# PUBLIC HEALTH ASSESSMENT

GRIFFISS AIR FORCE BASE
ROME, ONEIDA COUNTY, NEW YORK
CERCLIS NO. NY4571924451

*September 9, 1996*

Prepared by:

Navy/Air Force Section
Federal Facilities Assessment Branch
Division of Health Assessment and Consultation
Agency for Toxic Substances and Disease Registry

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## ROME, ONEIDA COUNTY, NEW YORK

## SUMMARY

This public health assessment addendum addresses the two public health issues identified at Griffiss Air Force Base by the Agency for Toxic Substances and Disease Registry (ATSDR): 1) exposures to contaminated fish from Three Mile and Six Mile Creeks, and 2) past exposures to contaminated groundwater through private wells off base. Selection of these issues was based on review of environmental sampling data, observations from ATSDR's site visits, and meetings and discussions with Air Force, New York State Department of Health (NYSDOH), and New York State Department of Environmental Conservation (NYSDEC) personnel.

**POTENTIAL PUBLIC HEALTH HAZARD: Frequent consumption of contaminated fish from Three Mile and Six Mile Creeks could pose a health problem. However, if NYSDOH fish consumption guidelines are followed, fish consumption should not present a public health hazard.**

ATSDR evaluated sampling data for fish collected from Three and Six Mile Creeks. If NYSDOH fish advisory guidelines are followed, the health risk from eating contaminated fish is minimized. For Three Mile Creek, the advisory states that women of childbearing age, infants, and children less than 15 years old should not eat any fish from Three Mile Creek. Others should not consume white suckers (one-half pound meals) more frequently than once a month due to PCB contamination. Other fish species should not be eaten more than once per week (one-half pound meals). For Six Mile Creek, the general fish consumption advisory for all freshwaters of New York State applies: no one should eat more than one one-half pound fish meal (any species) per week.[1]

**INDETERMINANT PUBLIC HEALTH HAZARD: ATSDR cannot evaluate exposures to contaminated groundwater through private well use prior to 1982 because there are no sampling data.**

There are no private well sampling data prior to 1982. Since the contaminant concentrations and length of exposure are unknown, and a definitive groundwater contamination source has not been identified, ATSDR cannot evaluate exposures prior to this time.

Based on private well sampling results from the 1980s and early 1990s, the Air Force and public health officials believed that people living in areas east and southeast of the base were being exposed to

contaminated groundwater (primarily glycols). In response, the Air Force provided over 900 residences in the areas north, east, and southeast of the base with either bottled water or carbon filtration systems in 1990. Additional investigations of this apparent widespread groundwater contamination showed there were few contaminated wells; approximately 15 wells south-southeast of the base had contaminant levels exceeding current ATSDR health guidelines. Based on further evaluation of those 15 wells, ATSDR has determined that exposures to contaminated drinking water between 1982-1990 did not pose a health hazard.

ATSDR initially planned to conduct a disease and symptom prevalence study and community education about exposures (Griffiss Air Force Base Public Health Assessment - Initial Release, April 5, 1993). However, because some of the initial data have been determined to be invalid and all valid glycol data are below health guidelines, the study and educational activities are not necessary and will not be performed.

People currently using private well water for non-drinking purposes (e.g., watering lawns and washing cars) can continue to do so safely.

## BACKGROUND

A. Site Description and History

Griffiss Air Force Base (Griffiss) is a 3,900 acre former Air Combat Command (ACC) installation approximately two miles northeast of the City of Rome, Oneida County, New York (Figure 1). The base was opened on February 1, 1942 as the Rome Air Depot. During World War II, the Rome Air Depot served as a staging area for aircraft bound for the European theater of operations, and several research functions were begun at the base during this time. Following World War II the depot mission ceased, however the research functions continued and were expanded. During the 1950s, the Strategic Air Command (SAC) became the host command and stationed long range bombers and refueling aircraft at Griffiss. Many tenant units have been located at Griffiss since the 1950s. Until September 30, 1995, the host unit at the base was the 416th Bombardment Wing, responsible for providing long range combat air power on a global scale. Current tenant units include the 485th Engineering Installation Group (responsible for providing communications systems installation worldwide), the Northeast Air Defense Sector (responsible for continental air defense in the northeastern United States), and the Rome Laboratory (an Air Force research and development organization). Until September 1994, the 509th Air Refueling Squadron was located at Griffiss and its tankers were tasked with air refueling operations worldwide.

As part of the 1990 Base Realignment and Closure (BRAC) Act, Griffiss was selected for realignment during the third round of the BRAC process in July 1993. The realignment of Griffiss became public law when the President and the Congress approved the third round of base closures and realignments in 1993. This process was completed September 30, 1995. The 416th Bombardment Wing was deactivated and Griffiss ceased functioning as an Air Force base. Several of the tenant organizations continue to

function as "stand alone" entities, with the majority of the base property turned over to the Air Force Base Conversion Agency. This agency will assist local developmental authorities in turning over this base property to private organizations and businesses. The Agency for Toxic Substances and Disease Registry (ATSDR) considered future land use when evaluating exposure situations in this public health assessment.

Past waste disposal and storage practices at the base have resulted in environmental contamination at multiple sites. In 1981, the Air Force initiated its Installation Restoration Program (IRP) to identify, investigate, and cleanup hazardous waste contamination from past operations and activities at federal facilities.

Through the IRP program, 54 potentially contaminated sites on base have been identified. The site identification codes and names are listed in Table 1 and the locations are shown in Figure 2. Of the 54 sites, 31 are designated as Areas of Concern (AOC) and are being investigated and remediated under the Federal Facilities Agreement between the Air Force, the Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation (NYSDEC). The other 23 sites are either being investigated (e.g., confirmatory sampling), have had or will have a removal action, or have been determined to require no further action.[2]

Figure 1.

Figure 2.

The Air Force is proposing to remove 15 of the 54 sites from the IRP program because those 15 sites have been investigated and/or had a remedial action. However, removal from the IRP is contingent upon approval by the EPA and the NYSDEC. If removed from the IRP, no future remedial actions will be taken at the 15 sites, although long-term monitoring may be required.

The Air Force has taken numerous actions to clean up and control the areas of contamination on base and to reduce contaminant migration. Base realignment will not affect ongoing IRP activities. A detailed discussion of IRP data and actions are provided in the Air Force's IRP documents maintained at the

Jervis Public Library in Rome, New York. IRP data are also maintained in the Air Force Base Conversion Agency Operating Location Environmental Management Office located on base. IRP data are available for public review.

B. ATSDR Involvement

On July 22, 1987, Griffiss was placed on the EPA's National Priorities List (NPL). The NPL is a list of hazardous waste sites in the nation slated for cleanup. ATSDR is mandated to conduct a public health assessment at each site proposed or listed on the NPL.

In June 1988, ATSDR issued a public health assessment for Griffiss (Appendix A). That initial evaluation concluded that Griffiss posed a potential public health concern (see Public Health Hazard Conclusion Categories - Appendix B) because of the risk to human health that could result from possible future exposure to hazardous substances at levels that may result in adverse health effects over time. Since the release of that public health assessment, new environmental data have become available that warrant an addendum to the document. The contents and conclusions in this addendum supersede those in the 1988 Griffiss AFB Public Health Assessment.

ATSDR identifies ways people have been, are, or could be exposed to contaminants (pathways of exposure) and determines if any exposures are of public health concern. Based on observations made during a tour of Griffiss, the IRP sites, and surrounding communities, and discussions with Air Force, New York State Department of Health (NYSDOH), and New York State Department of Environmental Conservation (NYSDEC) personnel, ATSDR identified five potential pathways of exposure. Data and information in IRP and other documents (e.g., U.S. Army Corps of Engineers and NYSDOH data) pertinent to the five identified exposure pathways were reviewed by ATSDR. We determined that two pathways required further evaluation: 1) exposures to contaminated fish from Three Mile Creek (IRP site SD-31) and Six Mile Creek (SD-32), and 2) past exposures to contaminated groundwater through private wells off base (SD-43).

The other IRP sites do not present public health hazards because contaminant levels are not high enough to pose a health hazard, they have already been remediated (cleaned up), or they are scheduled to be remediated before being turned over to private organizations and businesses.

**Table 1 - Installation Restoration Program Sites**[2]

| Current Site ID | Site Name |
|---|---|
| LF-01 | Landfill 1 |
| LF-02 | Landfills 2 and 3 |
| LF-03 | Landfill 7 |
| ST-04 | Bulk Fuel Storage Area (Barge Canal) |

| | |
|---|---|
| SS-05 | Lindane Spill at Former Entomology Storage Shed |
| ST-06 | Building 101 Yellow Submarine and Disposal Pit |
| LF-07 | Landfill 5 |
| SS-08 | Building 112 PCB Spills, USTs, and Lab Dry Well |
| LF-09 | Landfill 6 |
| DP-11 | Building 3 Drywell |
| DP-12 | Building 301 Former Entomology Shop Drywell |
| DP-13 | Building 255 Two Drywells |
| DP-15 | Building 219 Drywell |
| SS-16 | Floyd Annex Asbestos, Drywells, PCB/Fuel Spills |
| SS-17 | Lot 69 Former Hazardous Waste Storage Area |
| SS-18 | Building 101 Waste Oil Storage Area |
| SS-20 | Tank Farms 1 and 3 |
| ST-21 | Building 210 Former UST Site |
| DP-22 | Building 222 Battery Acid Disposal Pit |
| SS-23 | Building 20 Locomotive Storage Facility |
| SS-24 | Fire Demonstration Area |
| SS-25 | T-9 Storage Area |
| ST-26 | Building 43 Refueling Station |
| LF-28 | Landfill 4 |
| FT-30 | Fire Protection Training Area |
| SD-31 | Three Mile Creek |
| SD-32 | Six Mile Creek and Weapons Storage Area Lagoon |
| SS-33 | Proposed Coal Storage Yard |
| SS-34 | Building 786 (Nosedock 5) Soil Contamination |
| ST-35 | Building 26 Former Pumping Station |
| ST-36 | Building 110 Aqua Refueling System |
| ST-37 | Building 771 Pumphouse 5 |
| SS-38 | Building 775 Pumphouse 3 TCE Contamination |
| ST-39 | Building 117 Former Steam Plant |
| SS-40 | Weapons Storage Area |
| SD-41 | Building 782 Nose Docks 1 and 2 |
| SD-43 | Off-Base Groundwater Contamination |
| SS-44 | Electrical Power Substation |
| SS-45 | Industrial Soils Collection Pad |
| SS-46 | Glycol Storage/Use Areas |
| SD-47 | Buildings 215 and 216 Oil/Water Separator |
| FT-48 | Suspected Fire Training Area |
| LF-49 | Hardfill Areas |
| SD-50 | Building 214 Former Vehicle Shop Oil/Water Separator |
| ST-51 | Building 100 Fuel Hydrant System |
| SD-52 | On-Base Groundwater Contamination |
| ST-53 | Building 133 Underground Vault |
| SS-54 | Building 781 Pumphouse |

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# PUBLIC HEALTH ASSESSMENT

## GRIFFISS AIR FORCE BASE
## ROME, ONEIDA COUNTY, NEW YORK

## PUBLIC HEALTH ISSUES

(An evaluation of environmental data, exposure pathways, demographics, land, and natural resources information, and public health implications)

### A. Introduction

ATSDR's public health assessments focus on human exposure to contaminants. Chemical contaminants disposed of or released into the environment at Griffiss have the potential to cause adverse health effects; however, a contaminant release does not always result in an exposure. People can only be exposed to a chemical if they come into contact with the chemical. Exposure may occur by breathing, eating, or drinking a substance containing the contaminant or by skin (dermal) contact with a substance containing the contaminant.

The type and severity of health effects that occur in an individual from contact with a contaminant depend on the exposure concentration (how much), the frequency and/or duration of exposure (how long), the route or pathway of exposure (breathing, eating, drinking, or skin contact), and the multiplicity of exposure (combination of contaminants). Once exposure occurs, characteristics such as age, sex, nutritional status, genetics, life style, and health status of the exposed individual influence how the individual absorbs, distributes, metabolizes, and excretes the contaminant. Together these factors and characteristics determine the health effects that may occur as a result of exposure to a contaminant.

This section discusses the two public health issues identified by ATSDR at Griffiss: 1) exposures to contaminated fish from Three Mile and Six Mile Creeks and 2) past exposures to contaminated groundwater through private wells off base. Recommendations to prevent future exposures are also included. Exposure pathways are summarized in Table 2.[3,4,5]

**Table 2 - Exposure Pathways**

| Pathway Name | Potential Source of Contamination | Environmental Media | Point of Exposure | Route of Exposure | Time of Exposure | Exposed Population | **Comments** |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fish | Landfills 1,2,3,5,6,& 7, coal piles, runway runoff[3,4] | Fish | Fish from Three and Six Mile Creeks | Ingestion | Past Present Future | People who eat fish from Three and Six Mile Creeks (exact number of people cannot be determined, but likely < 50) | The health risks from eating contaminated fish are minimized if NYSDOH fish advisory guidelines are followed. |
| Groundwater | On base: landfills, tanks, dry wells, fire training areas, buried wastes etc.[5] | Groundwater | Contaminated private wells (off base) | Ingestion Inhalation Dermal | Past (length of exposure unknown) | Private well users in areas southeast of base (~45 people) | Exposures prior to 1982 cannot be evaluated. Exposures to contaminated well water (approximately 15 wells southeast of the base had contaminants above ATSDR health guidelines) between 1982-90 do not pose a health hazard. Currently, well water can be used safely for non-drinking purposes. |

**B. POTENTIAL PUBLIC HEALTH HAZARD: Frequent consumption of contaminated fish from Three Mile and Six Mile Creeks could pose a health problem. However, if NYSDOH fish consumption guidelines are followed, fish consumption should not present a public health hazard.**

Three Mile Creek

*Description*

Three Mile Creek is basically a storm-water drainage ditch used by the Air Force to receive runoff from the south side of the base (see Figure 2). The creek originates on base adjacent to the primary electrical substation, flows through the base housing area, and flows south approximately two miles to the New York State Barge Canal where people are known to fish.[3]

Migration of contaminants from several sources on base could have potentially contaminated the creek. The electrical substation was the site of a polychlorinated biphenyl (PCB) spill which resulted in the flow of PCBs into the creek.[2] Landfills 5 and 6 are in the Three Mile Creek watershed and the creek may receive runoff from them.[3] In the past, the creek has received wastes including plating rinse water, oils, solvents, fuel soot, pesticides, and fuels.[2] Contamination sources on base are being remediated to prevent future contaminant migration.

People are allowed to fish in the culvert of this creek on base and off base, but it is not known if this occurs.[4,6] Collection of fish for sampling from these areas suggest there are few fish that are large enough to eat. Because the creek is only up to four feet wide and three feet deep and the fish are small, fishing would probably not be popular. The creek is classified by the NYSDEC as "C" near the base, meaning it is capable of supporting fishing and fish propagation, but is not considered trout waters.

*1988 Fish Sampling Data*

Contamination was detected in whole samples of white suckers from Three Mile Creek downstream of the base during U.S. Fish and Wildlife sampling in 1988.[3] PCBs were detected at a maximum concentration of 4.7 mg/kg and were the only contaminant which exceeded FDA action levels (2.0 mg/kg for PCBs). FDA action levels apply to edible fillets and commercial fishing, neither of which directly apply to the fish data from Three Mile or Six Mile Creek. However, it is one of the few available regulatory guidelines pertaining to consumption of contaminated fish and human health and it is used as a comparison value in this public health assessment when available. PCB exposure doses were also evaluated using the Health Protection Value of 0.05 *u*g/kg/day recommended by the Great Lakes Sport Fish Advisory Task Force.[7] Other health comparison values used in this assessment are derived from additional FDA guidelines and EPA's Region III risk-based concentration for fish.[8]

White suckers were the only species collected. A backpack electroshocking system was used to collect fish at the sampling location. This method immobilizes all fish in the area where electricity is introduced, ensuring a sample truly representative of the fish population present (species and size).

*Fish Advisory*

Based on the PCB concentrations detected, the New York State Department of Health (NYSDOH) issued a fish consumption advisory for Three Mile Creek in 1990.[6] The advisory states that women of childbearing age, infants, and children less than 15 years old should not eat any fish from Three Mile Creek. Others should not eat white suckers (one-half pound meals) more frequently than once a month. Other species should not be eaten more than once per week.[1] Information about this advisory, and other New York state advisories, is provided when fishing licenses are issued. The creek is not posted.

*1993-94 Fish Sampling Data*

The Air Force conducted sampling of fish from four on-base areas of Three Mile Creek in 1993 and 1994.[9] Fish were collected using a backpack electrofishing system. Whole fish composite samples were analyzed for semi-volatile organics, pesticides, PCBs, dioxins, and metals. Out of the two fish species analyzed for contamination, ATSDR focused on white suckers, the species that would most likely be consumed. Creek chubs were also analyzed, but are not considered edible fish.

Lead was detected at a maximum concentration of 4.8 mg/kg in white suckers. Because an FDA action level is not available for lead (which can bioaccumulate in fish), we evaluated lead contamination using the *FDA Guidance Document for Lead in Shellfish*.[10] The results indicate that no adverse health effects are expected as a result of exposure to lead-contaminated white suckers if the NYSDOH fish advisory is followed. PCBs did not exceed the FDA action level.

## Six Mile Creek

### *Description*

Six Mile Creek flows through a rural area before entering the northeast corner of the base near Landfill 1 (see Figure 2). The creek is about 8 feet wide and 3 feet deep upstream of the base.[3] Flood waters are diverted via a canal to the Mohawk River which forms part of the western boundary of the installation. The creek runs the length of the eastern side of the base, flowing underneath the runway for approximately one mile. The creek exits the base and winds through a rural area with houses, bordering some residential properties. Fishing is not allowed in Six Mile Creek on base.

Six Mile Creek flows south from the base into the New York State Barge Canal where fishing occurs. The creek is up to 20 feet wide and 4 feet deep downstream of the base. Six Mile Creek is classified by the NYSDEC as "C(t)" near the base, meaning that it is capable of supporting fish, fish propagation, and is trout waters. As with Three Mile Creek, people are allowed to fish in Six Mile Creek off base, but it is unknown if this occurs.[6] Collection of fish for sampling from this area suggests there are few fish that are large enough to eat, thus fishing would probably not be popular.

Six Mile Creek receives almost all the surface runoff, including runway runoff (which includes glycols used for de-icing aircraft), and storm system drainage from the eastern portion of the base.[2] In the past, runoff and drainage has included oils, solvents, fuel soot, pesticides, and fuels. Leachate from landfills has been reported to have entered the creek.[2] Sources on base which contaminated the creek are being investigated and cleaned up under the IRP to prevent future migration of contaminants.[2]

### *Fish Sampling Data*

In 1988, U.S. Fish and Wildlife analyzed whole fish samples collected from Six Mile Creek off base and did not detect any contaminants above FDA action levels. In 1993-94, the Air Force conducted sampling

of fish from three on-base areas of Six Mile Creek in 1993-94. Fish were collected using a backpack electrofishing system.[9] Whole fish composite samples were analyzed for semi-volatile organics, pesticides, PCBs, dioxins, and metals. Out of the four fish species analyzed for contamination, ATSDR focused on the three that would most likely be consumed: white suckers, brown trout, and brook trout. Creek chubs were also analyzed, but are not considered edible fish.

Mercury was detected in brown trout at a maximum concentration of 1.3 mg/kg.[11] This slightly exceeds the FDA action level of 1 mg/kg for mercury. Dichlorodiphenyldichloroethylene (DDE) was detected at a maximum concentration of 0.37 mg/kg in brown trout.[11] DDE was evaluated and compared to the EPA Region III risk-based concentration for fish. No adverse health effects are expected to result from exposure to mercury and DDE-contaminated fish if the NYSDOH fish consumption guidelines are followed. The general guideline which applies to Six Mile Creek is "eat no more than one meal (one-half pound) per week of fish from the state's freshwaters."[1] No other contaminants in the species likely to be consumed exceeded comparison values for both sampling rounds (1988 and 1993-94). These limited data do not indicate widespread contamination.

## Data Limitations

ATSDR used all available data in this evaluation; however the data had three main limitations:

1) The fish sampled were too small to fillet (the longest was <7 inches in length), thus they would not likely be consumed.

2) Whole body samples (homogenates of the entire fish: bone, muscle, fat, internal organs etc.) were analyzed for chemicals. Whole fish samples may not accurately reflect contaminant concentrations people would be exposed to because people generally do not eat the whole fish.

3) Fish were not collected from areas where people are known to fish. The three species we focused on (those most likely to be consumed) generally do not migrate great distances, thus the fish sampled may not be representative of contamination in areas where fishing actually occurs.

NYSDEC plans to review the data again before deciding if more sampling is necessary.[12,13] The above data limitations should be taken into consideration if further sampling is conducted. NYSDOH staff review new fish sampling data yearly, if available, and will revise their fish consumption advisories as appropriate.[14,15]

## Conclusions and Recommendations

1. The health risk from eating contaminated fish from Three Mile Creek are minimized when NYSDOH fish consumption guidelines for the creek are followed. The advisory states that women of childbearing age, infants, and children less than 15 years old should not eat any fish

from Three Mile Creek. Others should not eat white suckers (one-half pound meals) more frequently than once a month. Other species should not be eaten more than once per week.[1]

2. There is no indication of widespread fish contamination in Six Mile Creek. The health risk from eating contaminated fish are minimized if the NYSDOH fish consumption guideline that applies to all of the state's freshwaters are followed, i.e., eat no more than one 1/2 pound fish meal (any species) per week.[1]

3. If more fish are sampled, edible fillets collected from areas of the creek where people are known to fish should be analyzed.

4. In the past, it is unlikely that people were eating fish often enough to experience adverse health effects from contamination.

**C. INDETERMINANT PUBLIC HEALTH HAZARD: There are no private well sampling data prior to 1982. Therefore, ATSDR cannot evaluate exposures prior to 1982 as to their public health significance.**

*The contaminant concentrations detected in private wells in the 1980s and 1990s in the area southeast of the base would not pose a public health hazard unless exposure to them occurred for approximately 40 years. Thus, exposure between 1982 (when wells were first sampled) and 1990 (when alternate water was supplied) is not expected to pose a public health hazard.*

*People currently using private well water for non-drinking purposes (e.g., watering lawns and washing cars) can continue to do so safely.*

Groundwater Contamination

*Sampling*

Private wells off base were first sampled in 1982 by the NYSDOH in response to citizen's concerns.[16] By June 1990, 133 private wells (mainly east and southeast of the base) had been sampled at least once by the NYSDOH, the Oneida County Health Department, and the Air Force.[17] Most of the wells had a single contaminant present at detectable concentrations. The most frequently detected contaminant was glycol (ethylene and/or propylene glycol), which was detected in 30 wells.[17] However, all glycol concentrations were below the current ATSDR health guideline of 7000 $\mu$g/L. Table 3 provides the contaminants detected above ATSDR health guidelines, the number of wells in which they were detected, the concentrations detected, and the ATSDR comparison values. Figure 3 shows the area were well sampling occurred.

In 1989, the Air Force provided carbon filtration systems to five private home owners because their

wells showed chlorinated solvent contamination. This was done at the request of the NYSDOH.[14] Negotiations with the NYSDOH lead the Air Force to provide bottled water to 940 residences in the areas north, east, and southeast of the base in 1990. This action was undertaken as part of the Air Force's Good Neighbor Policy while the apparent widespread groundwater contamination was investigated further. Additional private well sampling was performed by the U.S. Army Corps of Engineers in the vicinity of Griffiss AFB at the request of the Air Force.[18] In September 1990, the Corps sampled eight private wells for volatile organic compounds (VOCs) and ethylene glycol. Chloroform was the only contaminant detected above current ATSDR health guidelines.

Figure 3.

In January 1991, the Corps sampled 17 private wells for VOCs and 16 of those for ethylene and propylene glycol.[19] Carbon tetrachloride was the only VOC detected above ATSDR health guidelines. All glycols were detected below the current ATSDR health guideline. Sampling results for contaminants which exceeded ATSDR health guidelines are presented in Table 4.

In May 1991, the NYSDOH determined that several laboratories analyzing water samples had obtained a number of inaccurate or invalid results for glycols. The cause of the inconsistent results remains undetermined.[16] These laboratory errors resulted in reporting more wells with contamination than actually were contaminated.[14] Thus, groundwater contamination by glycols was not as widespread as first presumed.

ATSDR compared the concentrations of contaminants detected during the sampling rounds to current ATSDR health comparison values. Approximately 15 wells, the majority of which are southeast of the base, had contaminants exceeding health comparison values. ATSDR evaluated exposures from those wells.

*Potential sources of contamination*

A definitive source of off base groundwater contamination has not been identified. Hydrological data indicate that the general direction of groundwater flow in the vicinity of the base is in a southwesterly direction, towards the confluence of the New York State Barge Canal with the Mohawk River.[20] Groundwater in the south and southeast portion of Griffiss flows toward Six Mile Creek.[20] This area is where the majority of the 15 wells are located.

**Table 3 - Contaminants detected above ATSDR health guidelines in private wells (Data through June 1990)**[21,22,23]

| Contaminant | Number of wells in which contaminant detected (133 wells sampled) | Concentration Range (µg/L) (year max concentration detected in superscript) | ATSDR Comparison Value (µg/L) |
|---|---|---|---|
| nitrogen as nitrate | 3 | 12,000 - 17,000[89] | 10,000-MCL* |
| benzene | 2 | 0.5 - 1.1# | 1-CREG@ |
| tetrachloroethylene (PCE) | 2 | 6.9[89] | 0.7-CREG |
| carbon tetrachloride | 3 | 1.9 - 2.2[87] | 0.3-CREG |
| methylene chloride | 1 | 15[89] | 5-CREG |
| 1,2-dichloroethane | 1 | 1[89] | 0.4-CREG |

* Maximum Contaminant Level
# Date cannot be confirmed
@ Cancer Risk Evaluation Guide

**Table 4--Army Corps of Engineers Sampling (September 1990 and January 1991)**[19]

| Contaminant | Number of wells in which contaminant detected | Concentration Range (µg/L) (year max concentration detected in superscript) | ATSDR Comparison Value (µg/L) |
|---|---|---|---|
| chloroform | 2/8 | ND - 17[90] | 6-CREG |
| carbon tetrachloride | 1/17 | ND - 24[91] | 0.3-CREG |

Exposure Evaluation, Conclusions, and Recommendations

*Past Exposures*

Exposures prior to 1982 cannot be evaluated because there are no data available. Thus, it is not known when the wells were first contaminated. Since the length of exposure and the concentrations are unknown, and a definitive contamination source has not been identified, we cannot evaluate exposures prior to 1982 as to their public health significance.

Exposure to contaminants via ingestion of private well water ceased in 1990 when alternate water was provided by the Air Force as both a precautionary measure and as part of their Good Neighbor policy. ATSDR estimates that 45 people (15 wells with 3 users each[24]) southeast of the base were exposed to VOCs and nitrates at concentrations exceeding ATSDR's health comparison values. ATSDR evaluated the well data collected between 1982-1991. Adverse health effects are unlikely for people who drank water from contaminated wells during this period.

*Current use of private wells*

Based on available sampling data, ATSDR considers current non-drinking uses of private well water (e. g., watering lawns, washing cars) to pose no public health hazard.

Some residents of the houses connected to municipal water lines (installation began the fall of 1991--for details see the Public Health Action Plan) may desire to use their private wells as a drinking water source. Re-use of private wells would require installing separate home plumbing and cross connection prevention equipment to protect the public water supply system.[14] Also, private wells would need to be routinely sampled since contamination has been detected in area wells in the past and a definitive source has not been identified.

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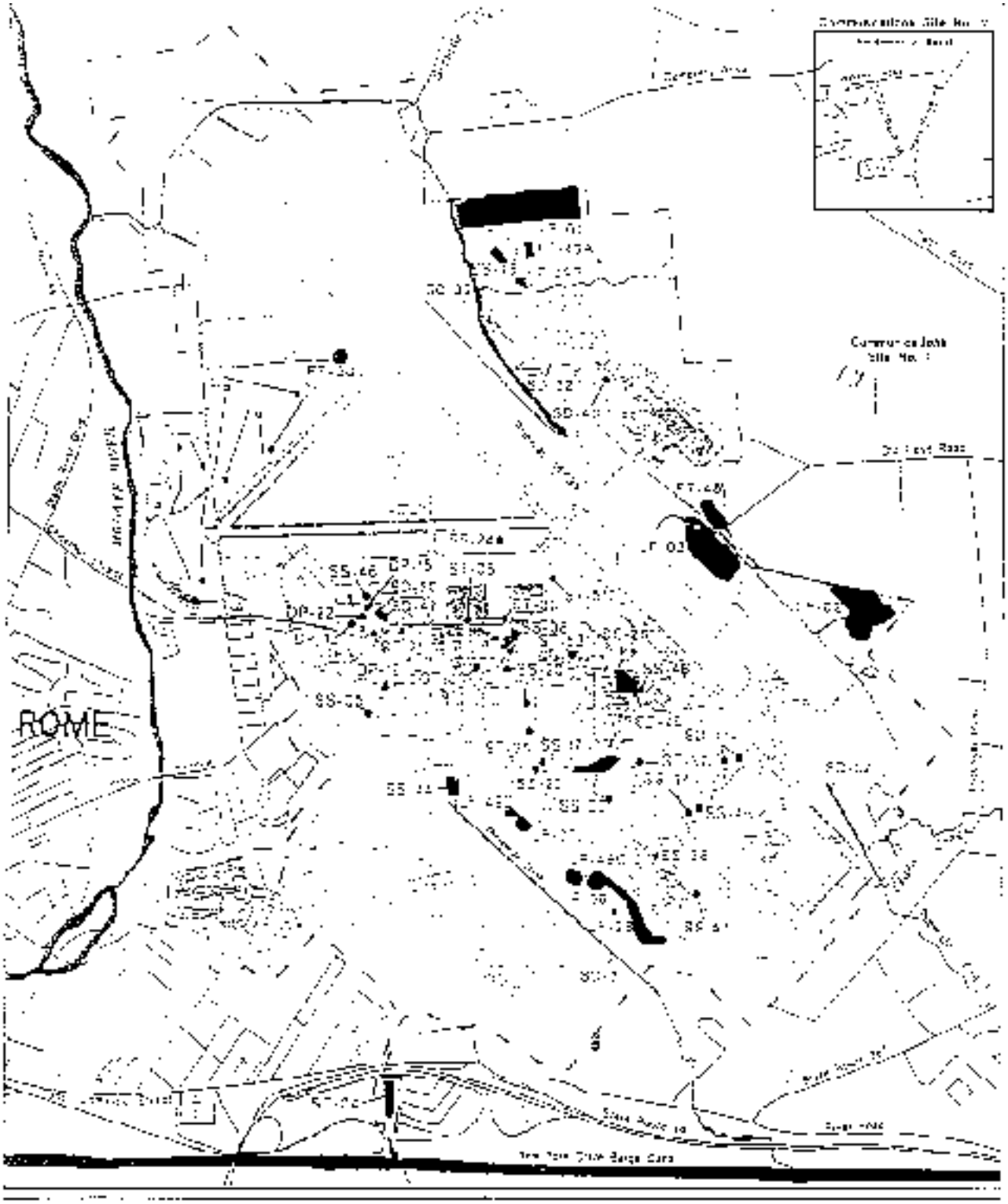


Location of
IRP Sites

Figure 2

Griffiss Air Force Installation
Tetra Tech Inc.

FIGURE 1

# GRIFFISS AFB LOCATION MAP

ROME, NEW YORK