific process for identifying and evaluating potential off-base drinking water receptors located downgradient of the installation.
2. The Air Force is recommending no off-base sampling for PFOS/PFOA be conducted at this time at Air Force Research Laboratory-Rome based on a technical determination made by our Subject Matter Experts (SMEs). Specialists in geology, hydrology, and chemical fate and transport contributed to this decision after careful evaluation of available data on these emerging chemicals of concern.
3. A Remedial Investigation is planned for the future, based on risk prioritization and availability of funds, to better characterize site conditions, determine the nature and extent of PFAS impacts, and assess potential for risk to human health and the environment.
4. If you have any questions, please contact me at 716-236-3125 or email lindsay.mairs@us.af.mil.

Lindsay Mairs

Lindsay Mairs
Remedial Project Manager

cc: Melvin Alli, AFCEC/CZRE

FINAL

SITE INSPECTION ADDENDUM

FOR

**AIR FORCE RESEARCH LABORATORY-ROME,
NEW YORK**

Prepared for:

Department of the Air Force

**Air Force Civil Engineer Center
Environmental Restoration Division**



May 2021

Addendum to the Site Inspection Report of Fire Fighting Foam Usage at Air Force Research Laboratory-Rome May 2021

Off-base Drinking Water Well Hydrogeology Analysis and Identification of Potential Pathways for PFOS, PFOA, and PFBS Migration

BLUF

There are perfluorooctanoic acid (PFOA) and/or perfluorooctane sulfonate (PFOS) contaminants present in surface water and shallow groundwater samples within the installation that could migrate off installation at the Air Force Research Laboratory (AFRL)-Rome facility within the former Griffiss Air Force Base (AFB). Multiple areas of former Griffiss AFB also have PFOA and PFOS contaminants present above screening levels and the migration pathways are likely the same as those for AFRL-Rome. There are known potential pathways for surface water or surficial groundwater to migrate off-installation, however, the well survey performed for the former Griffiss AFB PFOA/PFOS assessment showed that there are no drinking water supply wells, downstream or downgradient from the installation. Therefore, off-installation sampling of water wells is not recommended at this time and a focus area was not identified.

PURPOSE/ISSUE

The purpose of this memorandum is to document the findings of a technical review on the hydrogeologic and surface hydrology setting around the AFRL-Rome facility within the former Griffiss AFB for the potential impact of PFOA & PFOS and perfluorobutane sulfonic acid (PFBS) at off-installation drinking water supply wells. A key outcome of the analysis is development of a figure that presents the recommended focus area, if necessary.

RATIONALE/RULES

Groundwater and surface water flow directions are the primary indicators that determine the migration direction of contamination on an installation. Each pathway is evaluated in terms of the location where PFOS/PFOA/PFBS has been identified on the installation, the potential directions that contamination could migrate, and whether or not drinking water wells have been identified off-installation in an area that could be impacted. Drinking water wells as far out as 4 miles downgradient may be highlighted for follow-up evaluation if the wells are screened in a hydrostratigraphic unit that could be connected with groundwater migrating off the installation. Additional evaluation may include activities such as field verification of the presence/absence of drinking water wells and/or sampling of off-installation wells as a supplement to the Site Inspection (SI) which was performed pursuant to CERCLA and the NCP.

OFF-INSTALLATION WELL INVENTORY

In support of the PFOA/PFOS/PFBS SI effort, the Air Force team has accessed available electronic databases and records for information related to drinking water wells in the vicinity of each installation. State and sometimes local entities have the responsibility for maintaining records on the installed drinking water wells. The degree of accuracy for the drinking water well information varies on an area-by-area basis. As a result, recommendations for additional evaluation may be made on the basis of the potential for drinking water wells

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to be present. Field verification will be necessary in all recommended focus areas before the need for sampling can be determined.

ANALYSIS

Of the AFFF areas investigated as part of the former Griffiss AFB SI, 4 are potentially associated with AFRL-Rome. Thirteen out of the former Griffiss AFB AFFF areas had PFOS/PFOA and PFOS+PFOA in groundwater at concentrations above screening levels (Figure 1). This includes AFFF Area 7 (Building 101), and the outfalls to Three Mile Creek (AFFF Area 19), Rainbow Creek Ditch, and Six Mile Creek (AFFF Area 16). Potential pathway analysis for off-installation transport is provided in the following sections.

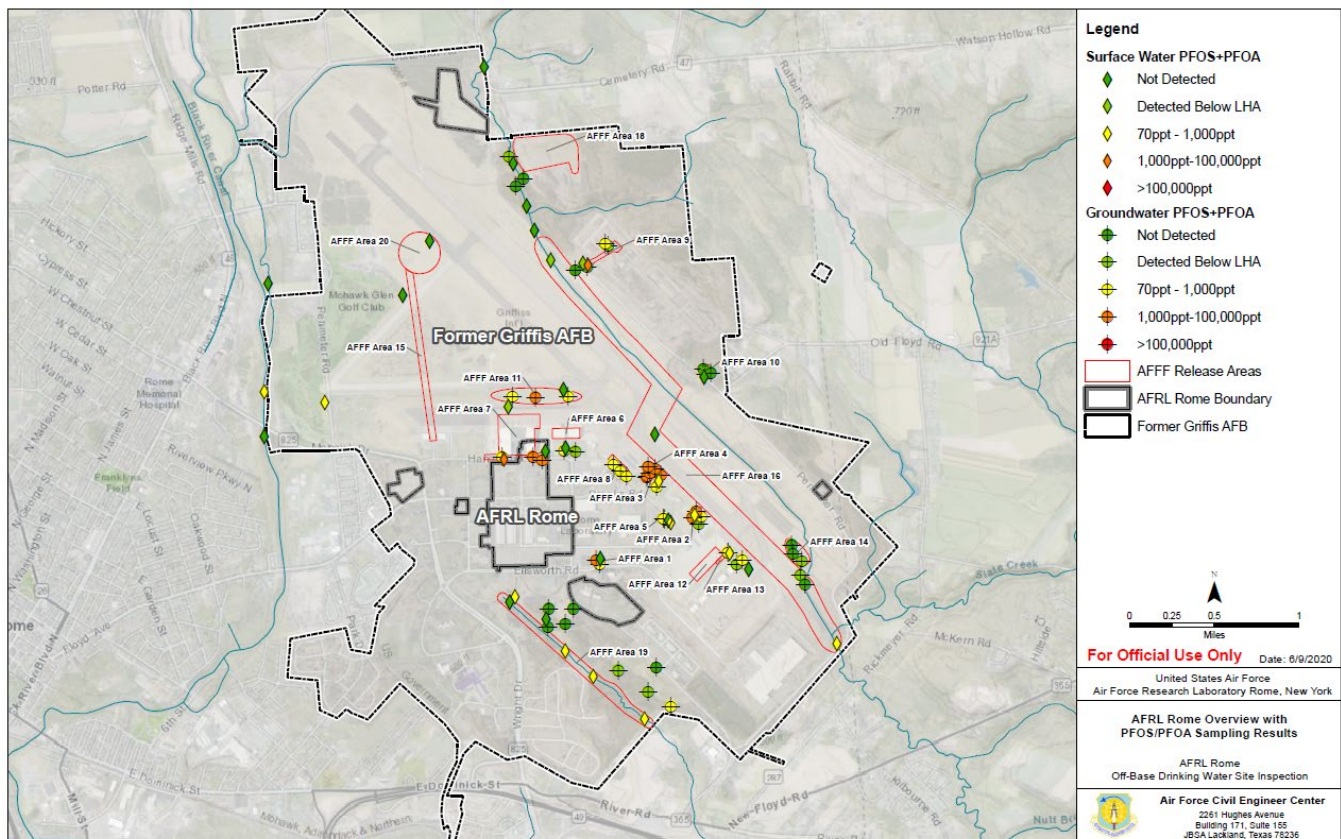


Figure 1: Area Map with AFFF Release Areas at Former Griffiss AFB and AFRL-Rome

Surface Hydrology: The majority of the former Griffiss AFB and all of AFRL-Rome installation boundaries are within the Mohawk River Basin. The northwest portion of the former Griffiss AFB lies within the Black River Watershed. There are three surface water features associated with former Griffiss AFB: (1) Six Mile Creek on the eastern portion of the installation, (2) Three Mile Creek to the south central portion; and (3) the Mohawk River to the west along the western installation boundary. These creeks are not directly adjacent to the AFRL-Rome Facility. However, surface water drainage from AFRL-Rome could be expected to reach the creeks via a culvert which then flows west to an outfall at the Mohawk River. Both Six Mile and Three Mile Creeks flow southward and ultimately drains into the Erie Canal, located approximately 1.3 miles south of the AFRL-Rome Facility (Figure 2). Storm drain culverts route runoff to the south for a large part of the former Griffiss AFB

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property. This includes the AFRL-Rome facility and Building 101 (AFF Area 7). Stormwater is carried through an open channel at Rainbow Creek Ditch and to outfalls at Three Mile Creek and Six Mile Creek.

Stormwater samples collected from the stormwater catch basin south of Building 101 had PFOS/PFOA concentrations above screening levels. Drainage from the area is routed toward and discharges into Three Mile Creek. Surface water sampled from Three Mile Creek at AFF Area 19 also had concentrations of PFOS and PFOA above screening levels. Considering the surface water flow paths (Figure 2), there is a potential pathway for surface water runoff from the installation to reach surface water bodies downstream. Additionally, the review of the well inventory indicates that there may be drinking water wells Nine Mile Creek within 4-miles of the facility. There is the possibility that shallow wells in close proximity to the surface water feature could draw the surface water into groundwater. However, the field investigation conducted for the PFOS/PFOA evaluation at former Griffiss AFB determined that there were no wells used for drinking water purposes within 4 miles of the installation boundary.

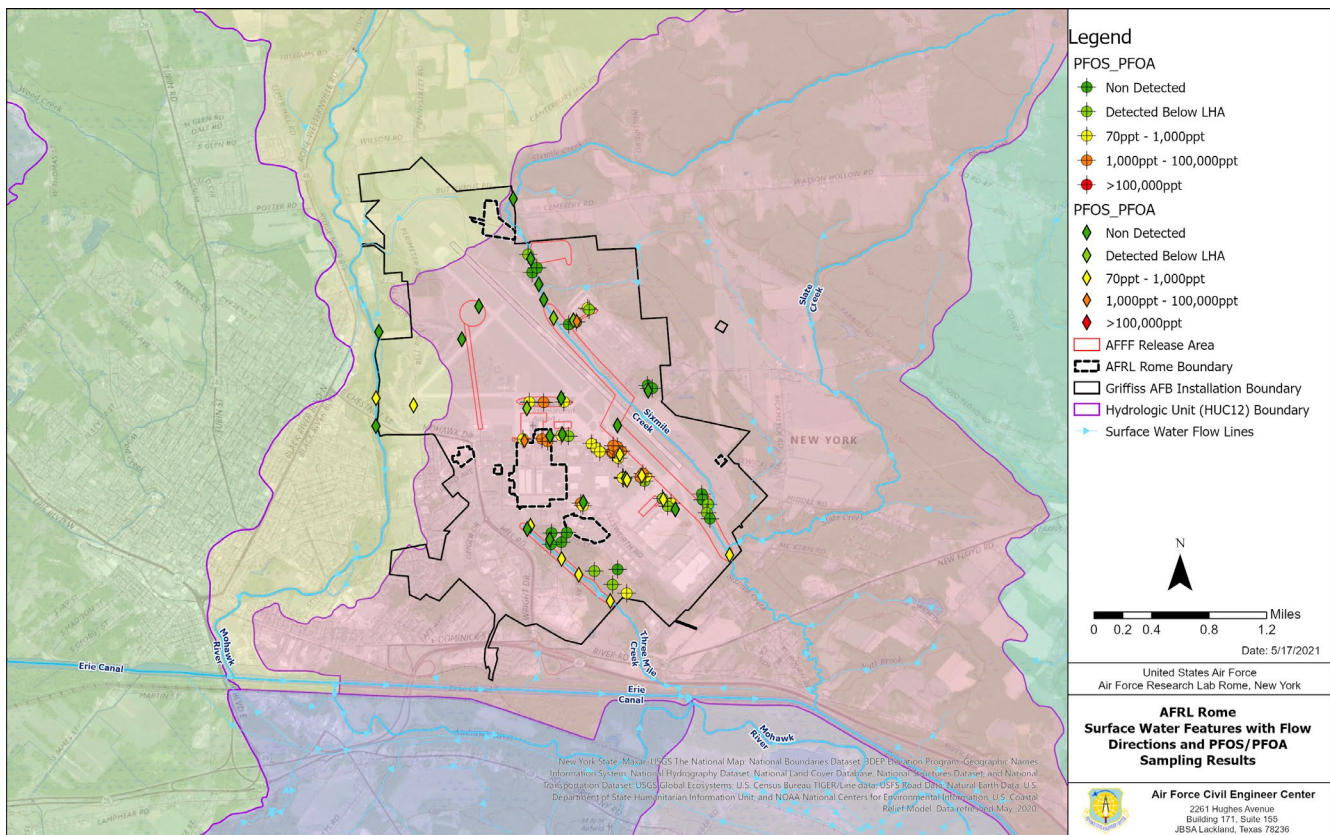


Figure 2. Hydrogeologic Map with Surface Water Directions at AFRL-Rome

Hydrogeology: The installation overlies: (1) glacial deposits of clay, silt, sand and gravel to a depth of approximately 130 feet (ft) below ground surface (bgs) in the southern portion of the installation; and (2) the underlying Utica Shale bedrock formations consisting of a black and gray, carbonaceous, slightly fissile to highly fossiliferous shales that occur to a depth of over 9,000 ft bgs.

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The surficial geology in the area of the facility includes deposits from glacial, fluvial, and lacustrine environments. Sand and gravel are abundant with only minor amounts of clay (Figure 3). Groundwater within the area is in an unconfined aquifer. The coarse-grained sands and gravel mean the unit is highly transmissive and there is no indication of zones that would significantly inhibit contaminant transport. The depth to groundwater ranges from 2 – 24 ft bgs across the area and the surficial aquifer flows in a south-east direction toward discharge points in the Mohawk River and the New York State Barge Canal (i.e., Eerie Canal). In the central portion of the former Griffiss AFB, there is a groundwater flow divide, resulting in local groundwater flow direction in the vicinity of the AFRL facility flows toward Three Mile Creek and Six Mile Creek (Figure 4).

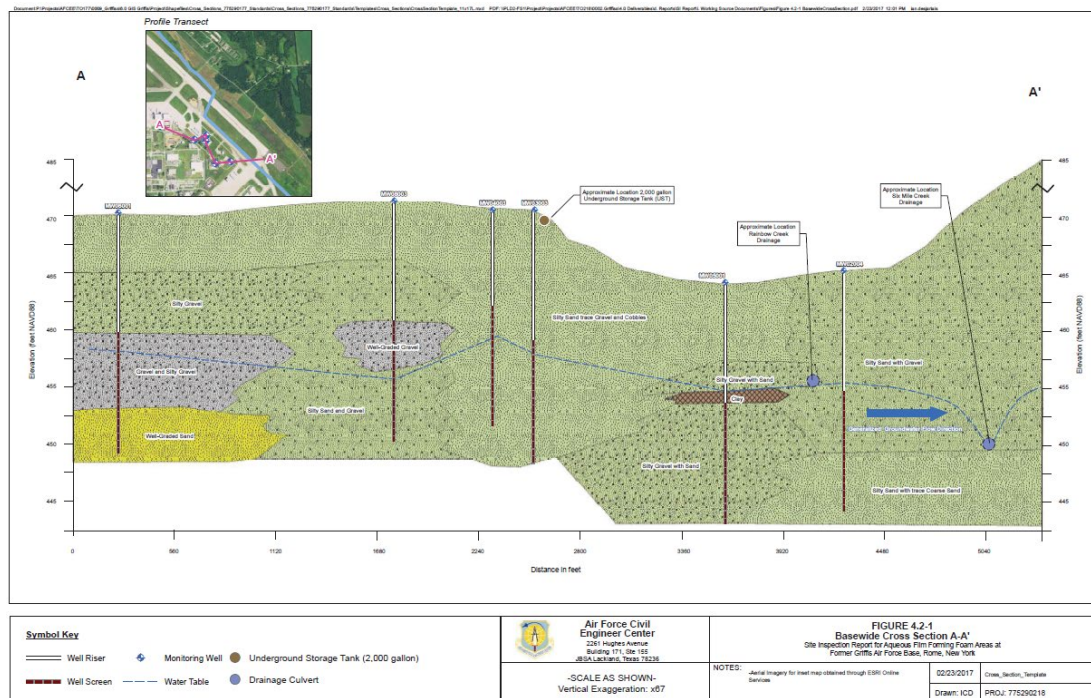


Figure 3. Cross-sectional Map at AFRL-Rome

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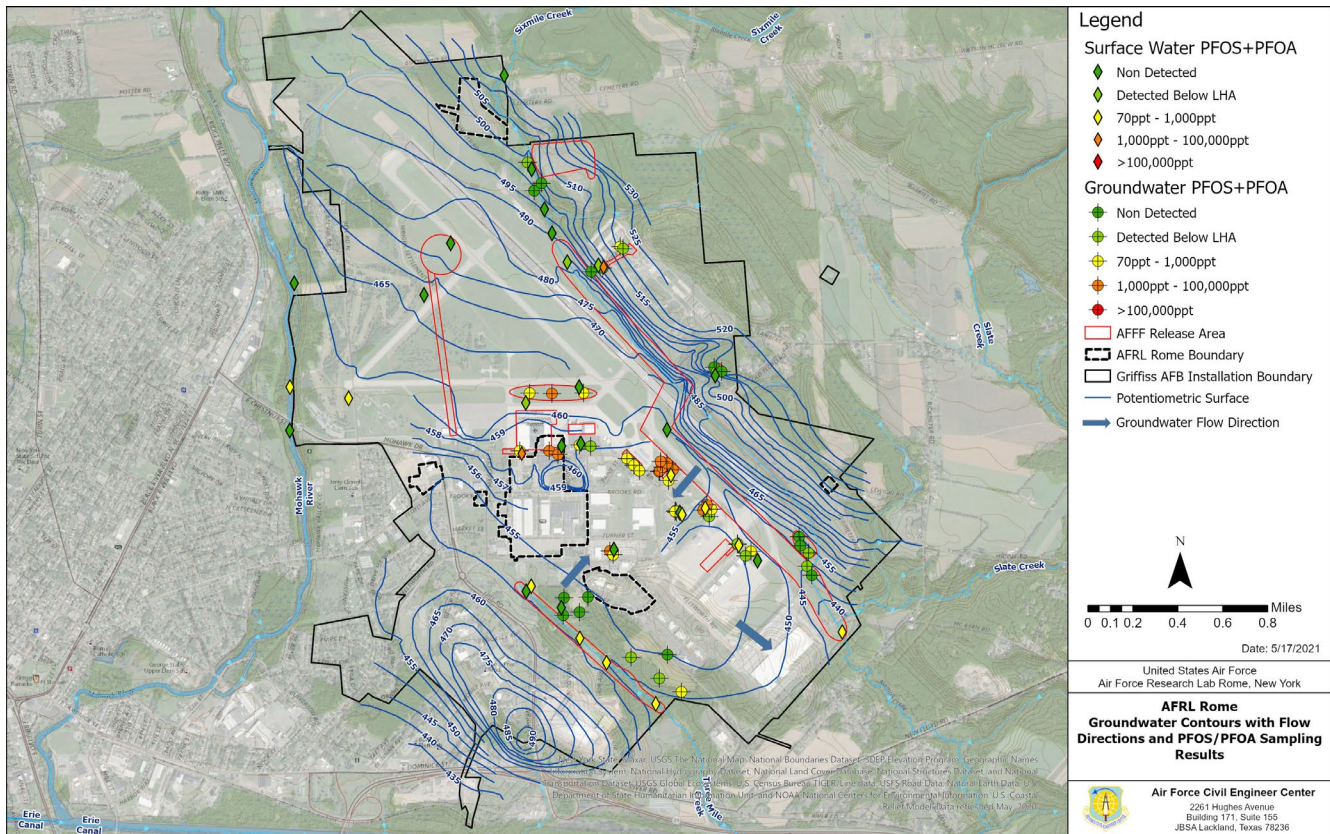


Figure 4. Surficial Groundwater Flow Direction Map at AFRL-Rome

AFFF Area 7 (Building 101), shown on Figure 1, was found to have PFOS and PFOA at concentrations higher than the screening levels in groundwater. As mentioned previously groundwater flow direction in the vicinity of the AFRL facility is to the southeast. A review of the well inventory found that there are a number of wells present in the area downgradient from AFRL-Rome (Figure 5). While a substantial water feature, the Erie Canal located to the south will not likely act as a hydraulic barriers to prevent from PFOS/PFOA contaminated groundwater migration since it is not deep enough to intercept the entire surficial aquifer. As a result, there is a potential pathway for groundwater to reach wells in off-installation areas if the wells are screened within the surficial glacial and lacustrine hydrostratigraphic units.

The potential presence of drinking water wells was evaluated for the PFOS/PFOA investigation conducted for former Griffiss AFB. The field investigation determined that although there are wells present, none are used as a drinking water supply within an area 4 miles to the southwest of AFRL Rome. Drinking water for the entire area is supplied by the City of Rome from Fish Creek and Tagasoke Reservoir 20 miles north of the city.

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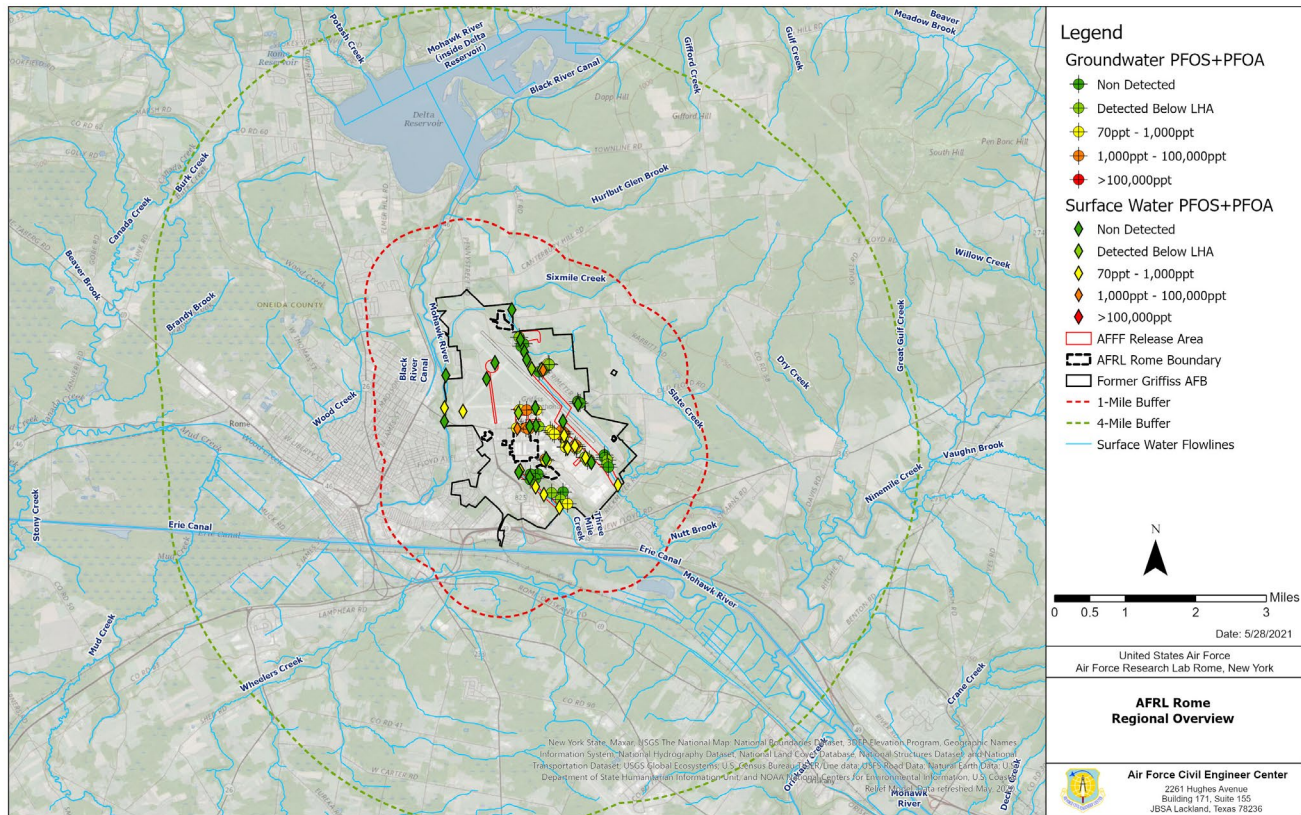


Figure 5. Regional Overview AFRL-Rome
(red line indicates a 1-mile radius and green line is the 4-mile radius from the installation boundary)

CONCLUSION/FINDINGS

PFOS/PFOA contamination is present in shallow groundwater at concentrations above screening levels as well as in surface water at the former Griffiss AFB installation boundary and within the AFRL-Rome facility. Potential pathways were evaluated for surface water and groundwater that could migrate off-installation and impact off-installation drinking water wells. Based on the well inventory review, wells in off-installation areas are present downstream (surface water) and downgradient (groundwater) to the south/southeast of the installation along the flow paths. Evaluation of these wells during the PFOS/PFOA assessment for Former Griffiss AFB determined that the wells were not used as drinking water supplies.

The AFRL facility and surrounding area relies on water supplied by the City of Rome from Fish Creek and Tagasoke Reservoir 20 miles north of the city. There is not currently a pathway for surface water or surficial groundwater to potentially reach off-installation drinking water wells. As a result, assessment of off-installation drinking water sources for PFOS, PFOA, and PFBS due to releases at AFRL-Rome is not recommended and a focus area was not developed.